How NCP is Reinventing Customer Analytics:

Increasing Engagement During COVID-19 with RapidMiner

To say that the COVID-19 pandemic changed consumer shopping behaviors would be an understatement. The way people shop, where they shop, and how often they shop shifted radically from pre-pandemic to the early days of pandemic-imposed restrictions. Today, ongoing supply chain disruption, labor market shortages, and extreme inflation continue to impact consumer behavior.

Imagine the disruption this created for companies who rely on high quality market research. National Consumer Panel (NCP), a joint venture between NielsenIQ and IRI, felt the brunt of the pressure to continue delivering insights to their clients. NCP collects and processes a wealth of data from their select panel of shoppers, a representative "mini-USA," to measure consumer attitudes and behavior. The data NCP generates is essential for their manufacturing and retail clients—it can be used to analyze market penetration, customer loyalty, and product propensity.

NCP's #1 job is to understand how people shop. At the height of the pandemic, many dedicated shoppers reached out directly to NCP for guidance—*how were they supposed to continue providing information about their weekly grocery runs when their entire lives were on hold?*

Disrupted Consumers + Disparate Data = No Easy Solution

When Thomas Schleicher joined NCP in 2011 as the Senior Director of the Measurement and Data Science team, his background in experimental social psychology and marketing analytics afforded him unique insight into the "why" behind consumer behavior.

An important part of Thomas's job is to use behavioral data to determine what makes the best panelist, making it easier for NCP to collect high-quality data to share with their clients, primarily retailers and manufacturers.

Customer
National Consumer Panel

Location
New York, USA

Industry
Media

Key Challenges
The COVID-19 pandemic made it impossible for consumers to maintain their regular shopping habits

NCP was struggling to retain its panelists and report consumer data to their clients

NCP's data was spread across the organization, making it difficult to find information quickly

Value Generated
Improved panelist transmission rates by 50% within weeks following pandemic-induced restrictions

Got panelists' response trajectory back to their pre-COVID track within 1-2 months of the shutdown

Sparked long-term change by improving cross-department collaboration and saving employee time on manual tasks

In 2019, Thomas was promoted to VP of Measurement and Data Science, taking on more responsibilities related to data science leadership. Shortly after the pandemic hit, his role became more pivotal. Consumer panelists who consistently send data over an extended period are essential for NCP to maintain their longitudinal, representative panel. How could he and his team leverage data to engage and retain these panelists amidst a wide range of pandemic-induced economic pressures?

Thomas had some tools to get him started. NCP, like many other companies, has a wealth of rich, first-hand data. The issue? It comes from multiple, disparate sources. The data is organized by function, but, as business priorities evolve to keep up with (and ideally ahead of) marketplace developments, its quantity and complexity only grows. Imagine walking into a room full of filing cabinets organized by subject: All the information you need is there, but there's no convenient, centralized, and connected system in place to find the information you need at a moment's notice.

Fortunately, Thomas arrived with an amazing background to draw from that would prove vital for solving the problem at hand:

1. As a consultant, he'd done marketing mix modeling and other analytics for a range of cross-industry clients. This experience taught him the value of gathering data from different SMEs to get the right answers to important questions.

2. As an experimental social psychologist and adjunct professor, he had extensive experience teaching, as well as applying, a range of quantitative and qualitative research methods, often utilizing advanced statistical analyses to evaluate results.

3. At NCP, he and his team had applied a range of analytical approaches to evaluate and optimize data collection methods, the cost of panelist recruitment, churn reduction, and the effectiveness of targeted messaging initiatives.

Key Challenges

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These skillsets would come in handy as he worked across NCP to ensure his team had access to the right data and the organization's collective wisdom. Though he had plenty of experience using data analysis to solve problems, he still had to figure out the most efficient way to approach the situation. What should he do with all this data? How could he leverage techniques like data mining and data science to discern patterns and optimize panelist targeting?

What Customer Sentiment Looked Like in 2020

Thomas and his team needed to understand the extent to which the pandemic was impacting panelists' participation levels—and they needed to do it fast. This dramatic, once-in-a-century economic change created a sense of urgency to understand consumers' perspectives so NCP could adapt and tell their clients what was really happening.

Similar to what was reported more broadly, NCP data collected in 2020 reflected dramatic changes in shopping behavior among panelists. Some confirmed shifts in behavior included:

- Panic buying resulted in significant spikes in consumer purchases across multiple categories— most notably, the spike in toilet paper sales in March through May of 2020
- Social distancing and other pandemic restrictions greatly reduced the frequency of in-store shopping trips
- The pandemic's severe public health and economic consequences impacted panelists differently:
  - Those impacted directly shopped less and/or substituted lower cost alternatives for their normal purchases
  - Those who were less impacted still changed their shopping patterns (I.e., going to the store once or twice per month instead of weekly)
  - Many shifted a higher percentage of their purchases to online retailers

Because of these significant changes in shopping patterns, NCP still needed to provide meaningful data to manufacturers and retailers, so that they, too, could navigate the uncertainties created by the pandemic. After thorough evaluation and cross-validation of data from multiple sources, NCP confirmed that their panelists' changes in consumer behavior patterns were an accurate representation of what the country's consumers were doing as a whole.

So, where should they go next?

Data Science to the Rescue: Solving Problems Smarter & Faster

At this point, **the only real certainty was uncertainty.** Thomas's team's biggest concern was to quickly ensure the number of reliable panelists remained stable so that NCP's clients could create effective response plans, faster. He decided to partner with RapidMiner to use data science to help solve these problems more efficiently.

Thomas first used RapidMiner when earning a certificate in Predictive Analytics earlier in his 11-year tenure at NCP. After comparing the platform with other options, it wasn't long before he determined that it was the best fit for NCP's current and future needs. RapidMiner's widely available, hands-on training helped Thomas's team make the transition, updating existing models and exploring new ones for a few key use cases.

Develop More Tailored Incentive Programs

Knowing who your best customers are is the first step to retaining them. The best panelists transmit data at a steady rate, are responsive, and are not easy to find, so keeping them engaged is one of NCP's top priorities.

However, if a good panelist tapered off, Thomas's team used advanced analytics to determine what factors led to their participation stalling. They analyzed a combination of behavioral, demographic, and other variables to determine what, exactly, influenced participation level.

With that information, they tested control incentive types and developed more tailored incentive programs for NCP's top households to prevent them from tapering off as well.

Handle a Greater Volume of Data with More Agility

Remember that visual of the room full of filing cabinets? Thomas's team used RapidMiner to save time going back and forth between file cabinets on opposite ends of the room, as well as doing all the heavy lifting analytically.

Using data prep, Thomas's team better organized the relevant information they had, enabling them to handle a greater volume of data with more agility and sort through lots of data in an expeditious fashion.

The best part of these systems is that they're sustainable. Thomas and his team can maintain their high degree of data agility today and in the future, especially compared to pre-pandemic baselines.

Analyze Textual Feedback

What's the best way to find out how your customers are actually feeling? Listen to them!

Using text mining, Thomas and his team converted raw text into numerical value, generating insights to help engage and retain panelists.

NCP's Panelist Support Center (PSC) is just what it sounds like—a customer service center for panelists. They respond to individual panelist feedback and needs, and their exchanges are recorded and logged. This unsolicited feedback is super valuable, especially in the most recent use case, where they've been able to directly compare panelists' top concerns pre-COVID and since.

RapidMiner's text analytics capabilities enabled Thomas and his team to turn this mountain of raw data into actionable insights. His team could track and forecast "new normal" trends as well as model and predict panelist churn. They could minimize efforts on time-consuming tasks like ETL, data prep, and data wrangling, as the RapidMiner platform remediated common issues like misspelled words and missing values to ensure the data was correctly categorized regardless.

During the pandemic, the nature of PSC feedback could be personal and sensitive, and leveraging text mining allowed NCP to be more sophisticated in how they responded, especially being able to detect general trends or patterns of concern.

Thomas supplemented the text files generated from unsolicited PSC feedback with insights from recurring panelist surveys about how the pandemic was impacting their everyday lives and participation levels. This allowed NCP to generate clearly defined segments and create targeted engagement communications, further cementing and personalizing NCP's relationship with their panelists.

Fostering Panelist Relationships, Crushing Business Goals, and Other Measurable Impacts

Leveraging data science for text mining provided significant operational benefits for Thomas and his team at NCP.

One of the most obvious areas of impact was saved employee hours. "We definitely realized an efficiency in terms of work hours put behind the effort, and we were able to get more comprehensive results with the use of RapidMiner as opposed to a more manual approach," Thomas shared.

Here's a few other ways data science helped save the day:

Improved Panelist Participation

Due to an overwhelming number of identified responses related to COVID, NCP decided to introduce a "Did Not Shop," or "DNS" code to promote better panelist participation. Even if panelists didn't make it out to the stores, they were still able to engage with NCP.

"It really did give us an opportunity to be proactive in reaching out to them and [saying], 'It's okay, nobody plans for a once-in-a-century pandemic.' Given the circumstances, we were able to react quickly in a way that allowed us to reach the panelists we really needed to. **We reduced churn that we would've otherwise felt and rebounded to our 'normal' routine in getting data back from them,"** said Thomas.

As a result, NCP saw a 50% improvement in panelist transmission in the weeks following the shutdown.

Implemented Solutions

- **Segmented users to develop more personalized incentives and encourage top-transmitting panelists**

- **Used data prep to sort through collected data and make it more readily available and usable**

- **Leveraged text mining to generate insights from raw text data and get an accurate picture of panelists' everyday lives**

Boosted Target KPIs

When the pandemic first hit, its impact on consumers caused dramatic swings in panelist data, deviating sharply from reliable KPI trends reported in years past. Having confirmed that the data deviations mirrored real trends, NCP took action to boost panelist participation so they could continue putting out robust, accurate data.

By combining data from panelist transmissions, COVID survey responses, and verbatim panelist feedback (text data), NCP created targeted communications and incentives that really worked. These modifications helped reach impacted panel segments and led to top transmitting panelists' KPIs returning to their pre-COVID trajectory within 1-2 months.

Optimized Collaboration Between Business and Data Experts

Text mining and data analytics don't stop with data science experts. On the contrary—bringing these insights to cross-functional subject matter experts helped further optimize processes at NCP, contributing to improved KPIs and overall business decisions.

Value Generated

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- Sparked long-term change by improving cross-department collaboration and saving employee time on manual tasks

Other RapidMiner-Powered Successes

Text mining for panelist engagement wasn't Thomas's team's first initiative using RapidMiner.

One of his team's earliest uses of RapidMiner was forecasting metrics from reliable, top-contributing panelists. Using a multiple regression approach, his analysts could predict panelists' shopping habits and behavioral patterns. This opened doors for them to rethink how they used the data they were already producing.

In other efforts, his team also used gradient boosted trees on RapidMiner to evaluate the effectiveness of different incentives they offered to their panelists. These classification models helped them identify sweet spots and optimize their approach to encouraging panelist participation.

What Part Does Data Science Play in NCP's Future?

While COVID-19 was the match that lit the fuse, many of these pandemic-induced changes are here to stay—**and businesses need to figure out a way to adapt and keep their finger on the pulse of consumer behavior.**

Thomas's use of RapidMiner for text mining is just scratching the surface of areas where data science can have an impact at NCP. Thomas has long been a champion for expanding data literacy across the organization—he has a history of representing NCP as a thought leader in market research/analytics and has spoken at Predictive Analytics World (PAW), Insights Association (IA), and the Institute of Business Forecasting (IBF).

Next at NCP, he's looking at ways his skilled team can build upon their cross-functional collaboration and establish a more robust data science program. One use case they're developing is determining how to leverage NCP's disparate data sources in creative ways to target and engage different household segments (expanding upon success they had during the early weeks of the pandemic). Using RapidMiner's library of classification algorithms, he can leverage the quantitative data NCP already has to identify those segments and offer them unique, personalized incentives for responding.

Thomas would be the first to acknowledge the rich history analytics had in driving success at NCP long before his arrival. With RapidMiner's help, Thomas plans to enable NCP to get ahead of potential problems by exploring data patterns in new and innovative ways, unlocking opportunities to generate more value-added insights within the organization, and more importantly, for their partners and clients.

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