

Securing Safety in Digital Advertising

Digital Advertising Anti-fraud Best Practices

White Paper for 2016



《Digital Advertising Anti-fraud Best Practices White Paper for 2016》

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59.8%

59.8% market share of China's
brand programmatic buying

Source: Analysys International 2015 China
Programmatic Advertising Report

Founded in 2008, Beijing Pinyou Interactive Information Technology Corporation (iPinYou) is the largest programmatic buying platform in China.

iPinYou is the first one introducing RTB technology to China market. Ever since, iPinYou has continued bringing innovation to digital advertising trading in China, including PDB, PMP, mobile, OTT programmatic buying. Relying on world-class real-time bidding (RTB) architecture and algorithm as well as advanced proprietary audience targeting technology, iPinYou helps thousands of brands in China to achieve robust programmatic buying practice.

iPinYou has formed a world's leading research team on data mining and machine learning algorithm, introduced leading big data research methods in the field of advertising technology, and independently developed Optimus™ system. This system accesses to China's largest Internet user behavior data and has patented on its audience analysis model and ad optimization algorithm. OPTIMUS™ system supports programmatic ad buying on PC banner, video and mobile as well as cross-screen of these three.

Almost all leading brands in industries such as FMCG, automobile, IT, finance, e-commerce, and gaming are using iPinYou programmatic buying platform to uplift their brand awareness and improve their operational efficiency. The platform has successfully served thousands of branding advertisers and tens of thousands of small and medium-sized enterprises. According to authoritative data, iPinYou represents 59.8% market share of brand programmatic buying in China. The future of advertising lies in Data + Technology.

COMPANY PROFILE



Xaxis

Xaxis is the GroupM's global digital media platform that programmatically connects advertisers and publishers to audiences across all addressable channels.

Xaxis leverages proprietary advertising technology, unique data assets and unparalleled media relationships, with the support of an excellent team formed by audience analytics experts, data scientists and software engineers. Through Xaxis' digital campaign, advertisers can achieve higher return of investment, while publishers are able to deliver relevant ad content to new and valuable audience.

Xaxis delivers results for over 2,800 clients in 40 markets across North America, Europe, Asia Pacific, Latin America and the Middle East. Since its entry to China in 2013, Xaxis has been rapidly localizing its global technology and tools to adapt to the China market for the past three years. We make steps in premium inventory, data, management and operation, integrating global innovations, technology, client servicing experiences with our understanding on China market situation as well as clients' needs to provide programmatic buying solution to 120 clients.

Xaxis' mission: Make Advertising Welcome.



Integral Ad Science

Integral Ad Science is the leading global provider of actionable advertising intelligence data for buyers and sellers of digital media and is the industry's standard for rating media quality.

Since launching the industry's first preventative brand safety solution in 2009, powered by constant growth and innovation, IAS has evolved into a global media valuation platform that is essential to the buying and selling of quality media. Integral focuses on a comprehensive solution set that enables advertising to appear in quality environments and receive favorable exposure — while the sell side can monitor and control its quality and performance. Integral's technology drives improved visibility, efficiency, and ROI for players across the digital media landscape.

Employing the industry's only media valuation platform, IAS evaluates the media environment and establishes a TRAQ Score (TRue Advertising Quality), a first-of-its-kind, quantifiable measure of media quality that ultimately benefits every media buyer, seller, publisher and trading platform. TRAQ Score supports an advertiser's ability to plan, execute and target their audience in an environment that reflects their brand image and drives ROI, while simultaneously setting benchmarks for publishers who wish to improve the quality of their content and design to attract premium advertisers.

IAS is headquartered in New York with operations in San Francisco, Chicago, Washington DC, London, Berlin, Sydney, Melbourne, Tokyo, Singapore and Paris. For more information, please visit www.integralads.com.

VIEW OF EXPERTS



Grace Huang

iPinYou
Founder / CEO

Digital advertising is the trend of the times, however the quality of the inventory, the good and bad intermingled ad technology companies, data transparency between advertiser/media provider and the supervision problem on digital advertising market, making advertisers more concerned about the safety and the quality of digital advertising. As the leading technology platform to serve the advertisers in China, iPinYou Interactive is committed to promote the healthy development of the industry, to enhance the confidence of advertisers in digital advertisement and to make our client to feel the transparency and safety of the technology. In the past eight years, the data and algorithms of the audience has always been the top priority of iPinYou. We act as a “smart buyer” for advertisers and improve the efficiency of advertising. We insist to use the most advanced technology to identify the quality of the media inventory. At the same time, we docked with the top brand safety companies across the world to offer a safer delivery environment. It was in 2012 that iPinYou formed the first anti-fraud algorithm expert team to research and develop the most cutting-edge technology solutions for digital advertising fraud. Meanwhile, iPinYou has been working with different partners along the industry to optimize specific programmatic buying technology and data advantages to actively promote the anti-fraud process within the entire internet industry.

"Digital Advertising Anti-fraud Best Practices White Paper for 2016" is compiled together by iPinYou, Xaxis and Integral Ad Science. For the last six months, we carefully build this Internet anti-fraud development summary report to analyze the roles and functions of each participants within the industry. The report also analyzes how programmatic buying techniques of great quality are proved to be able to add value on avoiding fraudulent inventory. At the same time, we demonstrate how we managed more than 24 billion of inventory daily through our advanced anti-fraud algorithm and technology to create a transparent and secure digital advertising environment for our clients.

We would also like to take this report as an opportunity to call on our fellow advertisers, media agencies, media groups, ad-exchange platforms and technical service providers, together we could initiate more regulations and programs to enhance industry transparency and safety for the long term good of programmatic buying industry.



Mark Xie

iPinYou
Co - founder / COO

In the industry of programmatic buying, for the past 8 years iPinYou has been acting as the industry leader and an open cooperative partner. "To become a radius and with its rules, then the power of all things carry on." Although the entire programmatic buying industry is becoming the hot spot, iPinYou still try to push for the benchmark and regulation of a higher standard for the long-term good and prosperity of the industry. In the early August of 2016, iPinYou collaborated with industry leaders such as Tencent, iQIYI, Youku Tudou, Procter & Gamble, Dentsu Anjies and Publicis Media Group to establish the first Media Evaluation Committee of China's advertising industry to ensure the effective implementation of the advertising standards. This time, we cooperated with Xaxis and Integral Ad Science to thoroughly present the progress of anti-fraud and the contribution to the programmatic buying.

Advertising fraud and anti-fraud have been battling since the beginning. In the era of programmatic buying, data and technology are the backbone to fight against fraudulent advertising. With years of accumulative experience and technological strength, iPinYou partnered up with the most heavyweight players within the industry again for this report. Fight against fraudulent advertising is everyone's responsibility, we will definitely need all participant to input their experience and ability to fight for it. iPinYou is willing to work with all advertisers, media agencies, media groups, ad-exchange platforms and technical service providers to build a more secure advertising ecosystem and increase the efficiency of advertising through programmatic buying.



Mickey Zhang

GroupM Programmatic
CEO

As the future media buying trend, programmatic buying is getting more public recognitions. Technology, data and traffic, being the three key elements in driving programmatic development, are also luring more attention from the market. While traffic quality and brand safety are the basic needs in the media ecosystem, they are also an issue that advertisers concern much no matter when using traditional media buying or programmatic buying.

As a global programmatic buying platform with in GroupM , Xaxis strives to provide advertisers high quality programmatic buying solutions. In particular on anti-fraud, viewability and brand safety, Xaxis has worked hard to establish a healthy and quality ecosystem, so that advertisers can feel safe to effectively and efficiently reach their targeting audience through programmatic buying and at the same time enjoy higher return of investment.

Xaxis also works closely with other partners in China including mainstream publishers and outstanding technology companies taking iPinYou as representative to promote the marketing understanding on viewability, brand safety and anti-fraud, and to establish an effective anti-fraud system. Under the technology revolution driven by the use of big data, we truly believe that with unifying clients, media, technology companies and media agencies altogether, programmatic buying industry could undoubtedly have a healthy and sustainable development.



Scott Knoll

Integral Ad Science
CEO and President

Fraud has become an increasingly large issue in the advertising industry, which is why we are dedicated to developing the best technology and tools possible to help combat it. Integral Ad Science has an Anti-Fraud Lab that will enable us to disrupt ad fraud and other deceptive behavior in all its forms, as well as participate in exciting efforts against cybercrime around the world.

Thousands of companies rely on Integral's technology daily, a role we take very seriously as proven by our commitment to continue to invest heavily in fraud prevention and the establishment of this first-of-its-kind operation. The findings we will share will benefit the whole industry.

We continue to develop cutting edge solutions for both buyers and sellers to ensure that our clients are protected against fraud.

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What performance improvements can Advertisers see after working with iPinYou?

**What can ad technology companies do
to ensure a safer digital advertising?**

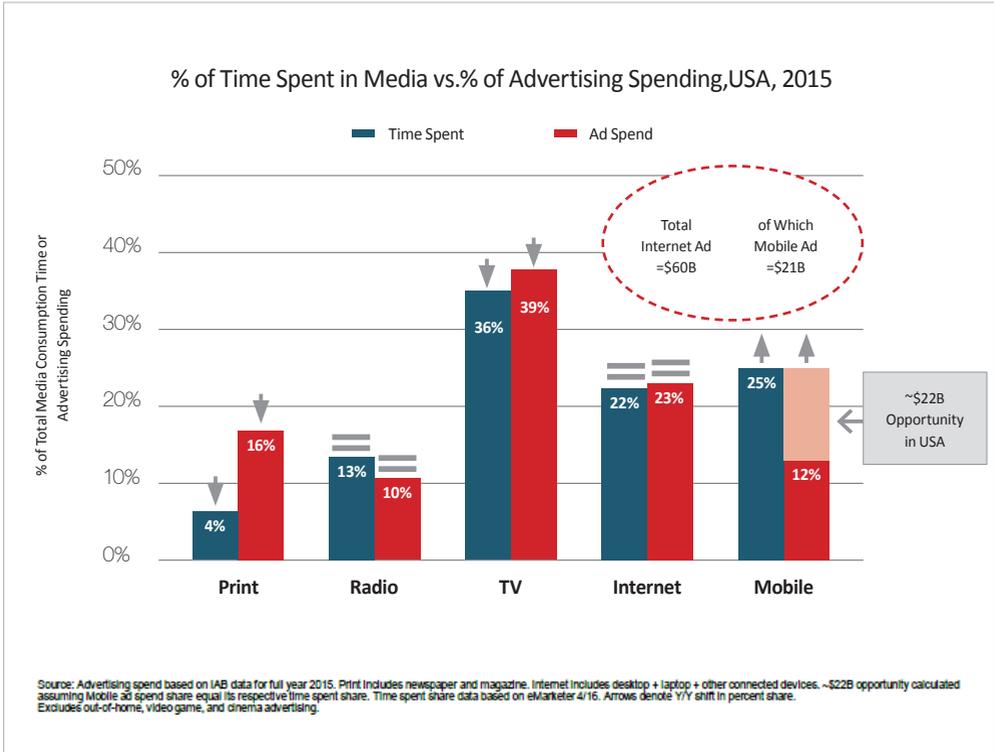
Part 1

Mobile

Programmatic

Tech Companies

While digital media gains dominance, the spending on digital advertising is still hindered by lack of transparency and safety



Data source : Mary Meeker «INTERNET TRENDS 2016 – CODE CONFERENCE»

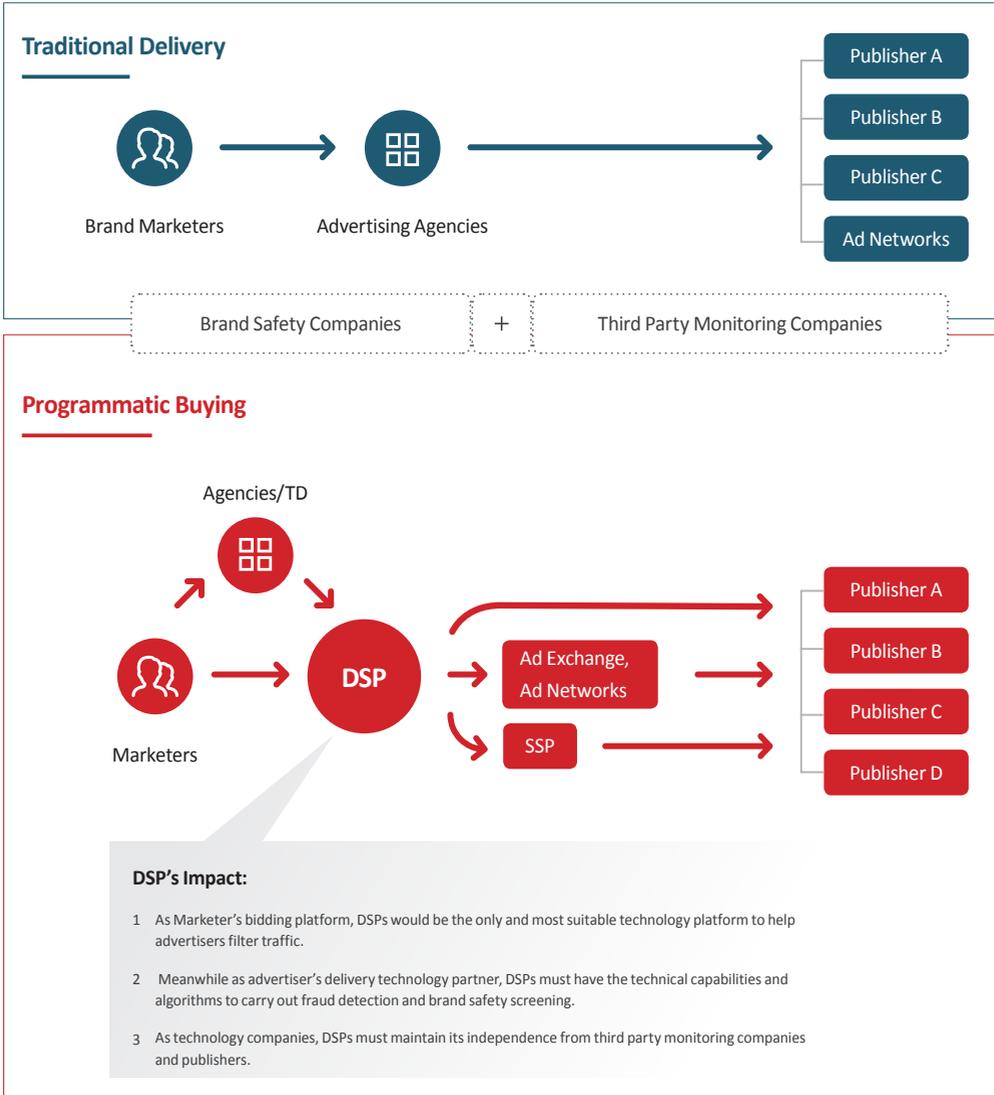
The mission of ad tech companies should be to provide better selection of inventories and secure brand safe environment

| | | Current State | Difficulties and Limitations |
|-----------------|--|--|---|
| Demand Side | Advertisers | <ul style="list-style-type: none"> Mainly rely on manual selection of publishers or human judgements to determine good quality traffic. Attempt to introduce more KPI indicators to hopefully solve for media quality issues. | <ul style="list-style-type: none"> Can only rely on publishers to determine fraudulent traffic and brand safe environment. Scope of delivery can be limited, thus making it difficult to work with new publishers or leverage new technologies. Fraudulent suppliers may sometimes take advantage of more KPIs indicators. |
| | Agencies/Trading Desks | <ul style="list-style-type: none"> Using own technology to help advertisers develop optimal media placement strategies, screening and high-quality media resources. Help clients develop campaign KPIs to maximize advertiser effectiveness. | <ul style="list-style-type: none"> Independent R & D is relatively weak. Many small agents may not have their own technical team or need to rely on external technical support, thus autonomy is weak. |
| Technology Side | Third Party Monitoring Companies | <ul style="list-style-type: none"> Increased fraud detection methods, mainly through mining and analyzing the relationships between different data points. The number of KPIs have increased beyond just IP and Cookies, including referral, frequency, exposure, click thru and time correlation, etc. | <ul style="list-style-type: none"> Provide post campaign reporting only, cannot take preventative actions due to lack of real-time data. |
| | Brand Safety Companies | <ul style="list-style-type: none"> With the appearance of Third Party Brand Safety companies and it's integrations with different DSP companies, not only are they able to provide viewability monitoring but can also offer real-time pre-bid brand safety targeting to help increase overall campaign's ROI. Offer marketers different brand safety standards, customizable solutions with multiple brand risk categories and thresholds. Address brand risk with the use of keywords that are specifically relevant to a client. | <ul style="list-style-type: none"> Mobile is still in development phase. |
| | Demand Side Platforms (or other technology companies) | <ul style="list-style-type: none"> From the initial formation of DSPs to Ad Exchanges trading methods, ability to provide advertisers greater flexibility in selecting quality inventory through assessing every impression. The real-time bidding mechanism of programmatic buying are the key drivers to the fraud detection technology, enable filtering out fraudulent traffic. As independent party to publishers, DSP companies can leverage large amount of data to build anti-fraud models thus provide relatively better verification technology to advertisers. | <ul style="list-style-type: none"> Not many technology companies can afford setting high key talent recruitment or hardware requirements standards to build anti-fraud modeling. Many DSPs lack the independence from supply side and therefore exist conflict of interests. |

Notes

- **Programmatic Buying:** Programmatic media buying is the practice of using computer algorithms to buy media placements for advertising. It refers to the use of software to purchase digital advertising, as opposed to the traditional process that involves RFPs, human negotiations and manual insertion orders.
- **DSP (Demand Side Platform):** A demand-side platform enables advertisers and agencies to automate the purchase of display, video, mobile and search ads. A DSP assesses the attributes of every single ad impression and can assign a bid based on those attributes. By removing rate negotiation and manual ad insertion orders, the purchase of targeted advertising across a wide variety of publishers and platforms becomes quicker and more efficient.
- **ATD (Agency Trading Desk):** An agency trading desk is a trading desk operated as a subsidiary of an agency or holding company. Agency trading desks typically handle programmatic buying on behalf of all media agencies within an agency family.

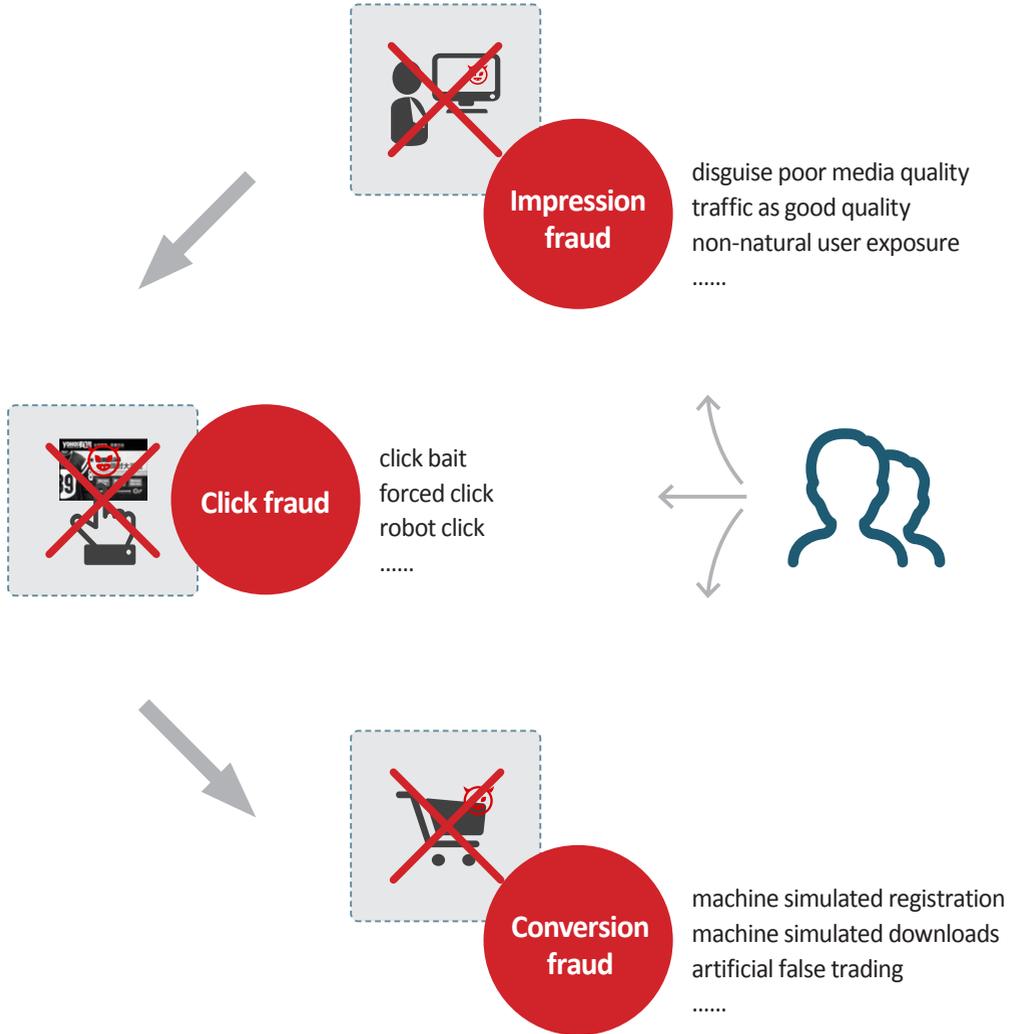
A true DSP should have the technology to improve and prevent ad fraud by using its algorithm and data



Notes

- **SSP (Supply Side Platform):** An SSP is a software tool used by publishers and their representatives to make impressions available to media buyers via exchanges, networks and programmatic direct. SSPs offer publishers tools to directly track sales, optimise yield, and whitelist preferred advertiser.
- **ADX (Ad Exchange):** Ad exchanges are auction-based, often highly automated, digital marketplaces that enable multiple parties including advertisers, publishers, ad networks, demand-side platforms, and sell-side platforms to buy and sell display, video and mobile inventory.

A worldclass anti fraud algorithm can help advertisers to filter non-human traffic and abnormal clicks



Notes

- **Impression Fraud:** the fraudulent practice by which ads are delivered and counted as served without having any chance to be seen by humans. Impression fraud is theoretically distinct from classic ad visibility issues. Impression fraud is when falsely generated ad impressions affect an advertiser's account. It's also called CPM Fraud because these ad impressions are purchased on a CPM basis (cost per thousand) and as long as a thousand impressions are generated, the advertiser needs to pay, whether or not it got any kind of action afterward.
- **Click Fraud:** Click fraud is a type of fraud that occurs on the Internet in pay-per-click (PPC) online advertising. In this type of advertising, the owners of websites that post the ads are paid an amount of money determined by how many visitors to the sites click on the ads. Fraud occurs when a person, automated script or computer program imitates a legitimate user of a web browser, clicking on such an ad without having actual interest in the target of the ad's link. It's also called CPC fraud.
- **Conversion Fraud:** Similar to click fraud and also known as CPA fraud. The fake lead can be generated by having humans fill in a form at extremely low cost and then selling the lead for higher cost to lead buyers, or can occur through bots and algorithms. Fraudsters will take credit for generating a fake lead or a sale.

Sophisticated DSP should also protect advertiser's brand safety

Guarantee Brand Safety

With Brand Safety company's automated blocking and real-time optimization solution, ad calls can be blocked and ads won't get served to sites containing risky content. For example, sites with pirated content or adult content, or sites that are outside of advertiser's designated geography and sites exhibiting fraudulent activity.

Results from advertiser who used Brand Safety solutions in 2015



By utilizing these solutions across all digital media, advertiser saw a 7x return on investment.

Based on Integral Ad Science case study, using patented Firewall Blocking and real-time optimization solutions to help protect brand safety.

Data sources : Integral Ad Science

How can different industry players collaborate to fight against fraud?

Part 2

Marketers

Agencies/TD

Publishers

DSP

It requires joint effort between Marketers , Agencies/TD , Publishers and DSP to fight against fraud



Active participation from Advertisers can help to prevent fraud

Request transparency from system and data.



Establish complete attribution analysis system, including exposure conversion, path to conversion, etc.

Establish objective KPIs that can be monitored or tracked.



Complete monitoring of all data points starting from the time ad is exposed.

Comprehensive programmatic delivery.



Choose DSP partner that is independent from publishers or Third Party ad tracking companies.

Strict evaluation of DSP's technical capabilities and strengths.



Advertisers can take various measures to detect and prevent fraud

Advertisers can take the following approaches to prevent wastage of marketing budgets and to develop proper marketing strategies:

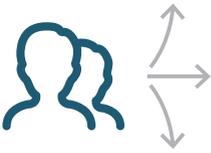
Use technology and data scientifically

1

Define reasonable KPIs

2

Adopt programmatic buying



Choose the strongest technology partners

3

Select outstanding Agency/Trading Desk

4

Select best DSP partner

Improve the objectivity and comprehensiveness of monitoring

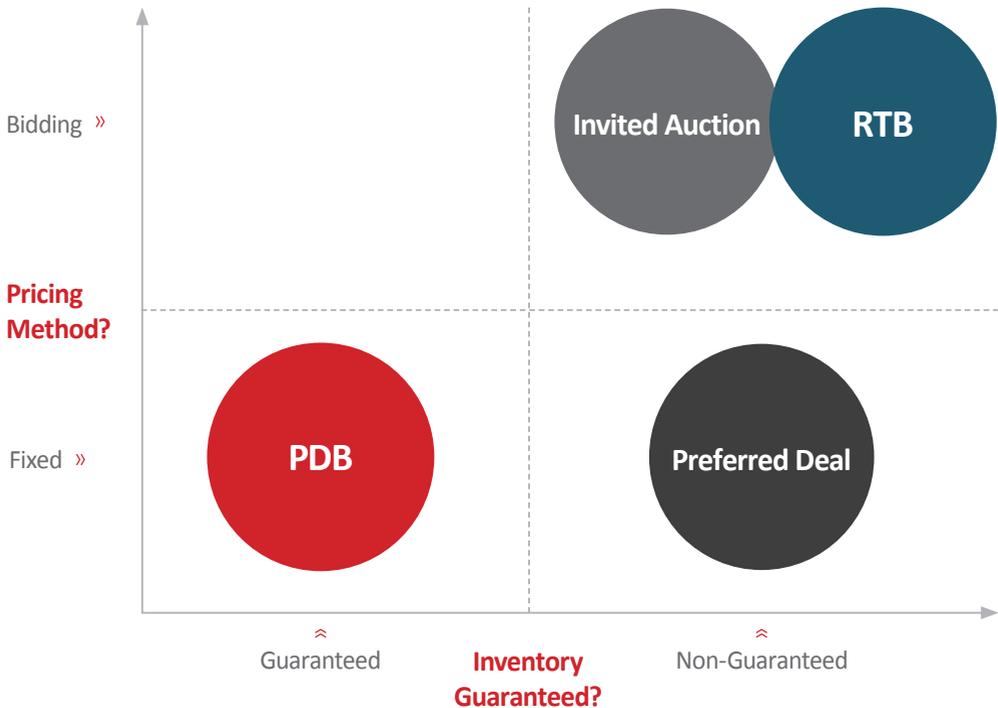
5

Increase protective system

6

Adopt Third Party Monitoring

A proper use of one system to manage various types of inventory can improve the effectiveness of anti-fraud



Notes

- **RTB (Real-time Bidding):** Real-time bidding enables the buying and selling of digital advertising through auctions which take place in a timeframe of milliseconds – the time it takes for a webpage to load. Auctions take place via media marketplaces such as ad exchanges that connect buyers and sellers, and the price paid for impressions is based on immediate demand.
- **PDB (Programmatic Direct Buying):** also called Programmatic Guaranteed which is a type of programmatic buying in which media buyers negotiate deals with sellers up-front, but select impressions for campaigns using programmatic technology. Key features: No auction, set CPM, guaranteed inventory.
- **PD (Preferred Deal):** allows Ad Exchange sellers to offer inventory to buyers at a negotiated fixed price, before the inventory is made available to other buyers in the Open Auction. Some publishers also choose to offer certain inventory exclusively through Preferred Deals. Key features: No auction, set CPM, non-guaranteed inventory.
- **IA (Invited Auction):** where one publisher or a select number of publishers invite a select number of buyers to bid on its inventory. Inventory purchased is transparent, the buyer knows exactly which site the ad will run on. Key features: Real time bidding, price floor, select group of advertisers.

It is important for advertisers to benchmark against different metrics and understand drivers for each

Advertisers’ most common advertising and website metrics to pay attention to:

| Indicator | Abnormality | Media Quality | Ad Placement’s Performance | Landing Page design | Website User experience |
|-----------------------------|---|---|----------------------------|--|--|
| CTR (Click Through Rate) |  Too Low <ul style="list-style-type: none"> Ad is placed at a poor location on the page Impression fraud | <ul style="list-style-type: none"> Poor ad creative (dull, lack of attractiveness) Ad dimension too small | _____ | _____ | _____ |
| |  Too High <ul style="list-style-type: none"> High accidental click through rate Click fraud | | | | |
| Landing Rate |  Too Low <ul style="list-style-type: none"> Poor click through traffic High accidental click through rate Impression fraud Click fraud | <ul style="list-style-type: none"> Traffic fraud (e.g. Telco Redirect) | _____ | <ul style="list-style-type: none"> Landing page takes too long to load | _____ |
| |  Too High <ul style="list-style-type: none"> Traffic fraud (e.g. Telco Redirect) | | | | |
| Second Click Rate |  Too Low <ul style="list-style-type: none"> Poor traffic quality from referral website Impression fraud Click fraud | _____ | _____ | <ul style="list-style-type: none"> Mismatched with landing page’s content and ad placement Landing page’s navigation path not clear | <ul style="list-style-type: none"> Page layout/app design not user friendly |
| |  Too High <ul style="list-style-type: none"> | | | | |
| CVR (Conversion Rate) |  Too Low <ul style="list-style-type: none"> Off-targeted audience traffic (poor quality target audience) | <ul style="list-style-type: none"> Conversion fraud. Traffic fraud (e.g. Telco Redirect) | _____ | <ul style="list-style-type: none"> Landing page’s conversion indication not clear/did not stand out Landing page conversion flow too complicated | <ul style="list-style-type: none"> Page layout/app design not user friendly Website’s conversion target not clear Mismatched with website’s content and ad placement Conversion journey too complicated and long Factors related to product’s quality, price and promotions, etc. Non-scientific conversion calculations (conversion exposure should be introduced) |
| |  Too High <ul style="list-style-type: none"> Conversion fraud. Traffic fraud (e.g. Telco Redirect) | | | | |

Any metric with unusually high or low results is a good indication that something is wrong. Every KPI may be affected by one or more factors, therefore it is important to analyze and compare KPIs objectively and holistically.

Publishers should also take preventative measures to create safer environment for advertisers



- Anti web crawler
- Minimize website or app security loophole

- Data transparency

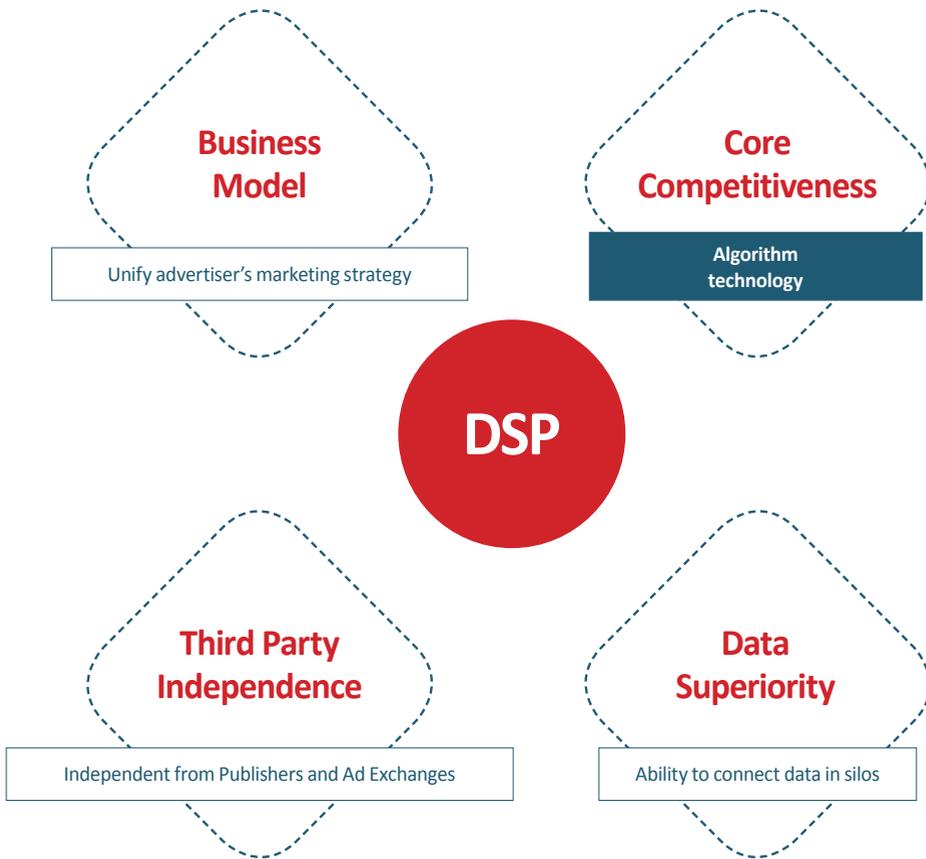


- Partner with multiple industry players
- Establish anti-fraud union

- Clean up internet environment
- Share green traffic



Demand side technology players should develop strong anti-fraud capability and avoid conflict of interests



Third party brand safety company can play an important role

For Advertisers

- Assess overall media quality, thus allowing advertisers' ads to show up in good quality media environment and obtain valuable exposure.
- Allow advertisers to monitor and control ad's quality and results.
- Offer advertisers customizable solutions with multiple risk categories and thresholds. Ability to also address brand risk with the use of keywords that are specifically relevant to a client.

For Publishers

- Allow publishers who want to improve content and design quality to set standards, thus attract high quality advertisers and improve user experience.
- Reduce low quality inventory to increase high quality inventory's pricing and maximize revenue opportunities.

For DSP

- Work with DSP on Pre-bid targeting integration to provide advertisers with good quality media inventory on brand safety, viewability and fraud.

For Industry

- Establish industry standards around media quality.
- Monitor and eliminate ad fraud and other forms of fraudulent activities.

Anti-fraud technology in action
– iPinYou real practice

Part 3

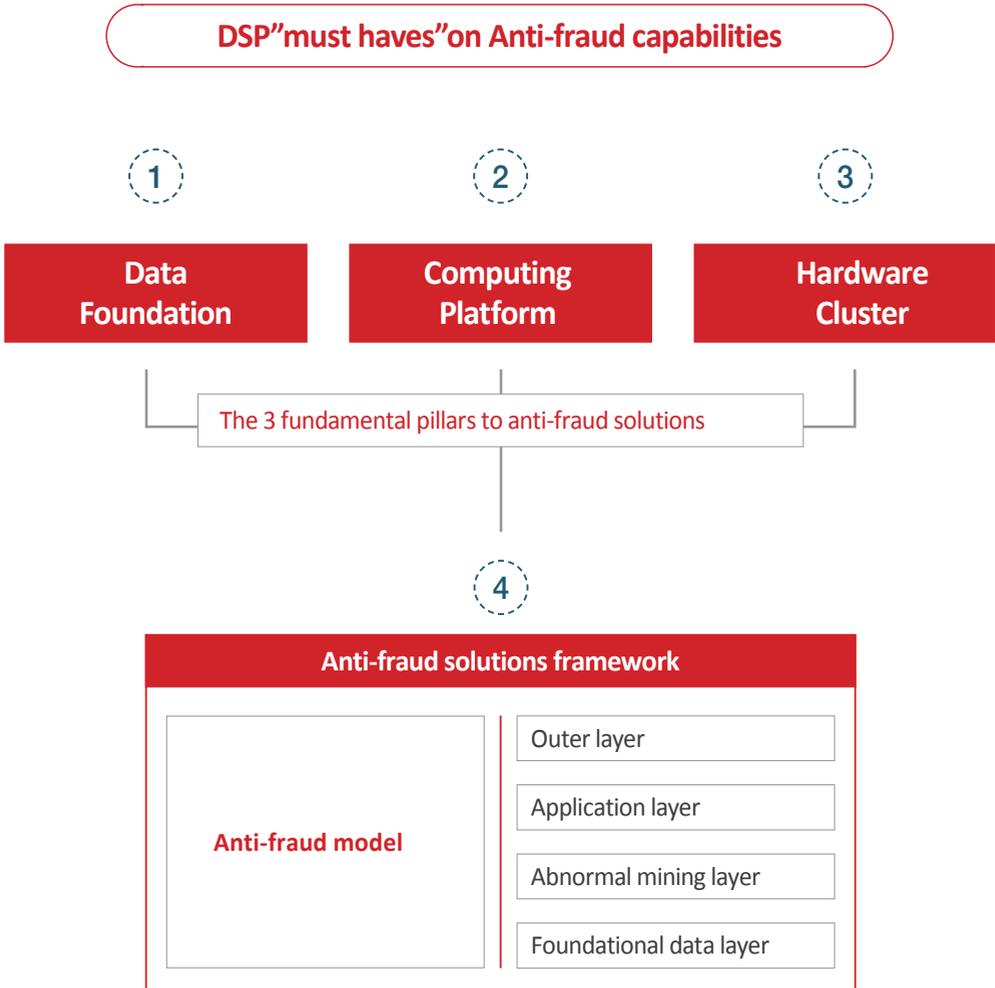
Data

Platform

Hardware

Technology

To develop strong anti-fraud capability, DSP must have strong data, computing platform and infrastructure



1 Strong first party, second party and third party data is required to build a solid anti-fraud solution



iPinYou's Data Partners

First party data

Based on advertisers internal data and data collected from advertiser's own website

Advertiser owned data

Advertiser's own website data

Advertiser's private DMP

Second party data

User or campaign data collected by agency or platforms

Agency

Xaxis DMP Turbine

Ad Exchange

Tencent Exchange

Google Ad Exchange

Baidu Exchange

Third party data

User data provided by third party monitoring company, publisher and operators

Data Management Company

Talking Data DMP

Ad Tracking Company

AdMaster DMP

Miao Zhen DMP

Publisher

Telco Operator and related Company

CMCC data

AsialInfo (China Unicom, China Telecom) data

Online and data companies by vertical industry

(e.g. Finance/payment data, etc.)

UnionPay Smart data

Mobile phone manufacturers data

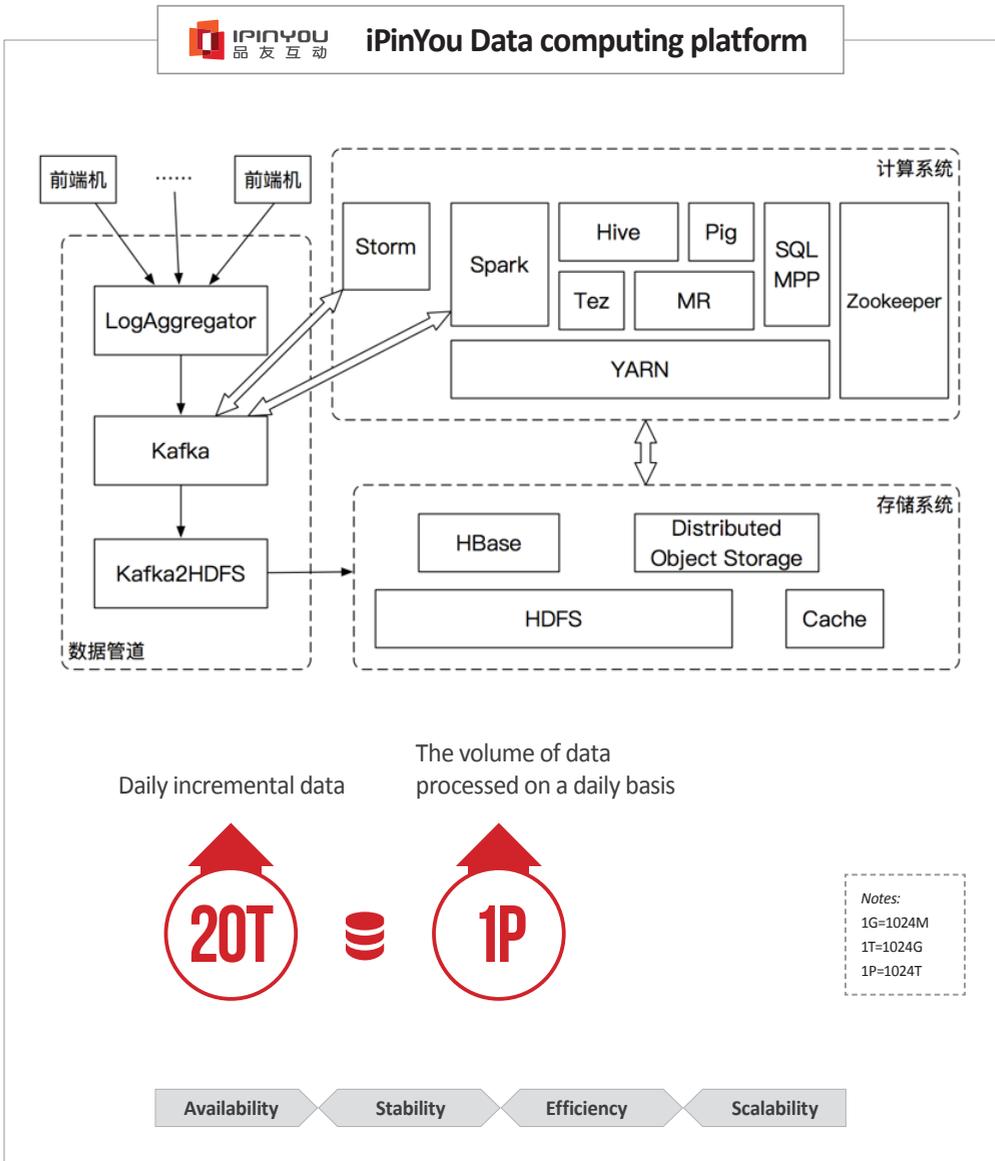
Smart wifi and Internet cafes data

Notes

● **DMP (Data Management Platform):** A data management platform is a centralised platform used by agencies, publishers and marketers to manage and merge data such as cookie IDs. A variety of data sources can be combined within the platform to generate audience segments for improved targeting.

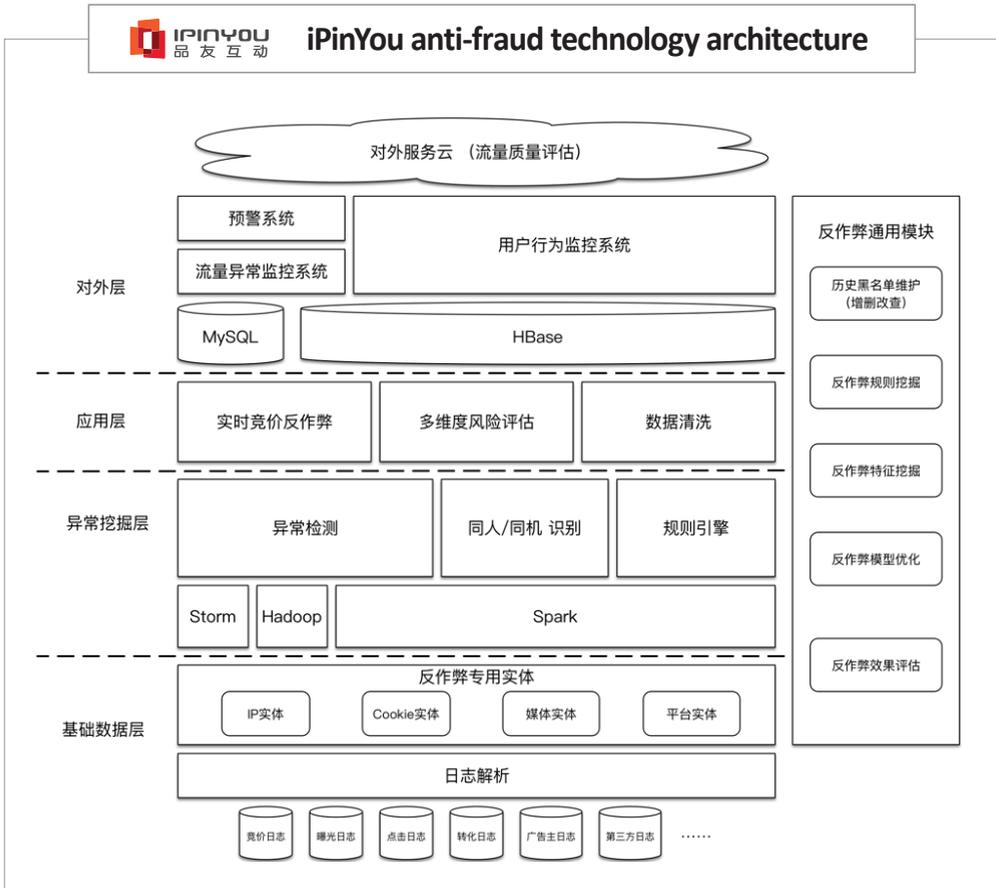
2 DSP needs to be able to build a multi-dimensional computing platform and algorithm

iPinYou as an example



3 DSP requires a strong anti-fraud technology architecture

iPinYou as an example



Technical Threshold & Challenge

1 Non supervised or half supervised learning

No historical data to set benchmarks prior to fraudulent activities occur; Many different forms of fraud with too many exceptions.

2 Time Sensitivity

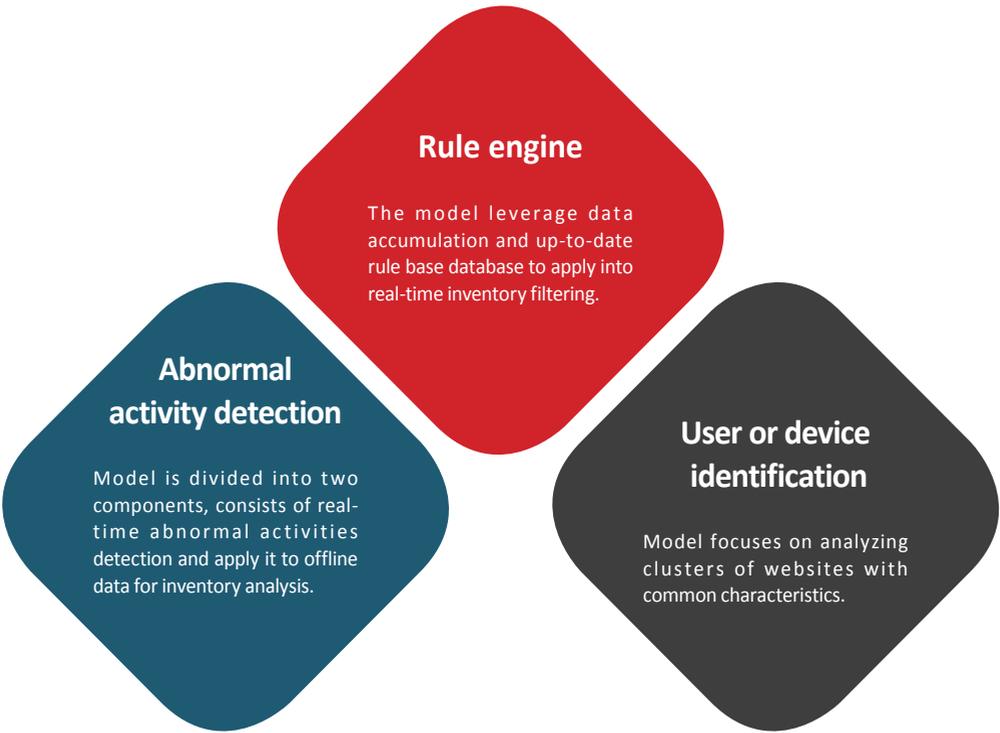
Data is extracted from back end while the discovery of new fraud activities are lagging. Timeliness is required in order to continuously improve real-time filtering of fraud traffic.

3 Monitor Overall behavior

Fraud detection requires overall monitoring of user behavior, with high demands on cluster calculations and stability.

Core anti fraud framework – abnormal data mining layers

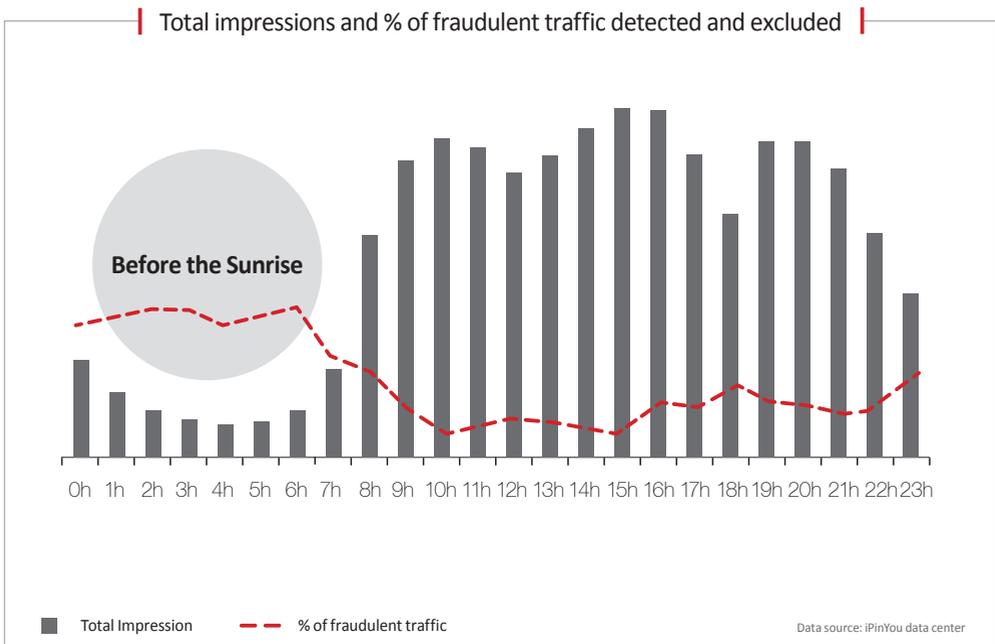
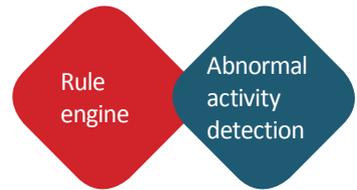
iPinYou DSP-3 key pillars to anti-fraud data mining solutions



Case Study 1

Eliminating unwanted fraudulent traffic through the combination of Rule engine + Abnormal activity detection

iPinYou identified the “Before the Sunrise” phenomenon and disqualified fraudulent inventory from real-time bidding.



Rules engine and Abnormal activity detection was able to identify fraudulent traffic typically occurs between midnight to 8am each day.

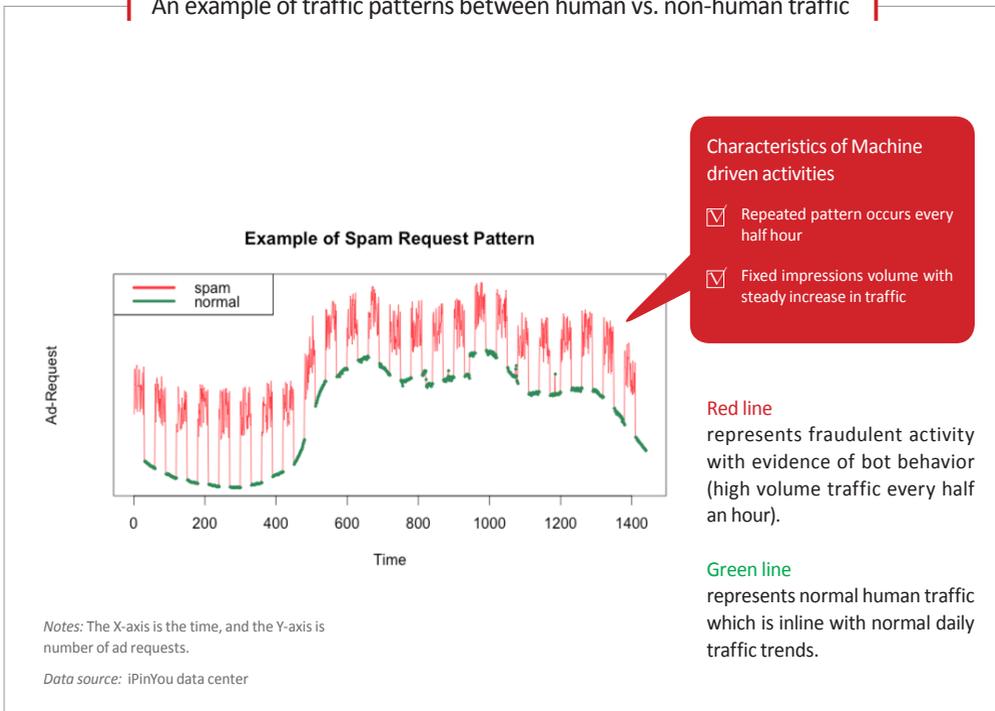
Case Study 2

Abnormal activity detection to identify non-human traffic through behavioral pattern analysis

Compared human behavior vs. machine driven activities and prevented bids against fraudulent inventory



An example of traffic patterns between human vs. non-human traffic



Through the Abnormal activity detection mechanism, iPinYou was able to assess every single ad position and identify normal human behavior vs. machine driven behavior.

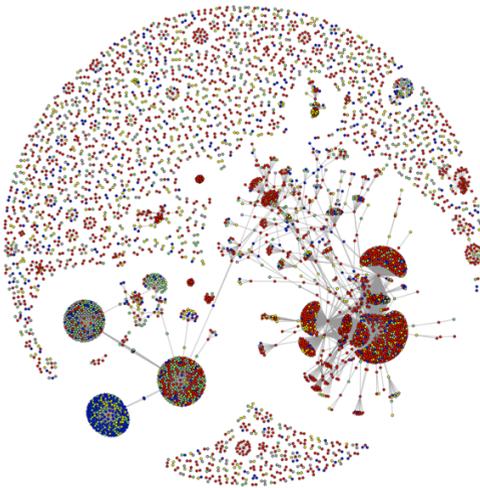
Case Study 3

Identify clusters of fraudulent websites through user and device analysis

Identifying commonalities between fraudulent websites

User and Device identification

Clusters of websites with common characteristics



- 1 Common characteristics were identified from groups of websites.
- 2 % of fraud amongst websites in the same clusters were very similar.

Notes:
Each dot represents a single website.
The lines between dots represent the correlations between the websites.
Colors represents the different % of fraudulent traffic.

Data source: iPinYou data center

Through a multi-dimensional analysis, iPinYou was able to detect fraudulent traffic by unique user/device.

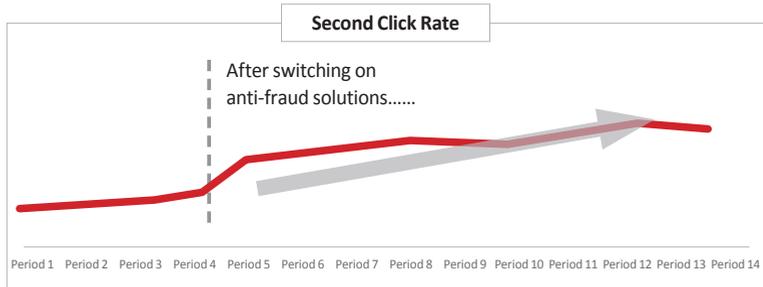
**What performance improvements can
Advertisers see after working with iPinYou?**

Part 4

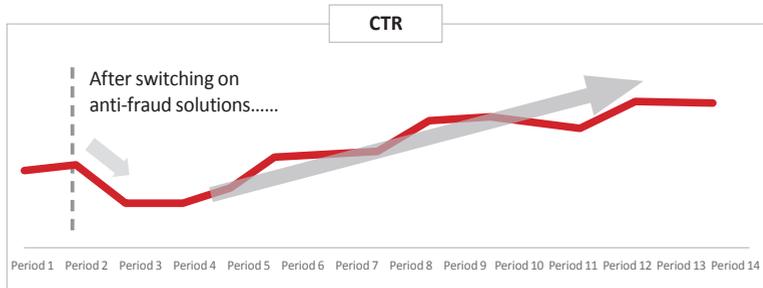
Improve effectiveness

Reduce cost

Advertisers is expected to see KPI improvements in the long run by working with DSP partners with strong fraud detection technology

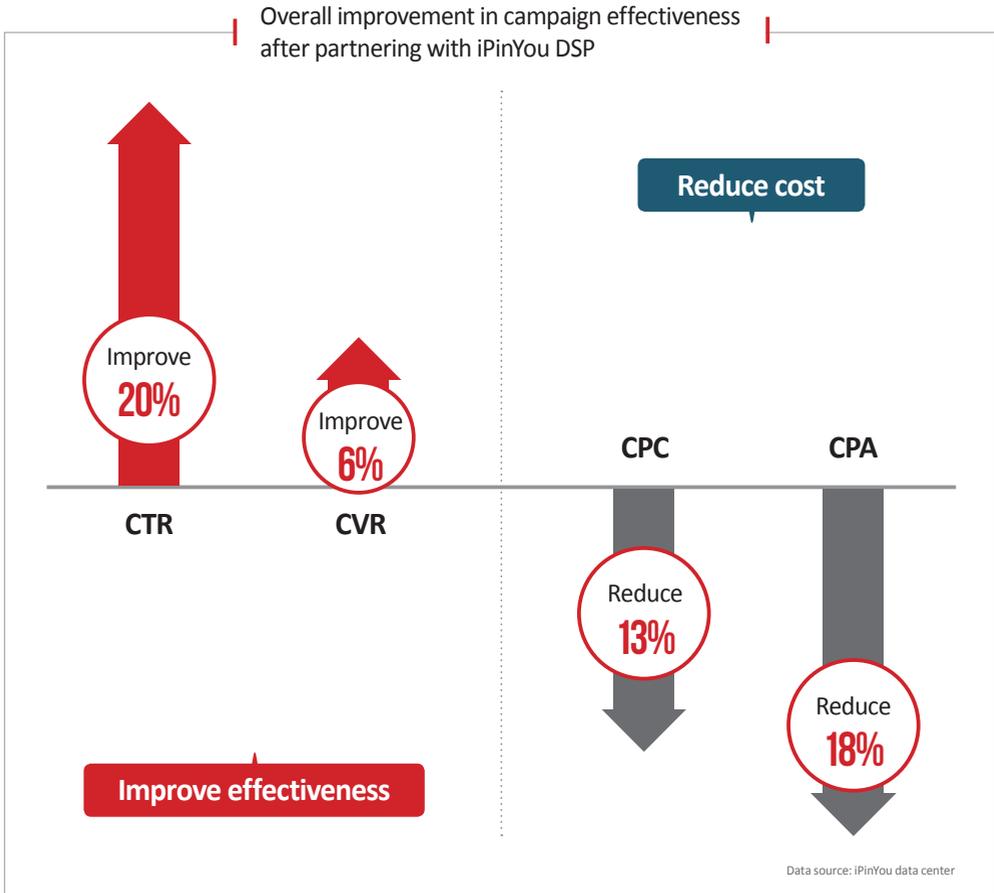


Indicators: Second click rate, new visitor rate, depth of visit, retention rate, etc.
Impact: By filtering out non-human traffic, KPI metrics such as exposure rate to humans, depth of visit, second click rate, etc. is expected to improve.



Indicators: CTR,CVR etc.
Impact: If fraud clicks exist, CTR is expected to drop immediately after switching on anti-fraud solutions, however in the long run results will improve.
 If conversion is the focused KPI, CVR will go down based on certain situations, while anti-fraud solutions will select good quality media and impact CVR in a positive way.

With the anti-fraud solutions, overall ad effectiveness will improve while cost will go down



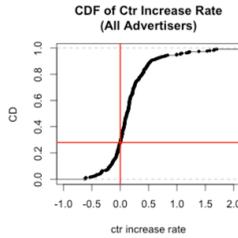
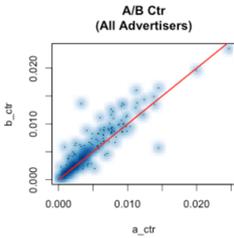
Time Period: June 2016.

Research objects: Study cover 580 programmatic advertisers within iPinYou DSP.

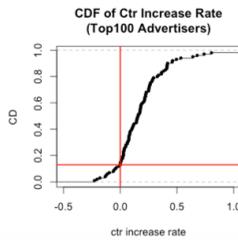
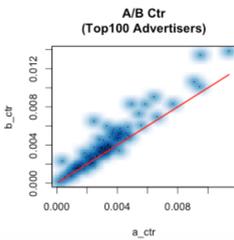
Media type: PC Display

Over 87% of advertisers saw CTR improvement with iPinYou's anti-fraud solutions

Advertisers saw improvement on CTR after partnering with iPinYou DSP



All advertisers saw 72% lift in CTR



Of the Top 100 advertisers, 87% of them saw increased in CTR

Note: (Left Chart) Each dot on the scattered charts represent a single advertiser. Dots above the line represent those advertisers who saw lift in CTR after using anti-fraud solutions. (Right Chart) Accumulative curve.

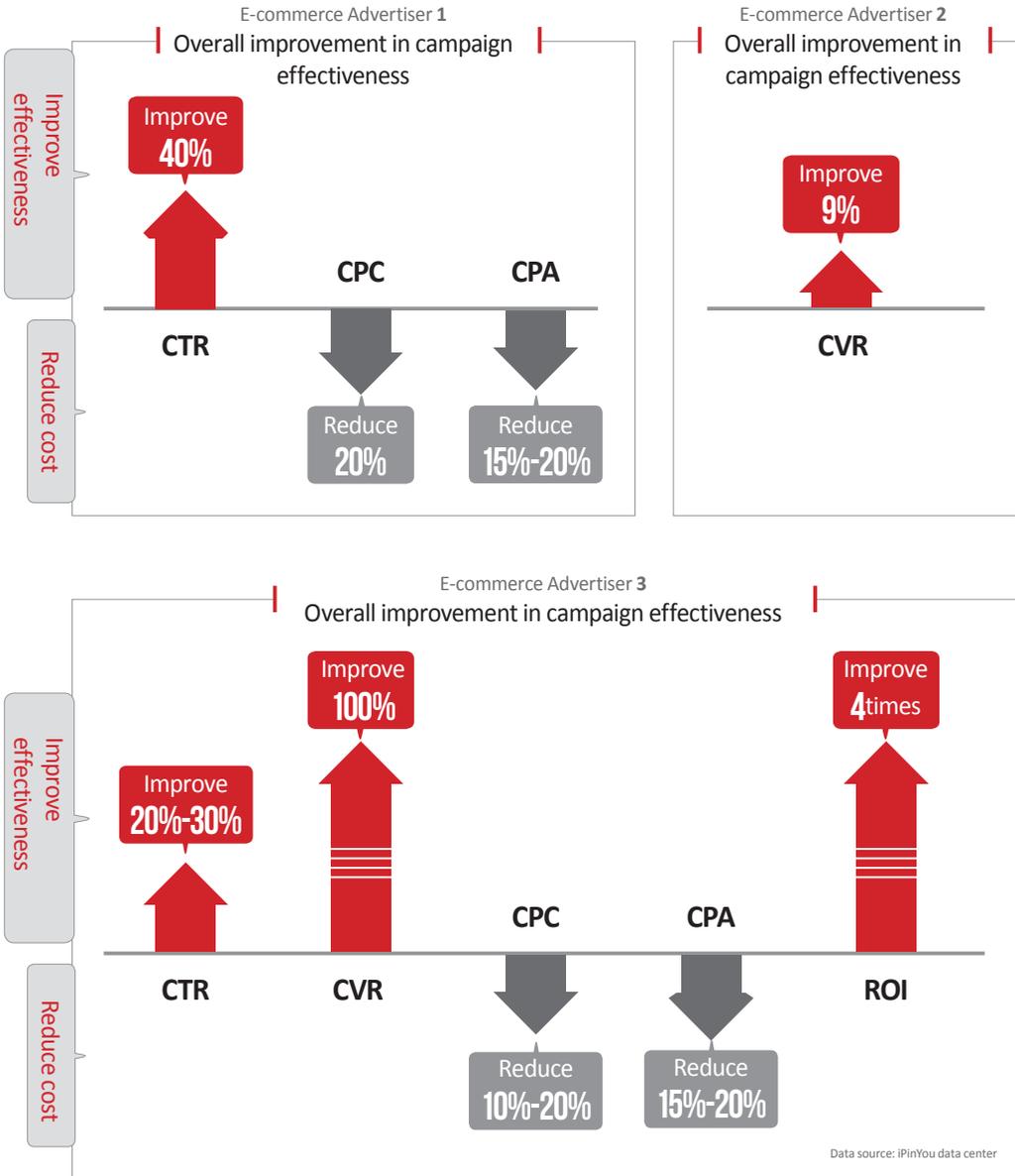
Data source: iPinYou data center

Time Period: June 2016.

Research objects: Study cover 580 programmatic advertisers within iPinYou DSP.

Media type: PC Display.

Improve campaigns' CTR, CVR and ROI, while at the same time reduce CPC and CPA



Time Period: Q4 2015.

Research objects: Study cover 3 programmatic advertisers within iPinYou DSP.

Media type: PC Display



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