dCPM and other common online advertising performance models

What is CPM?

Cost Per Mille. Usually reflects the price of 1000 banner impressions in dollar currency. Payment depends on the number of impressions solely. For example, a banner is being shown 200,000 times at CPM of $0.5, means that the payment by theadvertiser to the publisher would be 200,000 * 0.5 / 1000 = $100.

Advantages

- The advertiser knows exactly how many times the banner will be shown, and what would be his daily / total costs.
- Common model when buying media against a specific URL / site / ad spot.
- CPM is being prioritized first by ad-networks since the publisher knows exactly what the expected revenue per impression is.

Disadvantages

- Very weak performance matrix, very weak correlation with sales or leads.
- No indications for the advertiser on banner, campaign or media quality.
- When dealing with multiple sites or ad spots advertiser might receive cheap media instead of effective media.
- Effective frequency capping is unknown.

	Day 1	Day 2	Day 3
Impressions	200,000	150,000	200,000
CPM [fixed]	$0.5	$0.5	$0.5
Cost	$100	$75	$100

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What is CPC?

Cost Per Click. Known also as pay-per-click (PPC) from the publisher's point of view. In this model the advertiser pays for each click made on a banner impression. Payment depends on the number of clicks solely. For example, a banner is being shown 200,000 times, and being clicked 1000 times at a cost of $0.08 per click. The **Click through rate - CTR** in this case is 1000/200,000 = 0.5%. The cost to the advertiser would be $0.08 * 1000 = $80. Since the advertiser paid $80 for 200,000 we say that his **Effective CPM (or eCPM)** is 80/200 = $0.4.

Advantages

- The advertiser knows exactly how many times his landing page / site will be clicked, and what would be his daily / total costs.
- The banner will be shown until enough clicks are being generated
- Common model when looking for exposure with no direct lead or sale goals
- CPC is optimized quiet fast by optimizing ad-networks to generate high CTR
- Reasonable indicator for banner quality

Disadvantages

- Weak correlation with Sales or Leads
- Dependable on click tracking technology and measurement
- Weak performance matrix, vulnerable to click frauds
- No indication for campaign quality (only banner quality)
- Advertiser might receive cheap media instead of effective media
- Effective frequency capping is unknown

	Day 1	Day 2	Day 3
Impressions	200,000	150,000	150,000
Clicks	1000	1500	1000
CPC [fixed rate]	$0.08	$0.08	$0.08
Cost	$80	$120	$80
eCPM	$0.4	$0.8	$0.53

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What is CPL CPA CPS?

Cost Per Lead / Cost Per Acquisition / Cost Per Sale. In this model the advertiser pays explicitly per transaction type made by the buyer that resulted from a click on a banner impression. Payment depends either on the cost of lead, cost of sale or a percentage of the sale's revenue. For example, a banner is being shown 200,000 times, and being clicked 1000 times. 10 clicks converted to a lead where the advertiser pays 5$ per lead. The total advertising cost would be 10*5 = 50$.

Advantages

- The advertiser pays according to results only.
- The banner will be shown for unlimited period of time.
- Preferred model for the advertiser. Zero risk on his side.
- Low vulnerability to frauds.
- High correlation between sales and campaign and banner quality.

Disadvantages

- Publisher will not allocate premium media for questionable profit
- Publisher will refuse to work in this model when cpm / cpc models can fill his inventory
- Dependable on conversion tracking technology and measurement.
- Hard for the publisher to estimate when to stop a campaign

	Day 1	Day 2	Day 3
Impressions	200,000	150,000	200,000
CPL [fixed rate]	$5	$5	$5
Leads	10	15	12
Cost	$50	$75	$60

Note: There are many other Cost Per Action models, like Cost per Call (for cellular advertising), Cost per Download (for downloadable products), Cost per View (a common term for video based advertising). Advertisers who claim to support all available model sometimes use the term CPE – cost per everything.

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What is eCPA?

In order to explain what dCPM is easily, we need to introduce the term **eCPA – effective cost per action**. We add an action count (Lead for instance) to the previous examples, and calculate how much did the advertiser actually paid for each Lead act. **Lets assume the advertiser is profitable when he pays 5$ per lead.**

eCPA on a CPL/CPA/CPS model

Here naturally, the eCPA is the predefined CPL.

	Day 1	Day 2	Day 3
Impressions	200,000	150,000	200,000
CPL [fixed rate]	$5	$5	$5
Leads	10	15	12
Cost	$50	$75	$60
eCPM	$0.4	$0.5	$0.3
eCPA [fixed rare]	$5	$5	$5

Although the cost per Lead was as desired by the advertiser, the publisher might drop the campaign receiving only $0.3 eCPM on day 3.

eCPA on a CPM Model

In this case, the eCPA reflects the total cost each day divided by the number of leads. We can see that the advertiser has very little control regarding the price he pays for each lead.

	Day 1	Day 2	Day 3
Impressions	200,000	150,000	200,000
CPM [fixed rate]	$0.5	$0.5	$0.5
Cost	$100	$75	$100
Leads	10	15	12
eCPM [fixed rate]	$0.5	$0.5	$0.5
eCPA	100/10 =$10	75/15=$5	100/12=$8.3

Here, the publisher might be satisfied with his 0.5$ CPM but the advertiser loses on day 1 and day 3 paying more than 5$ per lead dropping the campaign as well.

eCPA on a CPC Model

Similar to the CPM model, the eCPA reflects the total cost each day divided by the number of leads. Although sometimes there is some correlation between the number of clicks and the number of acquisitions, still the advertiser has little control over the price he pays for each lead.

	Day 1	Day 2	Day 3
Impressions	200,000	150,000	150,000
Clicks	1000	1500	1000
CPC [fixed rate]	$0.08	$0.08	$0.08
Cost	$80	$120	$80
eCPM	$0.4	$0.8	$0.53
Leads	10	15	12
eCPA	80/10=$8	120/15=$8	80/12=$6.6

Although the publisher in this example receives satisfactory eCPMs, the advertiser is not profitable at $8 per lead.

Solution:
Dynamic CPM with a CPA target

What is dCPM with a CPA target?

Dynamic cost per mille with a cost per action target. This model is the most effective and balanced both for the advertiser and the publisher. In this model the the advertiser continues to advertise as long as his eCPA is under his CPA goal, and the publisher decides to advertise as long as the CPM he receives is higher than the competing advertisers. This is why neither the CPM nor the eCPA in this model is fixed. The following example describes the decision making process:

	Day 1	Day 2	Day 3
Impressions	100,000	150,000	200,000
CPM	$0.4	$0.5	$0.6
Leads	10	15	16
Cost	100*0.4=$40	150*0.5=$75	200*0.3=$120
eCPA	40/10=$4	75/15=$5	120/16=$7.5

Analysis: On day 1 the optimization process sees that the advertiser is profitable and even has a margin as he pays $4 for a $5 worth leads. This usually means that by driving more traffic, more leads can be obtained. On day 2, more leads have been obtained, advertising still paying under his target lead price. On day 3, even more traffic is being bought breaking the CPA limit of the advertiser. The optimization process decides to reduce traffic for the campaign.

	Day 4	...	Day 40
Impressions	150,000	...	150,000
CPM	0.5	...	$0.3
Leads	15	...	5
Cost	$75	...	$45
eCPA	75/15=$5	...	$9

Analysis: The campaign maintains a good balance between the eCPA for the advertiser and the CPM for the publisher until day 40 where even at the price of $0.3 CPM the campaign is not effective anymore at an eCPA of $9. Publisher cannot decrease the price since other advertisers bid more and advertiser is not profitable. The campaign is dropped.

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Advantages

- The advertiser is optimized toward paying according to results only.
- The publisher does not advertise unless advertiser pays minimal price.
- The banner will be shown for unlimited period and unlimited amount of time as long as being effective for both sides.
- Good balance between advertiser's risk and publisher's profit.
- Low vulnerability to frauds.
- **Allows the advertiser to compete over premium media with high CPM at low risk as long as his campaign is effective.**
- Campaign stops automatically.

Disadvantages

- Advertiser has to risk an initial sum before seeing results.
- Dependable on conversion tracking technology.

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