

## **NOBO – the cookie monster**

### **Abstract**

After a turbulent period in Dutch Internet Audience Measurement where the conflict between competing metrics both site centric and user centric led to a call for a new beginning, NOBO (Nederlands Online Bereiks Onderzoek) was born. It is a co-operation between Vinex (the association of Dutch Internet publishers) and SKO (the TV JIC). The vision was to build a single digital audience measurement system to measure online traffic and video.

NOBO involves the use of multiple measurement systems (Online video, traffic and commercials). The basis for these is a census measurement of all behaviour. From within this pool of census observations, panel members' data is extracted to form a panel database, a microcosm of the census. We then calibrate these two data sets (census and panel) to form a single (virtual) respondent database. The combination of these two allows us to retain the robust granularity of the census whilst adding the ability to define a specific audience.

From a single household panel of 5,000 we measure all devices used by our panel members including smartphones, tablets and computers. With all devices measured we can clearly account for overlap in usage of devices and household members. Any duplication from single panel members using multiple devices or panel members sharing devices can be accounted for.

NOBO and Kantar are happy to share our data and experiences on the journey we have had towards the delivery of this service and also the future plans to further optimize our system and integrate the outputs with other currencies.

### **Background**

Digital Audience Measurement in the Netherlands was lacking a standard, which was supported by publishers.

Until 2015 the Dutch were used to a centrally supported and assigned digital audience measurement, called STIR. STIR versions 1 and 2 were tagged based digital audience measurements. After the ending of STIR 2 the industry did not succeed in finding a new standard for Dutch Digital Audience measurement that was supported by all parties.

This called for a new initiative that would be able to meet the demands of media parties in the Netherlands and led to the organisation of a Media Owners Commutee (MOC) VINEX. VINEX' mission is to deliver transparent, reliable Digital Audience measurement for the Dutch market.

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Vinex, representing 20 Dutch publishing companies, together with partners E-Bay and Facebook started to work on a successor for STIR that would meet new demands and modern standard in a future proof research design. Challenges were numerous:

- The highly fragmented digital landscape and consumer use of digital media;
- The growing number of devices that consumers use to go online; especially smartphones;
- The growing relevance of app usage and the challenge to measure in app behaviour would require a tagged measurement system;
- The growing demand for insights into cross media reach for media brands, who's content is available through on- and offline platforms – print, TV, online, radio – and there is a growing demand for insight into cross media reach;

A solution was found in the cooperation with SKO (Dutch JIC for Television Audience Measurement) that had already set up a measurement system together with KANTAR MEDIA and KANTAR TNS that integrates panel measurement and census data.

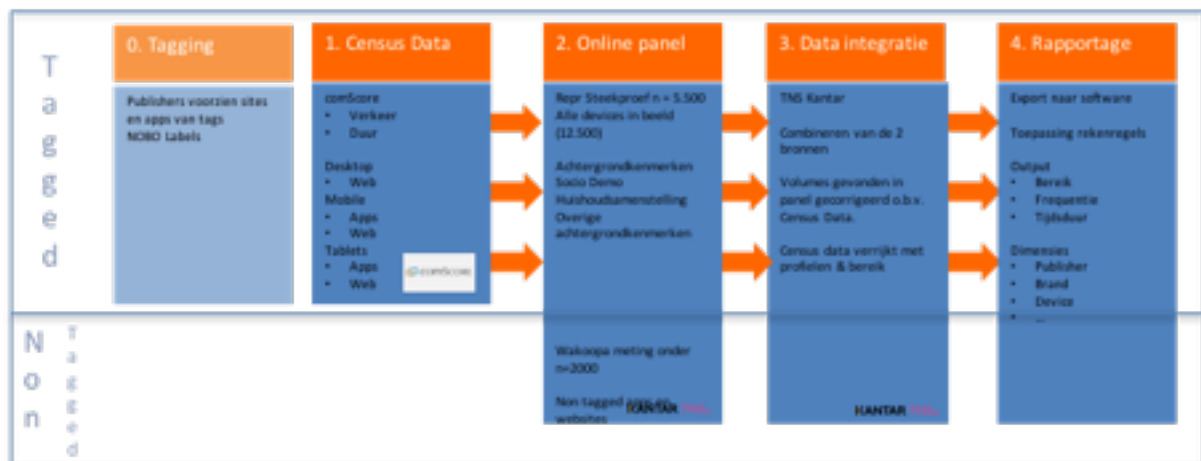
This cooperation is called NOBO and provides valid, accurate and reliable audience ratings for video and traffic, on a daily basis. NOBO traffic has been delivered to market since November 1st 2016.

### **NOBO Methodology Design**

The NOBO measurement incorporates two separate measurement systems. One is a primary measurement system which uses a combination of census, panel measurement and data integration to deliver a hybrid measurement to market. This measurement is deployed on the devices of all panel members. In addition to this we have also deployed a secondary measurement system which allows us to measure those sites unwilling or unable to undertake census measurement. This is mainly the larger global pure play digital brands and is deployed on a subset of panel member's devices, around 2,000 panellists in total.

We will outline both measurement systems here, for ease of understanding we have labelled one the untagged measurement and the other the tagged measurement.

The illustration over the page shows how the two measurements systems run in parallel in the overall NOBO measurements system.



## Tagged measurement system

The tagged NOBO measurement outlined is set up around three core components, census measurement, panel measurement and data integration.

### 1) Census

The basis for measuring online behaviour is laid down by a tag based measurement system. Participants are to implement tags on their sites and apps, so we can identify panellist's data from a wider census file. Publishers add information to the tags by using the NOBO labels that provides us with the possibility to add detail to the reported data: They add information about sub brands or sections within sites and apps, and content classifications that are used for reporting and data integration purposes.

The challenge with a tag based measurement system lies in the involvement of publishers. We learned that there are many people involved in the process of development of sites and apps and it is difficult to gain control over the processes they go through.

On the other hand, publishers could easily make mistakes in populating the required labels, which would lead to misclassification of content and titles.

This is why we implemented several control mechanisms and procedures to prevent issues:

- a) A thorough check at intake ensures that all tags are implemented correctly. Only legitimate sites are to be tagged and counted; no double implementations generating double volumes in pageviews, no tagging of cookie wall pages, etc.
- b) Daily alerting reports on unexpected volume changes to identify issues with tagging; all volumes are checked against certain business rules and our publishers receive daily reports and alerts to identify issues with their tags.

c) Vinex is also provided access to the raw data at any time.

Here is a sample report from our census dashboard report.



## 2) Panel Measurement - Online Mediapanel

KANTAR TNS is providing NOBO with a panel that currently consists of 5.500 persons from households that are recruited for this panel. Within our panel we measure online behaviour on all desktops, laptops, tablets and smartphones that give access to online. The total number of devices measured is around 12.000. The panel is representative for the Dutch 6+ population and its composition is monitored on a regular basis.

The use of a household panel has several advantages: It provides us access to young people in households (kids 6-12 years). Our Mediapanel is representative for the 6 years and over Dutch population. A household panel creates the opportunity to measure the shared usage of devices in households. This is highly relevant because the shared usage (multiple people using the same device to go online) is still very high: 55% of desktops/laptops have multiple users and even 61% of tablets (Source: data from background questionnaire 2017).

Critical to the measurement system process is the identification of the panel members' data within the wider census dataset.

The panelist behavior is extracted from the census data to create a panel data set. This is a direct subset of the census. This extraction process is done by matching identifiers on panelists' devices to the same identifiers that are available in the census. For browser or web

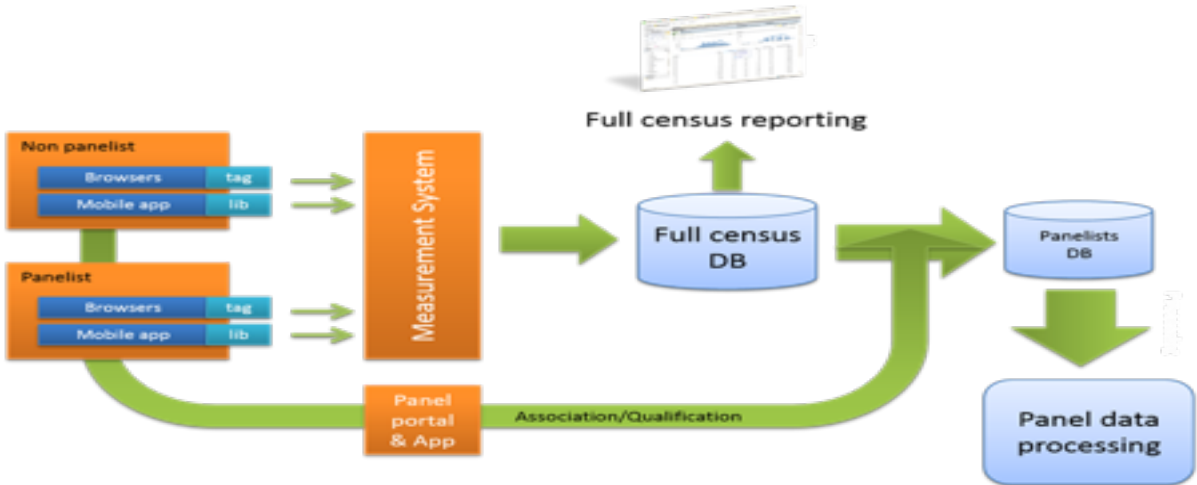
based behavior this is done using cookies. These cookies are set in the panel members browsers in the start page on PC or laptop or they are pushed to the browser by the app on mobiles and tablets. For in app behavior we use mobile identifiers which are extracted from panelist members' mobiles and tablets.

These panel member device identifiers are matched against the census and those devices that match the panel member identifiers are extracted into the panel database. At this stage we have identified the panelist's devices and now we link this to the specific panel members.

This registration or respondent identification is achieved by two tools:

1. A Web portal made the "home page" of each respondents browser that will have three purposes:
  - Initial Registration of the respondent and his devices
  - Refreshing the identifiers each time the homepage is opened.
  - Allow for the panel member to identify himself at the beginning of each "surfing session".
2. A mobile application that is installed on the iOS and Android devices of the panel member that will also facilitate the initial registration as well as the ongoing identification of the panel member. NB. In order to maximize participation, we assumed that smartphones are single user devices and therefore require no panel member identification.

The below chart illustrates the panelist viewing identification process.



### 3) Data Integration – Calibration of Panel and Census

Rich, unified datasets offering uniform insight and quality across each platform are seen as the holy grail of audience measurement. However, in reality, this is usually not achievable. The first challenge is obtaining a large enough sample of people willing to participate in the panel. Secondly, the cost of research at this level of granularity is likely to be impractical.

Traditional Internet Audience Measurement (IAM) panels have been the core of measurement services around the world, as they provide an accurate picture of the overall TV landscape. It is also a trusted data source on the accounts of the methodological rigour on which its reputation is based.

However, these panels normally suffer from sample size limitations which cause problems in the measurement of the ‘long tail’ (sites that have a small or niche audience and therefore showing very small or even zero panel observations) and these measurements often conflict with the larger more granular census or site centric measurement systems.

There is however, a significant potential opportunity when doing online audience measurement, which is the availability of census measurement. We now have the ability to gather huge amounts of data that can be leveraged to provide a new understanding of audiences.

The great opportunity is in combining both panel and census data, leveraging the potential that each one offers:

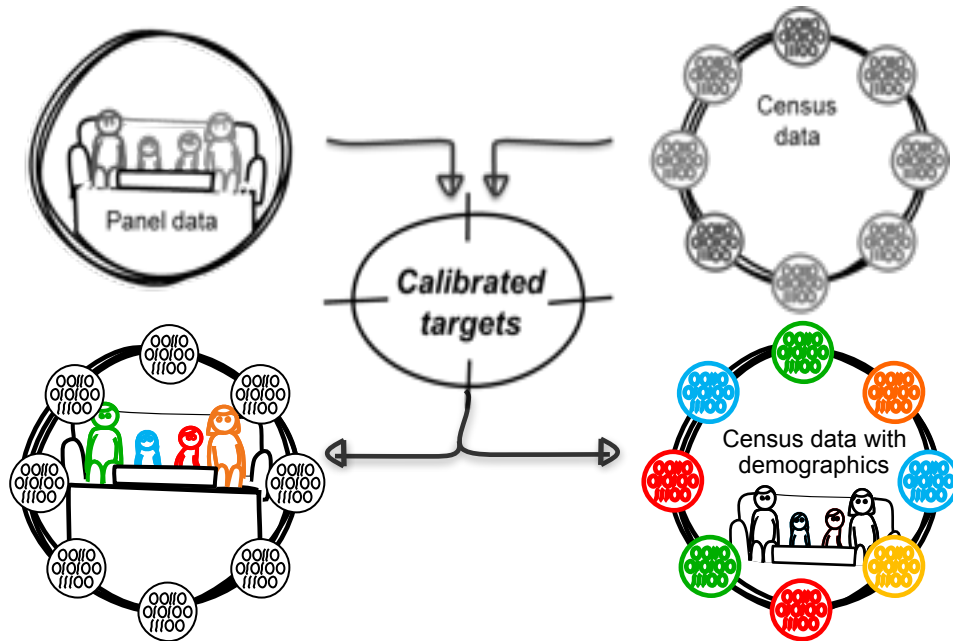
- Panel data provides an overview of the viewing landscape; one of its key strengths is offering individual level data from a well-managed, well balanced panel, which represents the (online) universe quite accurately. Panel data has historically been accepted by markets and used as the currency. Despite its limitations.
- Census data provides highly granular data through passive measurement, providing viewing totals for the platforms it measures. Even the very small ones.
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The goal of Data Integration is to strengthen the panel measurement by using the highly granular census measurement, representing a step forward in the understanding of audiences, in particular the “long tail”, whilst maintaining the strengths of a panel based measurement and data currency delivery.

***In this section we outline a very clear and precise approach to calibrating the panel data to available census data, along with options for how the resulting outputs can be processed.***

The proposed methodology has three key features:

## Stage 1



- i) The census data and panel viewing data are used to generate calibrated targets for relevant audiences and their profiles (Stage 1)
- ii) To allow the calibration algorithm to be applied to the panel viewing data, the granularity of the measurement can potentially be greatly increased by using a panel virtual expansion technique.
- iii) The expanded panel is then amended to match the calibration targets (Stage 2)

The goal of the calibration is to create a calculation engine that integrates target information from the census data and from the panel viewing data with the objective of combining the two, resulting in final calibrated targets.

At the core of the algorithm, there is a fundamental principle that guides the whole process, and underpins the methodological approach:

- The census data provides highly granular data through passive measurement, providing streaming totals.
- The panel data is the trusted source for all individual level data, derived from a well-managed, well-balanced panel.

The core of the algorithm is the calculation from the data of targets - viewing, demographics and reach for sub-sites, sites/apps, publishers, for different devices.

We obtain reliable demographic profiles for each piece of content, using in priority panel data. For some content however, especially those in the “long tail” with low volumes, we may have little to no data in the original daily panel data. We take care nonetheless to always derive a robust demographic profile, by using our bespoke SearchNet algorithm and by ingesting Census-Based Panel data.

SearchNet works by finding *related* viewings in the historical data, such as viewings of the exact same content, or of the same genre etc., widening as required the definition of “related”. This guarantees that the calibration process uses a reliable demographic profile obtained with a wide enough sample consolidated around the target content.

### **A second measurement system for non-tagged sites**

Not all publishers are willing to participate in a tagged measurement solution and specifically large global digital media brands are not. However, these brands like Google, Facebook, WhatsApp, Instagram and others are highly relevant for any market. For these brands, that will not allow a tagged measurement system, we measure through a metering solution.

For measuring non-tagged sites Wakoopa’s solution is used. Wakoopa supplies passive metering software (the ‘Tracker’) that panellists will activate on their equipment in such a way that the details of their online behaviour are measured and recorded. This measurement includes tracking of visited websites, search terms and applications used.

The Wakoopa Tracker is deployed to 2.600 panel individuals and their devices (1700 desktop/laptop, 1150 tablets and 1700 smartphones).

The Tracker is user-centric; every device has a unique ID and is connected to a unique Household number in the panel.

The Wakoopa desktop Tracker is installed on 1.700 desktop/ laptop devices of the participants and runs in the background. The Tracker measures visited URLs, including secure connections (HTTPS). The tracker has capabilities on both Windows and Mac and on all major browsers on these Operating Systems. Those include Microsoft Edge, Internet Explorer, Google Chrome and Firefox for Windows and Safari and Google Chrome for Mac.

For mobile (1150 tablets and 1700 smartphones) the Wakoopa solutions for Android and IOS are integrated into the Kantar Virtual Meter and branded as such to ensure the best user experience and highest installation rates.

Both solutions track visited URLs and the apps that have been used.

The approach to data measurement is the same for all devices and systems. Basic principles are:

- Device must be active.
- The process (app or browser) that is being measured is running on the foreground and is the activated process.
- Measurement starts when the process becomes active or moves to the foreground.
- Measurement stops when the process stops, moves to the background or when the device stops being active.



- The focus on the active processes allows us minimize the amount of data and makes reporting more efficient. This means that the data that is being reported always reflects the actual online behaviour and not background processes of a device.

## REPORTING

NOBO reports on several metrics on online behaviour by the Dutch population. The definitions and mandatory calculation and reporting rules are described and available for all users of NOBO data via Vinex website.

(<http://www.vinex.nl/upload/documenten/20170717-mandatory-calculation-and-reporting-rules-nobo-v5-2017.pdf>)

Core metrics reported are:

- Pageviews: Only pageviews (also called page impressions) are used for reporting. A pageview or impression is a file, or combination of files, seen by a unique user as a result of that user's request being received by the server.
- Duration of pageviews: The calculated time duration of an event (pageview)
- Reach is defined as the percentage of visitors that visited a specific content at least once during a certain period – day, week or month usually. In NOBO no specific threshold for reach is applied – one visit or pageview is enough to be accounted for as reached.

$$reach_{z,T} = \frac{\sum_{r=1}^R w_r d_{r,z,T}}{\sum_{r=1}^R w_r} \cdot 100\%$$

$$d_{r,z,T} = \begin{cases} 1 & K_{r,z,T} \geq X \\ 0 & K_{r,z,T} < X \end{cases}$$

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| $T$ :           | series of contacts with online content within a specific time frame or interval                                  |
| $reach_{z,T}$ : | <i>publishercontent</i> reach for publisher $z$ during the series of time intervals $T$                          |
| $R$ :           | number of respondents in the sample  |
| $w_r$ :         | weight of respondent $r$   |
| $K_{r,z,T}$ :   | personal criterium of respondent $r$ , calculated according to the specified conditions for publisher $z$ in $T$ |
| $X$ :           | criterium for the specified publisher reach  |

- Visits: A VISIT is defined by a user viewing content on a specific (sub) media brand related to a specific browser and therefore device – desktop, mobile or tablet. A visit is ended when 1. The next event is the start of a session on another specific (sub) media brand related to a specific device – desktop, mobile or tablet 2. There is no activity following the last activity (so the last event in the session ends) for 30 minutes. This is currently not available yet

- Brand visit: A BRAND VISIT is defined by a series of page views served from within the (combination of) media (sub) brand to the same respondent regardless of specific device, platform or browser.
- THE BRAND VISITS report on the contacts users have with brands, no matter what type of device, platform or browser they use.
- Contact frequency can be calculated on three levels: PAGEVIEW level, VISIT level and BRAND VISIT level. The number of PAGEVIEWS/ VISITS/ BRAND VISITS for a specific (sub) media brand for a specific respondent. The number of times a unique respondent has a PAGEVIEW/ VISIT/ BRAND VISIT on the specific (sub) media brand in a certain period.
- GRPs: Gross Rating Points represent the gross reach levels expressed in % reached in target groups. In NOBO GRPS are defined at three levels: PAGEVIEWS, VISITS AND BRAND VISITS. A GRP is therefore defined as the total number of PAGEVIEWS, VISITS OR BRAND VISITS within a target group, divided by the population that represents 1% of that target group. 1 grp represents the (gross) % within of the target group that had 1 PAGEVIEW, VISIT OR BRAND VISIT.

The data is available through planning software.

### **Bringing NOBO – the cookie Monster – to market**

With NOBO a friendly cookie monster was created – and it is even more than cookies the monster likes. The NOBO process as we described is complex, but transparent and well documented in methodological documents that are available to our users.

KANTAR MEDIA and KANTAR TNS succeeded in providing us with a solution that is supported by the Dutch publishers that are united in VINEX, supplemented by data partners E-Bay and Facebook. NOBO is able to deliver reliable outcomes in following an innovative solution by combining data from both census and panel measurement.

This solution is built to deliver actual ratings or reach levels, even for smaller titles: week by week, day by day.

In reality the mid tail for digital is already consisting of small titles that would require a huge panel to deliver actual results, if panel measurement was our only source, combined with a (very) long history of measurements to build upon.

Taking the into account the high costs that are involved with setting up and managing a reliable, high quality Mediapanel, and the need for efficiency, the use of census and a solid data integration process is promising for the future.