

From Panels to Precision: How Big Data + Panel is Redefining Audience Forecasting and Campaign Performance

As linear television continues to evolve, the industry is steadily transitioning from legacy panel-based measurement to modern big data-driven systems. This shift is motivated by the need for improved forecast accuracy, more granular targeting, need to leverage smaller networks and lower rated inventory and operational efficiency — particularly in an environment where viewership is increasingly fragmented and unpredictable.

At datafuelX, in collaboration with our measurement partner Nielsen, we've been closely evaluating the practical impact of this shift. This includes how big data influences both audience targeting accuracy and the financial outcomes associated with campaign planning and delivery.

Our focus is the benefits of Nielsen Big Data + Panel for publishers.

This analysis is focused on Nielsen Big Data + Panel Subsample. An update will be provided for Full Sample later in the year.

1. Forecast Accuracy = Financial Performance

One of the key benefits of big data is its ability to improve audience forecast accuracy. We conducted a structured analysis across six major networks, comparing performance between panel-based and big data-based forecasts. The analysis focused on six custom MRI target audiences that spanned a broad range of advertiser categories, including **Pharma, Auto, Quick Service Restaurants (QSR), Auto Insurance, Pharma Insurance, and Telco**.

Methodology and Insights

These forecasts were all run based on Adults 18+ within the MRI audience segment. The period forecasted was 9/30/2024 to 3/30/2025. The training period used for developing the forecasts was from 2/1/2024 to 9/30/2024.

Step 1: Measuring Forecast Error Across Audience-Daypart Segments

We evaluated **Mean Absolute Percentage Error (MAPE)** across each network and daypart for two publishers with multiple networks that vary in terms of rating size, comparing forecast error under legacy panel data vs. Big Data + Panel. Results showed a consistent improvement with big data across most time periods and audiences.

- **Overall MAPE improvement across targets was 23% for one network group and 72% for the other.**

- For one network group, the improvement was fairly consistent, with one network nearly having a 30% improvement
- For the other network group, three networks showed improvements over 50%
- One network group showed fairly consistent improvements by target
- The other group had nearly 100% improvement in forecasting accuracy for the smallest target, medical insurance

% Improvement in Forecasting Accuracy/Reduction in MAPE- Nielsen Panel Versus Nielsen Panel & Big Data Subsample			
Portfolio A		Portfolio B	
Network 1	-10%	Network 1	-14%
Network 2	-28%	Network 2	-15%
Network 3	-24%	Network 3	-57%
Network 4	-17%	Network 4	-82%
Network 5	-15%	Network 5	-78%
Network 6	-29%		

% Improvement in Forecasting Accuracy/Reduction in MAPE- Nielsen Panel Versus Nielsen Panel & Big Data Subsample		
	Portfolio A	Portfolio B
dfx_Sample_QSR	-28%	-37%
dfx_Sample_Telco	-12%	-37%
dfx_Sample_Insurance_Auto	-26%	-40%
dfx_Sample_Auto	-23%	-44%
dfx_Sample_Pharma	-19%	-50%
dfx_Sample_Insurance_Medical	-26%	-87%
Total 18+ Targets	-23%	-72%

Step 2: Understanding Impression Size Variability

We observed that **lower-rated networks and dayparts** tended to show **greater improvement** in forecasting accuracy when transitioning to big data. This trend appears related to how big data handles instances where panels might have previously reported a **zero rating** due to the absence of panelists, leading to under- or over-reporting volatility.

Big data appears to smooth this reporting behavior by incorporating larger, more continuous data sets, reducing the frequency of “jagged” measurement outputs (e.g., sharp spikes or zeros). However, this trend was not universal.

We wanted to understand how impression size, taking into account both the advanced audience size and the advanced audience rating, impacts the improvement in forecasting accuracy. For each network portfolio, we evaluated the MRI fusion targets by selling title, and sorted all targets and selling titles into quintile (Quintile 1- highest rated, Quintile 5 – lowest rated).

We observed that the move to Panel & Big Data Subsample improved forecasting accuracy across targets and selling titles, with the largest improvement for lowest rated selling titles.

% Improvement in Forecasting Accuracy/Reduction in MAPE- Nielsen Panel Versus Nielsen Panel & Big Data Subsample		
	Portfolio A	Portfolio B
Quintile 1	-14%	-21%
Quintile 2	-22%	-14%
Quintile 3	-38%	-20%
Quintile 4	-46%	-22%
Quintile 5	-90%	-79%

Step 3: Financial Impact Modeling

To understand the financial implications of improved forecast accuracy, we modeled a standard cross-network, daypart-realistic audience plan using **average panel audience budget** and **average panel target CPM** benchmarks

The key metric we analyzed was **Estimated Financial Exposure**, which represents the dollar value of average variability between forecasted and actual impressions. In other words, this shows the monetary value that publishers are dealing with — positively or negatively — due to forecast uncertainty on a given audience deal.

- **Budget:** \$415,868
- **Target CPM:** \$180.37
- **Average Absolute Difference from Target Delivery (Panel):** 19.38
- **Estimated Financial Exposure (Panel):** \$80,595
 - This means publishers can be operating within a **±\$80K swing** on forecast-based audience delivery.

With the improved accuracy seen using big data (14.85 absolute difference), the exposure is reduced:

- **Estimated Financial Exposure (Big Data):** \$61,755
- **Net Savings:** \$18,840
- **% Savings:** 24%

These results reflect just one campaign — but the financial relevance scales significantly. Across larger portfolio deals or quarterly planning cycles, even modest improvements in forecast precision can yield substantial reductions in liability and exposure, delivering real value both operationally and financially.

Another way to think about the financial benefit is from the perspective of inventory utilization. Let's assume that the publisher wanted to insure 100% delivery to target, and scheduled ADUs to cover the forecasting error. Using Nielsen Panel data, that publisher would need to schedule 24 ADUs for every 100 paid units; using Panel + Big Data, that publisher would need to schedule 17 ADUs for every 100 paid units. While this doesn't seem like a huge savings of inventory, 5% increase in inventory yield across all DDL deals could be material.

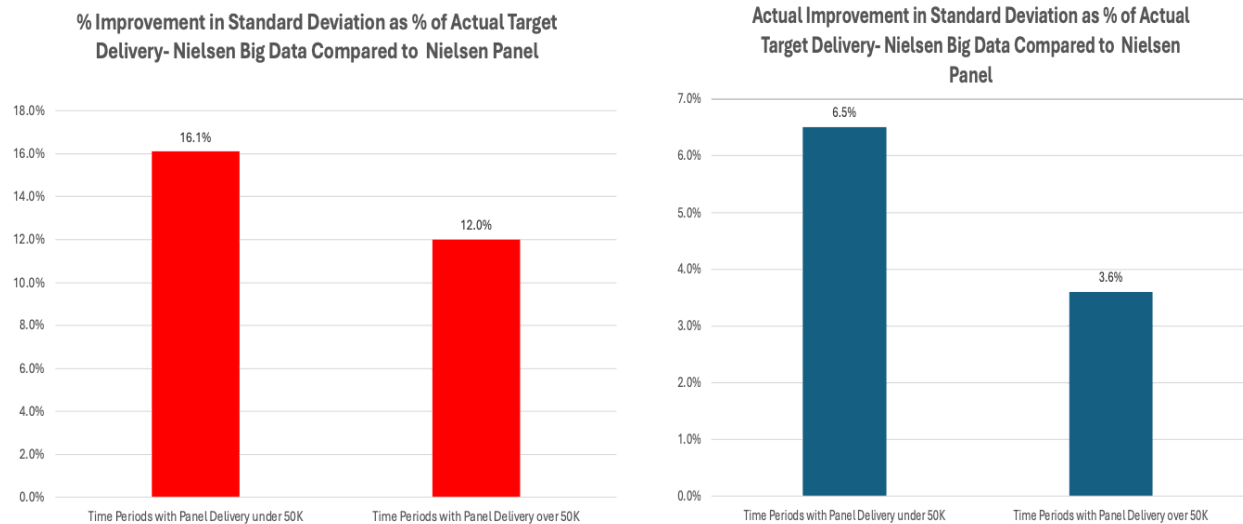
2. Weekly Delivery Stability: Why Big Data Helps Simplify Deal Management and Provide New Spot Placement Capabilities

Typical data driven linear deals leverage quarterly delivery estimates by sales rotation or program, and assume that the campaign is running enough spots within sales rotation across the quarter so the delivery should approximate the quarterly estimate. In reality, this might not be the case- there might not be sufficient spots running, or there are natural differences in delivery due to seasonality. Having both weekly ratings and weekly forecasts will enable more precise stewardship, from the broad plan outlines to the media flow chart with weekly spot detail through stewardship.

We analyzed a series of half hours for specific MRI Fusion targets. We analyzed weekly ratings, measured the standard deviation in weekly ratings compared to the quarterly average, and then compared the standard deviation to the quarterly average. Across all the targets and half hours measured, we found that Panel + Big Data provided a 13% reduction in week to week variance. And that the reduction was about 3 times higher for lower rated networks than higher rated networks. The higher relative sampling error associated with smaller ratings is the reason for this difference, though the absolute reduction in variance will be higher for larger networks. Big Data significantly reduces the sampling error and the remaining variance between forecast and actual is mostly forecast error - the uncertainty of the future.

Week to Week Stability Analysis- Comparing Average Target Delivery to Standard Deviation for Nielsen Panel and Nielsen Big Data										
			Nielsen Panel			Nielsen Big Data			Nielsen Panel Compared to Nielsen Big Data	
CHANNEL	Time Period	SEGMENT_NAME	St Dev	Average	St Dev- % of Average	St Dev	Average	St Dev- % of Average	% Improvement	Actual Improvement
Network 4	Thurs 1a	dfx_Sample_QSR	3232	4311	75.0%	3716	7341	50.60%	33%	24%
Network 6	Tues 9p	dfx_Sample_QSR	4933	5346	92.3%	10366	11905	87.10%	6%	5%
Network 4	Tues 9p	dfx_Sample_QSR	6591	5485	120.2%	11792	11048	106.70%	11%	14%
Network 6	Thurs 1a	dfx_Sample_QSR	6815	6918	98.5%	6585	7831	84.10%	15%	14%
Network 6	Sat 1p	dfx_Sample_QSR	5292	7495	70.6%	4171	6207	67.20%	5%	3%
Network 4	Sat 1p	dfx_Sample_QSR	5062	11981	42.2%	5383	22268	24.20%	43%	18%
Network 8	Thu 1a	dfx_Sample_Telco	6514	15834	41.1%	16560	36436	45.40%	-10%	-4%
Network 8	Mon 9a	dfx_Sample_Telco	8810	15944	55.3%	5154	12583	41.00%	26%	14%
Network 5	Thurs 1a	dfx_Sample_QSR	8583	20265	42.4%	7015	22524	31.10%	27%	11%
Network 5	Tues 9p	dfx_Sample_QSR	9920	27415	36.2%	14286	42254	33.80%	7%	2%
Network 5	Sat 1p	dfx_Sample_QSR	11082	29175	38.0%	9289	56117	16.60%	56%	21%
Network 1	Thurs 1a	dfx_Sample_QSR	13063	36608	35.7%	12034	44860	26.80%	25%	9%
Network 3	Thurs 1a	dfx_Sample_QSR	8536	36633	23.3%	5550	30733	18.10%	22%	5%
Network 2	Thurs 1a	dfx_Sample_QSR	11054	38540	28.7%	9981	60419	16.50%	43%	12%
Network 3	Sat 1p	dfx_Sample_QSR	13051	39062	33.4%	13621	50015	27.20%	19%	6%
Network 7	Thu 1a	dfx_Sample_Telco	14969	40705	36.8%	12644	16208	78.00%	-112%	-41%
Network 1	Sat 1p	dfx_Sample_QSR	14815	59669	24.8%	15442	62313	24.80%	0%	0%
Network 2	Sat 1p	dfx_Sample_QSR	31068	76024	40.9%	24211	99558	24.30%	41%	17%
Network 8	Sun 8p	dfx_Sample_Telco	30438	78654	38.7%	20925	61453	34.10%	12%	5%
Network 1	Tues 9p	dfx_Sample_QSR	24240	106355	22.8%	26132	109294	23.90%	-5%	-1%
Network 7	Mon 9a	dfx_Sample_Telco	20181	138922	14.5%	11076	75071	14.80%	-2%	0%
Network 3	Tues 9p	dfx_Sample_QSR	31508	157307	20.0%	25559	175618	14.60%	27%	5%
Network 7	Sun 8p	dfx_Sample_Telco	43671	159045	27.5%	22705	93364	24.30%	12%	3%
Network 2	Tues 9p	dfx_Sample_QSR	193804	533079	36.4%	167955	521309	32.20%	12%	4%

Another way to evaluate the benefit that Big Data provides from a stability perspective is to aggregate individual time periods together based on rating size, and evaluate the improvement for larger rated and lower rated time periods. As one would expect, the improvement is materially better for lower rated time periods.



3. Additional Benefits of Big Data in Audience Targeting

1. Persons-Based Targeting at Scale

One of the most meaningful advances in the transition to big data is the ability to activate **persons-based audience targeting at scale**. Historically, panel-based systems imposed strict universe estimate (UE) limits to maintain panel stability, which constrained audience targeting efforts — especially for more granular MRI-based audiences.

With big data, those constraints are significantly reduced or eliminated:

- **Nielsen's Panel + Big Data product maintains a persons-based framework**, unlike some other big data sources that are limited to household-level targeting.
- This allows for audience strategies based on **actual individuals, not just household proxies**, while operating at a scale that supports national TV planning and delivery. While many advanced audience strategies forsake age/sex targets that have been traditionally used as targeting surrogates and want to target everyone within the target, regardless of age/sex, there are some instances where interlacing the advanced audience target with an age/sex demographic overlay is the optimal approach.

Why it matters: This is not just a scaled-up version of old panel-based targeting — it's a **new approach** that opens the door to **fresh advertiser demand** and more precise activation opportunities across verticals like Pharma, Insurance, and CPG. While many brands have moved their TV activation from age/sex demographics to advanced audiences, many do that while still attempting to maintain their historical age/sex CPM benchmarks. Being able to execute, using the same data set, advanced audience optimization along with age/sex better supports this strategy.

Someone activating data driven linear campaigns who wants to overlay an age/sex target onto an advertiser target needs to proceed carefully. Obviously national penetrations and sample sizes are smaller- when we looked at our targets with an A25-54 overlay, penetrations were between 45% and 70% smaller. That said, every advanced audience should have an explicit and agreed demographic qualifier e.g. adults 18+ or 2+, but 21+ for alcoholic beverages.

But that doesn't mean the market should shy away from, where necessary, activating a campaign leveraging that demo overlay. When we look at the larger penetrated targets, the average network/daypart MAPE is about 1/3 higher for the demo overlay compared to total persons, but the overall average MAPE is quite reasonable- 38%.

2. Unified Workflow Efficiencies

Big data integration also simplifies the planning and execution workflow by supporting **audience and legacy demo targeting within the same environment**:

- Centralized audience discovery and plan development
- Streamlined forecasting and deal pacing
- Consistent measurement inputs for reporting and reconciliation

This results in **faster decision-making and reduced operational friction** across both buy- and sell-side teams.

Conclusion

The shift from Nielsen Panel to Nielsen Panel + Big Data represents a meaningful improvement in how TV campaigns are targeted, forecasted, and executed. While forecast accuracy gains are most pronounced in lower-rated areas, the benefits extend across audience types and dayparts, with measurable financial impact and improved operational workflows.

Nielsen Panel + Big data also enables persons-based targeting at scale, removes long-standing limitations in panel methodology, and enhances workflow integration — collectively positioning the industry to better manage complexity and drive more precise outcomes.