The Arrival of Real-Time Bidding

and What it Means for Media Buyers

Google™

OVERVIEW

This white paper describes Google's view of real-time bidding (RTB) for online display advertising, how buyers benefit from RTB, and how they can get involved with it.

PART 1

In "Real-Time Bidding Is Here to Stay" we discuss the need for RTB, show how it's grown to where it is today, and provide data to support why we believe it's here to stay.

PART 2

In "Real-Time Bidding Is a Technology" we discuss the two layers of technology that define real-time bidding.

PART 3

In "Clearing Up the Fuzzy Terms" we discuss some of the differences between the term real-time bidding and sound-alike terms like real-time buying.

PART 4

In "It's the Process that Matters" we share why buyers think of it as a process and propose a different term to refer to the process. Plus, we provide four ways buyers can intelligently acquire inventory in real-time.

PART 5

In "How to Do Real-Time Bidding" we define three paths to take to benefit from RTB.

PART 6

In "Real-Time Bidding with Google" we briefly describe three of Google's products and how they help buyers use real-time bidding for their campaigns: Google Display Network, DoubleClick Ad Exchange and Invite Media.

Whether you are a large or small advertiser, an agency or a trading desk or a media buying intermediary, Google would like to help you succeed with real-time bidding.

Real-time bidding (RTB) emerged at the intersection of data liquidity and inventory liquidity. Today, third-party data suppliers have put the power of audience information in the hands of media buyers. At the same time, the marketplace for online inventory has never been more liquid. There are vast pools of online inventory available to every kind of media buyer, from small businesses running their first display campaigns to large agency trading desks buying on behalf of Fortune 500 advertisers.

At this intersection of data and inventory, there's been an explosion of choice of where display ads can run. With millions of sites accepting display ads, it's too difficult for media buyers to buy the audience they want when buying directly from each individual site. To buy an audience across even a small selection of a few dozen sites, a buyer would have to define the audience for the campaign individually with each site on the media plan. It's operationally impossible to get the exact same audience targeting criteria setup with all these sites.

Real-time bidding helps media buyers find audiences at scale. This, in turn, helps drive performance by ensuring an advertiser's ad is seen by the audiences most likely to respond.

All media buyers can appreciate an enhanced ability to find audiences at scale, but how did real-time bidding emerge in the first place?
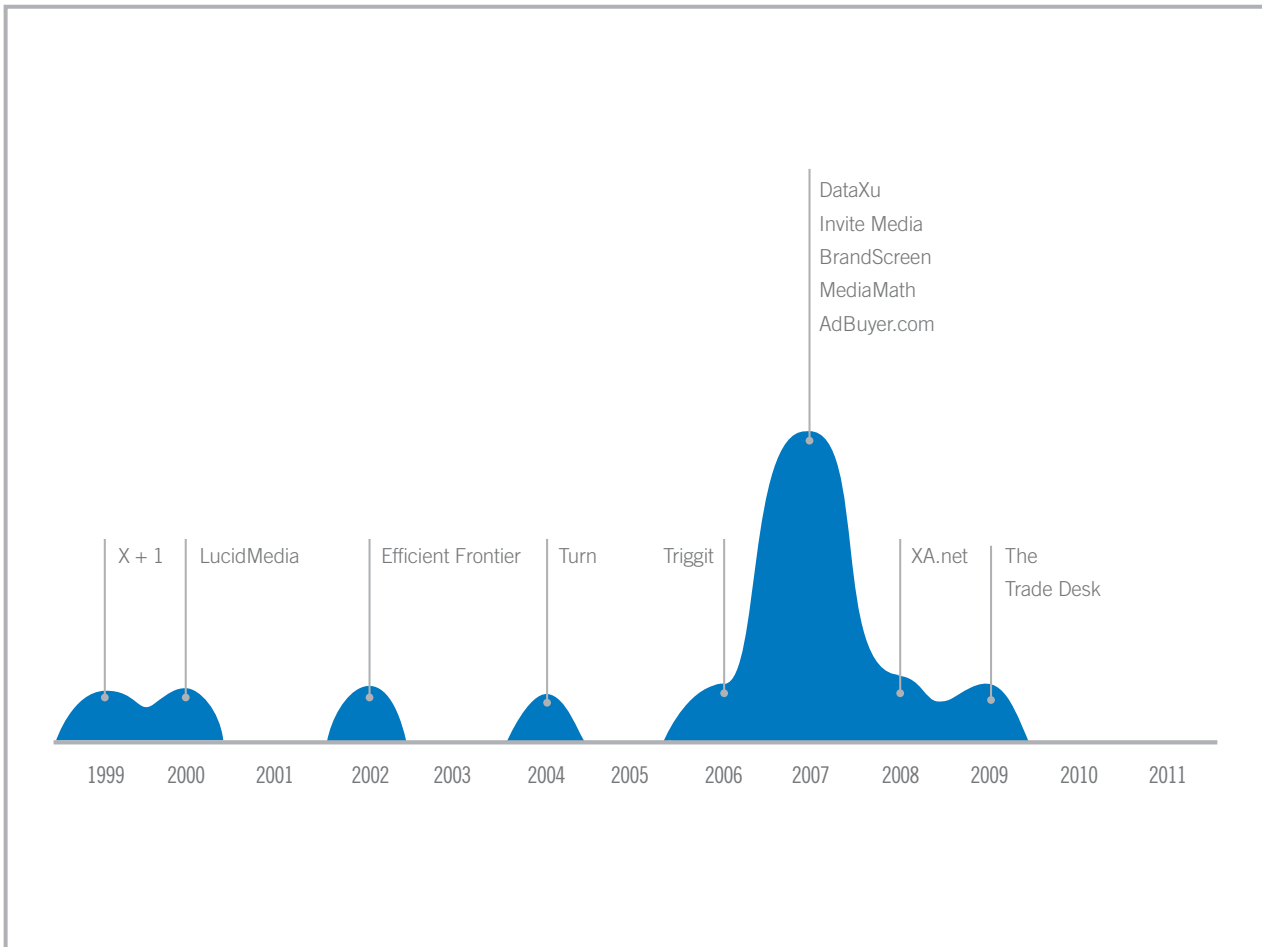
The Rise of Exchanges

When ad exchanges opened, they brought more liquidity to the marketplace for online inventory. 2007 was a pivotal year for ad exchanges. Three major exchanges were acquired that year: Yahoo! bought Right Media in April, Google bought DoubleClick in May and Microsoft bought AdECN in August. Each company quickly made vast pools of inventory available, which greatly improved the experience for many parties to transact in online display.

The Rise of Consolidated Buying

To help advertisers take advantage of this new liquidity, a new type of media buying intermediary quickly sprang up. These companies could access inventory from multiple exchanges with no need to aggregate inventory through relationships with publishers. Among these companies include the demand-side platforms (DSPs) who built their businesses on technology and services catering solely to the "demand-side" of the industry, the agencies and advertisers. As Figure 1 shows, 2007 was a banner year for DSPs too. Five of today's DSPs were founded that year, including Invite Media, a company Google acquired in 2010.

Figure 1. The Founding Dates of Companies Currently Operating a Demand-Side Platform, by Year Founded

DataXu
Invite Media
BrandScreen
MediaMath
AdBuyer.com

X + 1   LucidMedia   Efficient Frontier   Turn   Triggit   XA.net   The Trade Desk

1999   2000   2001   2002   2003   2004   2005   2006   2007   2008   2009   2010   2011

Sources: Founding dates listed on the corporate websites of companies currently operating a demand-side platform, as categorized by the DISPLAY LUMAscape ecosystem chart by LUMA Partners. Please note that the earlier companies on the list evolved into DSPs over time. Data compiled June 2011. LucidMedia added July 2011.

DSPs weren't the only companies to take advantage of the inventory exchanges made readily available. Ad networks began to look to exchanges as a way to supplement their existing inventory. Plus, other types of buying intermediaries began to specialize in niche businesses within the intersection of data liquidity and inventory liquidity, such as retargeting and audience targeting specialists.
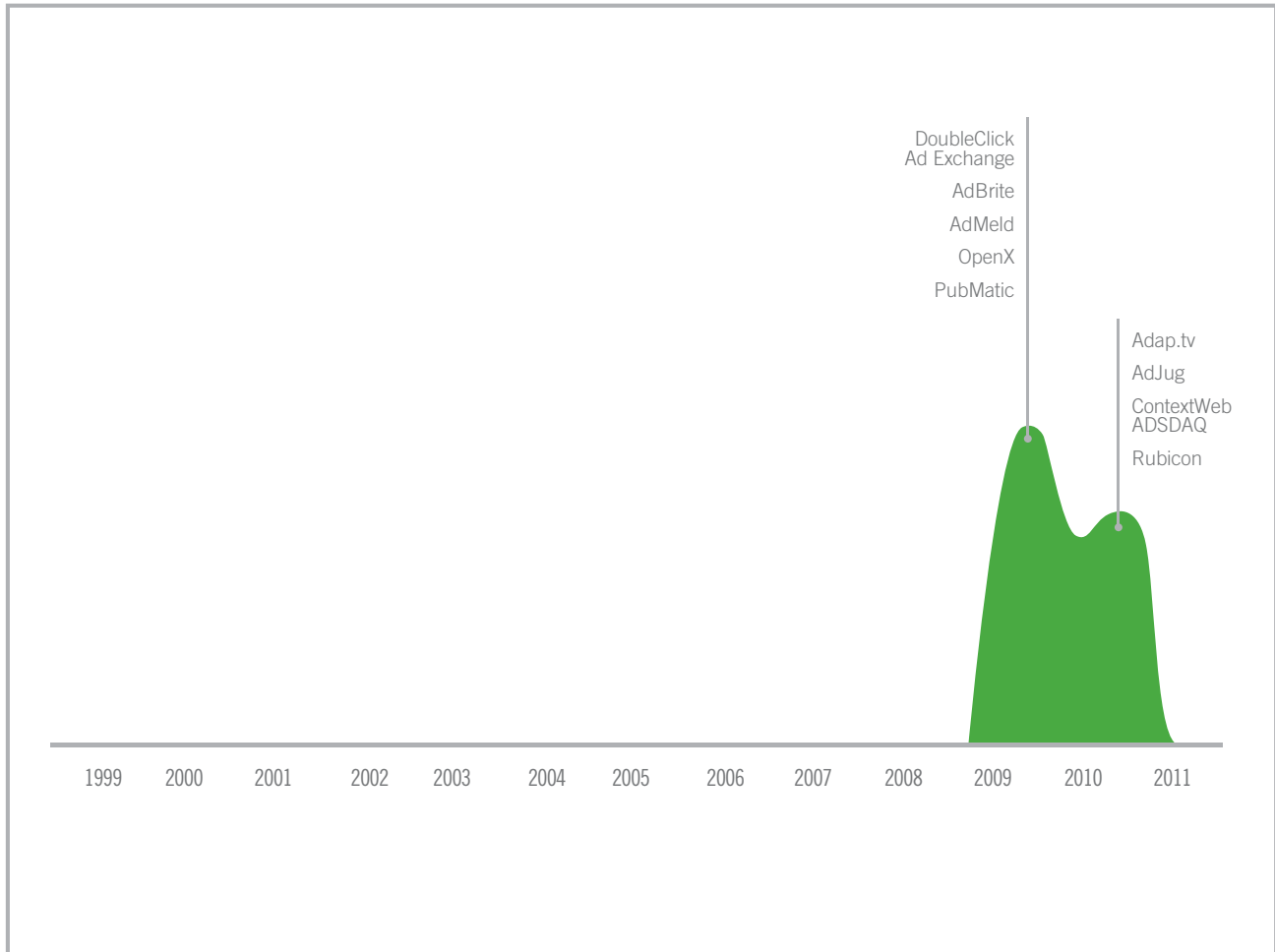
Before RTB, buying from multiple exchanges was time-consuming and inefficient for these companies. They had to use a different system to access each exchange. And since a typical campaign would pull inventory from more than one exchange, there was no easy way to achieve de-duplicated reach or to cap the number of impressions that audiences would see from any given campaign. They needed a faster, more automated way to buy across exchanges.

RTB Delivers Heretofore Unreachable Efficiency for Cross-Exchange Buyers

Now with large pools of liquid inventory and a robust ecosystem of buyers capable of accessing it, the market was ripe for innovation. RTB was the missing piece. RTB was conceived as a workflow solution tied to new opportunities in data-driven display advertising. Seeing the opportunity to grow the overall pie for online advertising, exchanges began to develop real-time bidding APIs.

As Figure 2 shows, a surge of activity took place in 2009 and 2010, when many ad exchanges and supply-side platforms (SSPs) announced support for RTB.
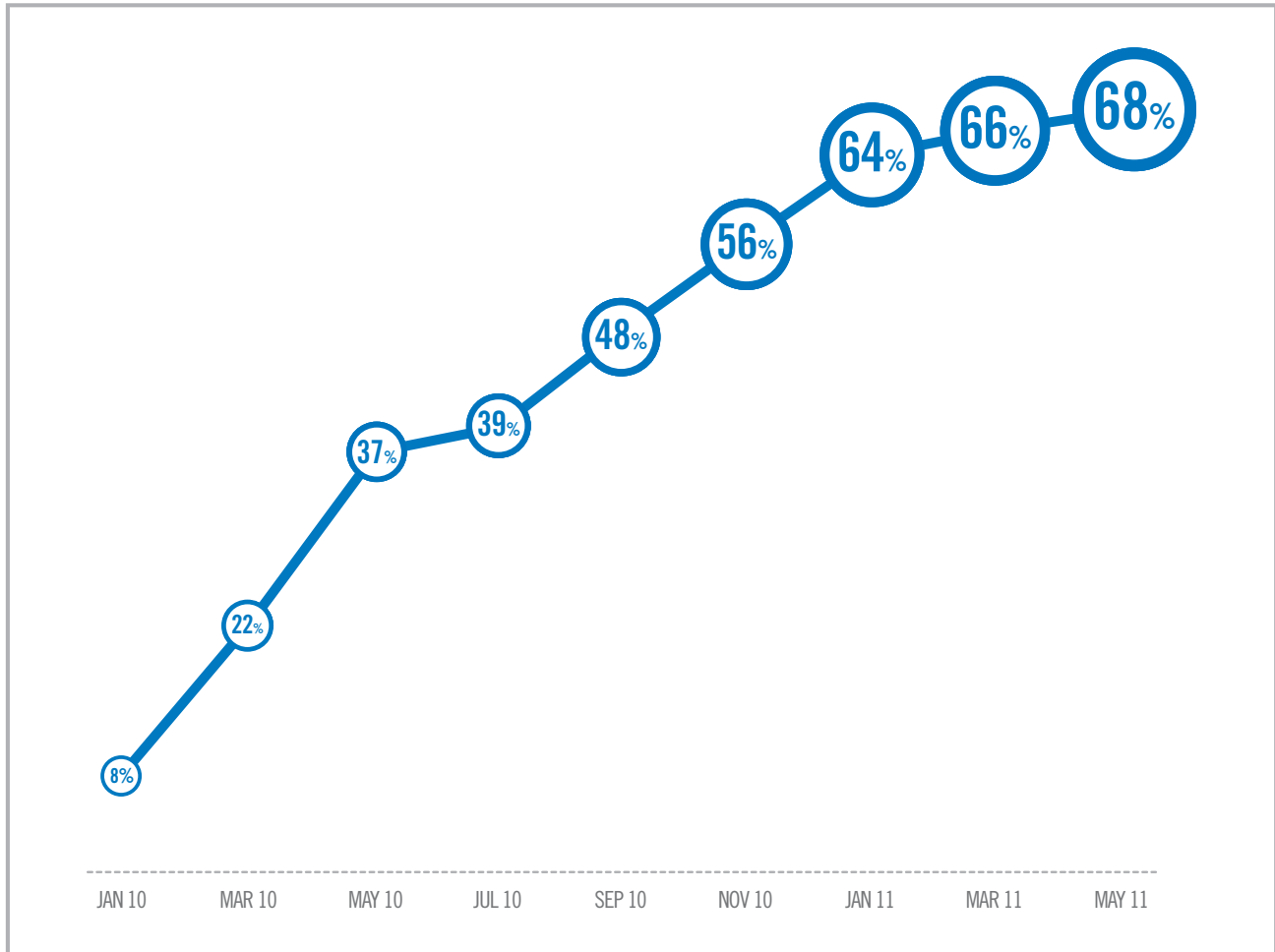
Figure 2. The Announcement Dates of RTB Support Among Exchanges and Sell-Side Platforms, by Year Announced

Sources: RTB support announcements posted to the corporate websites of ad exchanges and sell-side platforms (SSPs), as categorized by the DISPLAY LUMAscape ecosystem chart by LUMA Partners. Data compiled June 2011.

Since RTB offered a solution for efficiently acquiring online ad inventory, it began an unstoppable pattern of rapid growth. Cross-exchange buyers—DSPs, ad networks, agency trading desks and other media buying intermediaries—were quick to take advantage of RTB. This rapid uptake of RTB can be seen in the track record of DoubleClick Ad Exchange (ADX). As Figure 3 shows, ADX inventory sold through RTB jumped from 8% in January 2010 to 68% in May 2011—a tremendous upswing in just under a year and a half.

Figure 3. Growth of % Spend via RTB on DoubleClick Ad Exchange

Source: Internal Google data based on DoubleClick Ad Exchange spend via RTB, not including inventory won by AdWords. January 2010 through May 2011.

RTB has taken off for one simple reason: Buyers see real benefits from it. For example, in a comparison of ADX campaigns running in April and May of 2011 executed via RTB versus those executed through non-RTB mechanisms, RTB provided for a 19% savings on CPM rates and raised CTR performance by .06 percentage points, from .09% to .15% CTR.[1]

In a recent survey by Google and Digiday, 47% of advertisers and agencies who responded said they intend to spend more on digital advertising in 2011 because of the benefits of RTB.[2] A full 88% of advertiser and agency respondents plan to buy online display via RTB in 2011, up from 75% in 2010.[3] Plus, among media intermediaries (such as DSPs and ad networks), 29% expect their RTB volume will increase by 100% or more over last year; 19% believe it will go up by at least 200%.[4]

All this supports the assertion that RTB is a trend that's here to stay. But what exactly is real-time bidding?

1. Source: Google internal data based on all DoubleClick Ad Exchange campaigns from April and May 2011.

2. Source: Digiday and Google, Real-Time Display Advertising State of the Industry, February 2011, total survey respondents n=371, digital publisher respondents n=101, question respondents n=33

3. Source: Digiday and Google, Real-Time Display Advertising State of the Industry, February 2011, total survey respondents n=371, media buyer respondents n=110, question respondents n=49

4. Source: Digiday and Google, Real-Time Display Advertising State of the Industry, February 2011, total survey respondents n=371, media buyer respondents n=110, question respondents n=37
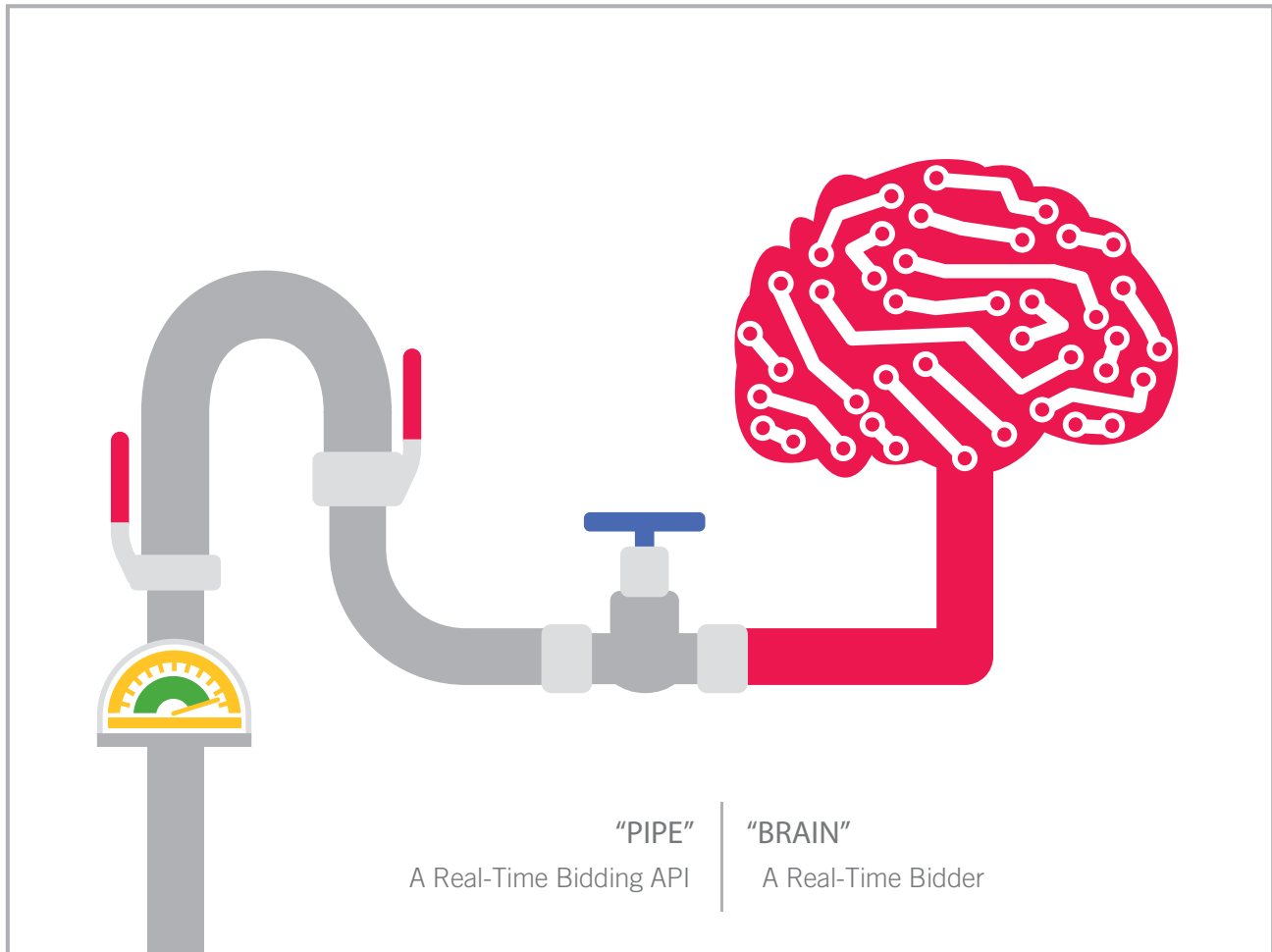
As a technology, real-time bidding requires two distinct yet interconnected layers:

• A real-time bidding API.
• A real-time bidder.

Figure 4. The Two Technology Layers of Real-Time Bidding

"PIPE"
A Real-Time Bidding API

"BRAIN"
A Real-Time Bidder

The real-time bidding API (RTB API) is the "pipe" of RTB. It provides a server-side connection to an inventory source and pushes out a real-time stream of impressions to eligible buyers. The "pipe" announces each impression individually as they become available for purchase. At Google, DoubleClick Ad Exchange's RTB API is the pipe that makes all Ad Exchange inventory available for purchase via RTB.

The real-time bidder is the "brain" of RTB. It connects to one or more "pipes" and evaluates every impression that's announced. The real-time bidder is responsible for making the best inventory acquisition decisions possible, on behalf of the advertiser. At Google, Invite Media's Bid Manager is a real-time bidder and Google Display Network uses a real-time bidder of its own.

In action, RTB takes place every time the "pipe" announces an impression and the "brain" evaluates it. By considering inventory in this manner—on a per impression basis—buyers get to be more selective about the inventory they buy. They can place premium bids on the inventory and audiences of the most value to the advertiser and can completely pass on inventory and audiences of the least value to the advertiser.

PART 3 CLEARING UP THE FUZZY TERMS

New ways of acquiring digital media have created tremendous excitement in the marketplace. The industry uses a multitude of terms to describe all the new ways. Some terms and their definitions include:

- Real-time buying: Acquiring inventory on demand.
- Audience buying: Acquiring inventory based on audience data.
- Auction-based buying: Acquiring inventory by placing winning bids in an auction.
- Data-driven display: Acquiring inventory based on data.
- Impression-by-impression buying: Acquiring inventory by evaluating each impression as it becomes available.
- Bid optimization: Employing techniques to ensure that bids to acquire inventory are placed in such a manner that goals can be reached optimally.

Each of these terms is a process. The main difference between real-time bidding and these terms is that real-time bidding is two distinct layers of technology that can be used to execute these processes. However, real-time bidding is not the exclusive way to execute these processes.

For buyers, acquiring digital media requires more than just good technology. It requires an intelligent process. Buyers can achieve great performance by intelligently looking at inventory on an impression-by-impression basis, evaluating it, and purchasing it on demand.

In this process, buyers must answer three essential questions about every available impression:

• Do you want to show an ad here?
• At what price?
• With what message?

Buyers sometimes use the phrase "real-time bidding" to mean the entire process of finding the answers to the three essential questions. To differentiate the process from the technology, we will call this process "real-time buying."

Four Ways to Do Real-Time Buying

There are at least four different ways to use real-time buying to find answers to the three essential questions. From the common to the sophisticated, real-time buying helps advertisers:

1 Consider one type of data.

2 Consider multiple types of data.

3 Assign variable values to each impression by weighting one or more pieces of information.

4 De-duplicate reach and manage frequency.

Consider One Type of Data

As an entry-point to data-driven buying, buyers can use a single type of data to inform their bidding strategy. For example, first-party retargeting data can be used to evaluate impressions based on whether or not the ad will reach a person who has previously been on an advertiser's website. Similarly, third-party data can be used to evaluate impressions based on whether the ad will reach audiences who match a pre-defined profile, such as a demographic, behavioral, or in-market profile.

Evaluations at this level use rather large, predetermined buckets. For example, a buyer may decide to bid on audiences who have been on the advertiser's site before or to bid for audiences who have recently researched new cars. Using just one piece of data ignores many other potentially valuable pieces of available information.

Consider Multiple Types of Data

In a more sophisticated approach, a buyer can consider numerous pieces of data about an impression and fuse them together to inform the bidding strategy for a campaign. For example, take an audience list that's being used to reach past website visitors and simultaneously consider the context of the page on which the ad would show.

To showcase the variety of impression-level data available to buyers, consider the data made available through a connection to DoubleClick Ad Exchange's real-time bidding API. With ADX, a buyer could consider any of the following data passed from the seller with each impression:

• Ad slot parameters: visibility (above or below the fold), size, excluded creative attributes, excluded advertiser URLs, allowed vendor or ad technology.
• Geo parameters: country, region, metro, city.
• Content parameters: site URL, site language, seller network, vertical or category.
• User parameters: browser, operating system, anonymous cookie (hashed), cookie age.

Just like when considering one type of data, by using the anonymous cookie parameter, buyers can consider first-party retargeting or third-party audience data from a data provider. However, they can go further in the evaluation by looking at more of these parameters. This helps a buyer learn much more about a particular user and a particular impression, gain a smarter answer to the three essential questions and make a more data-driven decision.

Assign Variable Values to Each Impression by Weighting One or More Pieces of Information

At a very high level of sophistication, a buyer goes beyond "yes/no" decisions and develops a scale by which the impressions with the most value to the advertiser receive very high bids and the impressions with the least value to the advertiser receive no bids at all. By bidding in this manner, an advertiser can consider many parameters and potential weightings for each parameter.

For example, with retargeting, instead of bidding simply on whether or not a user has been on the advertiser's site before, a buyer can weigh the value of each impression based on additional information, like how recently a site visitor left the advertiser's website.

Such fine-grained information helps buyers calculate an even more precise, optimized answer to the three essential questions.

De-duplicate Reach and Manage Frequency

To optimally manage reach and frequency, media buyers should consider consolidating as much of their real-time buying as possible to a single buying system. By executing a buy from a single system, buyers can easily expand a campaign's reach to audiences who have yet to be exposed. Dubbed "deduplicated reach," this capability is something every advertiser can appreciate. Another benefit of consolidation is universal frequency capping. This improves the web as a whole by helping advertisers avoid showing the same ad to the same people over and over again.

Do All of the Above Very Well

As these four ways show, there's a range of ways to use real-time buying for a campaign and within each level, the decision logic and quality of data used will have a big impact on the success of the campaign.

PART 5 HOW TO DO REAL-TIME BIDDING

RTB APIs and real-time bidders together help deliver efficient, high-performing display advertising bought at scale. The question for buyers is how to best access this technology.

Exchanges provide the first layer, the RTB API. But not every buyer has the interest or technical resources to develop the second layer, a bidder to link to an RTB API. Instead, most buyers join forces with an industry partner to use an existing bidder. A few invest in building their own bidders; these are organizations that manage campaigns for multiple advertisers.

When choosing how to use RTB for any given campaign, there are three main options:

1 Buyers can **partner with an ad network** that does real-time buying on its own inventory and who also connects to one or more RTB APIs using a real-time bidder.

2 Buyers can **partner with a trading desk, DSP or other RTB-savvy intermediary** and use the intermediary's real-time bidder to access inventory from one or more RTB APIs.

3 Media buying intermediaries who want to use RTB APIs to the benefit of their end advertisers can **build their own real-time bidder**. This is the path chosen by ad networks that use RTB, as well as DSPs and other RTB-savvy intermediaries like creative optimizers, retargeting providers and audience targeting providers.

The key difference between potential partners offering RTB technology is their sophistication within each way of doing RTB and how well they can produce performance gains for any given advertiser. After all, advertisers are not interested in technology for the sake of technology. They want to achieve better ROI on their campaigns.

Wherever you fit in the buying spectrum, from a small business advertiser to a large agency trading desk; whether you prefer to use RTB technology from an industry partner or develop your own, Google will help you find better answers to the three essential questions. When buyers choose Google for RTB they can receive guidance from display experts who guide them to the right solutions for today and over time as their needs evolve.

There are many overall benefits to working with Google for RTB:

• A global footprint of technology and resources to support regional or global campaigns.
• A vast infrastructure yielding excellent speed, reach and scale.
• Control over bids, transparency into pricing.
• Choice of where ads run, visibility into where ads deliver.
• A large, liquid pool of brand-safe inventory.
• Dynamic creatives to tailor your ads.
• Ability to use audience data with extensive flexibility for custom combinations.
• A contextual engine—driven by the same technology as Google search—that handles context at the page level.
• Over 10 years of experience optimizing bidding strategies for buyers.

Google has assembled a complete range of products that support RTB and help buyers find audience at scale, including:

• **Google Display Network**, a transparent, auction-based, RTB-savvy buying solution and full-service partner.
• **DoubleClick Ad Exchange**, a global, open, transparent and brand-safe marketplace connecting buyers and sellers through multiple deal types via its RTB API, UI and standard API.
• **Invite Media**, a high-volume, results-oriented demand-side platform (DSP).

The following sections briefly describe the highlights of each product in turn.

Google Display Network

Google Display Network (GDN) is a transparent, auction-based, RTB-savvy buying solution serving billions of ad impressions each day across more than 2 million websites.

From its inception in 2003, GDN has allowed advertisers to bid, through a real-time auction, for each ad impression. With its reach, scale and advanced contextual engine, GDN is a highly effective vehicle for consolidated buying. Advertisers drive performance, find de-duplicated reach and benefit from advanced methods of real-time buying. As an auction-based buying solution, GDN allows buyers to have control over their bids and provides transparency into pricing. Its full-service solution is designed to hit advertisers' campaign goals using built-in optimization that includes the weighting of multiple types of data at the impression-level. GDN helps buyers answer the three essential questions of real-time buying with a focus on evaluating the context of the page and the audience together.

Advertisers working with GDN benefit from Google's 10 years of expertise in developing optimization algorithms. GDN uses these algorithms to offer automated bidding settings that can be used to reach the buyer's goals either for clicks, customer acquisitions or conversions. Bids can be based on cost-per-click (CPC), cost-per-action (CPA) or cost-per-thousand impressions (CPM). And at any time, buyers can monitor their campaign results, control where ads deliver, and adjust goals as required.

GDN clients can reach hundreds of millions of users classified into demographics and interests. Using GDN's more than 1,000 interest categories, advertisers can reach an audience with specificity or more broadly through high-level categories such as auto, sports, travel and finance. These interests are either set by the users themselves in the Ads Preferences Manager or are based on a rich classification system that looks at how often and how recently pages about a topic are visited, often with a threshold of five to 10, and up to many dozens of pages viewed in a month for a topic.

GDN supports custom audiences whereby an advertiser can define an audience segment using a combination of interest categories, demographics and past site visitors. When remarketing on GDN, buyers can not only find an advertiser's past website visitors, but they can find them in the right context. Additionally, GDN offers dynamic remarketing whereby a dynamic creative is paired with an advertiser's remarketing list so that the ad that past website visitors see is custom tailored to attract them back to the advertiser's site with highly relevant offers.

When remarketing with GDN, buyers can find the reach, frequency and contextual diversity needed to drive campaign results. In a June 2011 analysis of remarketing lists running on GDN[5], we found that 84% of the typical remarketing audience can be found in a month. With respect to frequency, typical remarketing list members can be reached on between 10 to 18 or more unique days out of the month. Speaking to contextual diversity, on a typical day, these list members can be reached on between 5 to 10 or more unique domains and on 20 or more pages. These stats all contribute to the success of remarketing campaigns on GDN.

GDN's built-in optimization tools, like the Display Campaign Optimizer, help buyers achieve their goals more easily. Display Campaign Optimizer helps to increase conversions and saves advertisers time by automatically managing targeting and bidding for campaigns. Advertisers set their target CPA goals, and the Display Campaign Optimizer automatically determines the appropriate placements to show their ads at the right prices, helping to boost conversions.

Common targeting strategies with GDN include:

• Contextual (keyword or category).
• Audience (remarketing, interests, demographics).
• Geographic.
• Placement.
• A mix and match of strategies, such as context and audience together.

GDN is ideal for agencies or advertisers looking for audience, context and the fusion of both. It's ideal for buyers whose campaign performance can be improved by consulting with a world-class team of display advertising experts.

For more information, visit **www.google.com/adwords/displaynetwork/**

5. Source: Internal, global Google data pulled on June 7, 2011 based on an analysis of thousands of remarketing lists running for the prior 28 days. Each data point is individually calculated using a non-weighted average.

doubleclick ad exchange
by Google

DoubleClick Ad Exchange (ADX) is a global, open, transparent and brand-safe marketplace to buy and sell display advertising space. DoubleClick Ad Exchange helps media buyers and sellers connect through multiple deal types across this marketplace. For buyers, DoubleClick Ad Exchange provides real-time and impression-by-impression access to a large pool of high-quality inventory. Buyers can bring their own data, optimization and bid strategies to the exchange in order to easily meet their advertising goals.

By providing a large pool of inventory to DSPs, ad networks and other media buying intermediaries, ADX makes it optional for these buyers to work with publishers directly to acquire inventory.

ADX supports a completely open ecosystem of buyers including more than 100 ad networks, including Google Display Network, and a number of DSPs, including Invite Media. Google is open and impartial to all buyers, whether they are owned by Google or not.
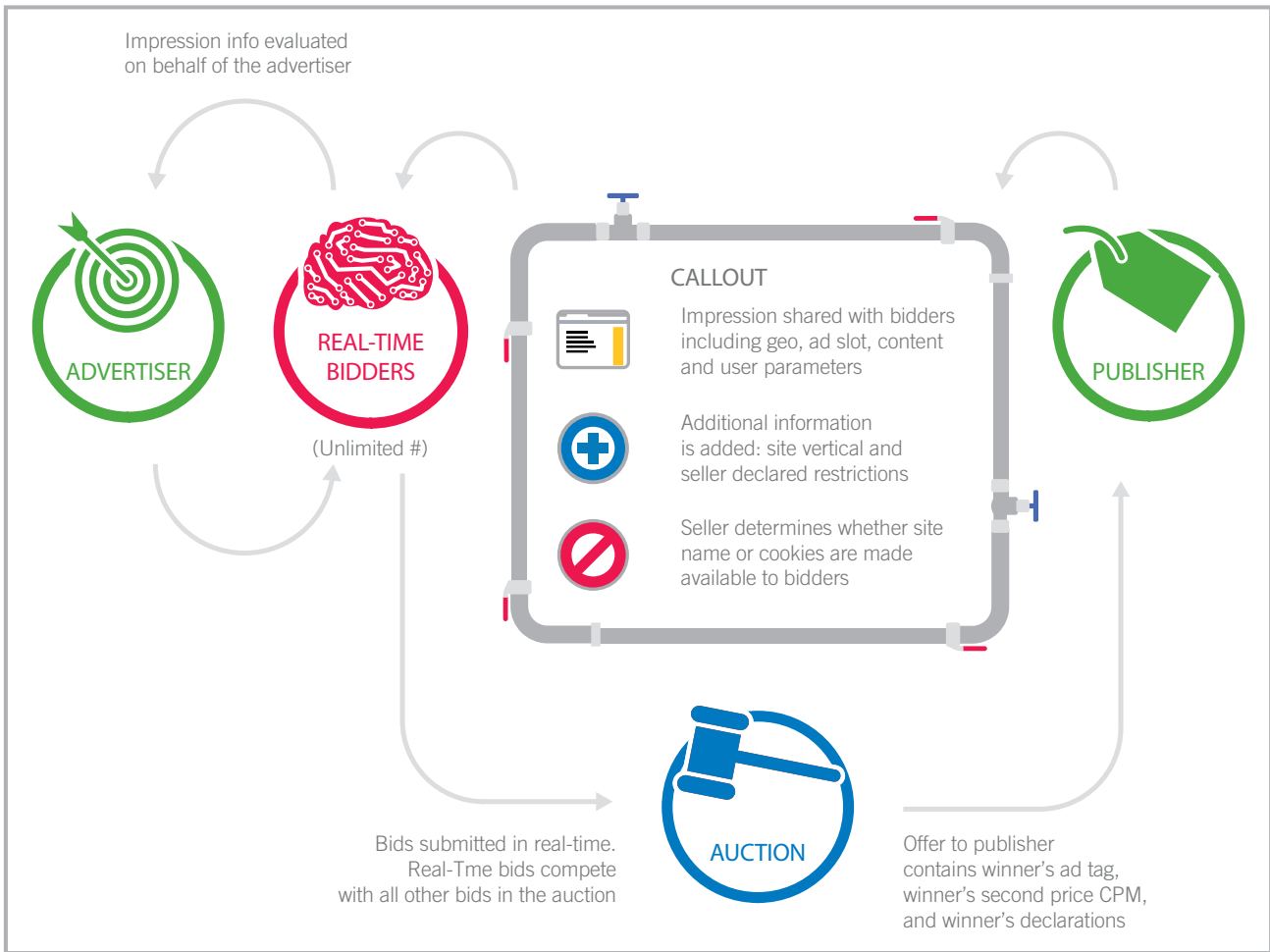
ADX helps buyers buy any way they want to buy:

• Programmatically through a real-time bidder linked to the ADX RTB API.
• With the ADX interface.
• With a standard (non-RTB) API.

As Figure 5 on the next page shows, the ADX RTB API provides many advanced capabilities:

• **Maximum information:** While respecting a publisher's wishes, ADX passes detailed information to buyers when each impression is announced, so that buyers can better value impressions and use RTB in highly sophisticated ways.
• **Unlimited bidders:** Google infrastructure supports an unlimited number of bidders, so all interested buyers can place bids without constraints imposed by technology.
• **Open competition:** All real-time bids compete with non-RTB bids in a fair auction, so RTB buyers have an equal chance to win impressions.

Figure 5. Server-to-Server Interaction Between Advertisers and Publishers Using DoubleClick Ad Exchange's RTB API

Impression info evaluated on behalf of the advertiser

ADVERTISER

REAL-TIME BIDDERS

(Unlimited #)

CALLOUT

Impression shared with bidders including geo, ad slot, content and user parameters

Additional information is added: site vertical and seller declared restrictions

Seller determines whether site name or cookies are made available to bidders

PUBLISHER

Bids submitted in real-time. Real-Tme bids compete with all other bids in the auction

AUCTION

Offer to publisher contains winner's ad tag, winner's second price CPM, and winner's declarations

Another advanced capability of ADX is ADX Direct Deals. This lets buyers and sellers work together more directly through fixed price deals. When a Direct Deal is setup between a buyer and a seller, the buyer then has the chance to buy impressions via RTB at the pre-negotiated fixed price before the impression goes to auction. This will help buyers access more inventory from the publishers they love while preserving the efficiency of the RTB workflow.

ADX is ideal for DSPs, trading desks and other media buying intermediaries that want to gain all the benefits of RTB on behalf of their advertisers, and for ad networks that want to expand their inventory pool without having to aggregate impressions on their own.

For more information, visit **www.google.com/ads/adxforbuyers**

invitemedia™
by Google

Invite Media is a high-volume, results-oriented demand-side platform (DSP) that was acquired by Google in June 2010. Invite Media provides an enterprise technology platform and professional services team that enables advertisers, agencies and agency trading desks to use RTB to buy and optimize online media. Buyers can use Invite Media's technology to set up and manage automated strategies to help facilitate more efficient buying across multiple ad exchanges and supply-side platforms, all in a single interface. With an ability to apply data from any major source to campaigns, plus the freedom to create business rules for bidding and optimization, Invite Media gives buyers flexible control over campaign performance.

Top agencies and advertisers rely on Invite Media's transparent universal buying platform, Bid Manager, to use their own and third-party data while gaining efficiency and scale from an integrated workflow and reporting system.

Invite Media clients benefit from efficiency in media buying, transparency into media costs, visibility into the sites in their buy and optimal performance from a proven partner. Now backed by Google's global infrastructure, Invite Media provides the reach, scale and speed buyers need to get optimal results.

Common strategies with Invite Media include:

• Retargeting.
• Third-party audience buying.
• Site targeting.
• Run of exchanges.

Invite Media is ideal for any trading desk that wants to bring more buying efficiency to its holding company and who wants to use RTB in highly sophisticated ways. Invite Media is also ideal for advertisers with in-house media teams that want to use RTB with a sophisticated range of targeting and optimization tactics.

For more information, visit **www.invitemedia.com**

CONCLUSION OPTIONS FOR BUYERS

Google offers a full range of options for buyers. Whether you're an advertiser, a media agency, a trading desk, an ad network, a DSP, or another type of player in the ecosystem, Google offers a wide range of options to help you find better answers to the three essential questions and profit from RTB.

- For advertisers or agencies that prefer to use a managed service supported by Google's 10 years of experience with optimization strategies, **Google Display Network** provides extensive reach, performance and scale with full transparency.
- For any buyer who wants access to a vast pool of inventory and a global footprint, **DoubleClick Ad Exchange** provides an RTB API that supports bidding in highly sophisticated ways.
- For trading desks and large advertisers that prefer to develop their own bidding strategies, **Invite Media** helps drive RTB campaigns with a high level of control to optimize campaign performance.

As media buying evolves, Google will continue to help buyers buy the way they want to buy. With a buyer's system of choice, Google will help you achieve the best possible campaign performance.

To find out more about how you can benefit from real-time bidding, speak to your DoubleClick, Google or Invite Media representative.

Google™