Programmatic Video

A Spectrum of Automation

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This document has been developed by the IAB Programmatic Video Working Group

About the IAB Programmatic Video Working Group

The IAB Programmatic Video Working Group is a group of IAB members working together to provide clarity and education around programmatic video as it evolves and continues to grow.

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About IAB

The Interactive Advertising Bureau (IAB) empowers the media and marketing industries to thrive in the digital economy. It is comprised of more than 650 leading media and technology companies that are responsible for selling, delivering, and optimizing digital advertising or marketing campaigns. Together, they account for 86 percent of online advertising in the United States. Working with its member companies, IAB develops technical standards and best practices and fields critical research on interactive advertising, while also educating brands, agencies, and the wider business community on the importance of digital marketing. The organization is committed to professional development and elevating the knowledge, skills, expertise, and diversity of the workforce across the industry. Through the work of its public policy office in Washington, D.C., IAB advocates for its members and promotes the value of the interactive advertising industry to legislators and policymakers. Founded in 1996, IAB is headquartered in New York City and has a West Coast office in San Francisco.

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Executive Summary

Programmatic is a term that's used frequently by digital marketers, but there is still a lot of confusion around how to differentiate one programmatic solution from another, specifically as it relates to digital video. Video DSPs, Ad Networks, linear TV providers, individual publishers, and many others in between all tout programmatic video capabilities in a marketplace where there appears to be little consensus on what the term "programmatic" even means. To be clear, IAB defines programmatic very simply: the automated buying and selling of inventory.

Much of the confusion stems from thinking about automation within a simple "yes" or "no" dichotomy. The reality is that there are many distinct processes within buying and selling workflows that can and cannot be automated, specifically as it relates to targeting, forecasting, transacting, delivery of creative assets, and reporting. The degree to which these can be automated is largely a function of the channels within which the video inventory is being sourced (desktop, mobile, OTT, Linear TV) as well as the technical infrastructures upon which they're being monetized (reserved inventory prioritization within an ad server, network-based monetization via tags or SDKs, or exchange-based monetization which, for the purposes of this report, refers to both DSPs and SSPs). Data has always been vital for the buying and selling of advertising: to inform rates, media plans, and delivery calculations. Today, the accelerating rate of automation is a function of channels and technical infrastructures that directly impact not only the amount but also the granularity, diversity, and real-time actionability of data that can be applied to the buying and selling of video inventory, so it can truly be said that data is the fuel for automation.

In order to effectively evaluate programmatic video solutions and the relative value they provide, industry practitioners need to first decouple the targeting, forecasting, transaction, creative delivery, and reporting functions from the broader offering and evaluate them individually. Given that these platforms and technical infrastructures evolve rapidly with shifting media consumption patterns and ad technology solutions, the goal of this document is to provide buyers and sellers with a framework to help them evaluate these features and functionalities during partner evaluation.

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Ways of Transacting Video

The underlying technical infrastructures that allow advertisers and publishers to execute video buys have evolved tremendously since the early days of the digital advertising industry. Publishers initially relied on their ad servers to cordon off specific sets of contextually relevant inventory that advertisers were interested in, then set delivery priority and pricing within a stack ranking of direct buyers (known as waterfall structures) to ensure the buys were delivered in full. Soon advertising networks were developed across a number of publishers via tags or SDK integrations. Networks gained traction by helping publishers monetize unsold inventory that their direct sales staff couldn't fill. Networks also enabled more sophisticated approaches to audience buying, allowing advertisers and agencies to start cherry-picking impressions against specific audience characteristics agnostically across the publisher instead of using site content itself as a proxy for their audiences. Eventually the introduction of exchange structures advanced this concept even further by creating much larger, data rich, open marketplaces where advertisers and publishers could use DSP and SSP software and associated data integrations to more fairly determine the value of inventory via real time auctions.

Today, buyers and sellers use a mixture of exchange-based transactions, network buys, and direct/reserve transactions set manually via ad server prioritization. However relative to such programmatic methodologies as Direct / Reserved buys (also referred to as Automated Guaranteed or Programmatic Direct), exchange and network structures facilitate the highest level of workflow automation. While programmatically monetized video inventory—those impressions sourced via network or exchange structures—brings great benefits in terms of transparency, efficiency, and scalability, a large portion of the video advertising ecosystem is still transacted via non-programmatic methods. Although an increasing amount of inventory moves into programmatic channels daily, the historical, and more manual ad server mechanisms for transacting still remain necessary because of the consistency provided in terms of delivery, cost models, and creative options.

Although the evolution toward exchanges was initially born out of a need to match supply with demand and enrich the process with more robust data, the evolution created stark differences in the degree to which automation is possible within buying and selling workflows. Specific aspects affected by these structures include targeting, forecasting, transacting, delivery of creative assets, and reporting processes.

In addition to the degree of automation provided across these processes, a video platform's monetization structure also introduced important strategic considerations for buyers and sellers. Buyers need to be acutely aware of the differences of each type of infrastructure in terms of the granularity of data that can be applied (for inventory evaluation, reporting, optimization), transparency, cost models that can be used, custom integration options, inventory quality, and pricing/pacing nuances. Additionally, sellers need to understand how these options affect the balance of yield and fill rates depending on which mechanisms can garner the highest ROI. Below is an overview of how each structure affects automation and buyer strategy.

Direct - Ad Server Prioritization (Waterfall)

Directly selling inventory and setting prioritization in a waterfall structure remains the standard approach to doing business. While more and more digital video transactions are happening via programmatic systems – eMarketer reports that programmatic digital video ad spend increased 313.6% on desktop/laptop and 517% on mobile in 2015 as compared to 2014 – there are still some that remain direct sold. Most OTT and linear television transactions are still performed via these traditional models.

Some of the key reasons ad server prioritization continues to be attractive include:

1. Risk Mitigation – This brings two major benefits:
    - Allows publishers to package inventory and control CPMs and fill rates, in turn mitigating potential risk of unfilled inventory.
    - Enables Unique Cost Models – By virtue of being able to control risk much more directly, publishers can offer unique cost models to buyers that help them back into their KPIs. Examples include cost-per-completed view (CPCV), viewability guarantees, or cost-per-engagement (CPE) approaches.
2. Access to Non-Standard or Unique Inventory – Buyers often need to look to direct buys to gain access to newer types of ad units that may not yet be available via programmatic channels. Programmatic systems need standardization to work efficiently. When brands look to differentiate their ad campaigns with unique characteristics, they often look to high-impact custom creatives that may not be supported in the programmatic standards.
3. Facilitates Alignment Against Known, High-Value Content – This allows advertisers to gain scale on particular types of inventory that have a unique value that they feel resonates highly with their intended audience. These are usually aligned to premium inventory such as long form video or content verticals like news, weather, or politics. Buyers may want to lock up as many placements on a site, app, or show and so look to direct negotiations to ensure that they have the supply that they need.

These benefits largely come at the expense of targeting capabilities against audience or segmentation criteria, scale, and reporting granularity / transparency.

Ad Networks

Ad Networks entered the digital advertising ecosystem as a means to aggregate inventory across many different publishers via tag or SDK integrations. Ad network models are based on buying inventory on a direct basis from many publishers and then reselling it to their clients using the markup they apply to cover losses from any unsold inventory (a practice known as arbitrage). This structure allows buyers to identify specific video audiences across all publisher relationships at much greater scale than could previously be achieved via a direct buy on a single publisher. Video ad networks traditionally had more video supply than exchanges, which had very limited scale when they initially launched.

Like site direct buys, ad networks can often offer unique cost models that are made possible by risk mitigation from arbitrage practices. They also frequently specialize in aggregating unique types of video inventory—full episode player, high viewability, other premium placements, etc.—that are harder to find in open exchange environments. Additionally, they are also able to provide the scale that some buyers are looking for as well as revenue guarantees that many publishers are looking for.

There are several known downsides to network models. While arbitrage approaches do provide cost model benefits to buyers, they also reduce transparency to the buyer in terms of how much they are contributing to the network's profit margin. Depending on the size of the margin, this often decreases efficiency of the video investment as not all of budget is going towards the cost of inventory. Additionally, ad networks usually only offer managed services to their clients. This further reduces the transparency and efficiency of the buy in terms of specific audience segmentation used, how pacing decisions get made, and the specific optimization levers being used.

Exchanges

At their core, exchange-based technology solutions like DSPs and SSPs facilitate workflow automation, enabling buyers and sellers to scale the number of transactions to levels beyond what is possible with network or direct buys. This automation is made possible through mass-market software tools: Demand Side platforms on the buy side (DSPs) and supply-side platforms (SSPs) on the publisher side. These tools are generally made available to users on a self-service basis; meaning campaign structure, pacing and optimization are done directly by the user instead of network intermediaries.

Data plays an increased role in exchange-based buys relative to networks. While data has always informed media buying decisions going back to the use of Nielsen ratings in the early days of network TV buys, exchange-based platforms are unique in their ability to incorporate much more granular data sets from many sources for inventory decisioning and reporting and in order to more thoroughly enrich the optimization process.

Transitioning to exchange-based mechanisms for buying and selling video brings multiple benefits as well as caveats. Benefits include: efficiencies due to workflow automation, transparency (for buyers in particular) around inventory quality, targeting, and optimization; more robust performance analytics / reporting; and more flexibility to build custom inventory and data integrations by virtue of a self-service SaaS model (for more information on the ways inventory can be organized within exchange structures, including Automated Guaranteed and Invitation Only Auctions, please refer to the IAB Programmatic and Automation one-sheet). In terms of potential tradeoffs, efficiencies can come at the expense of custom higher-impact ad unit options. Another trade off is the potential loss of publisher bargaining power that comes with impression-level competition as one moves to exchange-based mechanisms from more closely managed direct and upfront marketplaces, less control over delivery as a whole, high initial technical training/human capital requirements, and in the case of poorly managed distribution— exposure to fraud.

The following chart outlines some of the key strategic benefits and limitations for buyers given the three primary ways publishers monetize inventory: direct/reserve buys, network based buys, or exchange based buys:

TYPE	TRANSACTION MECHANISM	KEY STRATEGIC BENEFITS	KEY LIMITATIONS
DIRECT / RESERVE	PUBLISHER ADSERVER PRIORITIZATION (VIA WATERFALL)	• Direct access to high impact opportunities / custom units (Takeovers, Roadblocks, Fixed Units, Nonstandard units) • By assuming risk against built in margins, can offer unique cost models (CPCV, CPE, CPVI, etc.) not available via exchange mechanisms • Can include creative services • Guaranteed delivery, pricing	• Limited scale • Advertiser is removed from optimization process - can only be executed by publisher via direction provided by advertiser to manually re-submitting IO • Reliant upon standard ad server reporting
AD NETWORK	TAGS, SDK INTEGRATIONS	• By assuming risk against built in margins, can offer unique cost models (CPCV, CPE, CPVI, etc.) not available via exchange mechanisms • Can access unique network inventory at scale that's not readily available on exchanges (Rich Media, Native) • Moderate scalability • May offer bundled creative services • Moderate amount of information available for performance optimization (more limited because not based on OpenRTB infrastructure)	• Cost models incorporate built in margins as a fee for campaign management, building of inventory relationships • Limited transparency / access to self-service business models • Affects speed of optimization (as well as viewability, fraud, performance, pacing, transparency) • Limited transparency into audience data / segmentation criteria applied to decisioning
EXCHANGE	DSPS, SSPS	• Most inventory transparency • Deep analytics about performance • Most robust optimization capabilities	• Advertiser assumes risk on all media purchased • Can only purchase inventory on a CPM (GRP for TV) basis • Inventory quality has to be very actively managed via ad technology application, black/white lists, and PMP integrations • Requires high degree of technical fluency to set up campaigns, interpret data, and optimize campaign performance

A similar chart could be created for video publishers, who have the same options as far as monetization mechanisms, but a slightly different calculus when it comes to the pros and cons of each.

It's important to note that the availability of these mechanisms differs from video platform to video platform. In the PC and mobile arenas, programmatic transactions via direct, network, and exchange channels are all fairly common. In OTT and linear TV, programmatic often means automating existing direct buys, although specialist exchanges exist serving the spot TV and scatter market.

As programmatic video has become more prevalent in the industry, many ad networks have begun to supplement their network-sourced inventory with exchange inventory. Indeed, many video ad networks are beginning to change their business model, reinventing themselves as DSPs or SSPs and adapting to look more like today's agency models where they provide value through their programmatic expertise.

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Why Buyers and Sellers Transact Via Programmatic Video

Though programmatic transacting of video ad inventory takes many forms across the different video platforms, the motivations for transacting programmatically are fairly consistent. They relate to:

- Programmatic's power to leverage rich and diverse data sources
- The efficiencies of automation, and as a result of both of these
- Transparency of targeting and reporting that reflects transactional parameters

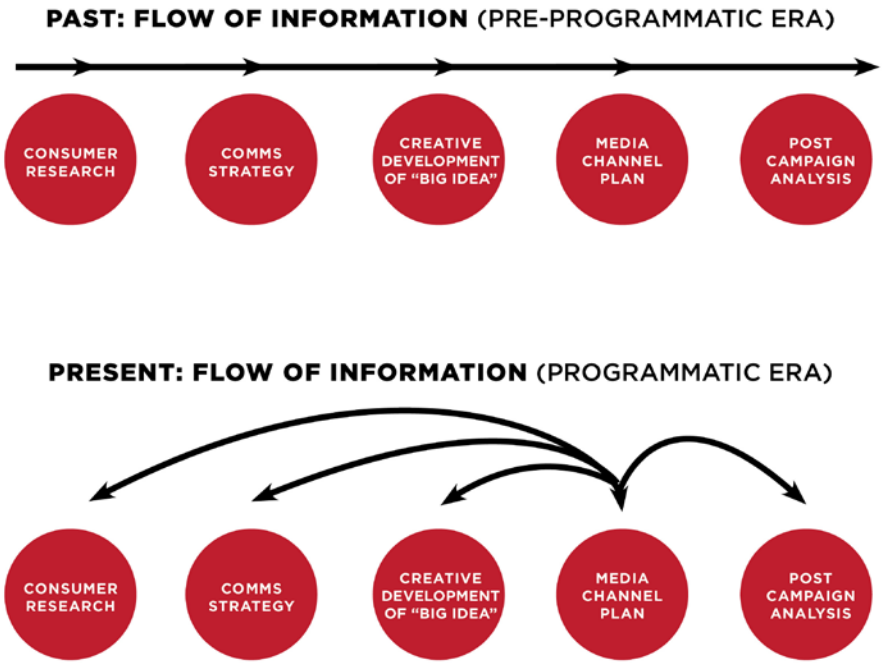
This section examines each of these motivators for shifting to increasingly programmatic buying and selling of video.

Data

As observed in the previous section, data has always been the lifeblood of advertising; media and creative decisions have always been informed by data of one type or another. What changes in the programmatic world is the ability to utilize much more granular data, and to take in and integrate data from multiple different sources, enabling advertisers to reach precise audience segments with the most relevant messages possible. An array of specialist vendors, called Data Management Platforms (DMPs) has arisen to deliver new data sources into exchange-based markets, to better inform buying decisions.

Another significant change from a pre-programmatic to a post-programmatic view of data is the growing importance of the media delivery platform as a source of data that can and should inform all other steps in the media planning and buying process. In the "Mad Men" era of advertising, data flowed in a very linear and highly front-loaded process based on research about the target consumer, passed to a communications strategy team within an agency, and from there on to a creative agency to devise the "big idea," which in turn informed the media plan, which led to the campaign. Today, in the programmatic era, decision-making is a much more decentralized flow of data originating in the media platform, due to the granularity of the data. Such data informs all steps in the advertising process, and includes:

- Age, Gender, Behavioral Characteristics
- Geo, time of day, day of week analysis
- Media consumption patterns
- Devices, content, context
- Path to conversion analysis
- Recency / frequency analysis
- Copy / imagery efficacy
- Sequential messaging analysis



In terms of the KPIs and post-campaign analysis, the media platform is the source for potentially dozens of different data points against contextual, geographic, device, browser, time of day, day of week, and reach/frequency signals.

Programmatic increases opportunities to use data in real time to optimize both creative and media based on what is measurably working to achieve campaign goals and associated KPIs.

Automation

Supply chain and workflow automation are key aspects of programmatic advertising and are especially relevant to programmatic video advertising considering the nuances of linear TV from a workflow perspective. Open auction based impressions make inventory easy to buy. However, video inventory is primarily being made available through mechanisms such as private marketplaces or preferred deals. To help buyers locate inventory across different supply sources and sales channels, many programmatic software tools enable centralized and automated inventory discovery across different programmatic transaction types, effectively automating many parts of the supply chain. API integrations between DSPs and SSPs allow for this supply discovery and subsequent negotiations to happen between disparate systems, for all digital video platforms. During discovery of these sources, programmatic tools can efficiently evaluate opportunities for buyers and sellers and forecast many different aspects of the available inventory. This can help a buyer make good decisions about what inventory to negotiate for and can even automate the negotiation and contract on behalf of the user.

In the context of linear television, it should be noted that creative needs to be provisioned well ahead of time so that it can be delivered to the correct physical locations in time for the ad to be inserted into the programming and delivered. Creative delivery is a key component of any programmatic solution, covering asset, brand, and copyright rules as well as other creative aspects beyond delivery. It should also be noted that for linear TV programmatic systems, true avails may not be available, so offline negotiations may still be required. The following sections have a more thorough breakdown of processes that are automated.

Targeting

A key benefit of programmatic buying of media is that so much of the process is the same regardless of the channel or the device. Each offers some unique variables and attributes that can impact the pricing of any given impression, but the core principles are the same across all media types. As with other digital media, buyers transacting video programmatically can access a rich combination of 1st, 2nd, and 3rd party data sources that can enable them to build audiences and reach relevant viewers with video ads. In web environments on both desktop and mobile, cookies are used to identify these users and target them. On mobile in-app and on connected TVs, a device ID can provide similar levels of audience addressability. Linear TV currently has limitations in addressability, but lookalike models can find statistically significant audiences based on a buyer's or seller's data set.

Forecasting

Just as targeting capabilities in programmatic advertising share many common mechanisms across channels and devices, so do the forecasting abilities. Forecasting of programmatic inventory benefits from the transparency created on both the buy and the sell side. Buy-side forecast accuracy depends on the ability to see as many of the available impressions that can be purchased on an ongoing basis in order to be able to predict future availability. DSPs must therefore have access to as much of the inventory pool as is possible to accurately forecast what will be available. On the sell side, publishers or SSPs need access to as many bids or prices on inventory as possible in order to forecast future demand. All of this is true for video as well as all other channels of advertising across all devices, although the relatively limited availability of video inventory makes it even more important for programmatic tools to have as complete a picture of the avails as is possible. Publishers should also be aware that often times audience and other decisioning criteria increase complexity and uncertainty and make it far harder for a publisher to accurately forecast and yield manage a highly constrained supply pool.

Reporting

Programmatic buying and selling of media across channels and devices for which data is being received can increase transparency in reporting by providing dozens of different data points about delivery quality directly to a buyer, often in real time, without any publisher intermediary. Buyers and sellers can have access to every piece of data about every impression bought or sold regardless of media channel or device. While different channels will have metrics that are applicable only to that channel (video completion rate for example), many of the core metrics that can help users optimize to their ROI goals can also be standardized across all channels and devices.

Beyond simple transparency in reporting, it is important that buyers and sellers be able to take action on every attribute for which they are receiving reporting data. A core tenant of programmatic is that anything that can be reported on, can be optimized on as well. While many companies offer technology solutions that identify problem areas in campaigns, these do not always enable buyers to quickly correct the problem. The closer a technology company is to the impression flow, the greater their ability to make actionable use of that data for optimization. DSPs and SSPs typically offer these technical capabilities.

Comparative Automation in Video Advertising by Platform

The following grid captures a visual representation of the automation capabilities discussed above, broken down by each of the major video platforms, and highlights the degree of automation in each step of the supply chain. The accompanying legend explains the meaning of each circle. The rest of this paper provides closer looks at the four major video platforms discussed here.

	DESKTOP VIDEO	MOBILE VIDEO	OTT	LINEAR TV
TARGETING- DEGREE OF AUTOMATION IN DECISIONING AGAINST INVENTORY				
FORECASTING- AUTOMATION IN IDENTIFYING AVAILABLE INVENTORY AGAINST TARGETING PARAMETERS				
TRANSACTING- AUTOMATION / SPEED WITH WHICH INVENTORY CAN BE PURCHASED / SECURED				
CREATIVE DELIVERY- AUTOMATION OF CREATIVE ASSET DELIVERY AFTER DECISIONING / PURCHASE				
REPORTING- AUTOMATION, SPEED WITH WHICH DATA IS RETURNED TO BUYER ABOUT CHARACTERISTICS OF INVENTORY DELIVERY				
INVENTORY AVAILABILITY- FOR AUTOMATED TRANSACTIONS				

Desktop Video

Of the four primary video platforms addressed in this report (desktop, mobile, OTT, and linear TV) desktop is the most mature in terms of automated capabilities and support for multiple transaction types. In desktop video all ways to transact programmatically are available, although anecdotally buyers and sellers report significant recent growth around private direct deals.

Most planning tools originate from desktop but are now being used across all devices. Planning/Forecasting tools within desktop video continue to advance, taking in not only targeting parameters but also KPI performance goals, especially around viewability. Viewability is a key metric in terms of available inventory as many brands are moving to a model where they don't pay for non-viewable inventory. Additionally, planning and forecasting tools need to take into account bot and site fraud to give the true available inventory. These planning tools enable the buy side to plan campaigns in a holistic and automated manner based on avails for viewable impressions across validated human audience segments.

Targeting on desktop video is fully automated and made possible largely via cookie technology. There are many data points used to create different ways for brands to target user profiles. These could be contextual or demographic data segments or using location or social based metrics and more to inform the best person to target. Data automation is very prevalent within desktop today, enabling rich segmentations for targeting at scale; however cookie deletion and expiration continue to pose challenges for reaching and retargeting audiences.

Another advancement and fully automated solution for buyers in desktop video is interactive creative, which adds the level of "touch" (as well as post-event attribution) to video ad spots. Integrating tags using the IAB VPAID specification enables standardized counting of video plays, full or partial views, and other metrics, enhancing automated optimization against a richer set of KPIs. As VPAID adoption grows, these kinds of enhanced data and interaction points help to further inform and optimize campaigns.

Optimization is another fully automated capability in desktop video, which can now be extended across all devices as well. Buyers have the controls to optimize towards a KPI or multiple KPIs allowing for a more automated way to hit buyer goals. The engagement data returned from video offers advertisers more effective and meaningful measurement of campaigns than has ever been available. Brands can achieve more certainty that they are reaching their audience effectively with video, and gain insight into those audiences' usage, response, and in some cases, influences to purchase. These data-driven insights feed back into the beginning of the cycle, contributing to an iterative process of media optimization and improvement, helping advertisers target, reach, and engage their audience more and more effectively over time. While video is much more of an awareness or branding medium, desktop video still allows buyers to track DR-type metrics. Additionally the advancements of the digital GRP allow buyers to better compare traditional TV with desktop video. On-target % or GRP is a metric that more and more buyers are looking to attain.

Digital video impressions and other KPIs are captured and reported automatically via available measurement tools. These reporting tools breakdown campaign exposure by the primary, secondary, and tertiary targets as well as provide transparency into when and where the ad ran. Advancements in reporting over the last year or so have really allowed buyers to understand what they are getting for their dollar.

Mobile Video

In Mobile video, all programmatic transaction types are available to programmatic buyers. The majority of access points are via the same planning and buying platforms as Desktop and Over the Top, though specific types of inventory, i.e. full episode player (FEP), premium short-form, etc. may be restricted to just certain types of transactions.

Current limitations in programmatic mobile video are centered primarily around targeting and measurement. Mobile video ad inventory is available via two channels: mobile web and mobile applications. While both can provide access to in-stream video inventory, they operate differently in how they can be targeted and measured. Additionally, VAST implementations differ across mobile SSPs more significantly than they do on desktop. As a best practice, DSPs should make sure they're passing all the correct parameters in the VAST ad call, per the SSP's spec.

In mobile web, the default setting of most major mobile browsers is to block 3rd party cookies, the lifeblood of desktop targeting. This creates a very limited number of available browser cookies for open eco-system platforms to utilize for targeting, and desktop cookies do not follow a user from one browser to the other. Only those with 1st party user data, or access to "device graphs"—anonymized probabilistic or deterministic data that can be used to track usage across screens, media, or platforms—can build identifiable audiences at scale across mobile websites. This lack of 3rd party cookies also limits measurement companies from running studies that rely on cookies to build control groups or link back to other datasets such as brand lift and closed-loop studies, though some viewability vendors can run in mobile web environments if VPAID or MRAID are enabled.

In mobile applications, there are no cookies at all, but there are Device IDs and major operating systems such as iOS and Android have created unique but anonymous identifiers, IDFA and ADID, respectively, to allow for cookie-like capabilities. In some ways, app identifiers even improve on cookies: they are universal, which simplifies data matching and synching processes. Additionally, they do not expire, although a user can manually refresh them, allowing for datasets with much longer shelf lives. These ID's also better support measurement than do cookies. In addition, publishers continue to grapple with the rollout of viewability in mobile apps, which remains a challenge due to various SDK (Software Development Kit) implementation requirements.

While creative development and measurement are very consistent across mobile websites, and generally work in similar ways from one browser/operating system to the next, the world of apps tends to be more complicated. The SDKs that publishers incorporate into their apps to facilitate advertising can in some cases handle, measure, and report video ad viewing differently from one another, creating hurdles for those who buy this inventory programmatically. In general, compliance with IAB standards like VAST, VPAID, and MRAID can help mitigate the differences and achieve consistency from one SDK to the next.

Measurement in mobile differs significantly from desktop where 3rd party vendors and buyers have been using metrics like viewability longer and where some vendors are beginning to offer gross rating points (GRPs). In both mobile websites and apps, video viewability and GRPs are still a work in progress, with video viewability guidelines only now being set by the Media Rating Council. As vendors begin to offer standardized viewability metrics at scale in mobile, the gap with desktop with respect to programmatic video will continue to close.

Across applications and certain instances of mobile web, one opportunity for targeting is location-based data, which can be passed to the buying platform for real-time decisioning. While desktop campaigns can use geo-location as well, and TV buyers can of course target local markets, mobile campaigns can access more precise location data, potentially increasing relevance and interest to the viewer. This is especially true with regard to

mobile apps (as compared to mobile websites). Precise location data is typically much more readily available for in-app inventory than it is for mobile web inventory, due to differences in how users give permission for precise, GPS-based location data to be used and shared (for more on this see the IAB Mobile Location Data Guide for Publishers).

In general, though, the notion of location-based targeting either to inform real-time targeting (i.e., using a "geo-fence" to reach all people within a specific area or a specific distance from a location, etc.) or to create local audience segments, insights, and targeting solutions off of the data (i.e., using location to infer demographic or other desired traits about a user) is very exciting for brands. All smartphone video inventories represent a great opportunity to tailor an ad message to the right person, at the right time, in the right place.

Over-the-Top (OTT) Video

The IAB Video Glossary defines OTT as "A device that can connect to a TV to facilitate the delivery of Internet-based video content (e.g., streaming boxes, media streaming devices and gaming consoles)." This can also include devices internal to the television as well.

Like desktop and mobile, both open and private programmatic transaction types are available for video advertising on Over The Top (OTT). The difference is, OTT provides a viewing experience and advertising/engagement opportunities that closely resemble traditional linear TV, while offering targeting and reporting capabilities that are more akin to desktop and mobile. Targeting in OTT is akin to the mobile app marketplace, although with less prevalence of advertising IDs. OTT VOD differs from Addressable TV in that it does support Dynamic Ad Insertion (DAI) and provides a one-to-one addressable/real-time marketplace.

OTT is a "cookie-less" environment that does not support traditional digital cookie based targeting and currently provides limited measurement as compared to PC based environments for validation of audiences and campaigns.

Available inventory types include:

- Pod formats; :15s/:30s
- Custom Offerings via publishers
- Interactivity via interactive video vendors

Linear TV

Programmatic television is the evolution of the sales process that has inherently been a part of the traditional TV landscape. Given the length of time that television has existed as an advertising medium, there are well defined processes and terminology associated with the buying, selling, and measurement of TV that differ from digital video and mobile. However, television has been one of the last mediums to adopt programmatic, and while it does have its own distinct language, it has also begun to adopt or modify terminology that has been previously defined by other forms of programmatic.

While the advertising world continues to embrace programmatic methodologies for the buying and selling of advertising, one of the most effective mediums for delivering those messages, television, has largely been considered an outlier in terms of its conformity to how programmatic is defined. This status isn't due to a lack of technological advancement, but is more due to the inherent limitations from long established processes,

infrastructure, and regulations that have been in existence for over 40 years and have been slower to adapt. As a programmatic medium, television is still relatively nascent when compared to video for web, mobile, and OTT. However in recent years, the industry as a whole has begun a slow, steady shift towards making programmatic a viable solution.

Identifying the degree to which television is a programmatic medium requires an understanding of the different inventory sources and components in the linear television marketplace and how the concepts of automation and real-time delivery apply across the ecosystem. The majority of online digital video sources have dynamic ad insertion capabilities (DAI) for delivery and tracking of impressions. Television, however, has varying levels of both automation and delivery and needs to be broken into separate components based on an inventory holder's ability to target and deliver ads to a specific individual, household or DMA. While the use of targeting has made video advertising very compelling from a data and delivery standpoint, the rise of Advanced TV[1] and beyond that, programmatic video on TV, even for linear TV, has enabled brands to now plan targeted and increasingly automated campaigns across the video ecosystem. The technologies that allow the serving and distribution of Advanced TV also return data that help advertisers find their specific audiences—and aggregate them at scale—regardless of device, time, and place. It is important to note that Advanced TV is not necessarily programmatic video and has been around far longer than programmatic video.

The varying levels of programmatic buying and selling within television can be attributed to the delivery methodology and data available to the inventory holder. The advancements in set top box (STB) and Smart TV technology through the connected home provides the MSOs (multiple-system operators) and MVPDS (multichannel video programming distributors) with access to return path viewing data and delivery capabilities that allow buyers a level of addressability that is not otherwise available in television. Addressable inventory relates to impressions that can be targeted and delivered to a household through the set top box or broadband connection to a streaming device (which is considered OTT or Advanced TV). Both sellers and buyers are now using this data to plan, execute and measure campaigns against secondary audience segments, as opposed to standard primary demographics (age, gender, income). However, despite the ability to plan and deliver impressions to the household level, Addressable TV[2] still lacks the real-time automation and decisioning found in other forms of media when transacted programmatically.

Due to regulatory and technological restrictions, national and local broadcast inventory cannot be served or targeted at the household level. Broadcasters do not have real-time access to viewership information or the means to dynamically insert ads to a home. Despite these challenges, broadcast inventory does share some of the attributes of other programmatic methodologies. Broadcasters do have access to certain levels of STB and Smart TV data that can allow buyers to find audiences within specific dayparts and programs. Addressability for local broadcast might not be far away, as the regulatory bodies, OEMs and broadcaster community is currently working on the ATSC 3.0 standard that would allow for two-way and return path data similar to that experienced by the MVPDs.

There have also been significant strides made by programmatic platforms to automate the buying and selling of television inventory. What has historically been a very manual and labor-intensive process to forecast and plan is becoming much more efficient with near real-time access to available audiences, rates and data. A process that used to take hours, days or weeks can now be planned in minutes, even if the content delivery is not real-

[1] Advanced TV is defined in IAB Advanced Television Advertising: *A Primer for Buyers and Brands*, as "Video and accompanying advertising, that is delivered by means that go beyond the typical capabilities of traditional TV, or, what is often now called linear TV"

[2] Addressable TV is defined in the IAB Video Advertising Glossary as "Technology that lets you show different ads to different audience segments watching the same TV program on IPTV and set top boxes. Those segments could be defined by behavioral, demographic, and geographic factors from 1st, 2nd, or 3rd party data sets."

time. This is true for all forms of television inventory, including MVPD, network and broadcast, which provide buyers with far greater options to reach their desired audiences.

There are still a number of challenges facing the television industry as it moves to become a fully viable programmatic channel. While there have been tremendous strides made in the use of data and technology to automate parts of the process, there is a long way to go to make television a dynamic advertising medium.

Measurement discrepancies—particularly related to timing and accuracy—remain one of the most challenging issues for buyers of traditional television inventory, whether it be linear, addressable or OTT / VOD. As viewing behaviors continue to shift, the methodologies for measurement will need to advance in order to accurately capture the true share and actual viewability of content across devices. Historically, TV has been bought and sold on GRPs (Gross Rating Point) and CPPs (Cost per Point), but with the advent of programmatic TV, more platforms, both sell-side and buy-side are transitioning to or trying to relate CPPs to CPMs as either a primary or secondary currency.

Conclusion

Programmatic advertising continues to drive growth across all mediums of digital advertising and video is no exception. Programmatic video brings buyers, sellers, and publishers access to the benefits of automation across all platforms, but there is a process of evolution. Not all video platforms are created equal and the capabilities and scale of programmatic video will continue to differ across the dominant video platforms.

Sellers and publishers should continue providing their programmatic video solutions with transparency and clarity around which components are automated and to what degree. Conversely, buyer expectations of programmatic solutions should be clear as to the extent of the automation that is sought, with the knowledge that the same capabilities are not ubiquitous from one platform to the next.

While there are varying degrees of automation in targeting, forecasting, transacting, creative delivery, and reporting, the general trend is towards increasing automation in each of these steps of the supply chain. Despite current capability variations and inventory scale differences across video platforms, in time it seems likely that there will be fewer and fewer differences from desktop, to mobile, to OTT, and even linear TV when it comes to programmatic video. There may even come a time in the not-too distant future when the term programmatic becomes completely redundant in much the same way that the word digital has become when referring to digital video. Until that day, this document can act as a reminder that Programmatic Video is not yet a one-size-fits-all solution for buyers, sellers, or publishers and often requires a deeper conversation and greater understanding.

Appendix

Additional IAB References for previously defined terms and standards

IAB Digital Video Advertising Glossary

Digital Video Player-Ad Interface Definition (VPAID) 2.0

Digital Video Ad Serving Template (VAST) 4.0