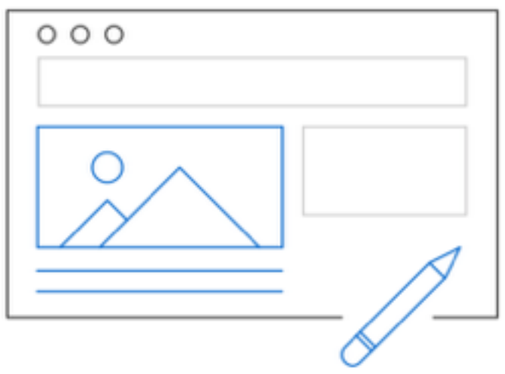
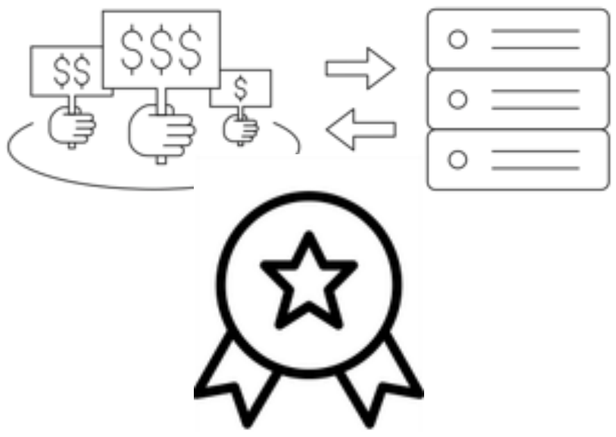
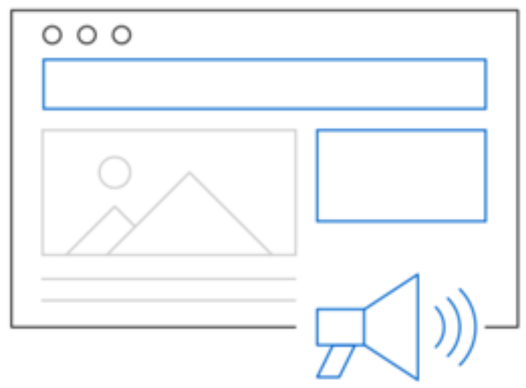
Ad Exchanges Are (not) All The Same

How Better Policed Exchanges Help Premium Publishers







OpenX®

Ad Exchanges Are Not All The Same:

How Better Policed Exchanges Help Premium Publishers

Paul Milgrom
Ely Professor of Economics,
Stanford University

Introduction

Programmatic ad exchanges have become an increasingly powerful revenue generator for online publishers and advertisers, and their role in online advertising continues to grow. Trillions of transactions now take place in programmatic exchanges each year, with ad revenues exceeding $14 billion in 2015 and expected to reach $36 billion by 2019.[1]

Exchanges create the most value when they pair premium buyers with high-quality ad inventory, bringing together both sides of the market in unique, instantaneous transactions. When exchanges function smoothly, the efficient matches that result benefit both buyers and sellers and provide relevant ads for the end user – all within milliseconds, billions of times every day.

“Adverse selection: markets in which buyers find that average quality of the selection they are offered is low.”

But the smooth functioning of ad exchanges is not automatic. For an automated system handling trillions of impressions to operate efficiently and grow, buyers need confidence about what they are purchasing and assurances that they are not being exposed to fraudulent inventory. Bad inventory creates a kind of problem that has been extensively studied by economists in a wide assortment of markets. The first economic analysis of bad inventory famously studied the problem of “lemons” in used car markets, according to which inferior used cars are the very ones most frequently offered for sale.

The general problem, now widely called “adverse selection,” describes markets in which buyers find that average quality of the selection they are offered is low. The critical lesson of these economic analyses is that mixing too much bad inventory with good can make buyers cautious or drive them away completely. In markets like that, both buyers and sellers suffer: buyers experience poor performance and the sellers of higher-quality goods are disproportionately harmed by receiving depressed prices.

OpenX is a leading desktop and mobile exchange that has, since its founding, taken seriously the challenge of avoiding adverse selection. Today, it leads the industry in its efforts to thwart fraud and ensure high standards in its programmatic exchange, outranking all other exchanges in overall traffic quality.[2] These advantages produce very real consequences – as one example, the Milwaukee Journal Sentinel switched to OpenX in 2013, and in the first six months saw its revenue increase by more than fifty percent.

“They reward buyers by eliminating wasted ad dollars, ensuring them the maximum return on their ad investments.”

An analysis of OpenX’s performance provides data supporting the theory that premium publishers and advertisers should both prefer exchanges that ensure high inventory quality. Those exchanges reward high-quality publishers with higher prices for their inventory, and they reward buyers by eliminating wasted ad dollars, ensuring them the maximum return on their ad investments.

Programmatic Ad Exchanges and the Evolution of Online Advertising

Assuring inventory quality has become both more important and more difficult as the online advertising industry has evolved. In the industry’s early days, advertisers often knew the publisher and conducted buys with a direct insertion order. Most contract sales have since been replaced by programmatic ad exchanges, in which ad space is sold to the highest bidder on an impression-by-impression basis. These real-time auctions can afford higher returns to publishers and more targeted purchasing for advertisers, but they also pose new challenges for maintaining quality. Without proper management, the increased anonymity of programmatic exchanges allows nefarious sellers to match to high-quality buyers, increasing the opportunities for misrepresentation and fraud.

“Advertisers will lose $6.3 billion to fraudulent traffic in 2015.”

As the value of transactions conducted in programmatic exchanges has increased, so too have the returns for bad actors engaged in fraudulent behavior. Last year the United States Senate published a report on the threats of fraud in online advertising, highlighting the increasing importance of detecting and eliminating fraud. A joint ANA/White Ops study predicts that advertisers will lose $6.3 billion to fraudulent traffic in 2015.[3]

Since 2014, Pixalate has published its Global Seller Trust Index, assessing the quality of hundreds of ad exchanges and networks. High trust grades are more than mere feathers in the caps of the best exchanges – they quantify an important advantage over exchanges plagued with fraudulent traffic. OpenX leads the industry in overall traffic quality, and its exchange offers an empirical evaluation of the returns to strict quality standards. The advantages of quality control, and the problems that can arise in its absence, can first be fully understood through the lens of economic theory.

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SELLER RANKINGS	FINAL SCORE	VIEWABILITY SCORE	FRAUD SCORE	ENGAGEMENT SCORE	MASKING SCORE	NETWORK SCORE	INVENTORY SCORE	MALWARE SCORE
1 Open X	93	75 A	95 A	88 A	97 A	90 A	95 A	96 C
2 Rubicon Project	92	81 A	93 A	89 A	95 A	87 A	95 A	98 B
3 Google AdExchange	92	94 A	95 A	78 A	97 A	99 A	95 A	95 C
4 Centro Brand Exchange	88	79 A	89 A	90 A	98 A	69 A	92 A	99 A
5 LinkedIn Network Display	87	87 A	88 A	73 B	98 A	71 A	98 A	99 A
6 Digital Throttle	85	80 A	93 A	93 A	84 B	59 A	92 A	99 A
7 Sovrn	84	62 B	92 A	85 A	99 A	66 A	79 A	99 A
8 The Blogger Network	84	87 A	96 A	66 B	97 A	60 A	82 A	98 B
9 PulsePoint	82	65 B	92 A	63 B	81 B	86 A	70 A	96 C
10 Gourmet Ads	82	94 A	94 A	87 A	98 A	74 A	84 A	61 D

September 2015 Pixalate Global Seller Trust Index Rankings

Asymmetric Information and Adverse Selection

Poorly policed exchanges harm premium publishers. The problem is not only that low-quality impressions are offered for sale; when substandard inventory is mixed with good inventory, advertisers are unsure of the value of their purchases. This "information asymmetry," in which sellers know much more about the value of goods exchanged than buyers, causes buyers faced with uncertainty to bid less for what is really high-quality inventory. That, in turn, causes high-quality publishers to withhold their best inventory from those exchanges.

"Information asymmetry causes high-quality publishers to withhold their best inventory from those exchanges."

George Akerlof earned a Nobel Prize in economics for his path-breaking paper entitled The Market for Lemons, which introduced the analysis of markets beset by adverse selection. His paper illustrated adverse selection with a parable about a market for used cars, in which sellers offer either cars of high value or low-quality 'lemons.' A smart buyer who is unable to determine the quality of a given car needs to be skeptical and offer no more than the average values of similar cars in the market. But because that average value is less than what the best used cars are worth, owners of good cars are discouraged from selling.

Conversely, the average price exceeds what the low-quality 'lemons' are worth, attracting sellers with bad cars to offer more of them to the market, thus skewing the available inventory toward vehicles of lower quality. The result is a market that functions poorly for both buyers and sellers, with a reduced volume of transactions, lower prices, and poorer opportunities for high-quality sellers. In Akerlof's own words:

> *"There are many markets in which buyers use some market statistic to judge the quality of prospective purchases. In this case there is incentive for sellers to market poor quality merchandise, since the returns for good quality accrue mainly to the entire group whose statistic is affected rather than to the individual seller. As a result there tends to be a reduction in the average quality of goods and also in the size of the market."*

"Variations of the adverse selection problem afflict many industries."

Although the details can differ, variations of the adverse selection problem afflict many industries.[4] Internet advertising is no exception. In poorly managed ad exchanges, bidders are uncertain about the quality of individual impressions and must rely on market averages, allowing disreputable sellers to create and sell low-quality inventory. Buyers become reluctant, high-quality sellers get lower prices and withhold their best inventory, and the quality of matches is degraded.

For markets threatened by adverse selection, self-help on the part of buyers is not enough, because it duplicates efforts and raises costs, and an unscrupulous seller only needs to find one victim for each impression. Instead, the only economically sensible defense against adverse selection is for the market maker to perform rigorous, ongoing quality assurance. Often, quality is most easily assured by means of disclosures, regulations and, as The Market for Lemons suggests directly, guarantees.

"The simplest way for buyers and sellers to avoid the pernicious effects is to participate in an exchange of impeccable quality."

The simplest way for buyers and sellers to avoid the pernicious effects described above is to participate in an exchange of impeccable quality. If individual buyers must pay for external quality assessments, they are likely to consider that part of the cost of their bid, reducing the price offered to the seller. Built-in quality standards, by contrast, remove the harm wrought by fraudulent participants entirely and attract the best buyers and sellers, creating a virtuous circle of assured standards, attracting higher bids and higher-quality inventory.

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Research on Auctions for Online Advertising

> **The lessons learned in other markets apply with full force to today's online advertising exchanges.**

Recent research at Microsoft and at Stanford University has focused on the problem of adverse selection in display advertising. Both Abraham, Athey, Babaioff and Grubb (2014) and Arnosti, Beck and Milgrom (2015) study the challenges for online auctions when some advertisers are better informed than others. If one advertiser has more detailed information (such as cookies or other diagnostic information) about the legitimacy of a user than another advertiser, that leaves the second advertiser open to disastrous adverse selection. As Abraham et al. describe, the situation is particularly problematic in the presence of lemons:

> *"The inherent asymmetry created by cookies can lead to cream skimming or lemons avoidance by informationally advantaged bidders, with potentially dire consequences for seller revenues."*

Abraham et al. plainly state the implications of unequal information when some bidders know which impressions are lemons: "in the 'lemons' case, revenue collapses to the value of the 'lemons.'" Arnosti et al. focus on adverse selection suffered by brand advertisers. For these advertisers, performance is notoriously hard to measure, which makes it difficult for them to detect deceptive publishers.

The Advantages of Quality Assurance

Although the researchers study different aspects of the problem, they agree about one general conclusion: the lessons learned in other markets about the lemons problem and adverse selection apply with full force to today's online advertising exchanges. High-quality advertisers and publishers do best in an exchange that enforces high standards.

OpenX is the top-ranked exchange in Pixalate's Global Seller Index, consistently outperforming Google's AdX, Rubicon and Pubmatic. OpenX's market position is the result of years of targeted investment in quality controls for its programmatic exchange, including real-time filtering and regular publisher reviews. Most critically, OpenX is able to block fraudulent traffic before it reaches auction.

A look at the performance of OpenX's clients offers data to confirm what economists and researchers predict – switching to an exchange with better quality controls produces more efficient buys for advertisers, increasing value for publishers. In 2012, United Online, a leading digital provider of consumer products and services, decided to shop for a new programmatic exchange, and determined that OpenX was the best option. Within three months of its decision, United Online exceeded its Effective Cost per Mille (eCPM) of its previous provider, Pubmatic, by 150%. In 2013, The Blaze, a news and information site, switched from Rubicon to OpenX, and increased its eCPM by 50%.

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Sam Metcalf of the Milwaukee Journal Sentinel states that "Since partnering with OpenX, we've significantly increased yield and overall revenue. The impact has been so large that it's commanding new attention throughout the company." OpenX is far ahead of its competitors in fraud detection and elimination, and those efforts directly improve the returns of publishers on its platform. The theory and data are in agreement: by eliminating the problems caused by adverse selection, well-managed exchanges provide the greatest value to publishers and advertisers.

Authored by:

Paul Milgrom, Ely Professor of Economics, Stanford University
Andrew Vogt, Research Assistant, Auctionomics

Paul Milgrom is the Shirley R. and Leonard W. Ely Professor in the School of Humanities and Sciences and professor of economics at Stanford University. He is a member of the US National Academy of Sciences, a Fellow of the American Academy of Arts and Sciences, and winner of the 2008 Nemmers Prize and the 2013 BBVA Foundation Frontiers of Knowledge prize. According to Google Scholar, Paul's research works have more than 69,000 citations covering multiple of fields in economics. A leader in radio spectrum policy and auction theory and applications, Milgrom is currently advising the FCC on the design and implementation of its 2016 "incentive auction," which will buy TV broadcast licenses and sell wireless broadband licenses.

1. http://www.magnaglobal.com/wp-content/uploads/2015/10/MAGNA-GLOBAL-Programmatic-PR-Sept-2015.pdf
2. http://www.pixalate.com/sellertrustindex/#!global
3. http://www.ana.net/content/show/id/botfraud
4. Health insurance markets and all-you-can-eat buffets provide two very different canonical examples. The specific problem of adverse selection in an auction setting has also been widely studied – the "Winner's Curse" describes a phenomenon whereby bidders participating in auctions for items of uncertain value tend to win most often when they overestimate the value of the item.In an online setting, this too could encourage advertisers to lower their bids, harming high quality publishers.


OpenX