

# Introduction to Web Science

## Assignment 11

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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.

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## 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.
2. Mention the advantages and disadvantages, for publisher and advertiser, of all the payment methods and explain them in your own words.
3. Provide real world examples for the three payment methods.

Answers:

1. Name all three methods.
  - a) CPC (Cost per Click)
  - b) CPM (Cost per Mille)
  - c) 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.
  - a) Advantages:
    - i. CPC  
Advertiser: Good way of tracking visits from people who saw the ad; Increase the traffic of the website.  
Publisher: Gets paid even if the customer do not buy anything.
    - ii. CPM  
Advertiser: Not hitting the target. The ad is show even to the group of people who are not the target.  
Publisher: Knows how much money he will make from publishing the ad.
    - iii. CPA  
Advertiser: Pay based on the results; Low risk of frauds.  
Publisher: Make more profit from the percentage of selling the product.
  - b) Disadvantages:
    - i. CPC  
Advertiser: High risk of fake traffic; Increased costs  
Publisher: Unsure if the publisher is earning money from posting the ad.
    - ii. CPM  
Advertiser: Cannot be sure if the website was visited  
Publisher: It requires a certain amount of traffic on the site to be a CPM publisher.

## iii. CPA

Advertiser: Pay based on the results; Low risk of frauds.

Publisher: Click on the ad does not pay anything; Higher risk of fraud from the advertiser.

## 3. Provide real world examples for the three payment methods.

- a) CPC. Let's imagine we have a person (advertiser) who wants to sell a handmade mugs online. He decides to go to some Ad agency in order to get his product more popular on Internet. The Ad agency offers him to publish an ad on a very popular blog that mentions something about mugs. He has been offered to pay to the agency 0.50 cents for every click when the user clicks the ad on that blog.
- b) CPM. Taking the same examples from the previous point, the Agency also could offer the seller to show the ad about the handmade mugs 1000 time on many different websites to different kind of users regardless their interest and their intention. For that the Advertiser should pay a fee of 100euros.
- c) CPA. In this kind of method, the advertiser should pay the Agency a certain percent from the earnings he will make when people visit the ad and buy the mug. For every purchase a user will make after visiting the website, he (the advertiser) will pay the agency a fee of 1% from the price of the mug.

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

Answers:

1. Given, 3 out of 10 visitor is perching a product and for that we are getting 20 €. Then the cost through rate (CTR) for my website is  $= (3/10) = 30\%$ . Then the  $CPM = ((20*1000)/10) = 2000$ . For this case the  $CPC = ((CPM/1000)/CTR) = ((2000/1000)/0.3) = 6.67\text{€}$ . And the new given offer for  $CPC = 0.70 \text{ €}$  For this reason I will not accept this offer. One the other hand, the lose per visitor would be  $(2-0.7) = 1.4\text{€}$ , as from 10 visitors we are earning 20 € which make 2€ for each visitor and they are offering 0.70€ for every click. However, the lose can be more as every visitors are not going to click our ads.
2. We earn from 3 out of 10 visitors = 20 € If we get as per  $CPC = 0.7\text{€}$ , then earning from 10 visitors =  $0.70 * 10 = 7 \text{ €}$   $CPA = 20/3 = 6.66$ . It has to be more then 6.66 to not lose any money. So,  $7/6.66 = 1.06$  customer have to act to gain minimal profit. So, minimal conversion rate (CR) =  $1.06/10 = 10.6\%$  to guarantee profit.
3. Given,  $CTR = 0.5\% = 0.005$   $CR = 20\% = 0.2$  Company "A" is providing  $CPM = 2.4 \text{ €}$ , that means it will show our banner for 1000 times for just 2.4 €. On the other hand, Company "B" is offering 6% of profit. And the average income is 40€ per transaction. From here, the  $CPA = (6\% \text{ of } 40) = 2.4 \text{ €}$ . Moreover, according to question at 0.5% CTR 5 person will click my add from 1000 viewer and then I will have to pay  $(2.4*5) = 12 \text{ €}$  According to that calculation I will go with company

“A” at CPM= 2.4 €

4. There are some reasons for not earning well for that website. First of all, if the website is getting paid from the advertiser as CPM(cost per mille) then it doesn't matter how good is the CTR( cost through rate) is the payment would be the same for all cases. On the other hand, if the advertiser is paying at CPC (Cost Per Click) then the CTR does matter as the higher CTR means the high click rate. However, this is also true for CPA (Cost per action) the more is the CTR the more action will happen and the more will that website be able to earn. So, there is the fact that I think why the website is not earning well.

### 3 Online vs. TV Advertisement (10 points)

- a) 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*)?
- b) 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*)?

Answers:

- a) Most similar payment model to advertisement on TV is CPM. Mainly because it is not responsible to track whether the user visited the web page or even bought the product. Further it does not pay attention to the target group when showing the ad.  
CPC is not similar because it is not possible to measure the eventual action that the user will make after seeing the ad on the TV. CPA is also far from similar to the advertisement on TV because we cannot be sure whether the user who is buying the product even saw the ad on TV.
- b) 5 advantages of on-line advertisement over TV.
  - i. Cost efficient. Showing an ad on Internet is cheaper rather than showing the ad on a TV.
  - ii. Target people. Nowadays people have very easy access on Internet and using different types of devices to stay connected during the day. It is also very easy to target the people that advertiser wants to show the ad to.
  - iii. Tracking. It is easier for the advertiser and also for the publisher to see and measure the effect of the ad on the Internet.
  - iv. Easy to manage. If the ad needs to be changed in some way it is easier to make the changes to the ad that is published online rather than change the ad on tv which is updated periodically.
  - v. Information. While posting an ad online it can give more information and it can also offer very quick access for further information, whereas the ads on the TV have a limited time and limited information.

## 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".

### **L**A<sub>T</sub>E<sub>X</sub>

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<sub>T</sub>E<sub>X</sub>engine to **LuaLaTeX**.