

Transparency in Proximity Advertising Campaigns

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Agenda

- ❖ Introduction
- ❖ Online Advertising
- ❖ Proximity Advertising & Issues
- ❖ Blockchain-Based Advertising Platform
- ❖ Conclusion

Online Advertising

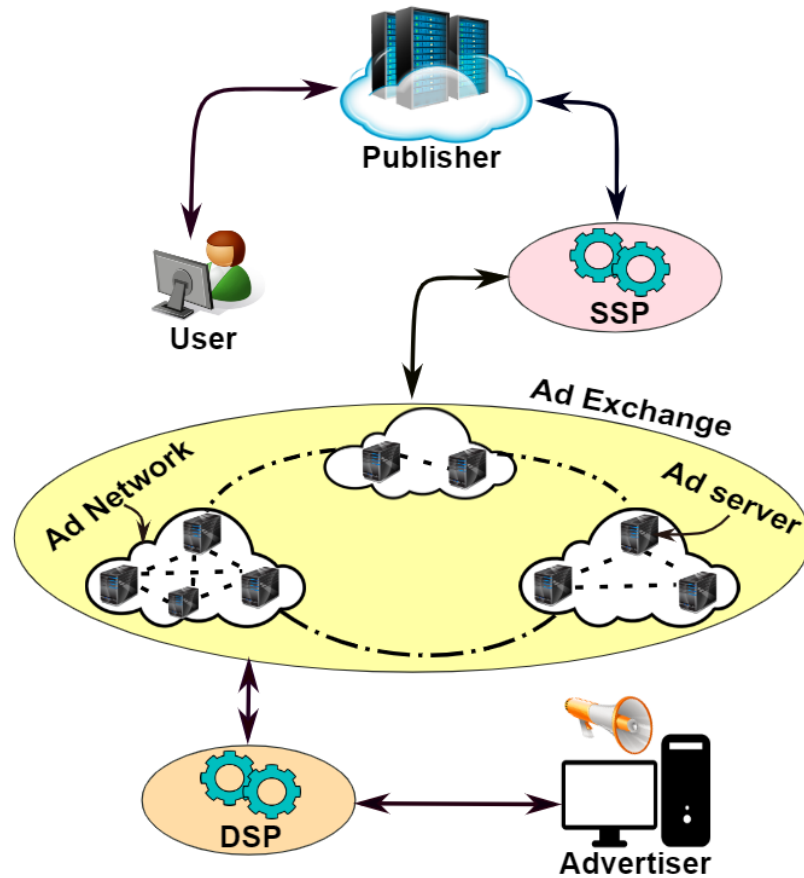


Figure 1: High level overview of online advertising ecosystem[1].

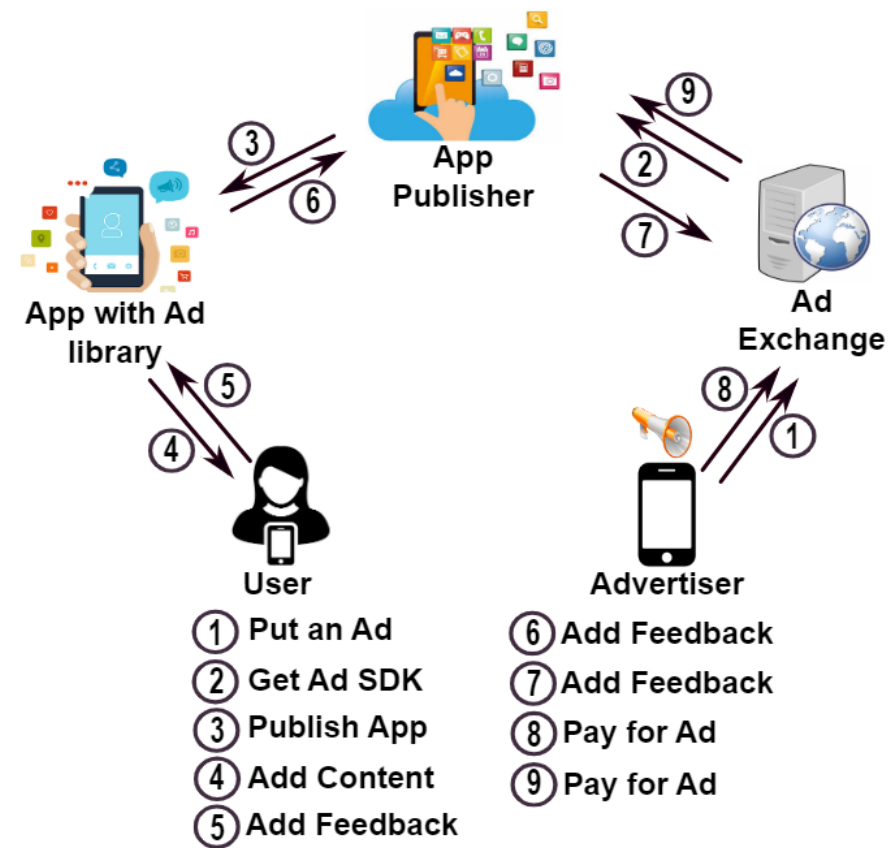


Figure 2: The process of serving ads in mobile advertising system [1].

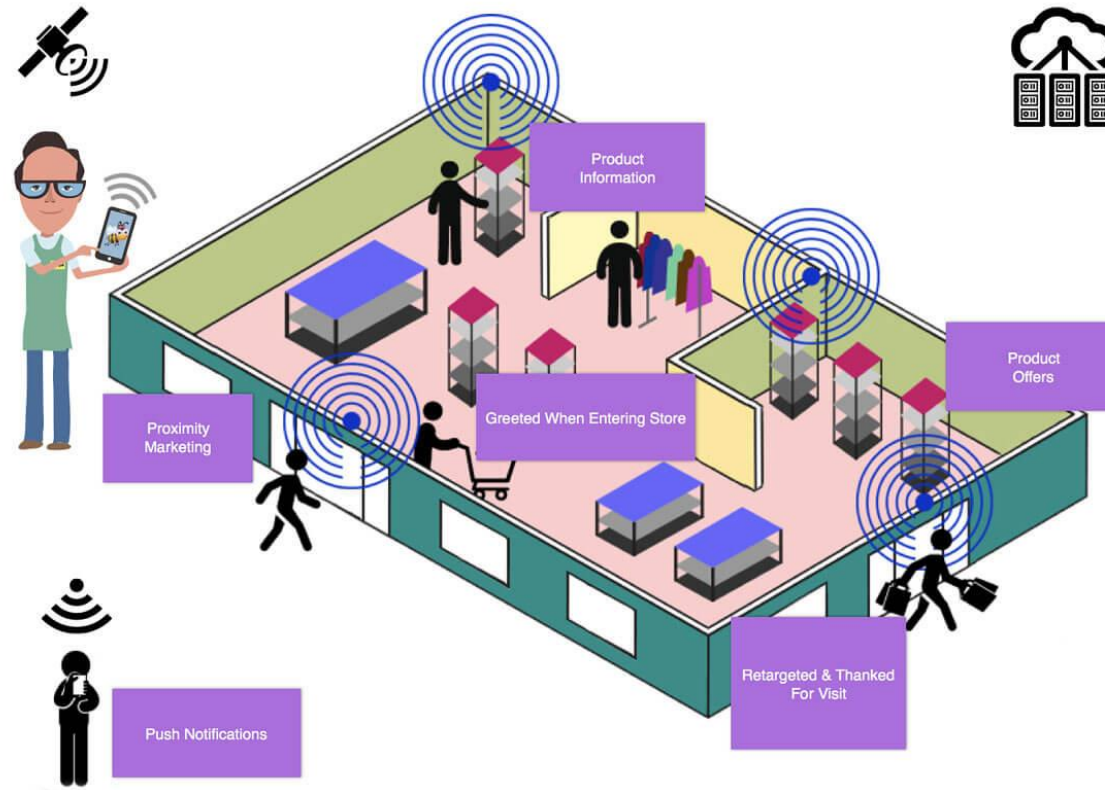
[1] Z. Pooranian, M. Conti, H. Haddadi and R. Tafazolli, "Online Advertising Security: Issues, Taxonomy, and Future Directions," in IEEE Communications Surveys & Tutorials, vol. 23, no. 4, pp. 2494-2524, Fourthquarter 2021, doi: 10.1109/COMST.2021.3118271.

Proximity Advertising

Advertiser: has a new store/product that wants to promote

Publisher: hired by an advertiser to deliver the promoted store/product's information (e.g., description, token) to customers

Customer: receives information on promoted store/product via smartphone



Who are using proximity advertising?

Amazon Go
Walmart
McDonald's
Nike
...

Which smartphones are supported?

Apple iBeacon: iPhone
Google Eddystone: Android

Figure 3: The process of proximity advertising [2].

[2] <https://yogobogo.com/proximity-marketing-beacons/>

Revenue Models [3,4]

- ❖ **Impressions:** the number of times customers received promoted product/store information.
- ❖ **Foot Traffic Rate:** the number of times customers have gone to the store after receiving the promoted product/store's information divided by the number of times customers have gone to the store.
- ❖ **Conversions:** the number of times customers have gone to the promoted product/store area after receiving the promoted product/store's information.
- ❖ **Interest Conversion Rate:** the number of times customers have gone to the area of the promoted product after receiving the promoted product's information divided by the number of times customers have received the product/store's information.

[3] <https://business.linkedin.com/marketing-solutions/success/best-practices/analyze-your-performance>

[4] <https://blog.beaconstac.com/2015/05/beacon-analytics-in-retail-4-essential-metrics-for-retailers/>

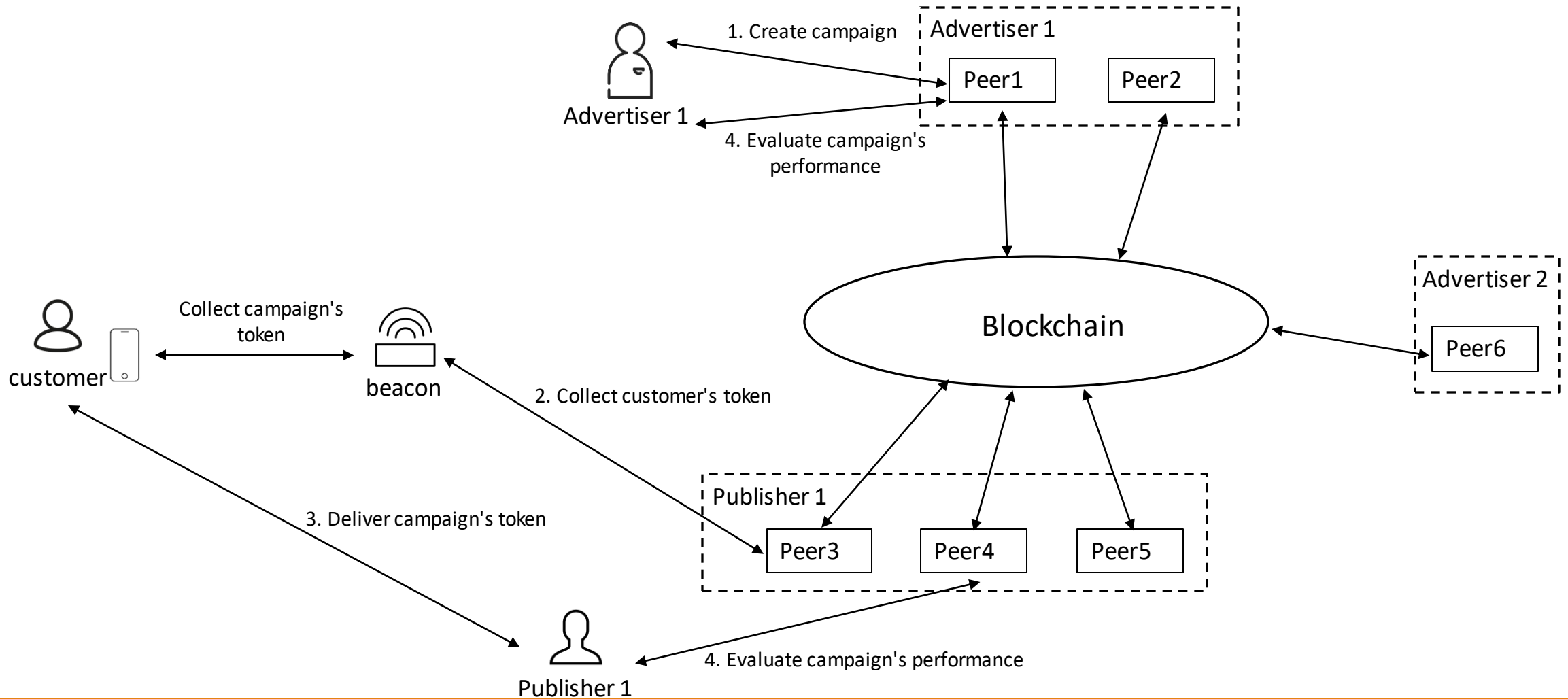
Possible Problems

- ❖ **Hit Inflation:** publishers manipulate beacons to increase the number of times customers have gone to the promoted store/product.
- ❖ **Crowd Fraud:** publishers hire customers that have gone to the promoted store/product.
- ❖ **Hit Shaving:** advertisers reduce the number of times customers have gone to the promoted store/product.
- ❖ **Security:** unauthorized beacons count the number of times customers have gone to the store/product's area.
- ❖ **Customers' Privacy:** customers' tokens are collected by beacons that can be used to track customers' locations.

Project Goal

- ❖ We exploit blockchain platforms to ensure the transparency, security, and privacy of proximity advertising processes.
- ❖ **Transparency:** ensures that the activities of an advertiser and a publisher are transparent and verifiable by each other.
- ❖ **Security:** unauthorized advertisers/publishers cannot evaluate the effectiveness of the campaigns of other advertisers/publishers.
- ❖ **Privacy:** all advertisers/publishers cannot track customers' collected data to infer their locations.

Blockchain-Based Proximity Advertising Platform



Design Principles

- ❖ Permissioned or Permissionless Blockchain?
- ❖ How to ensure advertisers/publishers follow the campaigns' tokens generation/collection's workflow?
- ❖ How to ensure the transparency of campaigns' performance measurement while protecting customers' privacy?

Conclusion

❖ A blockchain-based proximity advertising platform ensures that:

- Transparency
 - Protect advertisers/publishers from common attacks: hit inflation, crowd fraud, hit shaving
- Security
- Customers' Privacy

❖ Future work:

- Develop to track more detail customers' behaviors and bring more performance metrics.

Thank you for your attention