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DESIGN OF A SOCIAL MEDIA MARKETING CAMPAIGN MANAGER

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ABSTRACT

Adil Ilyas: Design of a Social Media Marketing Campaign Manager
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The virtual world of social media has come into existence in recent times. This has created large online communities in which users make social contacts. Users stay in touch with their friends, stay updated with the latest news around them and, they get to hear about the latest product launches/services around them. This creates a big and effective opportunity for businesses, weather they are big or small, to market their products or services to this huge audience. Digital marketers provide services from large business to small business owners to market their products/services in these virtual communities. Digital marketers manage many digital marketing campaigns in which they set the targeting demographics then direct the advertisement towards the niche audience. Creating the campaigns and then monitoring them to direct them towards the niche audience is a tiresome process. The solution described in this thesis work helps in creating the advertisement campaigns and then automatically optimizing/directing the live campaign towards the niche audience.

This thesis work was done with Whitepoint Oy in which I designed a social media marketing application. The requirements of how this campaign manager should be designed were gathered through interviews with the company people, group discussions and review of websites of similar products. A data scientist was also working with us for the automation of the marketing process and a digital marketer with years of experience in managing digital marketing campaigns for small and big businesses also participated. A user centred design process was adopted to build this platform.

A product was designed and developed using the Facebook Marketing API in which a Facebook marketing campaign can be created in a 4-step process. Creating the marketing campaigns was simplified so that advertisers/users can create many ad sets in a few steps for behavioural/interests targeting. Multiple versions of the ads can be created by just entering some titles, body-texts and images/videos then the algorithm generates all possible combinations. Once the campaign is posted live statistical data about the performance of the campaign is fetched and processed with machine learning to reach the niche audience.

This solution creates a professional campaign that can be tested for results faster. The optimization process in which the advertiser has to continuously monitor his/her campaign to see if it is converting has been automated so the advertiser can manage multiple campaigns without having to worry much about optimizing them.

The originality of this thesis has been checked using the Turnitin Originality Check service.

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1. Introduction

Social media platforms form a virtual world that has come into existence in recent times. In this virtual world people make new social connections and meet new people. Businesses have seen the potential of this online world thus they market their products and services to audiences in this online community. There are millions of people online browsing content for research or for recreation. This gives a great opportunity to market or create awareness of products or services and social media marketing has become an industry worth 380 billion dollars as of the year 2020 [55]. The cost of marketing in comparison to the number of people that can be reached is far less than traditional marketing techniques [29]. Jagyasi, Prem et al. in their article has said the success rate of digital marketing is higher as a far greater number of people can be reached [28]. In traditional methods of marketing advertisers send bulk emails, ring up people for telemarketing, run advertisements on television or radio for creating awareness about their product or service. In contrast to this, digital marketing helps spread information to a large online audience in a short span of time [1]. Digital marketing can provide better return on investment compared to traditional marketing techniques. The results of traditional marketing techniques are difficult to measure. The benefit to online marketing is that results start coming as soon as there is audience engagement with the advertisements.

This study is based on the Facebook marketing partnership program in which many companies around the world have developed their solutions to enhance marketing experience for advertisers. In this work the existing products have been studied to understand how companies have produced algorithms to automate manual work done by digital marketers to target niche audience for getting maximum results. There are existing algorithms that fetch statistics about how marketing campaigns are performing. This data is processed by them and they produce optimization results that are updated back to the Facebook Business manager. Companies have also produced their own version of the Facebook Ads manager putting in for functionality to enhance the user experience for creating advertisement campaigns.

The key thing for getting maximum benefit from online marketing is to target your advertisements towards specific audience that is most likely to engage with your advertisements and buy the product that is advertised [4]. When advertising online, it's essential to optimize the campaign to reach the right niche audience. I will be focusing on Facebook online marketing in this work. Digital marketers create an advertisement campaigns using Facebook Business Manager, a tool provided by Facebook, and then they monitor the performance. Facebook Business Manager is not a very easy to use

application for novice users. The following research questions will be studied in this work to make the process of creating and optimizing campaigns easier.

- a) To what extent can the manual work done by digital marketers be automated?
- b) How can advertising spending be reduced by automating the marketing process?
- c) What would be a good user interface for creating and maintaining Facebook campaigns?

The purpose of this research is to simplify the Facebook advertising campaign optimization work done by digital marketers. In this research I will identify the manual steps digital marketers perform for optimizing the campaigns. I have designed a new interface with which campaign would be easier to make. The campaigns made with the interface are in a format, where they produce results for comparison between different variables. The application can set up multiple versions of an ad set which differ in only the interest/behaviours towards which they are targeted, and then the campaign optimized towards the best performing ad set. Different versions of the advertisements can also be quickly created to identify the version that produces the best results.

This work has been done in the context of WhitePoint Oy, a company which develops a solution for digital marketers. I worked with the CEO of the company, director, product manager, their digital marketer and a professor of data science. I conducted individual interviews with them, and we had group discussions to understand the steps in optimizing an advertisement campaign. After identifying manual processes, brain storming was done to figure out how they can be automated. Professor designed the machine learning automation algorithm and I developed web application integrating his automation algorithm and connecting it to Facebook with the Facebook Marketing API. An online research of competitor products was also conducted by me and the team to understand how other companies are performing optimizations. I analysed the user interface of the Facebook Ads manager and had a look at the user interfaces of competitor products and then designed my own interface for creating new campaigns. After designing the interface for creating new campaigns I designed the user interface for the optimization's module. The design of the user interface for the optimization's module was based upon how the company envisioned campaigns would run automatically. I designed the user interface for the optimization's module according to the methodology of campaign optimization designed by the professor. After the user interfaces were designed, I worked in a full-stack developer role and developed the backend for creating campaigns and

optimizing them. The professor provided a machine learning algorithm that I integrated in the application that I developed.

This thesis consists of seven chapters. Chapter 2 starts with an overview of how advertisements are created on Facebook, the different parts of a Facebook advertisement and the steps to target the niche audience after the advertisement is running live. After an introduction there is a literature review regarding the best practices and techniques of creating advertisements and the steps to optimize running advertisements. Chapter 3 contains the methods how the research was carried out to gather requirements for developing the product. Chapter 4 contains the research findings. Chapter 5 describes the design created in this work. Chapter 6 contains discussion and chapter 7 conclusions which summarise the work and future work recommendations are also given.

2. Social Media Marketing

Social media marketing in different platforms has evolved into complex systems where advertisers can create different campaigns and bid in the platforms so that they can optimized how much money they are using. Targeting the advertisement to the selected demographic is also an important part of marketing. In this literature review section, I will review how effective advertisement is created, how a Facebook campaign is created, the different bidding models in Facebook and effects of demographically targeted and behaviourally targeted advertisements.

In Figure 1, a Facebook advertisement can be seen with its elements' names.

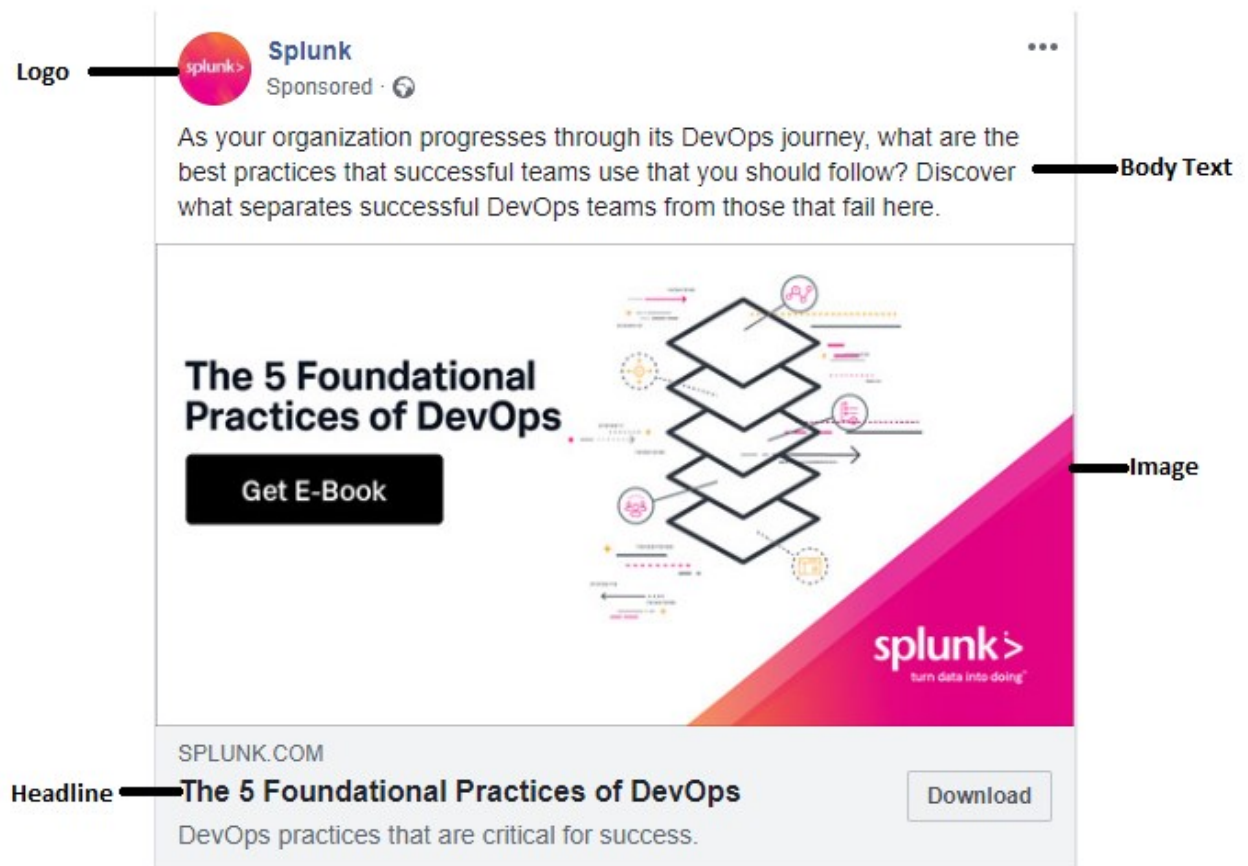


Figure 1: A sample Facebook advertisement

To create an effective advertisement, the brand should be clear, and this is achieved by including company logo image, the headline should support the contents of the image and there should be good supporting text. There are two types of headlines in Facebook advertisement. Literal headline describes in simple and straight forward terms. Sideways headlines are more appealing as they contain a perspective, sense of humour/inside joke, or the headline would be according to the user's personality. The advertisement image

should be gaze catching and should reflect the advertisement headline. The body text should further explain the product or service.

Advertisement quality and other relevance factors are aggregated into the ads relevance score metric which compares how relevant your ad is to the people compared to other ads in the same audience targeting. This quality score is calculated with the positive feedback (e.g. link clicks, video views, App installs) and the negative feedback (e.g. if someone reports the ad as inappropriate). The score is calculated as a range from 1 - 10 with 10 being that your ad is very relevant. [61] When users perform a desired action according to your advertisement, such as making a purchase or clicking, it is called a conversion [30]. There are two auction models on Facebook: the cost per click (CPC) and the Cost per one thousand impressions CPM. In the CPC model the user defines the maximum amount he/she would be willing to pay for a conversion. In the CPM model the advertiser is charged per 1000 impressions regardless of how many times the user has clicked the advertisement. After Facebook campaigns are running live, digital marketers optimize them so they generate the maximum amount of conversions for the least spend amount. Advertisements can be optimized by the click through rate (CTR) so only ads that have a CTR higher than a certain threshold value are retained. [27] The effects of demographically targeting ads according to age, gender, location, occupation and interests are discussed later in the chapter. In a study a group of users were shown normal ads and demographically targeted ads and their gaze patterns on the screen were recorded. The gaze patterns revealed that the users' gaze was significantly going more towards the advertisements that were demographically targeted. [10] Behavioural targeting of ads is also discussed later in the chapter in which the history of pages visited, and the users' search terms are collected. The users are then targeted with the same type of ad as their browsing and search history. Behaviourally targeting the ads causes the click rates to go as high up as 670 percent compared to ads if they are not targeted behaviourally. [12]

In the following section, most of the material comes from chapter 7 *creating killer Facebook Ads* from the book *Killer Facebook Ads: Master Cutting-Edge Facebook Advertising Techniques* by Marty Weintraub. He is the CEO of aimClear a digital marketing agency which has managed over 10 billion impressions for global brands such as Siemens, MarthaStewart.com, Second Life, BudgetDirect.au and more. I consider that

in this book he has comprehensively explained the Facebook advertisement process from creating the ads to optimizing them for best results.

2.1 Creating Facebook Advertisements

2.1.1 Brand Clarity

Clarity of brand is important when advertising your business online and it's about how much the company's brand is revealed online. For brand clarity the company's logo or picture of the companies' products should be displayed. One important thing is that good search keywords should be used to make it easy for potential customers to find the products. Good search keywords are important since when a client is looking for a product or service, the first thing done is searching for it with keywords on search engines with the keywords in mind.

To further explain brand clarity, I take an example of selling baked Alaska fish on behalf of my client on Facebook. The most important thing which grabs the attention of audience on Facebook is the headline of the advertisement, then the picture which supports that headline. The best combination of the headline and the supporting image would get maximum results. If you have for example 4 different images and 3 different headlines, you want to test out which combination of an image and a headline gains maximum response from the audience. For this we must compute the permutation of all images and headlines. Computing the permutation of 4 headlines and 3 images would result in 12 unique combinations. Each combination should be tested to evaluate which combination gets the maximum response.

One thing to be noted here is that having your company's logo which may or may not be well known will not automatically get you a lot of conversions. For getting good response from your audience a good logo for brand clarity in combination with a good headline and body text would grab the attention of online audience. The right balance of these things would result in maximum clicks from the audience. Having a greater number of clicks would result in your advertisements click through rate going up. This would result in more visitors on your external website's landing page or your Facebook business page.

Going deeper into your online marketing pitch on Facebook, the advertisement picture plays an important role. The advertisement picture along with the logo and picture further clarifies the objective if they clearly represent the brand.

Another good approach for advertisers with a mixed reputation is that they should not mention the brand at all. The advertisement should only mention the product that

they are trying to sell and after making the click, when the user goes to their landing page, they discover the company that is trying to sell the product or service.

Another approach would be to tease your online audience before the release of a product or service. The aim of this sort of marketing is not to generate clicks. It just creates awareness and interest and a sense of confusion/suspense before product release. It gives benefit of when there is the release of the product later as audience who have been following or clicking of the pre-release advertisements would engage more with the actual advertisements.

Facebook advertisements should be good and engaging as there is fierce competition in this online marketplace. [27]

2.1.2 Headlines

Headlines on a Facebook advertisement campaign need to be good. Good headlines are required as Facebook is a social platform where friends and other social contacts are posting, and users are emotionally more interested in reading their posts. Online users have a very short attention span when it comes to reading advertisements. In the Facebook desktop environment advertisements can be displayed in the main reading thread as well on the right-side column which is better as the advertisements stay visible longer to catch the user's attention.

Facebook headlines are value statements in a few short lines and in the right words. Headlines should be bound up with the associated images and should be imparting information, leading a perspective, fusing it with humour or other emotions. When writing a headline, it's important to understand what needs to be communicated. This should be done by writing long sentences about what should be communicated. After long sentences have been written and it becomes clearer what needs to be communicated. Next those long sentences should be condensed into a few words. Without doing this there would be a confusion about what needs to be communicated and no clear vision [27]. Headlines highly influence a user's decision to engage with your Advertisement. The headlines set the expectation for everything to come [48]. Most people only read headlines while browsing through Facebook. Headlines should be made to stand out, so your advertisement gets noticed on Facebook. There are many brands competing on

Facebook so your advertisement should be distinguished fast and a headline is the best chance of doing this [49].

The following section describes how headlines should be written for Facebook advertisements:

2.1.3 Literal Headlines

A literal headline communicates what an advertisement is about in simple and straight forward terms. A good example of a literal headline would be a florist offering discount on flowers. An initial supposed headline could go like “Florist offering 20% discount on prom corsages and boutonnieres”. Facebook imposes a 25-character length limit to the headlines, so this headline needs to be shortened to a bite-sized package for using it in the advertisement. The targeted audience for this advertisement would be young boys and girls so the audience will instantaneously know this advertisement is about prom. The headlines need to be written again to make them concise following the platform policies. Short headlines can be created by using formats like “Prom Flowers Saving”, “20% Prom Flowers Discount”, “Prom Flowers 20% Off” and “Prom Flowers 20% Saving”.

The Facebook imposed a 25-character limit to headlines makes them very concise. Digital marketers must A/B test the headlines to see which one works the best. This is done by giving each headline a fair time to run. After running each headline for a fair time marketer see which one produced the most conversions. The headline that has produced the most conversions should be used for further advertising. [27] After the limit of 25-characters Facebook cuts off rest of the characters and replaces them with “...”so the headline should be written short simple and to the point [48]. Headlines should be written clear enough so that anyone outside your industry should be able to understand them. When writing a headline, you should think about your family or close friend and they should understand it with ease. [50]

2.1.4 Sideways Headlines

In contrast to literal headlines, a sideways headline delivers a message that would be appealing to a user. These headlines contain a message that would be appealing to a user’s personality, perspective or sense of humour. They can contain an inside joke that only users of a particular product could understand. The idea behind these headlines is that advertisers would not need to get the whole message across in the headline, rather some catchy words that are enough to grab interest.



Figure 2: Sideways headlines

Figure 2 is an example of a sideways headline which addresses working professionals who have difficulties with working with their professional suite of tools. Having a look at these headlines they would understand that content in these ads would address their existing complicated office tool set and would give options for simpler ones. [27] Headlines should be written in a manner that motivates readers to act on your message. This can be done by using emotionally charged words that cause happiness, fear, excitement, sadness or curiosity. [50] Humans are emotional beings so this can be used as an advantage while writing a headline. Garrett Moon, founder of co Schedule, did an experiment in which he analysed some of the most shared headlines at co Schedule. The analysis was done with Emotional Marketing Value Headline Analyzer which is a free tool for determining the Emotional Marketing Value (EMV) Score which is a technology developed by the Advanced Marketing Institute. In his study he compared the EMV score for three sets of headlines. The headlines were for articles more than 1000 Shares, 500 Shares and 100 Shares respectively. The articles with more than 1000 Shares had an EMV score of 40, with 500 shares the EMV was 30 and with 100 share the EMV close to 20. This reinforces the fact that emotional words in headlines causes the audience to engage more.[49]

2.1.5 Advertisement Images

Advertisement images need to be catchy, as they have to catch the users gaze from a clutter of all other content on Facebook page. Making such an eye-catching image is possible by using colours cleverly, having the right zoom and cropping on the images and other techniques which would enhance the images content.

Secondly, the images need to reflect the advertisement headline, the two should be aligned with each other. As the headlines have the 25-character limit, the full meaning of the advertisement is conveyed in combination with the image. Taking the headline “*Get Ready to Rumble*” gets us a clearer meaning if the advertisement image is of a monster truck or of two hockey players. [27] Time has proven that visuals are what audience wants to see. Visuals are easily remembered and much more likely to be shared. Brightly coloured and artful arrangement of products grab attention. The advertisement images can be added with text that gives a clear value proposition. The value proposition should tell why your offer is better than the rest. Some expert tips for creating images that sell are that if you are selling a product, show people using it. This should be done

as people on Facebook are browsing activities of their friends and showing people using your product mixes it with content in their feed. Faces showing emotions should be shown on ads that are selling a service as such ads receive much more engagement. Creating a sense of urgency in the images by writing text such as “*Limited time offer*” can help people make decision who are already convinced to buy a product/service. The amount of text overlaying the image should be less than 20% just enough to get your point across. [51]

2.1.6 Advertisement Body Text

The body text is important as after reading the headline and seeing the advertisement image the body text closes the deal. This section should further explain the product or service to the user. An emphasis about the benefits and unique qualities of the product or service should be communicated here and it should end with a clear call to action that is encouraging the user to go to the landing page. The body text should be used to provide details about the title and image of the advertisement body. As body texts are advertisements of one’s business, they should answer the following questions:

- Why is your product or service better than competing option in the market?
- What are the problems that your product or service solves?
- You have to think in terms of closing the deal as if you were talking to a real customer. What are the things you would say to close the sales deal?
- Some customer reviews about why they like your product/service.

After the body text, the call to action button should be carefully selected as that leads to the landing page. The available call to action buttons on Facebook are Learn more, Join, Download, Reserve, Enrol, Subscribe, Read More, Contact Us and More buttons. [27] When an ad image is placed it should be in line with the body text. Otherwise the audience would get confused what is actually being advertised [52].

Stelzner in his article has explained having strong visual images and an advertisement body whose writing is below average will cause the advertiser to lose a huge audience that was willing to read more. The body text is an articulation of the attention that has been grabbed.

Some tips for writing the body texts so it grabs the audience’s attention is to focus on the “*Why*”. For example, if you are promoting a webinar it is important to know the current emotional state of your audience and the points they are struggling with. After watching your webinar how will the lives of people improve. Writing it in this manner will effectively increase the interest people show towards your advertisement.

Stelzner has further explained three ways to hook the audience towards your ad which he describes as follows:

The Pain/Benefit hook. In this first the point, pain is described then the benefit is described which would effectively solve the pain that is experienced.

Every group of audience in a market has feelings and influencing people how they feel about themselves is a very powerful way to market. In this feelings-based hook, care should be taken to create a positive feeling in a person and then encouraging them to use your product/service. An example of such an advertisement would be of a health supplement in which they tell that after using this for six months people would be coming up to you and asking what have you been doing? You look amazing and I also want some of that.

In a logic-based hook, facts and logic statements prove your point in the body text. People who are logical thinkers would agree and want to continue. [53]

2.1.7 Creating Facebook Campaigns

There are six steps for creating a Facebook campaign. These steps have been taken from the Ads Espresso guide for Facebook marketing [54].

Step 1: Select your campaign objective

The objectives have been categorized into three main types: awareness, consideration and conversions. The objective should be chosen according to what best describes your end objective. With the campaign, if you are looking forward to drive people to your physical location, the *Local Awareness* objective should be selected. Similarly, if you are trying to drive people to your website the *conversions* objective should be chosen.

Step 2: Give your ad campaign a name

Giving a meaningful name to the campaign is essential so the campaigns can be easily organized. Writing the date range for the duration of the campaign in the campaign name is a good practice for naming campaigns. More details can be added in the name according to the situation such as client name/website, target audience/location, custom audiences, creative type (video or carousel), Facebook page, etc.

Step 3: Set up the audience targeting.

How audience is targeted demographically. Behavioural targeting and methods of behavioural targeting are explained in detail in a section 2.2 of this literature review. Besides the detailed targeting methods explained later, *look alike audience* is a powerful feature of Facebook targeting. In this, an existing audience that has performed well is taken and Facebook creates a similar audience. After some time, results begin to decline in an audience that was performing well, marketing the product/service further in the

look alike audience yields results again. The pixel, which reports back analytics from a website to a Facebook campaign, is also a good way to build up audience. It tracks events on your website, and it can be used to build custom audiences who are active on your website.

Step 4: Set up your ad placement

The placements options of ads on Facebook are Facebook, Instagram, Audience Network and Messenger. All these placements have sub placements within them, e. g., Facebook has feed, instant articles, in-stream videos, right column, marketplace and stories. Facebook has the option of automatic placements in which Facebook itself optimizes the placements to give the best results. The other option is edit placements in which the advertiser can self-select the placements which he/she thinks would work the best.

Step 5: Set up campaign budget

Setting the right campaign budget is critical for the success of the campaign. The campaign budget can be assigned as the daily budget or the lifetime budget.

When the campaign is set to daily budget, Facebook will spend an amount roughly equal to the set budget. On days when there are more chances of conversion Facebook will spend about 25% more than the daily budget and simultaneously lower the spend on the days with less opportunity to convert.

When the campaign is set to lifetime budget Facebook will ask for the campaign start and end dates and would divide the budget more or less evenly across the campaign dates. [54]

The key thing when setting up a Facebook campaign is the budget allocated to the campaign. In a campaign, a lifetime budget can be specified which is a maximum spend cap specified by the digital marketer. After a lifetime budget is allocated the advertiser can set daily spending limits known as the daily budget. Another important thing is the bid amount, which is the maximum amount an advertiser is willing to pay for a conversion event.

The lifetime spending cap is a good way to avoid overspending on Facebook ads as after reaching this limit Facebook stops showing the campaign in 15 minutes. [27]

Step 6: Setting up campaign bidding

When advertising on Facebook you are competing with hundreds of advertisers in the same demographic settings. Facebook ads are auctioned in the process and the advertisement with best bid, relevance score and "estimated action rates" wins and is

shown first. The bid amount can automatically be decided by Facebook or the maximum amount that you are willing to pay per result can be entered. [54]

Facebook bills the users by two methods which are the CPC (cost per click) or CPM (Cost per one thousand impressions). There is a quality score associated with the advertisements which is a combination of the bid price advertisers are willing to pay, the click through rate of the advertisement and a report of if the audience has reported they do not like the ad. Combining all of these factors give the quality score which determines where the ad should be placed in the audiences news feed. The quality score determines if the ad should be placed higher up or lower in the news feed or on the right-side column. The quality score is essentially for pushing away ads on which users don't click. [27]

The cost per click (CPC) and cost per impressions (CPM) billing models are explained below

In the *cost per click model (CPC)* of Facebook bidding advertisers are not charged more than the maximum amount of bid they have entered. For instance, if your maximum bid price is \$1.10 and the competition to gain the advertisement spot is less competitive or you can win the auction on a lower price of \$0.80, Facebook will only charge the minimum price for winning the auction. The benefit of cost per click model is that the impressions (number of times the ad is shown) on which there has been no clicks are not charged. You are only charged when the audience clicks on your call to action button. All the impressions which go unclicked are free branding for your product/service. [27] On the other hand, if there are many clicks and your ad is getting a high click through rate (CTR) the money will be spent very fast. [56]

Cost per impression CPM is a bidding model in which advertisers are billed for every thousand advertisement impressions. The billing is based only on impressions regardless of if there were any clicks or not. This bidding model is for creating brand awareness when the advertiser is not particularly interested in gaining clicks. [27] Selecting to be charged by impressions (CPM) can cause you to waste a lot of money when your ads are performing poorly. On the other hand, if your ads are performing well this methodology might be beneficial as you are not charged per click, rather you still pay on the CPM basis. This strategy can also be used to find a high performing audience and to identify the high performing ads. [57]

Step 7: Set up Facebook ads

This is the final step of creating an advertisement in which the Facebook ad type can be selected, the images or videos can be added and then the title and body text is written [54]. An advert can be created using an existing post on your Facebook page or by creating a new one. For creating an advert using an existing post you can do this by first selecting the page, then pick the post on that page. For creating a new advert first, the

advertiser has to select the format of the advert which can be carousel, single image, single video, slideshow or canvas. Once the format is selected the advertiser has to select the media (images or video) and enter the title and body-text.[58]

2.2 Optimization of Facebook Campaigns

Key terms as used in Facebook marketing that are important to understand include.

- **Spent amount:** the amount of money spent on a campaign during the selected time period.
- **Impression:** the number of times an advertisement has appeared on screen in total for the entire audience.
- **Reach:** the number of unique users that have been reached. If the same user has seen the advertisement 13 times (13 impressions) this is counted as one in the reach metric.
- **Frequency:** Frequency is the average number of times a user in the targeted audience has seen the advertisement. As an example, if there are 500 users and 5,000 impressions have been delivered, the frequency would be 10.
- **Clicks:** total number of clicks an advertisement has received.
- **CTR (Click Through Rate):** the ratio of clicks to the impressions an advertisement receives.
- **Bid:** the maximum amount a marketer is willing to pay per click in a CPC model, or per 1000 impressions in a CPM billing model.

2.2.1 Optimizing for CTR

The quality score of the ads depends on the CTR so it's good optimization to turn off such advertisements which do not have a good CTR. According to Weintraub, Marty et al. for optimizing, the CTR there should be a wait for 7,500 impressions and if there is not 1 click in 7,500 impressions, that advertisement should be paused as the CTR will go below 0.015% and thus the quality score of the advertisement will also go too low. [27]

Connecio.io has explained how the CTR for ads can be improved in 4 steps. *Step 1* for increasing the CTR is to target the right audience for your ad. When advertising in a location, don't advertise to everyone, rather narrow down your audience. Some products may be suitable for some age groups and genders so the right age groups and genders should be selected. The audience's interests and behaviours that may be suited to your product/service should be drilled down to get an ideal audience rather than just targeting generically. The placement of your ad should be according to its nature, if your ad has more visuals and requires more space to understand it should be placed in news feed and desktop devices only. *Step 2* After you have targeted the ad towards the right audience the advert should look impressive for encouraging the audience to click. Your headline

and body-text should be very well written. The image or video placed in the advert should bring good value to the audience. The right call to action (CTA) button should be placed so for example if you want someone to sign up, it should be written on the CTA button. The type of ad should be well chosen, for example, if your marketing an ecommerce store a carousel ad should be made so people can browse through multiple products on the store on the same ad. *Step 3* The offer on your ad should be strong so that it really motivated the audience to take action. *Step 4* A/B testing should be done of everything, different settings in the targeted audience, the image/video, body-text, and CTA button should all be A/B tested. [59]

2.2.2 Targeting Ads Demographically

Demographic targeting is tailoring the ads for the users according to gender, age, professional interest, place of residence, and occupation [7]. Targeting demographically advertisers get to know the users' interests, needs and a group of users having the same interests behave in a similar way according to the theory of social categories [8]. Advertisement becomes more efficient when demographic effects are included in the advertisements. There is little study relating the effects of demographically targeted ads and their relation to eye movements or where the user's attention goes while ads are displayed on a webpage [9]. A study was done at The University of Cologne for evaluating the effects of demographically targeted ads and the user gaze patterns on the web page. Participants were shown 25 webpages that contained ads, some of which were demographically targeted, and others were not. The participants viewed each web page for 45 seconds. Their eye gaze on the webpage was tracked and later they filled in a questioner about the website measuring the appeal, hedonic and pragmatic qualities. The participants also reported their interest, purchase intention and trust in the brand advertised. The participants paid more visual attention to demographically targeted ads in terms of dwell time and eye fixations towards the images demographically targeted. The participants did not pay much attention towards the advertisement titles, texts and logos. [10]

2.2.3 Behavioral Targeting

Online marketing professionals often complain about click through rates (CTRs), high cost of online advertisements and poor ROI. The central reason for low CTRs and ROI is the relevance of the advertisements. Certain online advertisements are very general and not specific to an individual interests and requirements. Without applying any segmentation to the online audience and advertising to everybody is the primary reason for the low CTRs. To improve the CTRs the behavioural profiles (interests, browsing history) of uses who click on certain Ads should be recorded. When a new user comes to

the site their behavioural profile should be checked and matched with previous users with similar profiles and on which ads they have clicked. The ads on which previous users have clicked with similar profiles should be served to this new user. serving ads like this is called behavioural targeting and this increases the CTR and ROI significantly. [42] One effective way of targeting ads is via behavioural targeting in which information about the users' online browsing behaviour is collected via their search terms and web pages that have been visited and ads are targeted accordingly by cookies stored on the user's web browser. If a user has visited some automotive pages, then that user will be shown automotive related advertisements on the pages the user visits. Users are much less likely to purchase a product that has not be targeted behaviourally. [11] The click through rates go as high as 670 percent compared to ads that have not been targeted behaviourally [12]. Data collected from online data networks reveals that the chances of a click converting to a sale is about twice as high as traditional advertising [13].

2.2.4 Methods of Behavioral Targeting

An example scenario in which behavioural targeting would be used is when a user has left some items in a shopping cart on an online webstore or website visitor has gone some steps in filling in a form such as an insurance quote. If the user stops, the best method would be to temp them back. This can be done by sending e-mails to users who have dropped out or giving an extra discount or offer can often help in bringing them back.

Some websites have a system which analyse visitors on their sites about which previous website they came from, the ISP they are using and the information they are browsing on the site.

Another form of behavioural targeting that is used by ISPs, publishers and a network of sites is they pull a lot of data about the web users by using tracking cookies. They use data from these training cookies to add value to their advertising. Targeting advertisements with data stored in their tracking cookies causes site visitors to respond better to stimuli in the advertisements.

For example, Tacoda is a behavioural targeting network which has recruited 4,500 sites. These sites on average reach people 50 times a month and 89% of the US

population. Users browsing on these sites are shown specifically targeted advertisements according to their surfing behaviours on the network. [13]

2.2.5 A/B Testing

A/B testing is the process of testing two or more versions of an advertisement, email or other marketing asset by varying one element. If you are A/B testing the headline, different versions of the advertisement will differ only in the headline they contain.

The variations are used in real marketing and reactions of actual target population of the marketing are measured. A/B testing lets you know what works the best, which images, titles, videos or body texts bring about the most response from the audience. [44] In digital marketing experimentation is a common practice to test out different elements of an advertisement. In these experiments' marketers test out how one element affects a change in another element. The marketer is testing to see if there is an observable change in one element due to the other element. [60]

2.2. Optimizing Live Running Campaigns

For optimizing campaigns an audience engagement funnel should be created. If it's a video ad campaign, a video advertisement should be created and shown to a broad audience. The video should be shown until a certain threshold of views has been reached, e.g., 3000 views. After the threshold has been reached audience that has viewed at least 25% of the video should only be targeted further. Visitors who have seen your message previously are 3 to 5 times more likely to convert.

When showing the advertisement to the audience again the frequency goes up initially. Users who have seen the ad previously are more likely to respond. As the frequency increases further users start to ignore the ads which leads to increased costs and reduced ROI.

For this technique initially several ads should be setup and the ad with the highest CTR should be selected after all the ads have ran for a threshold number of views. For the winning ad the budget should be increased until there is a noticeable decline in the performance. [45]

After performance has decreased there is an option of lookalike audiences on Facebook. A lookalike audience should be generated, and the ad should be targeted towards that audience with the same strategy.[46]

When marketing campaigns are running online it's not just beneficial to optimize them, rather it's a necessity which is required from advertisers. Maxifier et al. further emphasizes that during the lifetime of a conversions campaign it should be optimized for an average of 11 times for the duration it runs. In comparison to a conversion campaign a brand recognition campaign needs to be optimized only seven times. This optimization

is essential so the campaign budgets can be reallocated towards the areas that are delivering the best results.[41]

There are many other online marketing platforms amongst which the popular ones include Google AdWords, LinkedIn, YouTube and Facebook. Google AdWords gives the users the option to target users in a display campaign by the audience demographics (age, gender, location). Google also gives the option to target users based upon searches they make. [33] Google handles about 40,000 search queries a second. Google matches the ads to the search keywords and displays a relevant ad to the user [31]. LinkedIn is used by professionals for seeking jobs and young audience is not available on the platform. LinkedIn advertising is not very detailed and is expensive as well [32]. YouTube advertising is managed by Google and videos can be targeted demographically, i.e., by their age, gender, parental status, household income and they can also be targeted by their interests [34]. There are 1.49 billion active monthly users on Facebook, and it provides very specific targeting options. This gives the benefit that you don't spend on people who are out of target market for your advertised product or service. The level of granularity that Facebook provides can be judged from the following targeting that can be made "*Spanish & English-speaking men, between the ages of 30 and 53, located in a 10-mile radius of Boston, Ma*". [36] Amongst all advertising platforms, Facebook provides the most targeted form of advertising. Your exact audience can be reached with Facebook demographics targeting. Advertising with Facebook is cheap to the extent that with \$5 you can reach 1000 people. This advertising is fast, so immediate results are achieved. People who wish to sell products from their own website will find Facebook useful as it can increase traffic to your website. [35]

How the Facebook marketing processes are carried out will be discussed in this section. The targeted locations in which advertisements would be running is the "audience" on Facebook. Facebook provides many targeting options to reach your niche audience. Weintraub, Marty et al. [27] in their book *Killer Facebook Ads: Master Cutting-Edge Facebook Advertising Techniques* has described the targeting methods Facebook provides. Different combinations of the following targeting methods can be made to reach the core audience.

- **Location:** Location targeting provides the ability to target users based on where they are living in, i.e., country or region. This option goes down as deep as targeting users living on a particular street address, zip code or their workplace.
- **Demographics:** Facebook provides targeting based on population demographics which include age, sex, income levels, marital status etc.
- **Interests:** Interest based targeting on Facebook allows to target users based on the interests that they have mentioned on Facebook. Facebook gets the users

interests through the pages they have liked and their activity on Facebook, i.e., it is possible to target users who like R&B artists and jazz music.

- **Behaviors:** Facebook pixel is a tool installed on an advertiser's website. It reports back actions that visitors performed on their website [37]. Behavior based targeting is done using the Facebook Pixel. A user who saw the pricing page on your website or blog would be retargeted with the pixel to encourage the user to buy or view the webpage again.
- **Engagement:** Engagement targeting is when someone has liked or commented on your post or follows your pages. Engagement targeting would show your ads to these users.

The Facebook business manager provides a tool for managing marketing efforts and provide access to other people for managing campaigns. It also allows to easily manage assets such as your pages and multiple ad accounts.[38] Facebook campaigns are created from ad accounts and all these targeting options can be adjusted from the ad accounts. Digital marketers make the initial marketing settings and then monitor how Facebook campaigns are converting in to results based upon their targeting settings. The campaign budget is divided in two parts, the first part is the testing budget which the digital marketers uses to run a test in which he/she advertises to a broader geographical area consisting of multiple countries or regions. When the testing budget is exhausted the marketer checks to see the countries or regions that have produced the best conversions. With the remaining budget the marketer runs the campaign again in a smaller area which consists of a group of countries or regions that had performed well. In the smaller group advertisement budget is concentrated over a comparatively small area so initially there will be more conversions. As the frequency begins to increase the conversions again begin to decrease as either people have seen the advertisement, or they are not interested. To regain the interest of the audience the advertiser refreshes the creative in which he/she changes the advertisement image/video, title or body text so the audience gets something new to see in hope for getting more conversions. This may lead to more conversions but eventually when the frequency increases, the audience's response start to decline again. There comes a stage when the audience does not seem to be interested in the advertisement anymore. The marketer then searches for new areas for marketing and at this stage the look alike audience feature of Facebook is very useful. The look alike audience feature generates a similar audience which further produces more conversions. Facebook has also provided with the Facebook marketing API which gives programmatic access to the Facebook business manager. Using the API, programmers can automate any manual processes that digital marketing managers perform. Thus, an algorithm could be written to automatically reach the core audience. There are many solutions in the

market that have been developed to automate the Facebook marketing processes. Smartly IO is one such company that has produced a product for creation and optimization of the Facebook marketing processes.

3. Methods Used in Research

This work consisted of many steps where understanding of user needs, and competition was collected, and a new solution was designed and implemented. The utilized methodologies are discussed next.

3.1 Interviews

Many researchers choose interviews as means of collecting data. The interviewer gains understanding of the other persons views with face to face verbal exchanges. Interviews are a good way to gather “facts” or to conduct a qualitative research in which the interviewee aims to gain insights, understand opinions, observe behaviours, get to know experiences, processes or behaviours.[14]

Interviews have different levels of structure. At one end of the spectrum would come structured interviews in which a few questions are asked and its expected that the interviewee would provide brief answers. Structured interviews are more like a questionnaire, but the interviewee is not filling up the answers and returning the responses which often leads to low response rate. Structured interviews are means of increasing the response rate to a questioner. On the other end of the spectrum are unstructured interviews in which there is a limited number of topics or prompts. They are more based upon eliciting the ideas of the interviewee and giving the interviewee a chance to speak on a given theme. The questions are not set beforehand in this sort of an interview and the questions evolve according to the direction in which the interview is going. [15] Interviews give the best results when conducted where the users feel most comfortable or on their home ground. This gives two benefits, the first it puts the interviewee at ease. The second advantage is that the interviewee would have his/her work and could demonstrate his/her tasks thus would be able to explain in greater detail. [17] When working on a certain project, information relating to it is not readily available in written form. Interviewing people who are expert in the field or have enough knowledge are a good source to gather information. An interview is a prepared meeting in which an interviewer asks questions and records the answers by either audio, video or through notes.[39]

3.2 Focus Group Discussions

In this technique requirements are elicited by discussing them with project stakeholders. The analyst of this discussion serves as the moderator who introduces the topics to be discussed and then gets every participant’s opinion on the topic. These discussions help to build the project ideology as the discussion participants build their ideas on top of ideas of others in the discussion. This helps to clear the project vision and early signs of disagreement among the stakeholders can be identified. An important thing to moderate

in group discussions it that dominant individuals can skew the project idea, so the moderator needs to make sure everyone gets a fair chance to voice their ideas. There may be two experts who believe that their approach is right to solve the problem. In this case the ideas of both experts should be listened to, and a comparison should be made among their approaches to the problem or domain. [18]

3.3 Observation of Users Working

Observing how users do their work activities helps in understanding facts and actions that users would not tell when interviewed. This helps to get the bigger picture of how people communicate in the business and understand informal activities or details which are important from software development point of view, but users would not consider them important enough to tell about. Observations should be combined with mini interviews to learn the process well. Ethnographic analysis is a more detailed study of work activity. [19] [20]

3.4 Participation

In this approach the researcher performs the tasks under the guidance of the user. This helps to learn about the difficulties in the procedures the user performs. Seeing an expert perform a task makes it look easy while trying to do it yourself reveals the technicalities in it. Participation is a valuable way of understanding details in users' task, eliciting tacit knowledge and uncovering hidden assumptions. [16]

3.5 Documentation analysis

This technique is useful for getting all the ideas on one paper which can be shared in the project group. It contains all the requirements and how the system was designed accordingly. All the technical design aspects are listed in this document. [16]

3.6 Online Research of Competitor Products

When researching for developing a product, it's a key step to make competitor product analysis to understand the competition in the market. The simplest approach would be to conduct an online research and learn about the competitor products. An effort should be made to learn about the pros and cons of competitor products by reading online reviews of different products. The online product reviews provide a rich source of information for designing a competitive product. A comparison should be made, and the pros and cons of all competitor products should be listed then a product which can compete well in the market should be designed. [16]

3.7 User Centered Design

The Interaction Design Foundation States that user-centred design is a design process in which designers iteratively focus on the users' needs in each phase of the design process.

UCD requires participation from users in each phase of the design process through many research and design techniques for creating a usable product.

User centred design is a research on users' habits, their vision about how the product should look and how they wish to interact with it.

User centred design requires that you first speak to target users about a product idea. Getting feedback about your idea before any development starts gives the benefit to know how sellable your idea is to the audience being targeted. Not getting early feedback from the targeted audience can lead to a lot of effort being put to develop complex functionalities which are not in demand. This will create a situation where you would need to redesign many things. Users would not show much interest for you to break even. So essentially it is designing a product from the user's point of view and perspective rather users adopting their behaviour to use your product.

The five major UCD principles are:

1. A clear understanding of your users and the tasks they perform.
2. Using feedback from users for drafting the requirements and making the design.
3. Early evaluation of the product design and their involvement in the process.
4. Other development activities should be integrated with user-centered design.
5. There should be an iterative design process. [48]

4. Findings of Interviews and Competitor Analysis

The company's management/owners, digital marketer and data scientist were interviewed. Questions were asked to understand how the user interface should be designed and how live running Facebook campaigns should be optimized. The main points discussed were written down during the interviews. A google document was made in which all the points were written, and the document was shared with all stakeholders. The document was reviewed by the company's management and a combined decision was made about the automations to perform. In the interviews it was decided to make a step layout for creating new campaigns and adding the functionality for creating multiple unique ad versions for A/B testing. Optimization of live running Facebook campaigns was discussed in which the campaigns would be optimized with machine learning. Machine learning would be working in two phases and in phase one would be monitoring how the variance is growing in the data. In phase two the best ads, demographics and hours would be selected as variance in their respective data has grown sufficiently. The design of the interface that would show how the automation is performing was discussed and it was decided to place the automation results on the same screen so the overall optimization could be easily monitored from the same screen.

In this chapter findings of an online research that was conducted are also mentioned. A comparison was made between selected existing products. In this research, websites of four products were reviewed and it was noted what features they have in their products. The websites of Smartly IO, Ads Espresso, Make Me Reach and Nanigans was reviewed. The key features of their products as mentioned on their websites are mentioned below.

4.1 Findings of Interviews

The company's owners/management had a concept/idea in mind how an automated Facebook marketing algorithm could work. The digital marketing manager had good knowledge of how to optimize campaigns, so they produce more conversions for the same amount of money spent. The professor had a good idea of how to develop an algorithm that could combine all thoughts and in result produce a working solution. In this situation, interviewing and discussions was the best solution for data collection. After the interviews, group discussions, documenting the ideas and sharing them with all concerned company people made everyone's ideas converge into one document.

The data was collected by means of interviews and then the discussions were written down. The stakeholders were told that these interview results will be used for my research thesis writing purposes. User centred design approach was used to gather requirements from the stakeholders to get early feedback if the work was proceeding according to their

requirements. One feature was developed then reviewed and improved, after wards the next feature was developed.

In the interviews there were discussions about how the user interface for creating new campaigns should be designed. The features of existing products were discussed, and then it was decided which features should also be a part of our product. Brain storming was done on features that existed in other products and how they could be improved and developed in our product.

For the creation of new campaigns, a 4-step procedure was decided which was according to the steps for creating a new campaign in Facebook. The digital marketer discussed that certain groups of Facebook interests produce more conversions than other. To handle and test out various interest groups an interface was developed so the user could make separate ad sets differing in only the interests. Making ad sets like this gave the advantage that different interest groups could be tested and the interest group that produced the most conversions could be easily identified.

Digital marketers have trouble finding out which ad headline, body-text or image works the best. To find the right combination of the headline, body-text and image that drives maximum conversions A/B testing module was decided to be a part of creating a new campaign module. In this module the user will be able to enter multiple titles, body-texts and select multiple images/videos and then the permutation of all these will be calculates for generation all possible unique combinations.

Once the campaign is live, it has to be optimized, so for this the application of machine learning was discussed. Live campaigns generate a lot of data about how the demographics/targeting are performing. It was decided that the machine learning would analyse the data being produces and it would run in two phases. In phase one the machine learning algorithm would monitor the data being generated live and record how the variance in the data is growing. The variance in the number of conversions produced by each ad version, the variance in the countries and regions and the hourly conversions should be recorded. In phase two the algorithm would make the optimizations and remove all the ads, countries, regions and hours on which the campaign was not producing good results.

It was decided that the automation would not narrow down the target audience to a very small audience. Narrowing down to a very small audience has the drawback of the cost per conversion going high and some areas that have the potential of producing results but slightly less than others would be turned off. The audience would be sorted in two groups one containing the best audience and the other containing rest of the audience.

The best audience would be the one which has produced above average results. The campaigns would run as long as they are producing conversions.

All the different versions of the ads would be delivered simultaneously to the audience and machine learning would check how the variance in the different ad versions was growing. Once the ads have enough variance amongst different versions only the ads that have produced above average results would be allowed to continue further.

The results of the ads, demographics and hourly optimization should be displayed on the same screen. Displaying on the same screen gave the benefit that all the results could be monitored at the same place.

Delivering the advertisement campaigns 24/7 was more costly as at certain times when users were not particularly active the cost per conversions were high. Therefore, it was decided that the advertisements would only run at times which produced conversions more than the average number of hourly conversions.

In the group discussions that I had with the company CEO, director and my manager they were experts in the media and entertainment industry. They had a general idea of how campaigns should be optimized but not in-depth knowledge. This created the problem that the approach had to be re-designed several times as when surveys were done with digital marketing companies, they have differing opinion about how the optimization should go.

As companies with mature products were not willing to reveal the techniques they used for optimization. The optimization steps were designed as an intuition and after reading several web-blogs how the optimization steps should be. The interviews were not recorded so the discussions had to be recalled from memory with the main points written. Existing digital marketing optimization companies are not willing to reveal all their techniques on their website. I had to work based upon some intuition as well and analysing product reviews to understand the processes they are using to optimize their campaigns. When designing this application there was just one digital marketing expert working part-time in the project.

4.2 Findings of Competitor Analysis

To get an idea of the competition a thorough online research of 4 Facebook marketing products was conducted so we know about the available solutions and design something comparable. While conducting the online research on websites of competitor companies the information on the websites was more like a general overview. Key features that that were included in their product were listed on their websites. In-depth study about how

they are optimizing the campaigns was not mentioned. I listed all the features each product had to get a general idea of how other products are working.

4.2.1 Smartly IO

Smartly has mentioned on its website that their product has an easy to use UI for launching new campaigns on Facebook and Instagram. Multiple ads can be launched from their product, then A/B testing is done to identify the best performing ads. Many manual tasks have been automated such as once the user has entered audience demographic targeting, made ad creatives or any other campaign settings can be saved for reuse later in another campaign. The reporting of campaigns has been customized by combining the Facebook data with Google Analytics to produce more meaningful reports. The reports can be exported or automatically emailed to clients. Predictive budget allocation has been implemented in which budgets are automatically shifted between campaigns and ad sets. The user defines the goal and predictive budget allocation makes the optimal budget distribution to maximize campaign performance. There is a budget pool and budgets are allocated across the different campaigns so a group of campaigns can be optimized. The audience response starts to decline when an ad is shown too much. To get a steady response from the audience the ads are rotated/changed based upon how long a certain ad has been displayed, its performance (CTR) and the frequency (average number of times the audience has seen the ad). Smartly performs more comprehensive A/B testing such as testing the interests and various other demographics to monitor different factors in a campaign. Their product can integrate with any product feed, it can receive data feed from Google sheets, XML, CSV, JSON and convert it to dynamic ads. To assist in ad creation there are dynamic image templates for creating the ad images. Behavioural targeting is done according to what the user did on the client's website. They have developed a page post boosting tool that maximize the content reach and reduce manual work.

4.2.2 Ads Espresso

Create Campaign

When creating campaigns Ads Espresso has the functionality to enter multiple ad titles, body texts and select multiple images then it calculates all possible combinations. Ads Espresso also allows creation of multiple audience targeting groups. After creation of multiple targeting groups and ads, Ads Espresso runs them and identifies the most profitable ads and audience targeting groups. In their product a simplified method to manage custom audience has been developed with an option to easily create look alike audience which is a Facebook feature that generates similar audience according to the provided demographics. An ad scheduling module has been built which controls when

ads should be displayed so that they are shown at times they perform better. Ads Espresso tests out where the ads should be placed on Facebook, the main locations are the main news feed, right column, mobile feed and Instagram. The best performing locations are identified, and the ads are placed there.

Analyze Your Campaigns

Ads Espresso displays simple visual analytics showing only few metrics which matter the most. Information is displayed in an easy to understand way showing how the campaign is being optimized. It shows the performance of all campaigns at a glance by showing them side by side and highlights all key metrics to show what works. Individual campaigns can be grouped up to generate aggregated reports of grouped campaigns so multiple projects or customers can be easily managed. Ads Espresso analysis allows to easily identify the best interests which can be used to optimize other campaigns from the begging. What users do when they engage with your ad is analysed by Ads Espresso and a relative score is given to your product in comparison to other products in the market.

Optimize Your Campaigns

Ad Espresso displays results of each campaign side by side and to easily identify what's working and then suggestions are given based upon the client's campaign objective. The campaigns metrics are analysed, and daily recommended actions are given based upon them as daily tips. Facebook campaigns work better on certain hours of the day or certain days of the week. Ads Espresso finds the trend and schedules ads accordingly.

Reporting

Reports are generated according to the metrics the user cares about the most, e.g., they can select CTR, CPC down to cost per conversion. The reports can automatically be delivered to customers.

Campaign Approvals

In the campaign's approval module, the users can make campaigns and then get them first approved from their clients by sending them for approval by sharing a link in an email. Clients can make them go online in one click of a button or if they don't like it, they can send it back for editing.

4.2.3 Nanigans

Nanigans is a one end to end solution that manages all ad creation, optimization and analytic reporting of the results. The optimization process is very transparent about the costs, how bids are placed and what actually is getting results is clearly shown to the user. Nanigans does predictive optimization in which it learns from the data that has been produced and then it places bids to maximize the return. They perform ad creative testing

or A/B testing in which users can test out thousands of images and creatives and it auto optimizes the creatives and targeting of the campaign. Nanigans has a ROI (Return on Investment) based rule building system that reaches high valued online shoppers and people who frequently purchase online. In their budget management system initially, budgets are allocated to the campaigns and the client only pays for the highest paying ads. Campaign performance data is gathered from all campaigns and one campaigns performance data is used to optimize another campaigns performance.

4.2.4 Make Me Reach

Make me reach automatically promotes the best posts, budgets are automatically reallocated, bids are optimized at ad level. Email alerts are sent to the clients against the set optimization objectives. The campaigns are optimized based on external data pervaded by Google Analytics, Zapier and mobile tracking partners. In Make me reach multiple social media ad accounts can be managed from one platform which include Facebook, Twitter, Instagram, Snapchat and Messenger. Reports are generated from multiple accounts and performance of an ad can thus be compared on different online advertisement platforms.

5. Design of Facebook Marketing Solution

5.1 Goal of The Design

I was given the task of designing a software application that could perform digital marketing automatically. Along with designing this application I was also tasked with integrating the solution with reinforcement machine learning so an automated algorithm could adjust the live running campaigns in Facebook on the fly. There are many other such solutions available in the market so I had to research the available products and how the product we are designing can compete with them.

When designing a product there are many business activities, procedures and ways of doing things that are followed in an organization. Many of these things must be observed to understand how activities are carried out in the organization. After observation the solution is crafted accordingly that would fit the business needs. Observations of the workflows in the organization was one important way to gather the requirements of the project.

We were optimizing Facebook campaigns which was done currently by the digital marketing manager. In order to get it all automated I had to learn digital marketing from the digital marketing manager. This involved learning and optimizing campaigns myself so I could learn the procedures, tips and tricks to create campaigns which create more conversions and how to target the best audience for a service, brand or product being advertised.

My goal was to design a user interface in which the digital marketer could efficiently create a new campaign in which he/she performs minimum steps and in an organized way he/she can setup ad sets for behavioural targeting, create many versions of ads for A/B testing. After creation of the campaign the digital marketer can start optimizing them according to the steps discussed with the data scientist. When the campaign is being optimized the digital marketer should be able to monitor how the optimization is progressing.

5.2 Facebook Business Manager

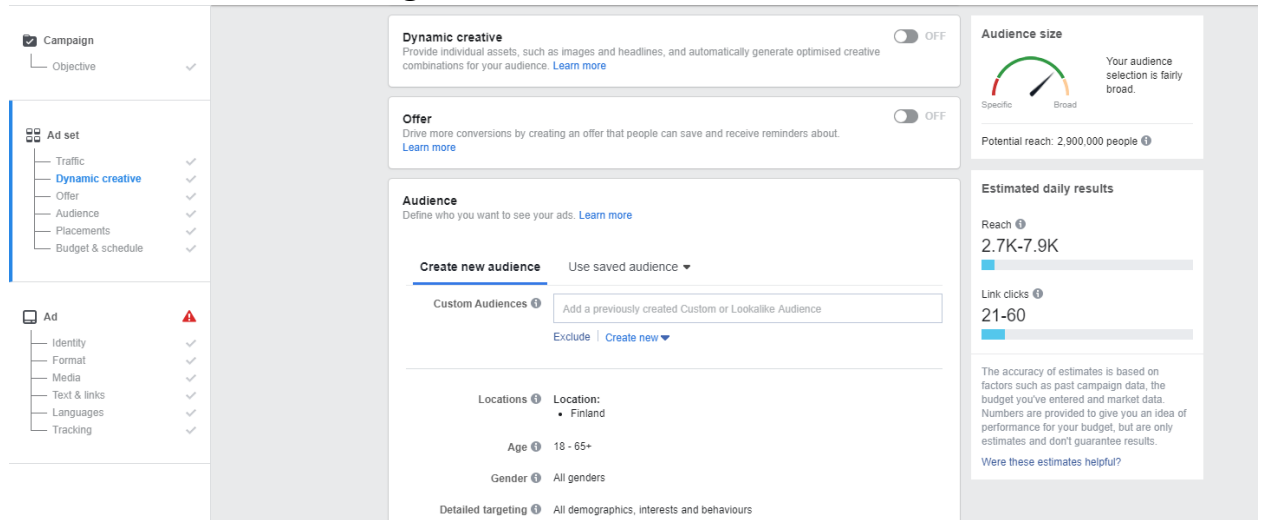


Figure 3: The Facebook Business manager user interface

When designing the solution, the structure of the Facebook business manager was reviewed. The basic flow of steps in creating a Facebook campaign was adopted from the business manager. On top the basic steps some innovative ideas to enhance the experience for creating campaigns were placed. There have been user complains about the Facebook business manager is not appealing and easy to use, and it can be hard to understand how it works [21]. The solution aims to simplify the complex nature and make it a more enjoyable experience for creating campaigns.

5.3.1 Facebook Targeting

The image shows the Facebook targeting settings interface. It is divided into several sections:

- Custom Audiences:** Includes options to 'INCLUDE' or 'EXCLUDE' people based on custom audiences or lookalike audiences. There are two input fields for this, one for 'INCLUDE' and one for 'EXCLUDE'. Below these is a 'Create New' dropdown.
- Locations:** A dropdown menu is set to 'Everyone in this location'. Below it, a list of locations is shown, with 'United States' selected. There are also options to 'Include' or 'Exclude' and a link to 'Add locations'.
- Age:** Two dropdown menus are set to '18' and '65+'.
- Gender:** Three buttons are shown: 'All' (selected), 'Men', and 'Women'.
- Languages:** A text input field with the placeholder 'Enter a language...'.
- Detailed Targeting:** A section for 'INCLUDE' people who match at least one of the following. It has an input field for 'Add demographics, interests or behaviors' and a link to 'Exclude People'.

Figure 4: The Facebook demographics targeting setting user interface.

Figure 4 above contains the Facebook interface for setting the audience targeting for an ad set. The Facebook targeting section provides an interface for setting all the demographic targeting options. The locations, ages, genders languages, ad placement and interests/behaviours can be set from here.

The digital marketer adds a list of countries/regions in the locations field. When the campaign runs, some countries/regions would perform better than other countries. After the campaign has ran for some time the digital marketer checks to see which were performing well and adjusts the countries/regions from over here according to their conversions and the cost for advertising there. This was handled in the designed solution using machine learning to figure out which are the best countries/regions for advertising.

The interest groups that can be targeted are also set from this interface. The interests/behaviours section greatly influences the conversions produced by the ad set as was discussed in the literature review section of behavioural targeting. One group of

interests/behaviours can be added. For adding another group of interests/behaviours a new ad set has to be created and the second group that the digital marketer wants to test are added to it. This process of creating a new ad set and adding the second, third, fourth... group for testing which group produces the most conversions was simplified. In the solution the digital/marketer just makes all the groups that he/she wants to test, and the software automatically generates all the required ad sets with separate interests/behaviours added to it as defined.

5.3.2 Create Facebook Advertisement

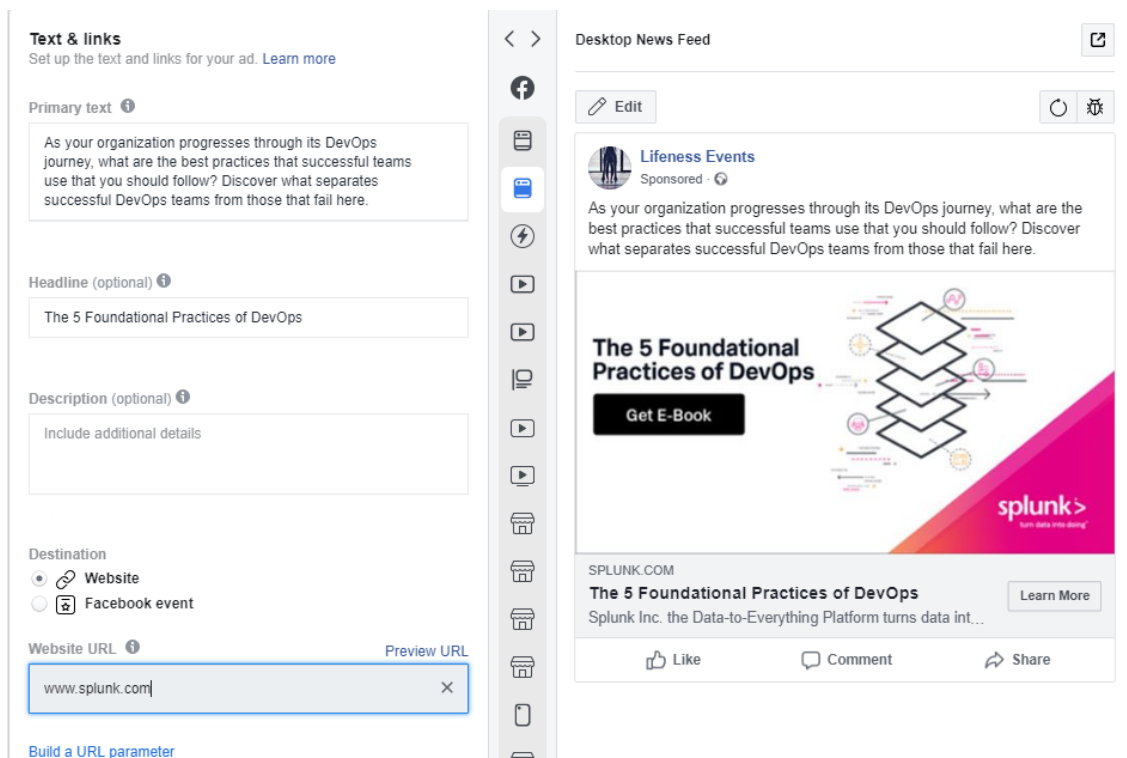


Figure 5: Facebook ads creation user interface

Figure 5 above contains the interface from where the digital marketer creates advertisements. When creating an advertisement, the marketer can enter one body-text, one title and add one image. As it was discussed, digital marketers have to test out multiple body-texts, titles and images to see which one works the best. For testing this the marketer has to create many versions of the advertisement again through the ad creation procedure on Facebook. In the solution this procedure was simplified by another designed interface in which the advertiser enters all the possible titles, body-tests and adds all the images/videos. The algorithm generates all unique combinations which are delivered to the audience.

5.3.3 Ad Delivery

Multiple ads are created as discussed in the previous section. Facebook can deliver these multiple ads simultaneously within the same ad set but after 10,000 impressions according to Ad Espresso documentation it's advisable to run only the ads that have the best CTR. After the ads have been running for a long time people have seen the ad repeatedly so it's advisable to change the ad images to keep them fresh and maintain the click rates on them.[23] Ad Espresso studied how the frequency of the ad effects the click-through rate and the cost-per-click of Facebook ad campaigns. The relation between them is shown in the graph below.

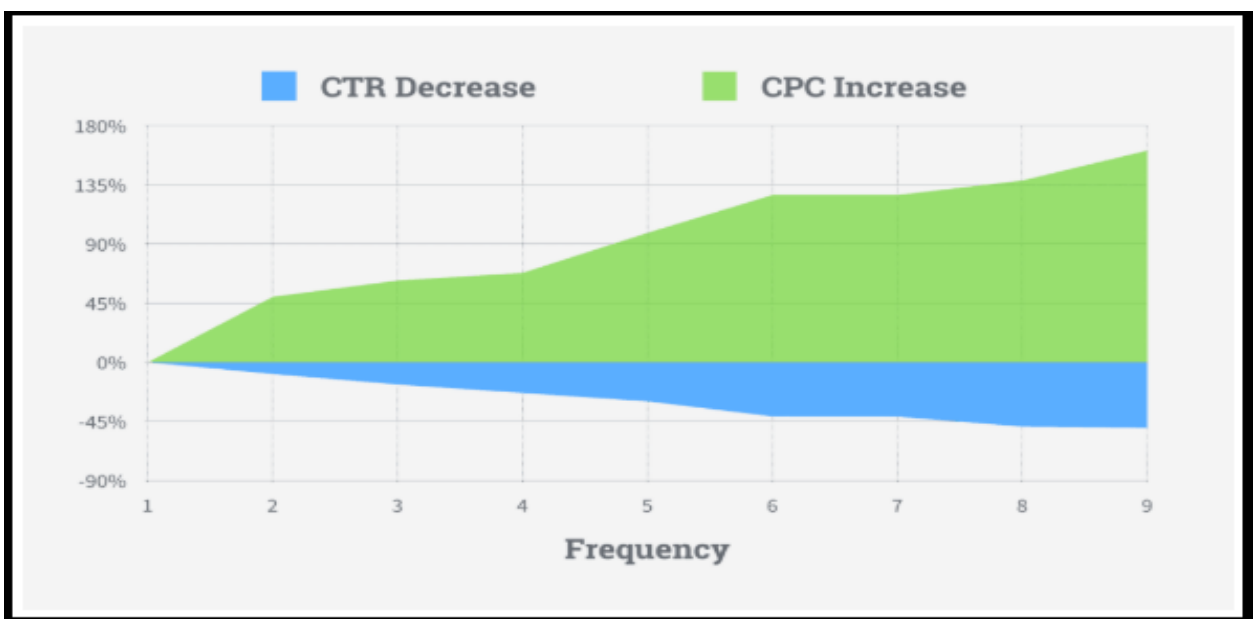


Figure 6: CTR and CPC performance w.r.t Frequency.

In Figure 6 we can see that there is a significant increase in the CPC (cost per click) when the frequency increases to four times or more and the CTR (click through rate) decreases. [24] From this Ads Espresso's guide we can see that ads that its profitable to run only the ads that have a high CTR so in the solution the CTR of all the ads is monitored and only the ads having CTR greater than a threshold value are retained.

5.3.4 Ad Delivery Schedules

When Facebook advertisements are running 24/7 there are some days and hours which generate more conversions than the rest. There are some weekdays that contribute more conversions at low Cost per acquisition (CPA). This can be seen from the Facebook ads manager by breaking down the campaigns on Days. Multiple past campaigns running

with the same demographics can be analysed to discover the best times for advertising. [24]

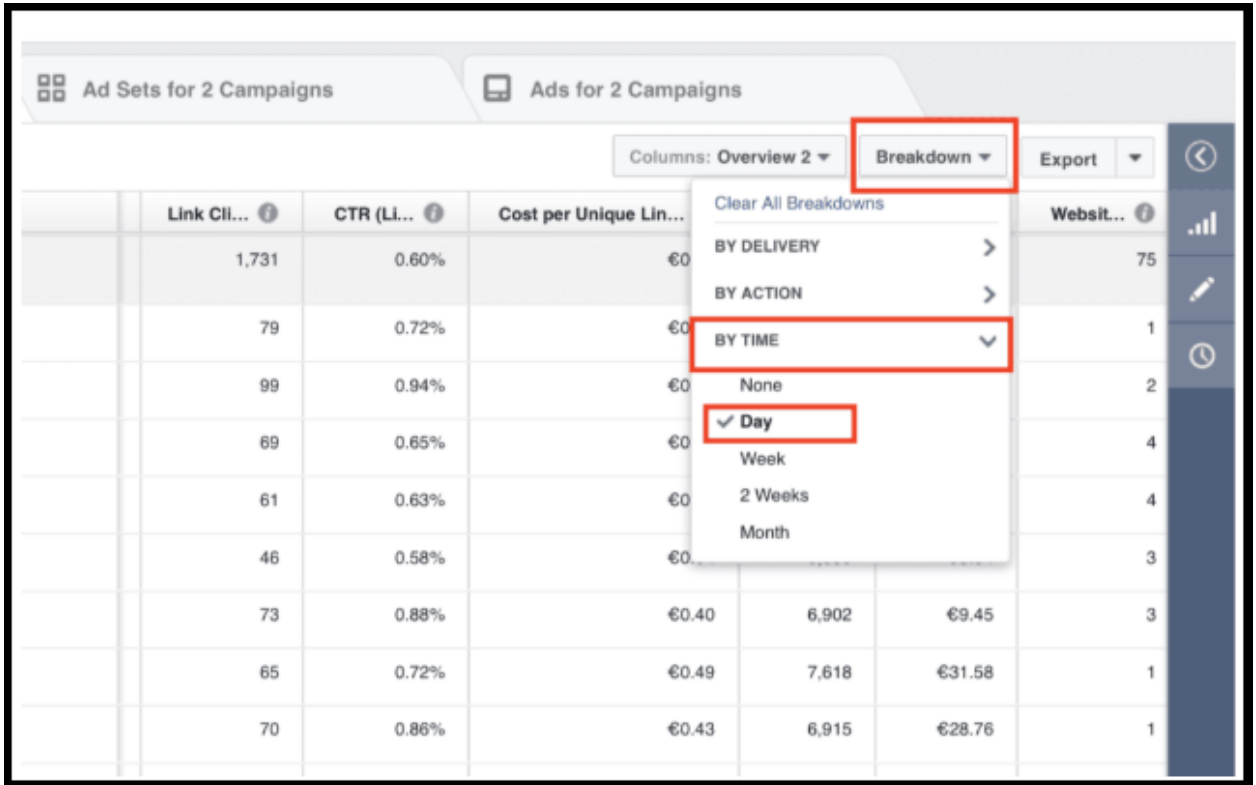


Figure 7: Selecting analytics breakdowns in Facebook

In Figure 7 above Facebook ads interface for breakdowns is shown. To achieve the best ROI the campaign should run at time when there is maximum activity by the audience. This gives the advantage that all the campaign budget is spent at peak hours when the audience is most active.

5.4 The Design of The Solution

In this section I have documented the details of how I designed the software product. The software product has two modules: the create new campaign module and optimization of live running campaigns module.

In the create new campaign module the advertiser can create a new Facebook campaign in a 4-step process. In the first step the advertiser writes the campaign name and selects the optimization objective. In the second step the advertiser defines the demographics/targeting's where the ad should be displayed, selects the ad placements locations and sets the ad set budget and bidding strategy. In the third step an A/B testing module has been developed in which the advertiser can enter multiple titles, body-texts and images, then the permutation of all the elements is calculated to get all possible

unique combinations. In the fourth and final step the advertiser can view all the ads that have been generated and make edits to them and delete some ads which he/she wants to.

The optimization of live running campaigns starts by the user selecting all the ad sets he/she wishes to optimize. After all the ad sets for optimization have been selected, they are initialized by selecting the optimization objective, the lifetime budget and according to which time-zone they should be optimized. Once optimization starts, the advertiser can have a bird eye view on how the optimization algorithm is progressing. In the first section the advertiser can see how all the different versions of the ads are performing. In the second section, the performance of the campaign demographics can be monitored. In the last section the hourly conversions produced by the campaign can be monitored.

Machine learning has been integrated in the software product which works in two phases. In the first phase it reads the campaign statistics being generated and in the second phase, after processing the data, it makes recommendations. Machine learning in the second phase recommends which advertisements to run, advertisement in which countries or regions should be retained and at what time the campaign should run.

I created the solution mentioned below keeping in mind the principles of usability for creating a product with good usability. A user centred design approach was used for developing the product so all the ideas of the project stakeholders could be added to the product and it would be according to their expectations. Along with this I will also write down my finding and how I made the process of creating campaigns in the Facebook Business manager easier. Our aim was to simplify creation process and make a more enjoyable user experience. The ads manager has a complex structure so in this section I will present my solution that would simplify the process.

5.4.1 The Campaigns Dashboard

Digital marketers have to manage many different ad accounts as they are working with many clients, so the dashboard of the application shows all the campaigns that are within

an ad account. All the different ad accounts can be scrolled with a drop-down menu on the top left corner. The thumbnails are the advertisement pictures the campaigns contain.

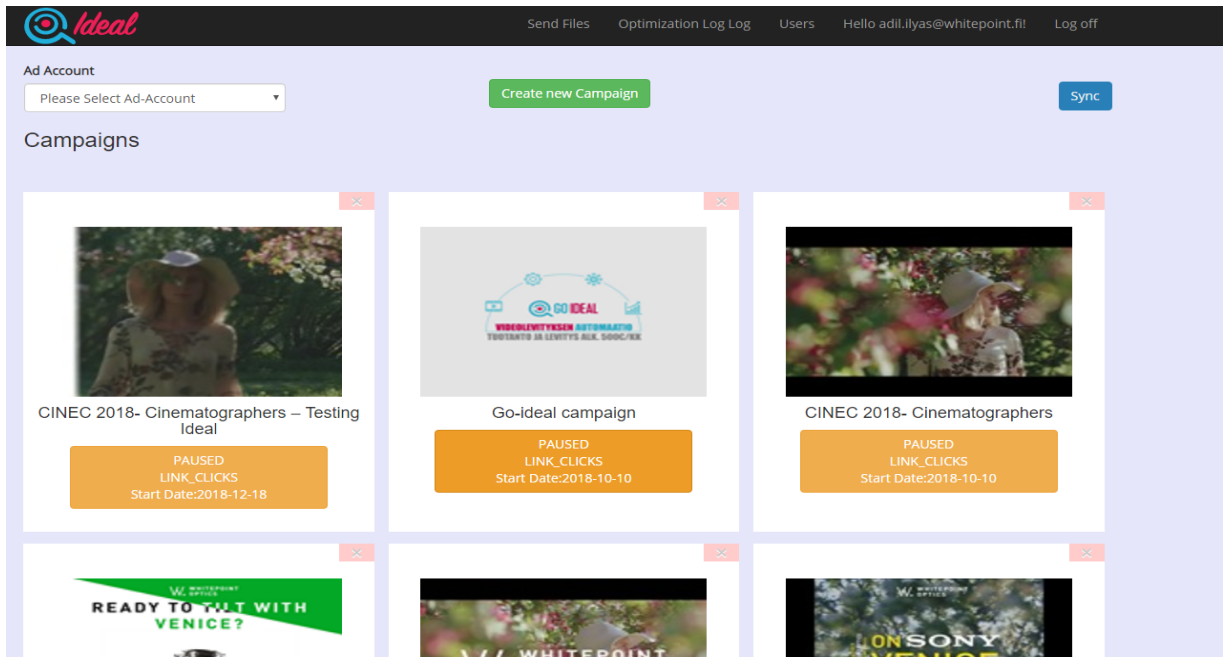


Figure 8: The campaigns dashboard

Figure 8 shows the campaign dashboard in which the user can click green “Create a new campaign” button on the top centre and the user will be redirected to the new campaigns creation mode which will be discussed later in the chapter.

Clicking on the thumbnails opens start optimization of campaigns module so the user can initialize campaign optimization which will be discussed later. If the campaign is already being optimized, there is a redirection towards the module which shows an

overview about how the campaign is progressing and the optimizations that have taken place.

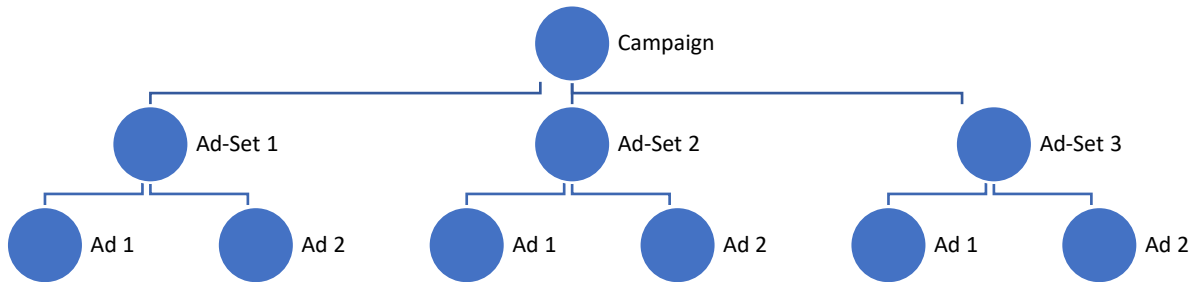


Figure 9: Structure of a campaign in Facebook

As can be seen in Figure 9, a campaign can have multiple ad sets and each ad set can contain one or multiple ads. The conversions of all the ads are summed up in the ad sets and the conversions of all the ad sets are summed up in the campaign statistics.

5.4.2 Create a New Campaign

This module was design as a four-step process keeping it consistent with the Facebook campaign creation process. In the first step the name of the campaign and the optimization objective is defined. In the second step the audience demographics, interests and placements of the advertisements are set. Multiple ad creatives are made in the third

step and finally in the fourth step all the creatives are previewed and posted to the Facebook Business Manager.

Step 1:

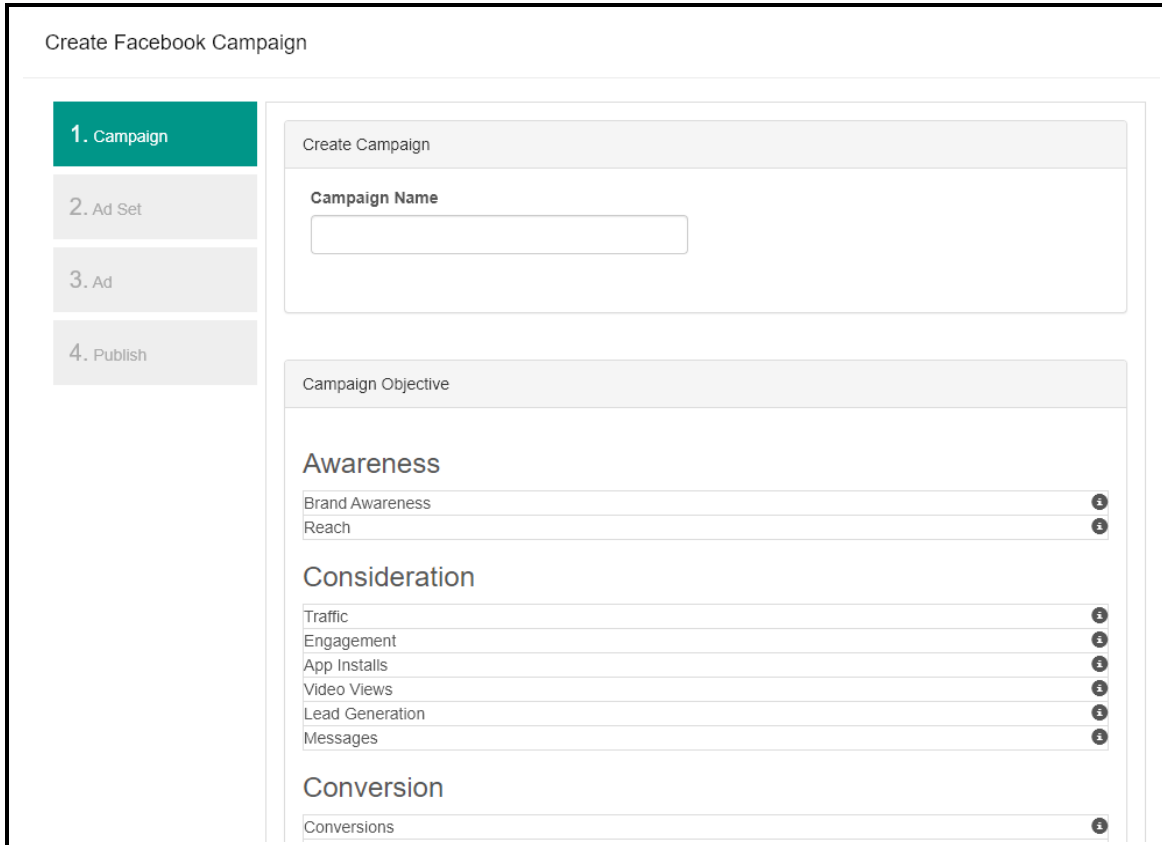


Figure 10: Step 1 of create a new campaign user interface

This step is designed to be consistent with the Facebook Ads manager procedure. The user can enter the name of the campaign and select the campaign optimization objective from those which Facebook provides. There are three categories of optimization objectives: awareness, consideration and conversions. The objective of the campaign sets the goal of what you want people to do when they see your ad.

- **Awareness:** The aim of this objective is to create interest and tells the audience why your business is valuable.
- **Consideration:** This encourages the audience to think and seek more information about your business.
- **Conversions:** This objective encourages the interested audience to buy or use your product or service. [26]

Step 2:

The screenshot shows the 'Audience' section of an ad creation interface. It is divided into several sections: 'Locations', 'Location', 'Age', and 'Gender'. The 'Locations' section contains a large empty text area with a vertical scrollbar on the right, and 'Delete' and 'Reset' buttons below it. The 'Location' section features a search input field with the placeholder text 'Type country,region or city here', a magnifying glass icon, and a blue '+Add' button. The 'Age' section has two dropdown menus; the first is set to '13' and the second to '65+', with a minus sign between them. The 'Gender' section has three buttons: 'All', 'Male', and 'Female', with 'All' selected.

Figure 11: Step 2 setting demographics section

In this section of step 2 the ad set audience demographics is set, i.e. the countries, regions, cities or street addresses, ages and gender. The user experience for creating the ad set has been enhanced and kept quite similar to the Facebook interface so users who are

experienced on the Facebook Business Manager don't have difficulty adopting to this interface.

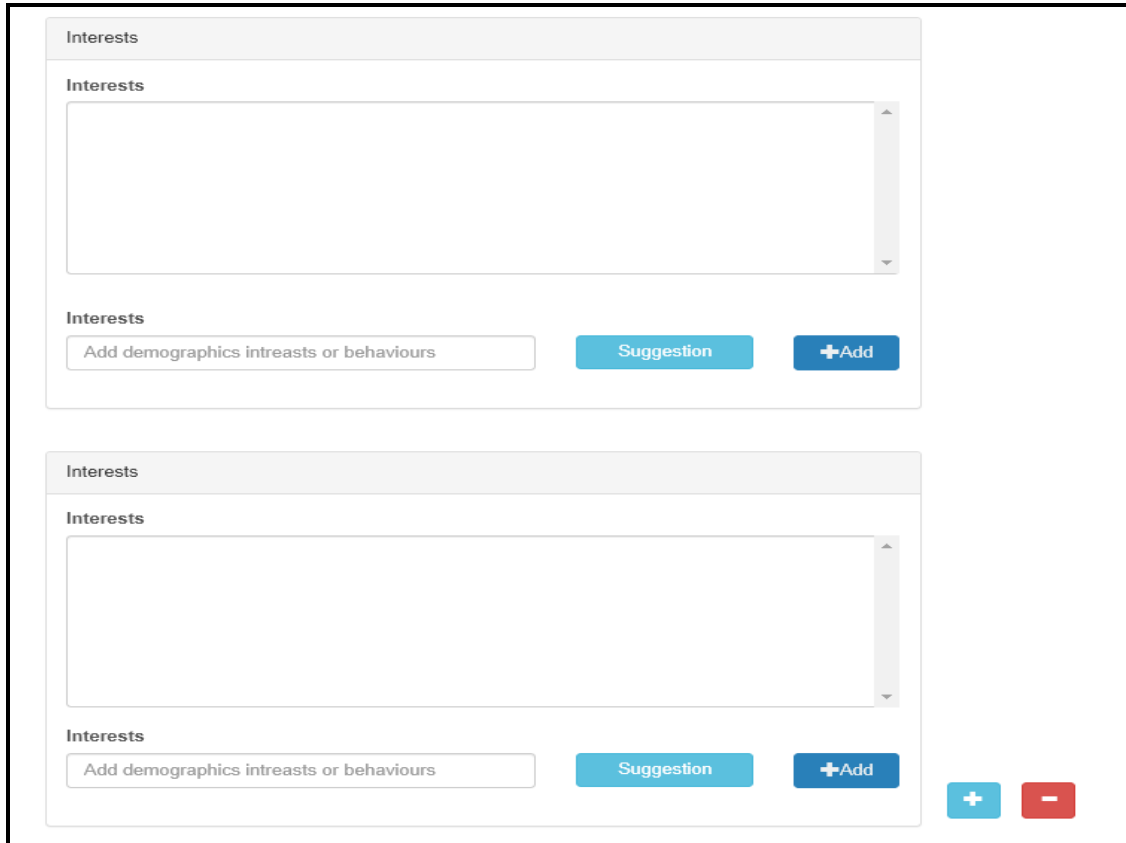


Figure 12: Step 2 setting behavioral targeting section

Further down in step 2 the interface for behavioural targeting has been implemented in which groups of interests can be specified. These groups of interests are assigned to

different ad sets which gives the benefit that it can be measured which groups of interests perform best for your product/service.



Figure 13: Step 2 setting placements section

In the last section of step 2 the placements are set, i.e. the locations on Facebook where the ad should appear which are Facebook feed, right hand column, Audience Network and Instagram.

Step 3:

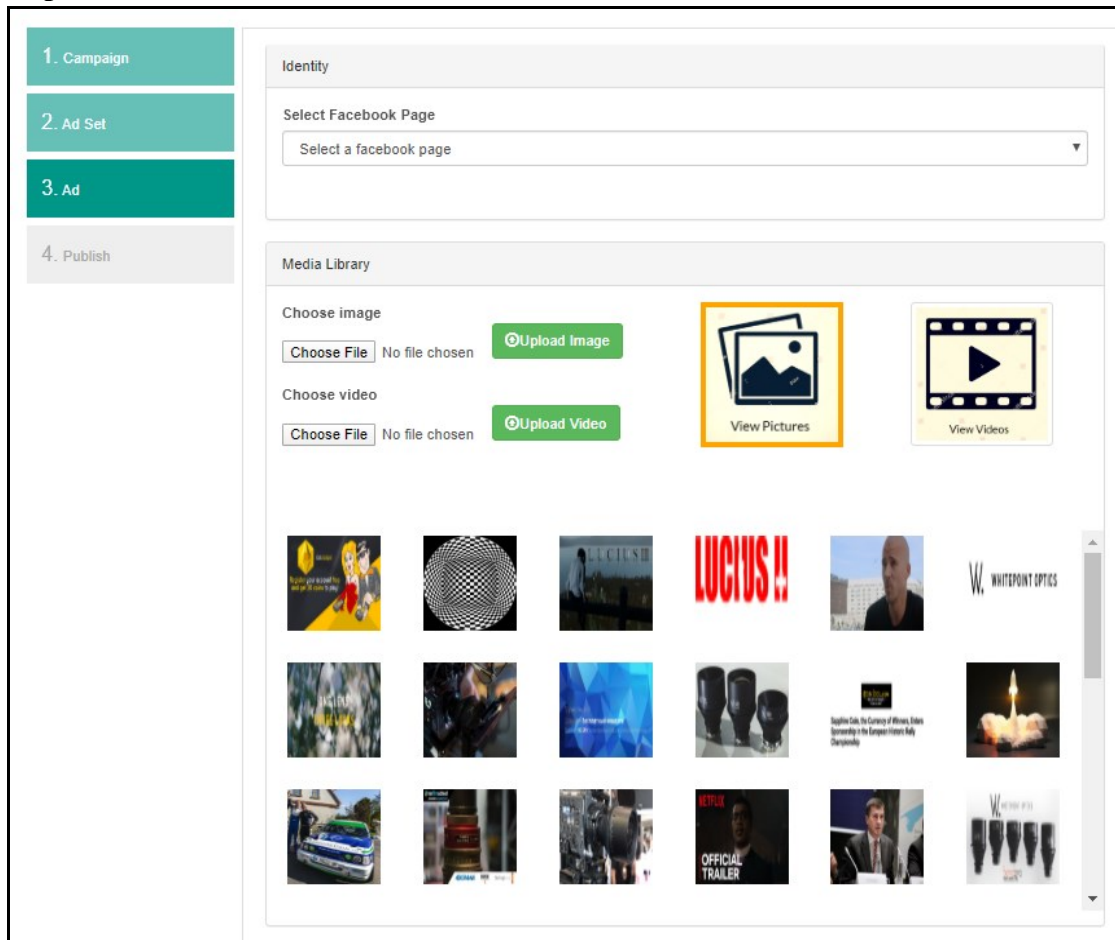


Figure 13: Step 3 selecting multiple images and videos section

Multiple versions of the advertisements are required for A/B testing as discussed in the literature review section. In step 3 multiple versions of the ads (creatives) are generated by selecting multiple images and videos.

The image shows a screenshot of a web interface titled "Advertising Titles and Texts". It is divided into two main sections. The first section, "Campaing Title", contains two horizontal text input fields. To the right of the second input field is a small blue square button with a white plus sign. The second section, "Body Text", contains two larger rectangular text input fields. To the right of the second input field is another small blue square button with a white plus sign. The entire interface is enclosed in a light gray border.

Figure 14: Step 3 entering multiple titles and body texts section

After selecting multiple images and videos, multiple advertisement titles and body texts can be entered. The algorithm calculates a permutation of all media, titles and body texts. For example, for 3 media items, 2 titles and 4 body texts $3 \times 2 \times 4 = 24$ unique creatives will be generated. All these versions are previewed in step 4 and posted to the Facebook Ads manager. Posting multiple versions for A/B testing gives the advantage that all

versions can be tested for sufficient amount of impressions. The versions that have high click through rates (CTR) are retained.

Step 4:

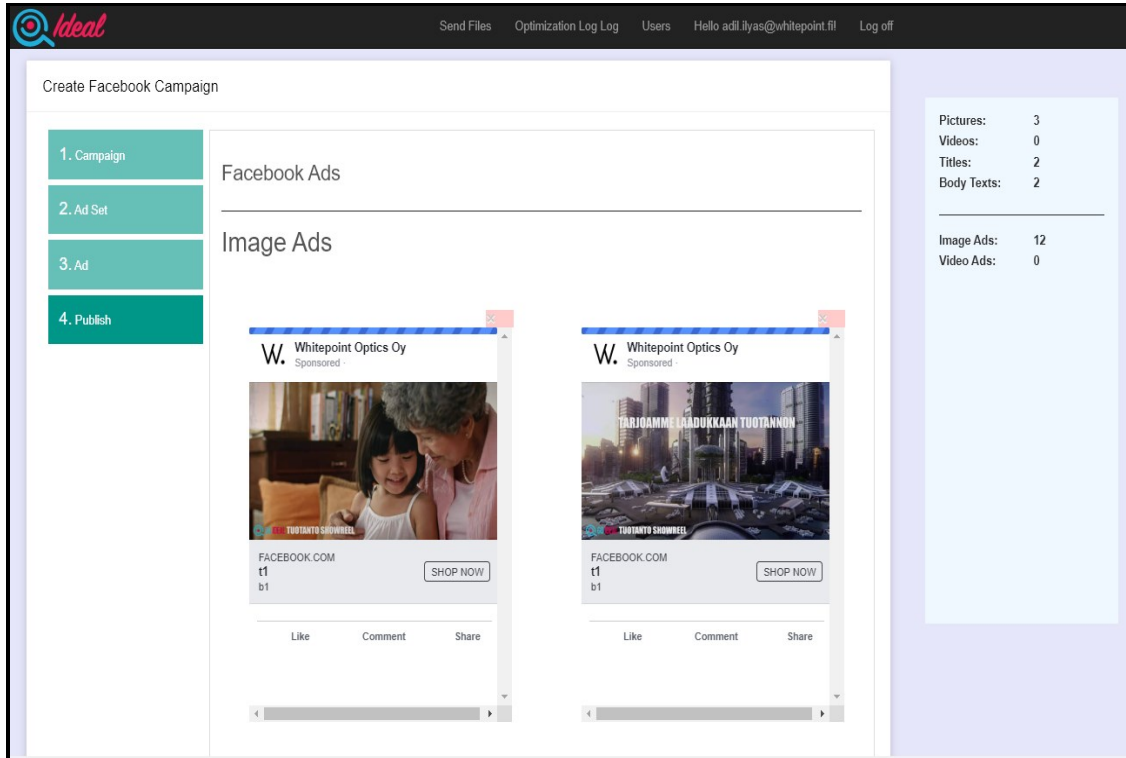


Figure 13: Step 4 of create a new campaign user interface

In the final step the users can preview all the combinations of creatives that have been generated. If there are any mistakes the creatives can be edited and if certain ones are not appropriate or not required, they can be deleted by pressing the delete button on the top right corner. On the right-hand side data is shown about the previous selections the user

has made. In the above image 3 pictures, 2 titles and 2 body texts have been entered and this gives a total of 12 image ads.

5.4.3 Start Optimizing The Facebook Campaigns

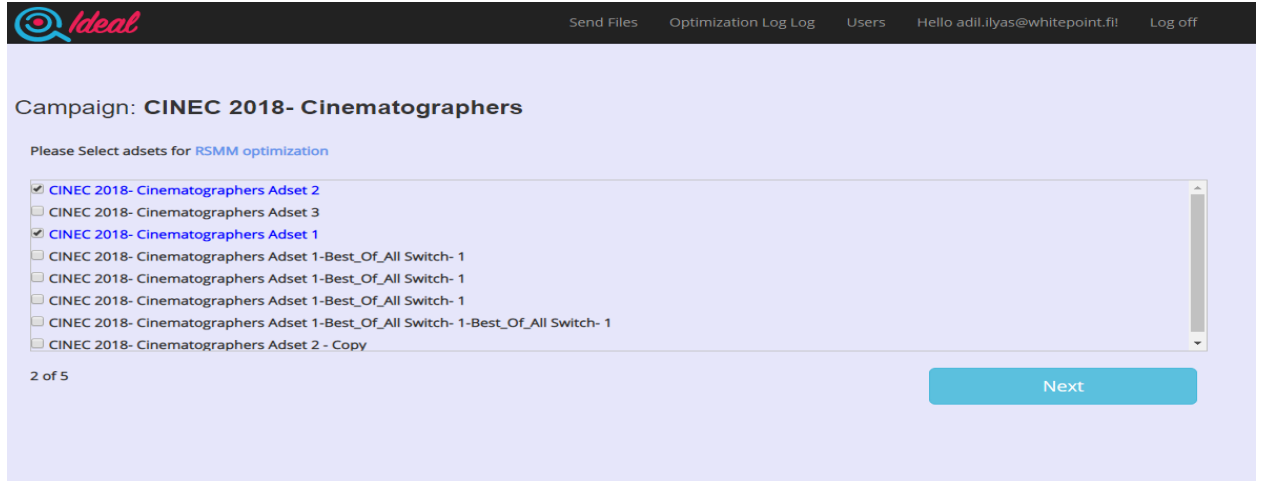


Figure 14: selecting multiple ad sets for optimization

Once the ads have been published it creates a new campaign with multiple ad sets according to the number of interest groups that have been made for behavioural targeting. Within the ad sets all the versions of the creatives/ads run. The new campaign appears as a new thumbnail on the dashboard. Clicking on the thumbnail redirects towards the screen above. This contains all the ad sets within the campaign and the user can select the ad sets he/she wishes to optimize and click next.

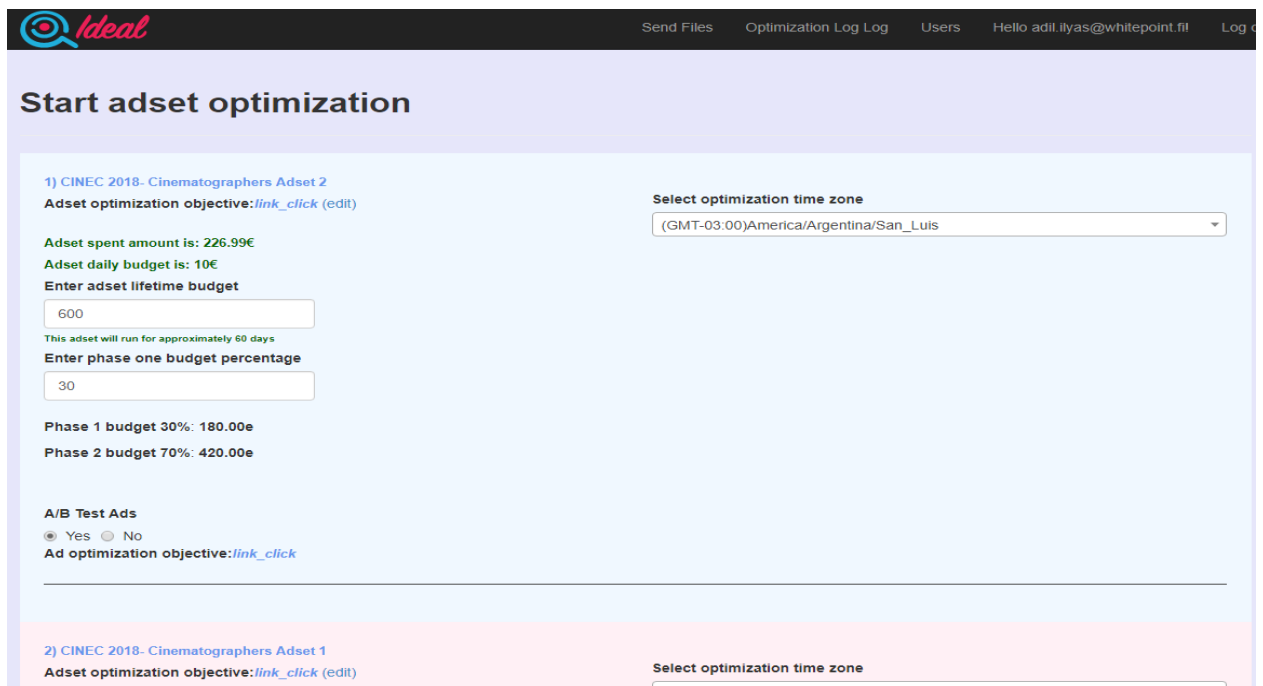


Figure 15: Initializing the optimizer

After the user has clicked next, a screen in which the ad sets are initialized for optimization appears. The lifetime budget for ad sets are defined and the percentage of the budget that is supposed to be assigned to phase 1 (will be discussed next) is written. The optimization objective of the ad set, and the ads is set to link clicks by default. The ads are optimized according to the viewers time zone, so their respective time zone is also selected.

5.4.4 Monitoring Facebook Ads/Creatives

The screenshot shows the 'Ads- A/B Testing' interface. At the top, there is a navigation bar with the 'Ideal' logo and links for 'Send Files', 'Optimization Log Log', 'Users', 'Hello adil.ilyas@whitepoint.fil', and 'Log off'. Below the navigation bar, the page title is 'Ads- A/B Testing'. A 'Select Adset' dropdown menu is set to 'CINEC 2018- Cinematographers Adset 1'. Below this, there is a table titled 'All Ads' with two columns: 'All Ads' and 'Conversions'. The table contains three rows of ad creatives. To the right of the table, there is a 'Current Running Ad' section. It displays the name 'CINEC 2018- Ad-fixed cities – Copy - Copy' and 'Conversions: 0'. Below this, there is a video player showing a woman wearing a hat in a field of flowers. The video player includes a play button and a 'Learn More' button. Below the video player, there is a URL 'HTTP://WWW.WHITEPOINTOPTICS.COM/' and the text 'Experience our full frame lenses!'. At the bottom right of the video player, it shows '7.2K views'.

All Ads	Conversions
CINEC 2018- Ad-fixed cities – Copy - Copy	0
CINEC 2018- Ad-fixed cities – Copy - Copy	0
CINEC 2018- Ad-fixed cities – Copy	199

Figure 16: Monitoring the performance of the ads

Once the optimizer has been initialized the user can see an overview of how their campaign is running. In the first section of the overview the performance of all the creatives are shown. The user can see which creative is producing the most conversions.

The Click Through Rate (CTR) is monitored in the background algorithm. In phase 2 (which will be discussed later) the ads that have low CTR will be paused.

5.4.5 Campaign Demographics Monitoring

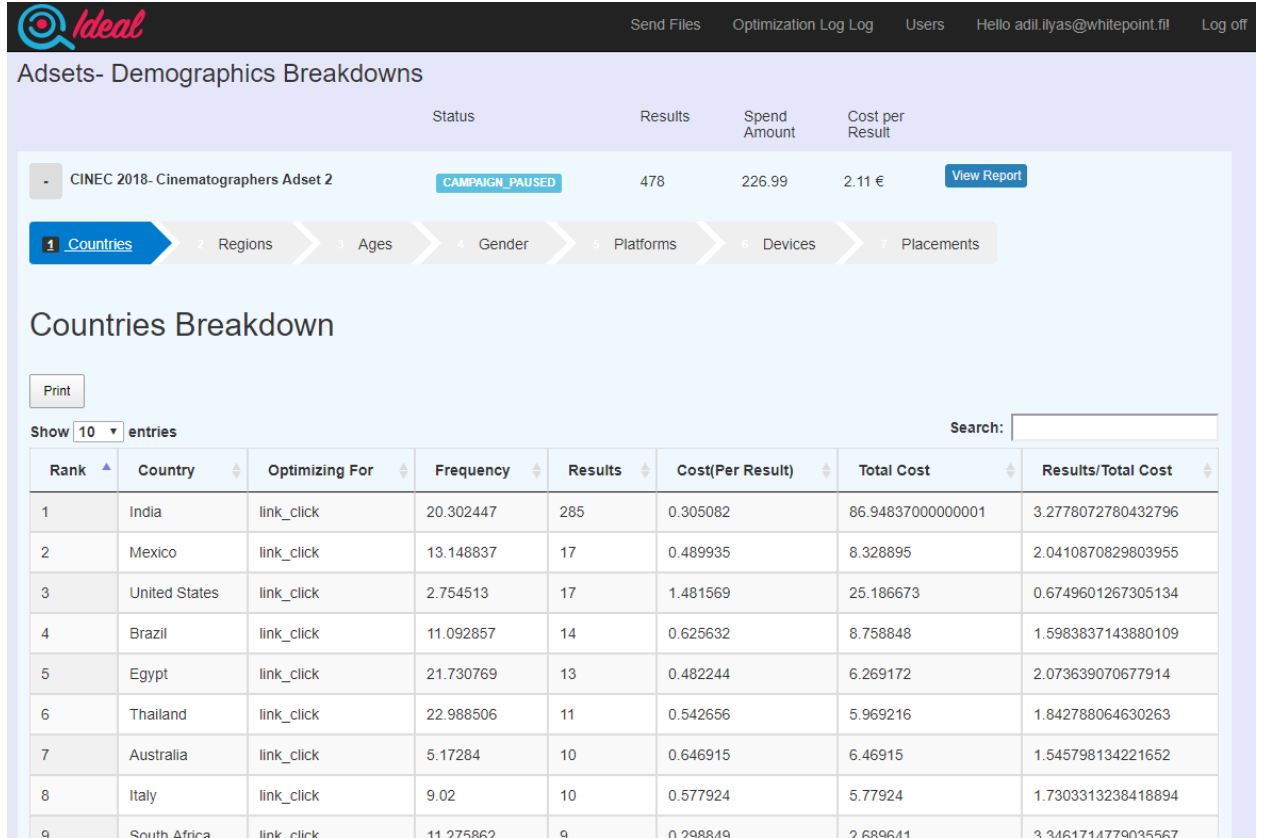


Figure 17: Monitoring the performance of the demographics

In the next section of the ad sets monitoring there is a breakdown of how the ad set demographics are working. If the ad set has been targeted towards multiple countries, a breakdown of how conversions are going in each country and regions inside, conversions in ages, platforms (Facebook, Messenger, Audience Network, Instagram), Devices (desktop, mobile, tablet) and placements (main feed, right column, mobile feed, Instagram feed, stories). Certain demographics are working better than other so initially a broad audience is targeted and measured which demographics work the best (phase one). The demographics that work the best are labelled as the set of best candidates and

the targeting is updated and made more specific according to this set of best demographic candidate (phase two).

5.4.6 Ad Set Timing Monitoring

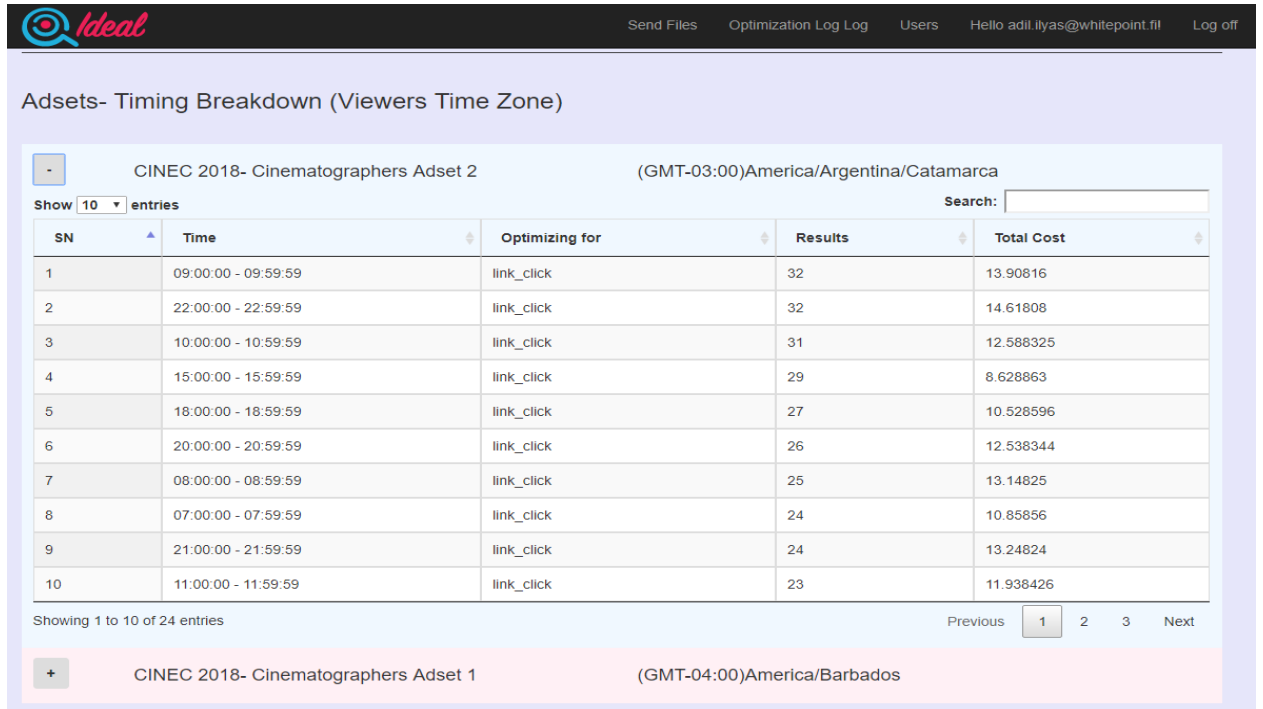


Figure 18: Monitoring the hourly performance of the campaign

Initially the campaigns are allowed to run 24/7 in phase one. At some times of the day the ad set produces more results. The variance between the results is calculated. When then variance becomes sufficiently large the times that have produces results above average are retained. Retaining the times which produced results above average saves on advertisement costs as the budget is used only at times when the users are likely to be most active. When the users are most active the cost of advertising decreases at those times.

5.5 Application of Machine Learning

For optimization of the campaigns a machine learning algorithm as developed by the data scientist. This was a reinforcement machine learning algorithm that continuously learned from the outputs of the campaign proceeding. The algorithm in phase one measured the variance in the breakdowns of the demographics. The algorithm has three states green, yellow and red. The red state means there is low variance in the demographics, the yellow state means there is medium variance and green state means there is high variance. High variance means that good demographics have been identified and the algorithm should proceed over to the next phase. In phase two the machine learning algorithm measures

how, the campaign is converting into results. The campaign is allowed to run as long as it is producing results.

5.5.1 Phase One

This is the testing phase of the algorithm imitates how a digital marketer optimizes a campaign. For optimizing a campaign, a certain amount from the campaign budget has to be allocated towards testing what works, which countries/regions, ages, genders, placements, devices and platforms produce the most results. When the campaign progresses the variance between the candidates (countries, regions) increases. When the variance has grown sufficiently the best countries and regions can be identified that have produced majority of the conversions. Once the best countries and regions have been identified the ad set is updated with this smaller set of best demographic candidates. This increases the frequency of the ads in areas which are giving good results. Doing this increases the CTR (Click Through Rate) and decreases the CPC (Cost per Conversion) thus makes the campaign more economical and efficient to run.

In parallel to this, the performance of the ads is monitored to see which ones are producing the most conversions and have high click through rates. The ad set is running 24/7 even when few conversions are being produced. The conversions produced each hour are logged.

5.5.2 Phase Two

In phase two of the algorithm the ad sets continue to run as long as they are producing enough conversions. When the conversions begin to decline the ad sets are paused. This ensures the spending does not go wasted on a campaign that is not producing any conversions.

When sufficient variance has been detected in the demographics the machine learning algorithm signals green. The green signal indicates best demographics/candidates should be selected now. As there is sufficient variance the average of the conversions is calculated for example in the regions. All the candidates that have above average conversions are called the best candidates and updated to the targeting of the ad sets in the Facebook ads manager.

All the versions of the ads were running in phase one now in phase two the versions that had a good CTR compared to a threshold value are allowed to run further. The ad set was running 24/7 but sometimes were not producing much conversions so the average of all the conversions are calculated. The ad set will run at times which produced conversions more than the average number of conversions produced hourly. In phase two

the ad set is continuously monitored to see if it's converting and producing results. If the conversions start to decline the ad set is stopped.

5.5.3 Budget Saving

Performing the steps in phase one and two saves budget. A/B testing the ads and retaining the versions that have the highest click through rates causes the audience to click more thus will result in more results in the same amount of spending. Targeting the ads towards specific audience which responds better saves the budget spent on a broader audience which does not produce much conversions and the advertiser pays for advertising to them thus a low ROI in that case. Running the advertisements 24/7 also causes more budget being spent as at certain times the audience is not active and the advertisements are being delivered. The cost per result decreases when the audience is more active as it's a measure of the amount spend divided by the number of conversions produced.

6. Discussion

In this section I have discussed how much the audience should be narrowed down and how successful the phase two of the machine learning algorithm was. Further I have suggested how the campaign creation module can be enhanced and how much beneficial these tools would be to the marketer. The implementation of the machine learning algorithm evolved so that the algorithm does not narrow down to very small areas for marketing. The regions were initially narrowed down to a single country or region. Narrowing down to such narrow regions caused the cost of advertisement to go high as there are fewer potential clients in a smaller region so Facebook starts charging more for conversions. This behaviour of Facebook was corrected by not going into very small regions when a campaign has been started to target a broader region initially. The algorithm was not rigorously tested due to testing budget constraints so the exact comparison in the effectiveness in both techniques is not known. The second phase of the machine learning algorithm which looks at the budget, so it's only spent while the number of conversions is increasing was successful when the billing event was set to impressions. This was because when the billing event is impressions the campaign continues to spend regardless if the campaign is gaining more conversions. In the case when the billing event was set to link clicks Facebook only charges when someone performed a click. Otherwise there are no charges for the campaign, so the client is only being charged when someone's clicks is handled by Facebook.

In the ad creation interface, I have carefully designed the process for creating the campaigns step by step. Behavioural targeting has been implemented to target ad sets according to interests so the effects of interest groups could be evaluated. The interface graphically shows all the different ad versions that have been generated so the user can have a good look at the advertisements that are being posted to Facebook. The campaign creation interface can be enhanced by showing the look of the ad being made dynamically as he/she writes the title, body-text and ads the image/video. Another good enhancement would be to add an image editor so the user can edit the images and add captions to it while creating the advertisements.

The optimization interface shows how the algorithm is performing as it shows how all the demographics are producing results. The module also shows how each version of ad is performing and at what times the campaign is producing the most conversions. The data is shown in the form of tables. This reporting of the analytics could be enhanced to show more details about how different analytic variables are performing. Graphs should be made to show how the CTR, CPC and other variables are performing. There should also be a side by side performance comparisons between different campaigns.

With these tools digital marketers can automate the process of finding their niche audience which is likely to convert. The advertiser can include all regions which he/she

thinks have the potential to produce conversions and the algorithm will retain the demographics that produce the most results compared to the amount of money spent. The digital marketer can also create many different ad versions and see which versions converts the best. After creation of the campaign the advertiser can visualize how all the ads are performing and visualize as the automation works which demographics are producing the most results. Performing these steps would also save the advertisers budget by getting more conversions for the same spent amount.

7. Conclusions

The aim of this thesis was to figure out how can the manual work performed by digital marketers for optimization of Facebook campaigns be automated. Adjusting the campaigns to target the niche audience results in more conversions for the same amount of money spent. How can the adjustments be made most efficiently for maximum amount of savings? Another problem which novice users face is that Facebook Business Manager is not very easy to use. A simpler interface was designed using Facebook marketing API.

After interviewing a digital marketer, company admin and online research about the techniques used by digital marketers to optimize ad campaigns I identified the steps that should be automated and wrote them as an algorithm to automate the optimization process. For selling a product, e. g., in some selected counties there are many regions (states or provinces) included. Some regions produce more conversions than others. Narrowing down to very few or one region is not a good approach as costs per conversions increase. The general marketing area should be a somewhat wide. When running a campaign, it was divided into two phases 1 and 2. The total campaign budget was split in two parts and phase 1 budget was for advertising in all regions to get data about which regions performs the best. After getting statistics about the conversions each region has produced, the average number of conversions was calculated and all regions which produced conversions above average were placed in the group called *best countries* and the rest in a group called *minus best countries*. Along with this, in phase one multiple versions of the ads were created for A/B testing and ads with above average click through rate were selected for running in phase 2. At certain hours of the day the audience is more active and clicking. It was observed that when the audience is more active, the cost per conversion are low. After phase one the campaign was only allowed to run at times which produced above average conversions. Essentially, in phase two the optimized ad set ran in the best regions, delivering the ads with above average click through rates and running at the times which produced above average results. In phase two the conversion rate of the ad set was monitored. When the rate of ad set conversions started to decline it was stopped.

The campaign creation module was designed so the users would be able to easily create multiple versions of ad for A/B testing. When audience are targeted according to their behaviours and interests, we get better response from them. Another functionality was added for behavioural targeting in the campaign creations module. In this functionality the user would easily be able to create multiple identical ad sets only differing in the interests/behaviours set in them. This would give the benefit that multiple

behaviour and interest groups can be tested. The interests/behavioural group that produces the most conversions will be continued in phase 2.

When conducting an online research of competitor products, the information available on their websites was a general overview. The key features that their products had were mentioned on their websites. Brief descriptions of how their algorithms work were mentioned. The decision makers about how the product is supposed to function were experts in the media and entertainment industry, so a clear vision about the end-product was lacking. The product was redesigned several times according to the feedback from other digital marketing agencies. There was just one digital marketing expert involved and he was not fully involved in the product development.

Certain days of the week are producing more conversions than others so the results of allocating separate budgets for each day proportionate to the number of daily conversions should be studied. This way of optimizing campaigns should be tested with more digital marketers and marketing agencies. As running campaigns online is costly, this way of optimizing should be thoroughly tested with larger budgets to figure out how much savings are produced.

As the virtual community of social media continues to grow so does the opportunity for large companies and small business to tap into these online crowds of audiences and sell their products/services. Due to the size of this online audience and the opportunity for business that it has created, digital marketing has become an industry worth 380 billion dollars as of the year 2020. Digital marketers are employed from large to small companies to manage their online presence and advertise their products/services. Individuals try to advertise themselves or employ digital marketers.

This solution of digital marketing automation can be of great help for digital marketers who have to manage many advertisement campaigns for various clients and make sure they are producing results. On the other hand, novice users who don't have much experience regarding how to optimize their digital marketing campaigns can also benefit from this digital marketing automation solution. These novice users would just have to enter the broad demographics where they think their product/service would sell and the automation will take care of the rest.

Social media continues to grow as new users join these platforms and new platforms such as TikTok emerge. These platforms need funding to survive in the online market and most of that is obtained through advertisers posting ads on their platforms. Advertisement campaign automation products are essential to manage a large number of client campaigns. These products help in the creation of advertisement campaigns and optimize them as they run on social media channels automatically.

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