

Introduction to Web Science

Assignment 11

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Submission until: February 08, 2017, 10:00 a.m.

Tutorial on: February 10, 2017, 12:00 p.m.

This assignment focuses on **Online Advertisement**. As discussed in the class, teams with exact similar answers that give an indication of copying will receive null points for those questions. If you are taking answers from some source, please cite your sources.

Team Name: Oscar

1 Online advertisement (10 points)

In the videos about online advertisement, you learned about the three different payment methods for online advertisement.

1. Name all three methods.
 - CPC - Cost Per Click
 - CPM - Cost Per Mille
 - CPA - Cost per Acquisition
2. Mention the advantages and disadvantages, for publisher and advertiser, of all the payment methods and explain them in your own words.
 - CPC - The cost that the advertiser pays for every click on the advertisement. The publisher has the risk that no one shows interest on the ad by clicking on it. In the other hand, the publisher still gets payed even if the customers don't subscribe or buy from the advertiser's website. The biggest drawback of CPC is click fraud.
 - CPM - How much the advertiser has to pay to the ad agency in order to have the advertisement delivered 1000 times to the costumers of the website of the publisher. The revenue is shared between the agency and the publishers. It favors the publisher a lot since they know how much money they can earn for attracting 1000 page views. In the meantime, the advertiser has a high risk because the ad can be unappealing to the customer and may not generate any traffic to the website.
 - CPA - The amount of money that the advertiser pays to the advertising agency if the consumer interacts with the advertisement in a way such that a certain goal in the advertisers website is met. In the example of shopping website, the goal is a sold item and the cost would be a percentage of the price of the item. The disadvantage for the ad agency is that it requires a tracing technology on the advertiser's website. It also has a high disadvantage for the publisher because he carries all the risk. If no one buys products from the advertisers, then he doesn't get a revenue.
3. Provide real world examples for the three payment methods.
 - Cost Per Click - Google AdSense pays you when someone clicks on Ads. The average cost per click in Google AdWords is between 1 and 2 dollars on the search network. The average CPC on the Display Network is under 1 dollar. Germany has an average CPC 31 percent less than the US average.
 - Cost Per Mille - Facebook usually offers this kind of payment for 2.48€, for Germany in order to show the advertisement to 1000 people on Facebook.

- Cost Per Acquisition - Target CPA is an AdWords Smart Bidding strategy that sets bids to help get as many conversions as possible at the target cost-per-acquisition you set. It uses advanced machine learning to automatically optimize bids and offers auction-time bidding capabilities that tailor bids for each and every auction.

2 Payments in Online Advertisement(15 points)

Provide the complete calculation with your solutions for the following questions.

1. An online advertisement company offers you to advertise your website on a cost-per-click base (CPC) with a cost of 0.70€ per click. Assuming that in average three out of ten visitors of your website are buying a product from which you are earning 20€, would you accept this offer? What is your average profit/loss per visitor?

$$\text{CPC} = 0.7 \text{ €}$$

$$\text{CR} = 0.3$$

$$\text{Product price} = 20 \text{ €}$$

For 10 visitors the advertiser has the cost of $0.7 * 10 = 7 \text{ €}$. If, in average 3 out of 10 visitors buy a product from the company, then the profit for the advertiser would be $3 * 20 = 60 \text{ €}$, as the price of a product is 20 €. The average profit/loss per visitor is $60/7 = 8.571$. So for every euro the advertiser spends, he earns 8.571 euros. The acquisition cost is $0.7/0.3 = 2.3$.

2. What would be the minimal conversion rate (CR) to guarantee your profit?

If, from 100 people, only 3 of them buy a product from the company, the costs for the advertisement is 70€, and the revenue from the sales is 60 €. In this case the company is losing money. But, if from 100 people, 4 of them buy a product the revenue would be 80 €, and the costs for the advertisement would still be the same. The difference of 10 €, tells us that the company is gaining 10 € from the sales. The minimal conversion rate would be $4/100 = 0.04$.

3. Two online advertisement companies A and B are making you offers to advertise your website. Company A follows a cost-per-mille (CPM) model with a cost of 2,40€ for displaying your banner advertisement thousand times. Company B follows a cost-per-action (CPA) model charging a commission of 6% from every profit generated on your website through clicks on the banner ad. Assuming a click-through-rate (CTR) of 0.5%, a conversion rate (CR) of 20% and an average profit of 40€ for every transaction on your website, which offer is the best?

$$\text{CPM} = 2.40 \text{ €}$$

$$\text{CPA} = 6\%$$

$$\text{CTR} = 0.5\%$$

$$\text{CR} = 20\%$$

$$\text{profit/transaction} = 40 \text{ €}$$

The CTR says that from 1000 people that see the advertisement, 5 click on it. The CR says that from people that click the advertisement, 20% of them take an action

that is profitable for the company. We also know that the company has an average profit 40 € for every transaction.

If we take the example that 1000 people see the advertisement, then 5 click on it and only 1 takes an action. The revenues in this case would be 40 €. If the company takes the offer from the advertisement company A, the costs would be 2.4 €. If the company takes the offer from the advertisement company B, the costs would be $0.06 * 40 = 2.4$ €. As we see, from these metrics, the cost for the advertiser is the same for both the advertising companies. If we base the decision only on costs, then the advertiser is indifferent because the costs are equal.

4. Assuming an online advertisement campaign for a website has obviously a high click-through-rate (CTR), but the earnings from the website are still very poor. What do you think could be the problem (please provide your answer in one or two paragraphs)?

If the Click-through-rate is high, but the earnings are very poor, the explanation is the following:

- Low CR

It might be the case that even though there are a lot of people that click on the advertisement, after they visit the website, they decide not to take action that profits the website. For example they might not like the products and so they decide not to buy them. In this case the revenues barely cover the costs of the advertisement.

- High costs

It might also be the case when the revenues are high (high CR) but the advertising company follows a cost-per-action or cost-per-click payment. If the advertising company follows a CPA payment that is high, that really reduces the advertisers income. Even if it is a CPC payment, the costs are high because CTR is high.

3 Online vs. TV Advertisement (10 points)

1. Which of the three payment models is most similar to advertisement on TV (*explain your choice and also why you think other models are not similar*)?

Let's take into consideration the example of a company in the fashion industry that sell clothes in stores. The company has done a advertisement and wants to show it on television.

Cost-per-mille payment is the most similar to advertisements on TV because the company pays for the advertisement to be seen 1000 times. The same thing happens for TV advertisements, where different advertisers pay for their ad to be shown a specific amount of times.

Cost-per-click payment is not that similar to TV advertisements because the company cannot measure if customers that went to their stores, went there because of the advertisement shown on TV, or because word-of-mouth, previous experiences with the company, casualty, or other reasons. In the this case the publisher is very unclear about its revenues. So in this case the "click-through-rate" from the advertisement is not clear.

Click-per-acquisition payment is not similar to TV advertisements because of the same reasons stated for the cost-per-click payment.

2. What do you think are the most important advantages of online advertisement compared to advertisement on TV (*highlight 5 advantages and explain each of them*)?
 - Online advertisement can attract customers from around the world with cross-regional, cultural, gender, age diversity, while TV advertisements are more local. This is a great advantage for companies that plan to expand internationally.
 - The costs that advertisers have when they advertise online are cheaper than advertising on TV, especially for advertisements in between big sports events, concerts, award shows, movie premiers, or TV shows.
 - Online advertisement makes it easier to target specific costumers. Based on what a specific person has searched before in search engines, it is possible to bring advertisements for products or services that he needs or that are similar to what he has previously searched. In the other hand, TV advertisements shows advertisement to the whole public that watches TV.
 - Online advertisements are more interactive than TV advertisements. For instance, game advertisements "trick" the viewers to play with them, without downloading or paying for the game. This is a practice to give the viewers the experience of the game and convince them to purchase or download the game. This would not be possible in TV advertisement.

- Online advertisements offer stronger campaign tracking and analytics. When a company advertises online, it is easier to measure the exact number of people that saw the advertisement, the number of people that showed interest for the product (by click-through-rate), the number of customers that the company gained from the advertisement (by conversion rate).

Important Notes

Submission

- Solutions have to be checked into the github repository. Use the directory name `groupname/assignment11/` in your group's repository.
- The name of the group and the names of all participating students must be listed on each submission.
- Solution format: all solutions as *one* PDF document. Programming code has to be submitted as Python code to the github repository. Upload *all* `.py` files of your program! Use **UTF-8** as the file encoding. *Other encodings will not be taken into account!*
- Check that your code compiles without errors.
- Make sure your code is formatted to be easy to read.
 - Make sure you code has consistent **indentation**.
 - Make sure you comment and document your code adequately in English.
 - Choose consistent and intuitive names for your identifiers.
- Do *not* use any accents, spaces or special characters in your filenames.

Acknowledgment

This latex template was created by Lukas Schmelzeisen for the tutorials of "Web Information Retrieval".

LA_TE_X

Currently the code can only be build using **LuaLaTeX**, so make sure you have that installed. If on Overleaf, there's an error, go to settings and change the **L**A_TE_Xengine to **LuaLaTeX**.