

Методи, Засновані на Знаннях, для Прогнозування Цифрової Реклами та Підвищення Ефективності Рекламних Кампаній

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Knowledge Based Methods for Digital ad Forecasting and Enhancement of Advertising Campaigns Effectiveness

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Анотація—Запропоновано використовувати методи засновані на знаннях в існуючих системах цифрових рекламних кампаній для прогнозування аудиторії та обрання ефективної маркетингової стратегії.

Abstract—The article presents the approach of introducing the knowledge based methods into the existing digital advertisement systems for audience forecasting and selecting the effective marketing strategy.

Ключові слова—digital advertisement; forecasting; knowledge base; effectiveness

Keywords— digital advertisement; forecasting; knowledge base; effectiveness

I. INTRODUCTION

Digital advertising has become one of the most important revenue sources for lots of technology companies nowadays. Unlike those traditional advertising techniques, digital advertising unlocks far more reliable insights about the campaign performance. Therefore, more and more advertisers start to put more budget on online ads, and more and more technology companies start to offer advertising options on their platform [1].

Ad exchange is finally following its programmatic peers and moving to a first-price auction model, in which the advertiser that places the highest bid wins the impression and

pays as much as they bid. It's a more straightforward setup than the traditional second-price model, in which that advertiser would only pay a penny more than the runner-up bid. However, transitioning from second-price auctions to first-price auctions can be more complicated — and costly — for advertisers [2].

The advertiser has to change the strategy of ad campaigns budgeting and requires having more tools to predict the audience.

Most part of audience forecasting tools are cost consuming due to usage of external payed data sources and doesn't correspond to the audience of this specific DAS. Those tools don't take into account the historical data of audience behavior of this specific DAS. Big DASs work mainly with clients for a long time, so that this historical information could be really useful for predicting the possible audience of the ad campaign and change geo targeting or budgeting strategy to achieve the marketing goals.

II. REFERENCE ARCHITECTURE OF DAS

The Fig 1. diagram shows the overall architecture of a fully functioning digital advertisement system. Some DASs may have more enhancement to meet the specific needs. However, this architecture has all main blocks:

- advertisement platform,
- data processing platform,



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- advertisement serving module,
- statistical data collection platform.

Advertisement platform is used by operation managers for ad campaigns setup and is served on advertisement servers, usually it's client-server applications.

Advertisement serving module provides the advertisement located on CDN and tracks the impressions logs on the static files repository. Statistical data collection platform helps to track user clicks for further click through rate calculations – the main ad KPI.

Data processing platform (AWS EMR on the Fig. 1) is used for running multiple aggregations pipelines.

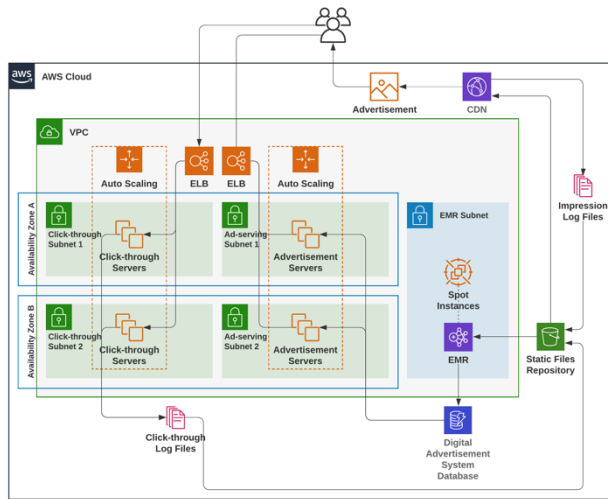


Fig. 1. Reference architecture of Digital Advertisement System.

III. DAS WITH KNOWLEDGE MANAGEMENT PLATFORM

To provide the forecast functionality based on existing DAS data stored in its database we need to introduce the Knowledge Management Platform KMP (Fig. 2).

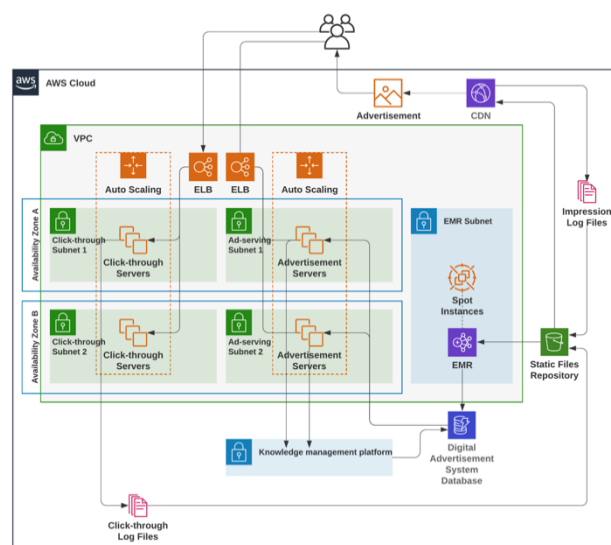


Fig. 2. Digital Advertisement System with Knowledge Management Platform

The adding of KMP into the existing DAS have to be done in two stages:

- Extracting keywords from existing digital advertisement system database
- Introducing the keywords extraction into existing campaign creation and statistics collection, processing pipelines for real time knowledge base updates.

There are multiple approaches for automatic keyword extraction based on machine learning methods. Two main approaches can be distinguished for keyword extraction: centered on the document content or driven according to external knowledge [3]. The steps of the keywords extraction pipeline is presented on Fig. 3.

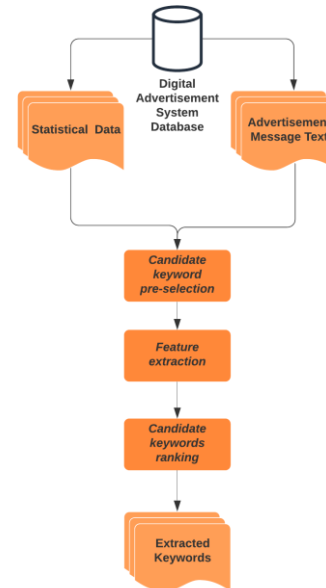


Fig. 3. The overview of the steps of keywords extraction pipeline.

IV. CONCLUSION

The architectural approach of introducing the knowledge management platform into DAS could be the reference for the advertisement system architects. This approach consists of system architecture diagram, steps required for introducing it into the existing DAS system. The KMP is going to help advertisers to set up more campaigns to experiment with their marketing strategy by using the keyword-based audience forecasting.

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