

they're
here!

actionable user needs

triple **n**

news • needs • notifications

smart **ct** 

june 2021

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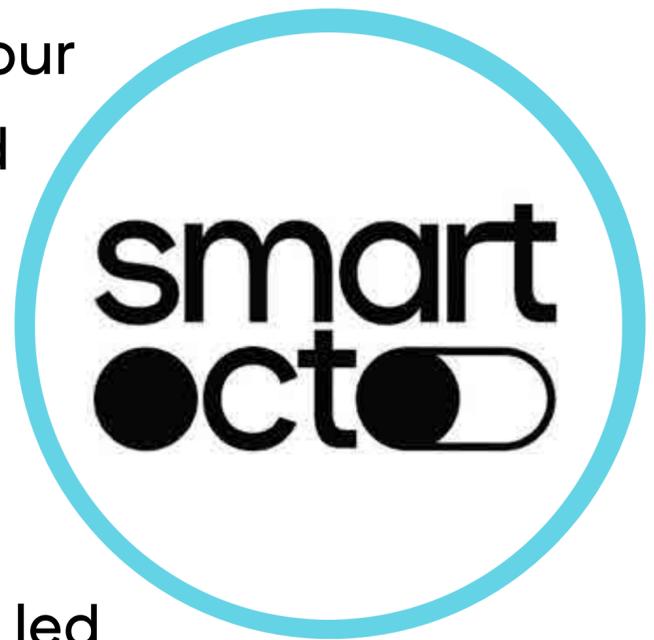
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executive summary

introduction

Smartocto is Europe's most advanced editorial analytics system. Our approach is informed by our experience working in newsrooms, and our solutions finessed by consulting with them. At the heart of the smartocto promise is actionability - and this is underpinned by extensive research and development, which has led to our unique system of notifications, a groundbreaking approach to measuring loyalty and conversions. Right now, we're working on a public metric, which will help public broadcasters and publishers analyse their success. We are based in Nijmegen, the Netherlands and Novi Sad, Serbia.



Dmitry Shishkin is an independent digital publishing consultant who helps media and other sectors involved in content creation do digital better - from transformation and strategy, to culture change and innovation. Before going on his own, Dmitry worked as chief content officer at Culture Trip, and prior to that spent 20 years at BBC World Service, where he worked on (and further developed) the audience-centric content model based on news user needs.

actionable user needs make for a more efficient newsroom

News has traditionally fulfilled the function of 'updating' its readers. That is of course fine. It's the bread and butter of many news organisations, and what most users consider 'news' to be: headlines and breaking news alerts.

The problem is that there is more to news coverage than updates. With the benefit of data analysis we now know that actually the highest levels of engagement and loyalty - two things considered absolutely essential to driving and sustaining the modern publisher - are not found in the 'Update Me' category of news article, yet newsrooms continue to overproduce them.

In 2016 the BBC World Service started to analyse the balance of its news coverage. Their findings (most memorably that at one station 70% of content fell into this aforementioned category, yet accounted for only 7% of traffic) prompted a critical reappraisal of the way it commissioned content - and they quickly became one of most high-profile proponents of what is now known as the 'user needs' approach.

That statistic related to a single station during a six month study six years ago, but it was still enough of a compelling finding to lead us to check our own data. Our analysis of our three partner newsrooms for this project shows that there is still - five years later - a huge misalignment and apparent blindness when it comes to the balance of user needs in newsrooms. But, as the adage goes: you can't manage what you don't measure, and the solution which resulted from this project helps on both counts.

The Triple N project - News, Needs, Notifications - sought to bridge the gap between the traditional 'user needs' approach and the realities of work flows in the typical modern newsroom by creating a tool that not only identifies these user needs, but sends actionable notifications that enable publishers to optimise their output and enhance reader engagement.

It's groundbreaking for three reasons:

- 1** User needs are important for news publishers and if you don't have them for your newsroom, you and the audience are missing out.
- 2** We have confirmed that satisfying diverse user needs consistently impacts your performance positively.
- 3** We are able to send you smart notifications for your journalists and editors to alert them about the user needs based opportunities for further commissioning.

We first created a self-learning algorithm that automatically recognised user needs in news coverage. Then, in the latter part of 2020 and the spring of 2021, we developed a system of actionable notifications in response to zero measure studies undertaken at three very different newsrooms in Belgium, the Netherlands and Indonesia.

As an editorial analytics solution, Smartocto is renowned for the emphasis we put on actionability - and on notifications in particular. Many newsrooms around the globe work with the features and services smartocto offers on a daily basis to optimise their news coverage and online presence.

Many clients have asked us if we would be able to be more specific in the way we identify stories that might benefit from an update. We agree it can be a bit vague. So, we decided to look much more closely at this through the lens of the user needs approach to see if our algorithm could be trained in such a way that it would a) recognise user needs (or lack thereof) in realtime and b) create more directional notifications on how to follow up on stories or improve particular business goals with a user needs-rich approach.

The results are clear: understanding the distribution of user needs, and planning content with them in mind not only makes for a more efficient newsroom, it bolsters engagement too.

newsrooms & user needs

newsrooms and user needs

1 newsrooms, now

The editorial analytics sector is a mature one. Digital publishers have been paying attention to all sorts of metrics for a long time, making data-informed decisions about their strategy and tactics, placing audience engagement at the heart of their operations, installing big screens in the newsrooms to track, inform and persuade. Data has helped transform media relations with its audience and bring in culture change. All of this is not new and of course, access to data and general data literacy are those special characteristics that always stood digital publishing apart from its broadcast siblings, TV and radio. Everything on digital is quantifiable, and it has been for some time.



“Without data, you are just another person with an opinion.”

W. Edwards Deming



As a sector, digital publishing has come a long way - from anecdotal evidence and direct audience feedback via post-forms and emails of the late 1990s to first channel-centric and then story-centric data analysis in the 2000s, followed by a vast improvement in data visualisation through dashboards, apps, widgets and suchlike in 2010s. Growth hacks and A/B tests were introduced by the most advanced newsrooms - journalism's data parity with its product counterparts was being achieved in front of our eyes. Newsrooms have never had so much meaningful data before.

That abundance of data has been both a good and a bad thing. Editors are still very busy, if not more, and the omnipresence of data, while being helpful, started to contribute to the general sense of overwhelmingness, fatigue and mental exhaustion the newsrooms have been so familiar with. That's how the Triple N project came to being. How can we, as an advanced editorial analytics company, help editors with their main job - tell interesting and important stories? What should be improved? What's the most important thing journalists can get from a dashboard, apart from ever-changing numbers and signals?

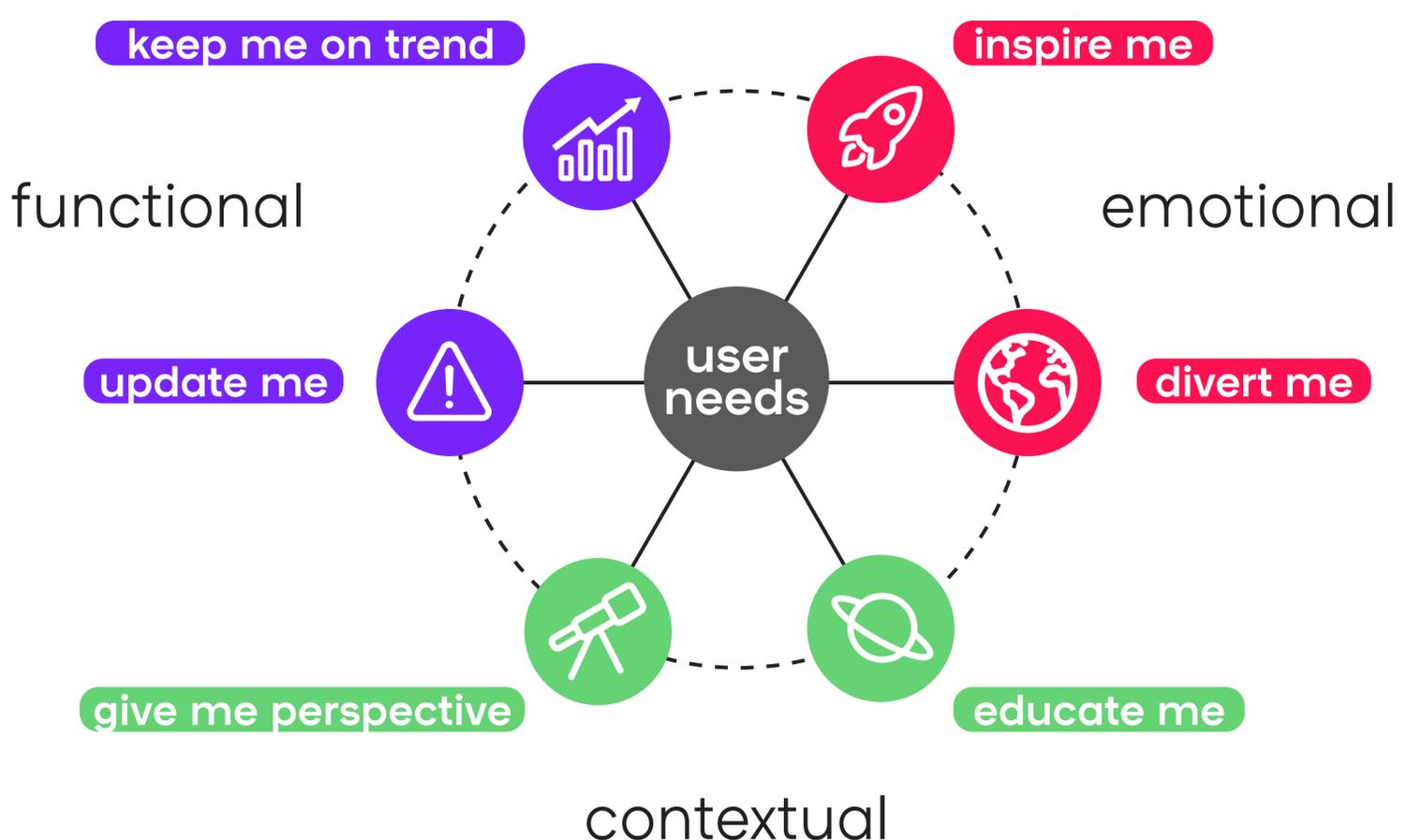
So to us, the next decade, the 2020s, is going to be about content analytics companies becoming much more actionable, able to lend a steady hand to newsrooms with the help of machine learning, data science and business intelligence. Excitingly, content analytics is being integrated with other crucial systems - from CMS to CRM, and more, contributing more effectively to business objectives.

Yet, more data doesn't mean better decisions. Editors and journalists are tired after the past almost year and a half of the global pandemic, so we need to be smarter in the way we help them.

In other words, we asked ourselves, how can we provide more actionable insights that would make the journalistic process and choices more effective?

● a new way forward

It all starts with the user. We have been thinking a lot about why people consume news and why certain pieces of content work while many others don't. Unsurprisingly, we have been a big admirer of [the 'user needs' model BBC World Service developed in the mid-2010s](#). More so, we agreed that user-centric based commissioning is the only productive way forward for journalism to really connect with audiences and rebuild the trust that has been eroding for years now.



We also must learn from the best - our colleagues in product management have been satisfying 'user needs' since the beginning of the web, creating products and features to match that coveted 'jobs to be done' state of mind. Journalism has only been waking up to that need fairly recently, and content and product alignment has been another trend in the sector.

That's how the Triple N project was thought of initially - the alliance of two key components (the expectation to satisfy user needs and the need to help newsrooms with more actionable data), in our view, is the most sought after combination in which content analytics can truly be helpful to its customers.

We got Dmitry Shishkin on board, who once helped transform BBC World Service's 40+ global editorial teams into a digital-first, data-informed, user needs-based operation.



User needs-centric thinking has been a trend for some time. If you look at Nieman Lab's predictions for 2021, you'll see several entries talking about user needs.



"My job, and the job of any community manager, is to facilitate the creation of content that solves a problem our readers have, not just reports on it."

Nico Gendron, WSJ.

"That new franchise you're building, that podcast, the video series: Who is it for? What need is it serving? What will the audience do with it? Do they really want it, need it? Or are we just trying to keep their attention long enough for the ad to serve?"



Cory Haik, Vice Media Group.

It's time to spread the user needs goodness much wider, and here is why and how.

smart
octo

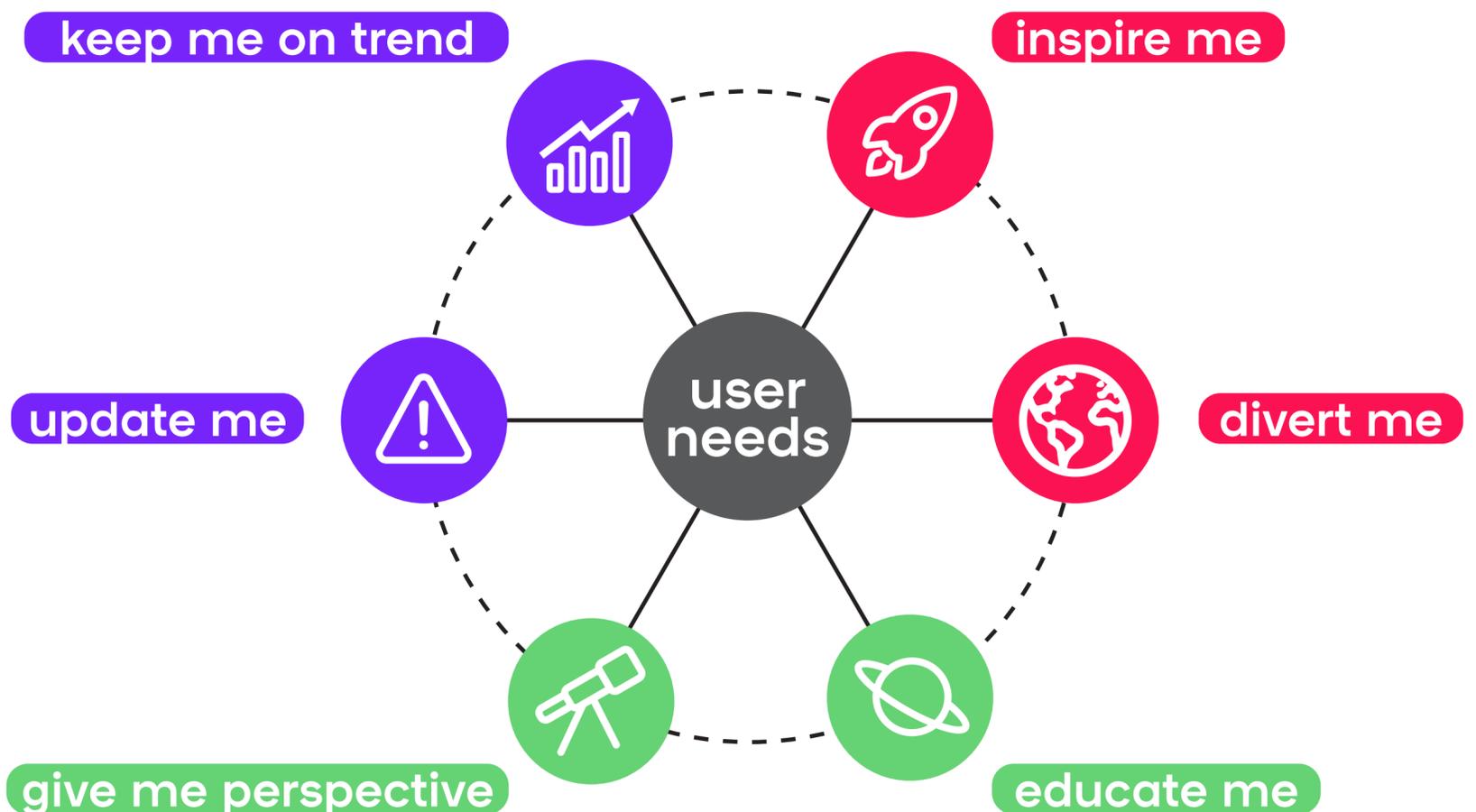
And if you're totally new to the user needs approach (or you're in need of a quick refresher) check out this blog post where we guide you through everything you need to know! smartocto.com/blog/explaining-user-needs/

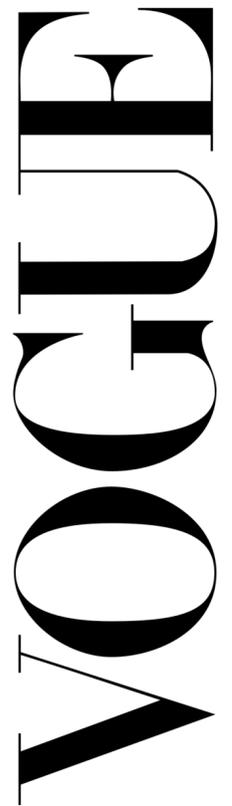
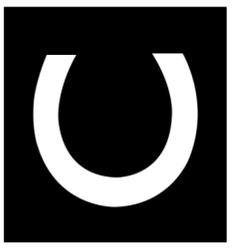
newsrooms and user needs

2 user needs

BBC World Service [user needs model](#) was introduced in 2016, roughly at the same time a separate, but similar model was being used by BuzzFeed. At that time it became evident, through numerous qualitative and quantitative studies, that news consumers did not only want to be updated - they wanted other things from news coverage.

The now famous user needs wheel graph was born.



Newsrooms that had not been attentive to that change, started to lose audiences' attention. Users told the BBC - and the model was later proven effective globally irrespective of the type of funding, size of the audience and competitive set - that they still wanted to learn about the day's events, they just needed journalists to tell those stories differently, not defaulting most of its coverage to 'update me' user need articles. Once the BBC teams switched over to a new model, growth returned and it was adopted into a wider strategy for successful global expansion (the digital audience on BBC World Service language grew some 2.5x between 2012 and 2017, from 40m to 100m monthly browsers).

Later on, other user needs models started to appear, and all of them were either based on or inspired by the BBC one, which could be considered quite universally applicable (after all, it was indeed used by 40+ teams globally, from East Asia to Latin America and everywhere in between).

Vogue International piloted their own user needs model, Turkish broadcaster TRT has their own one, so does Wall Street Journal, [according to their transformation report.](#)

The table below shows how several publishers already using a user needs approach have categorised them. What's significant is that although the way they identify them may be slightly different, they're all in broad agreement about the kinds of perspectives or user needs they need to cover.

User need / Outlet	BBC	THE WALL STREET JOURNAL WSJ	VOGUE	TRT	OMROEP BRABANT
F U N C T I O N A L Update me	✓	✓	✓	✓	✓
Keep me on trend	✓	Connect me	-	FOMO	✓
C O N T E X T U A L Give me perspective	✓	Help me understand	-	Challenge me	Give me perspective + educate me
Educate me	✓	Help me understand	✓	✓	✓
E M O T I O N A L Inspire me	✓	✓	✓	✓	✓
Divert me	✓	Entertain me	✓	Move me	✓
Additional one	n/a	n/a	Make me responsible	n/a	Make me feel connected to my locality

● so, why is this important?

Media companies centring their editorial strategies around satisfying news user needs is not surprising. It's been widely acknowledged that 'hard' news is not enough to attract people regularly or with sufficient engagement anymore. Commodity, 'agenda' news is everywhere, relevancy and engagement become the differentiator. Worryingly, there has been a significant misalignment between what the audience wants on digital platforms - not only facts but also an explanation, inspiration, utility, fun - and what it currently gets from media outlets.



Lots of these points are covered in this Reuters Institute for Study of Journalism excellent report ["What Do News Readers Really Want to Read About? How Relevance Works for News Audiences"](#) by Kim Christian Schrøder, Professor of Communication, Roskilde University.

As we learned in the past, growth in engagement comes when different user needs are addressed consistently, creatively and strategically. When they are not, it leads to waste, overproduction, weak long tails, and more.

We compared the classic 2016 BBC Russia results with those from our clients to understand if this misalignment still holds true.

What we found was that generally there's still a massive overproduction of Update Me articles.

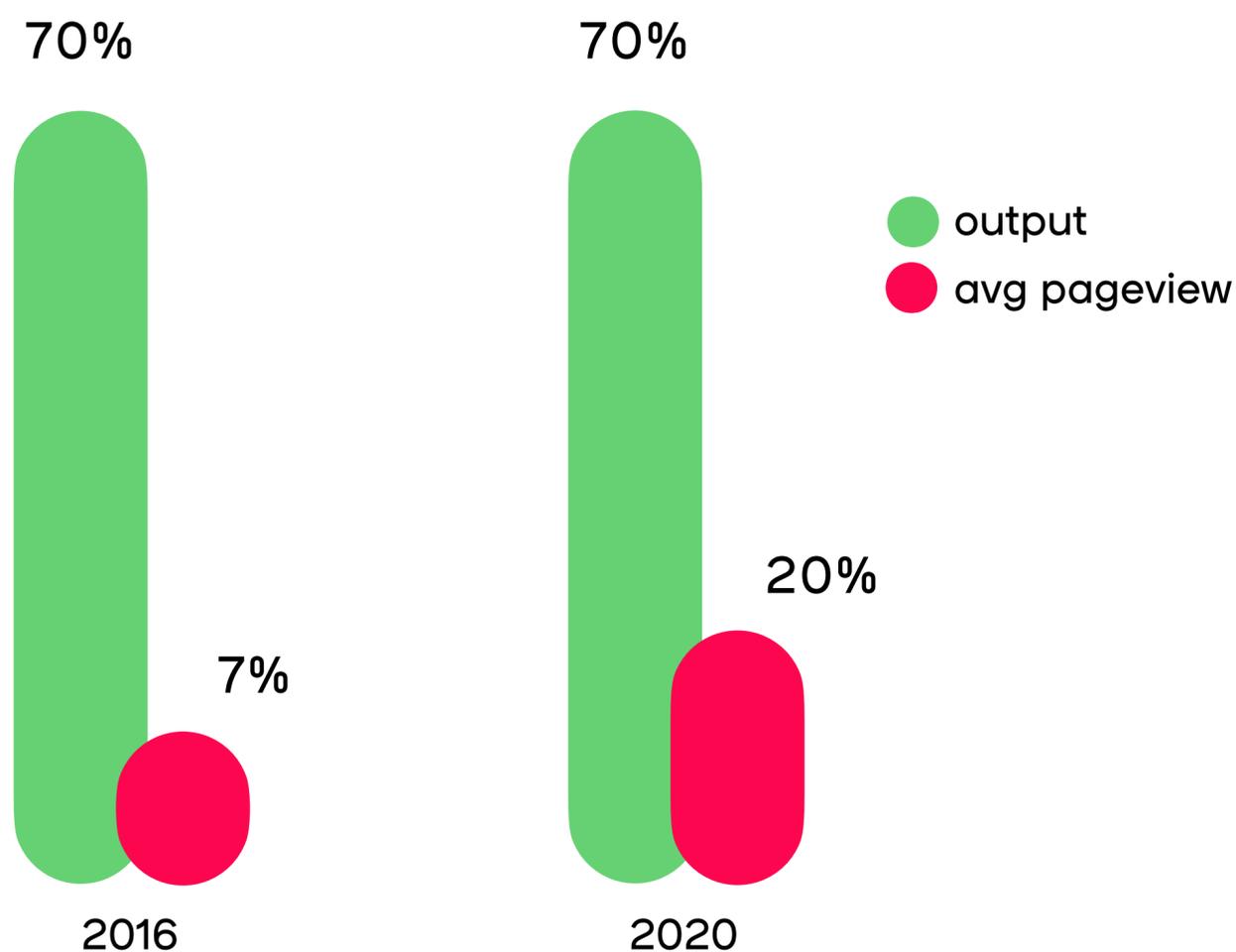
It was this finding which made us decide to launch the Triple N project so that we could better understand why newsrooms continue to overproduce stories their audience isn't interested in - and ultimately how we could help overcome this practice.

Clearly, that newsroom was producing lots of content its users did not find interesting (see the bar on the left), in those volumes.

Update Me articles highlight a huge misalignment between output and needs

BBC

OMROEP BRABANT



! overproduction of Update Me articles (70% of total output) not matched by percentage of actual reads by user need

! newsroom not producing content users actually needed or wanted

This, in turn, indicates problems with media companies finding its unique 'product-market fit', suggests the absence of a unifying mission statement and internal alignment that would guide editorial choices. All of these are important and none of these problems are unique - in our practice, we see many graphs highlighting similar issues.

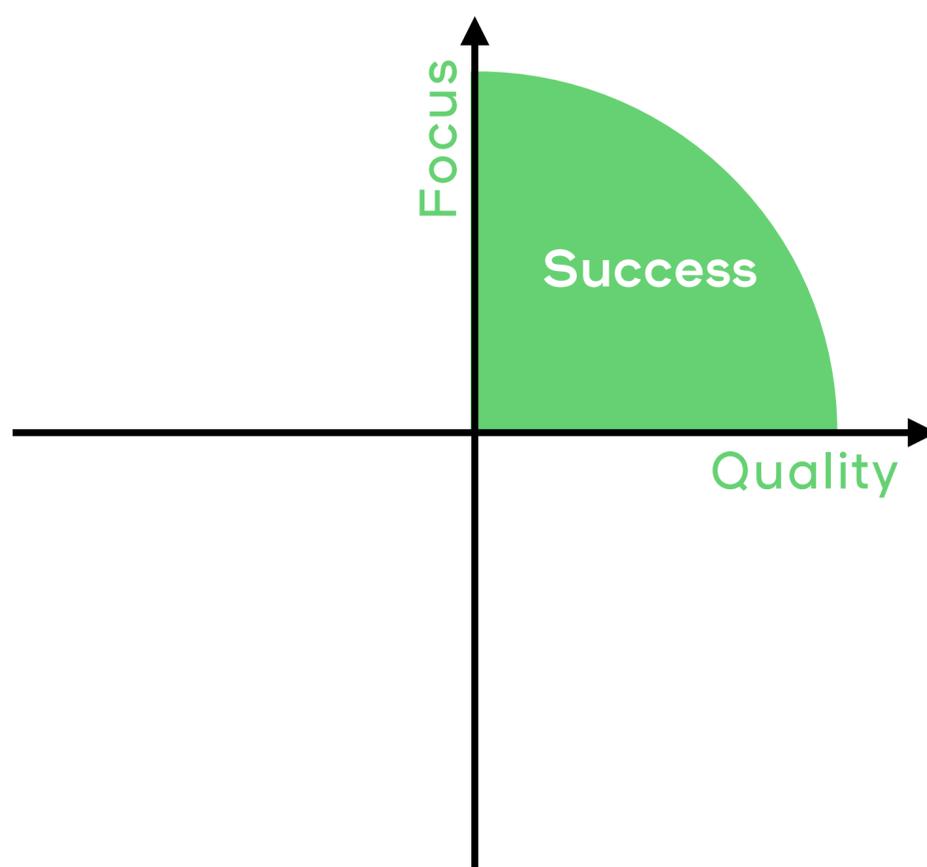


"The beauty of a user need model is simple - it comes from users, the model itself is external, not internal - it challenges newsrooms by reminding them not to preach but to listen, before starting on. And having worked with various newsrooms in my life, I can see a direct correlation between strong performance, finding your audience and satisfying its needs properly"

Dmitry Shishkin

If your audience tells you about a need, capture it and own it - we really like Ben Thompson's [notion of a 'myriad of niches' on digital](#) - as long as you operate within the axis of quality and focus, you should do well.

Focus and quality as determinants of success on the internet



Source: Notion of a myriad of niches on digital | Ben Thompson



"What is important to note, though, is that while quality is relatively binary, the number of ways to be focused — that is, the number of niches in the world — are effectively infinite; success, in other words, is about delivering superior quality in your niche — the former is defined by the latter"

Ben Thompson

That quote could as well have been describing a user need centric approach to content creation.

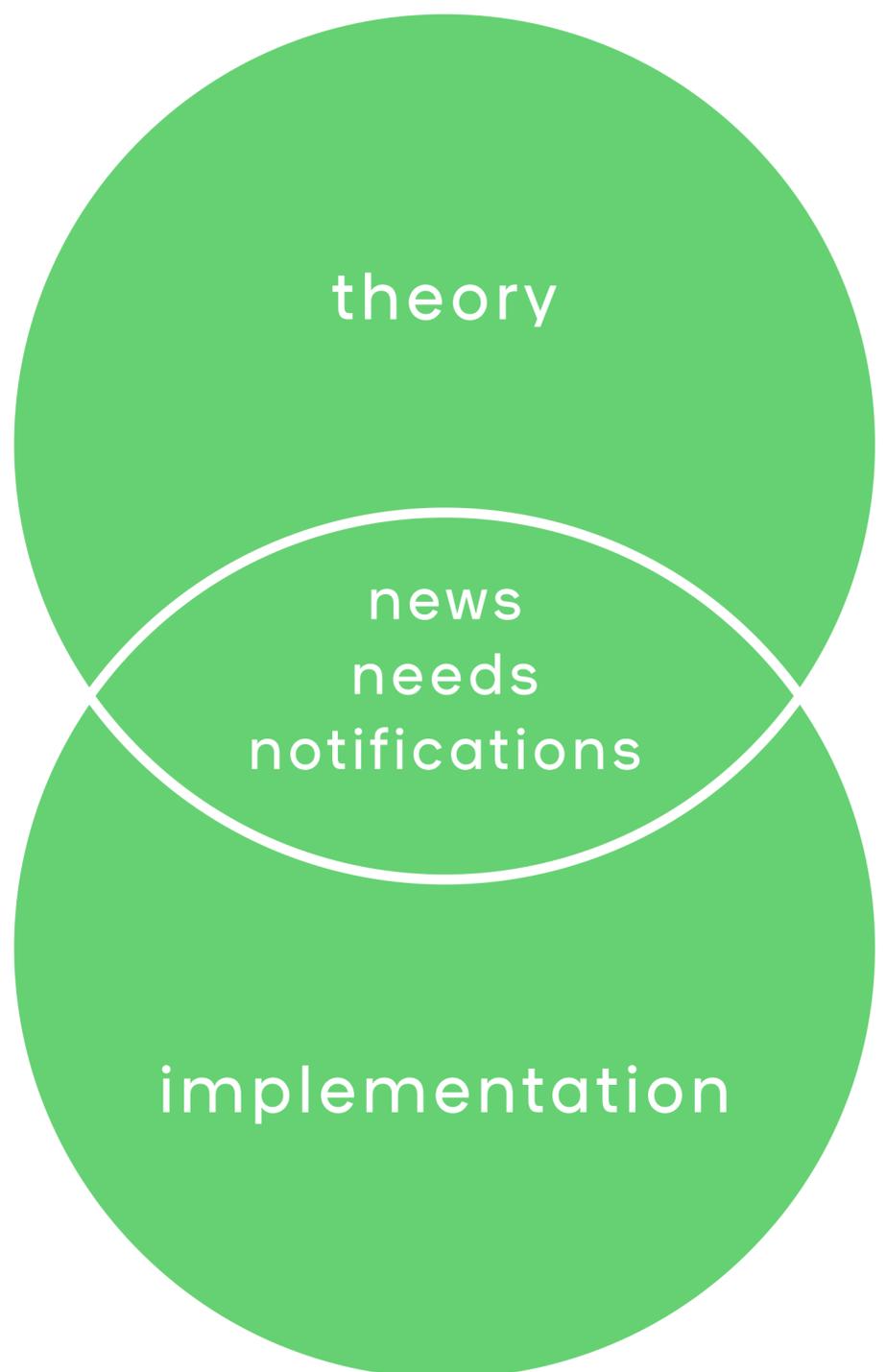
● what's next? what's missing?

The findings from those news organisations make a strong case to employ user needs more consistently across all news media but, with a few notable exceptions, the approach seems still to exist mainly in the theoretical.

This may be at the heart of the problem: there's a gulf between the theory and implementation.

It's hard to disagree with the premise, but how do newsrooms put this into practice? Something is currently missing, and that something sits between the theory and the pre-existing workflows of the newsroom. Something with actionability at its core.

And so, we launched the Triple N Project.



the question and the hypothesis

the question and the hypothesis

Could a system of smart, actionable notifications (fired from an algorithm with user needs at its core) help newsrooms to commission content more efficiently? And, would this result in better engagement?

We felt strongly that it could - on both counts.

Our goals were to ...

- ! ... create an algorithm that would identify different user needs
- ! ... confirm the ongoing misalignment within general output and user needs ratio based on audience engagement
- ! ... prove that once identified, user needs-based growth hacks will lead to better audience engagement, in both reach and engagement terms
- ! ... explore the theory that newsrooms are stymied by their reluctance to accept and activate change management

introducing the players

introducing the players

1 our research partner

The reason that Dmitry Shishkin decided to work with smartocto on this project was that the insights found during the BBC project in 2016 are still widely relevant and applicable now, in 2021. As an industry, little progress appears to have been made to redress the imbalances found.

To name the most important issues:

- overproduction of Update Me articles
- misalignment of other user needs in covering the news
- lack of insights on timing, format, channel, topics in combination with user needs
- too many orphan stories (failure to write follow ups to stories the audience is engaging with)



Newsrooms aren't benefiting from the traction they gain from single, successful articles, for the simple reason that they're not aware of these pitfalls. Instead of capitalising on the reach they gain from these articles, they discard the subject and move onto new articles. Of course there's always new news to publish, but as Dmitry's experience at BBC Worldwide showed, the approach he championed then - and the way we're developing it further now - can have a remarkable impact on the health of newsrooms, if only they're made aware of its simplicity.



"Editors are busy people and, understandably, everyone has so much on their plates. Being truly data-informed is no longer about simply having access to data, it's about taking meaningful and consistent action from data - constantly fine-tuning, optimising and adapting your output to benefit audiences, and as a result of it, your company's financial performance, too. Lack of engagement with your output indicates fundamental problems with your newsroom's product-market fit, your niche. Without really satisfying your audience's needs, chances to succeed are not high."

Dmitry Shishkin

introducing the players

2 the clients

In the Triple N project we decided to work with three different clients.

These three news organisations are a good representation of the complexity of the news media ecosystem in 2021: we have a local and national/ international title; public and commercial businesses; titles with a specific demographic or geographic remit; legacy media and comparative startup.

The fact that all these publishers were keen to become involved speaks volumes about the relevancy of Triple N's promise - regardless of remit, size or location, user needs can benefit all newsrooms.

Let's introduce them:



DeMorgen.



introducing the players



A public broadcasting corporation from the Netherlands, operational in the province of Brabant and which has to comply with the regulations in the Media Act. This means, among other things, that 50% of the programming must relate to information, education and culture from Brabant.

Their mission: "We create relevant stories that touch you every day". It's their hope that users of their publication will get a 'feeling for the area' when they engage with it.

They place a high premium on connecting with their locality.

Traditional Radio & TV but more and more online focused on an 'online first' approach to covering the news.

some numbers

24.6k

average monthly
pageviews per
article (April 2021)

28m

online visits per
month (to website
and apps)



257k fans



211k followers

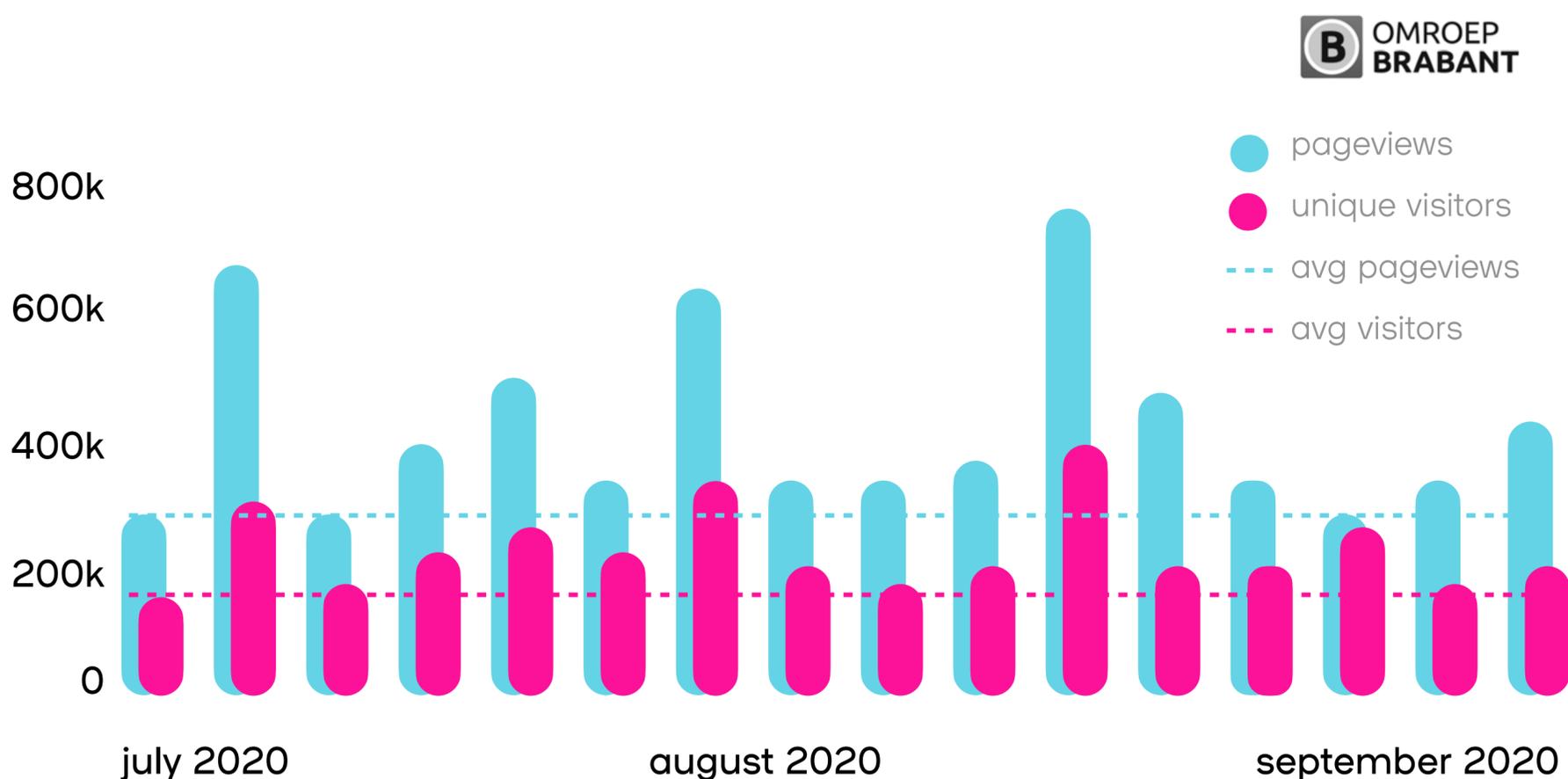


148k followers

Omroep Brabant - although it's a regional broadcaster (there are 13 in the Netherlands) - ranks in the top 10 of most impactful online news organisations in the country.

focus in project

An impactful and ambitious news organisation that creates online stories on multiple platforms for a broad audience. They are traditionally focused on Update Me articles but are changing their journalistic strategy and creating more engaging and relevant storytelling to increase audience loyalty. With the user need approach they wanted to learn to better understand how various user need stories can better service their audience demands.

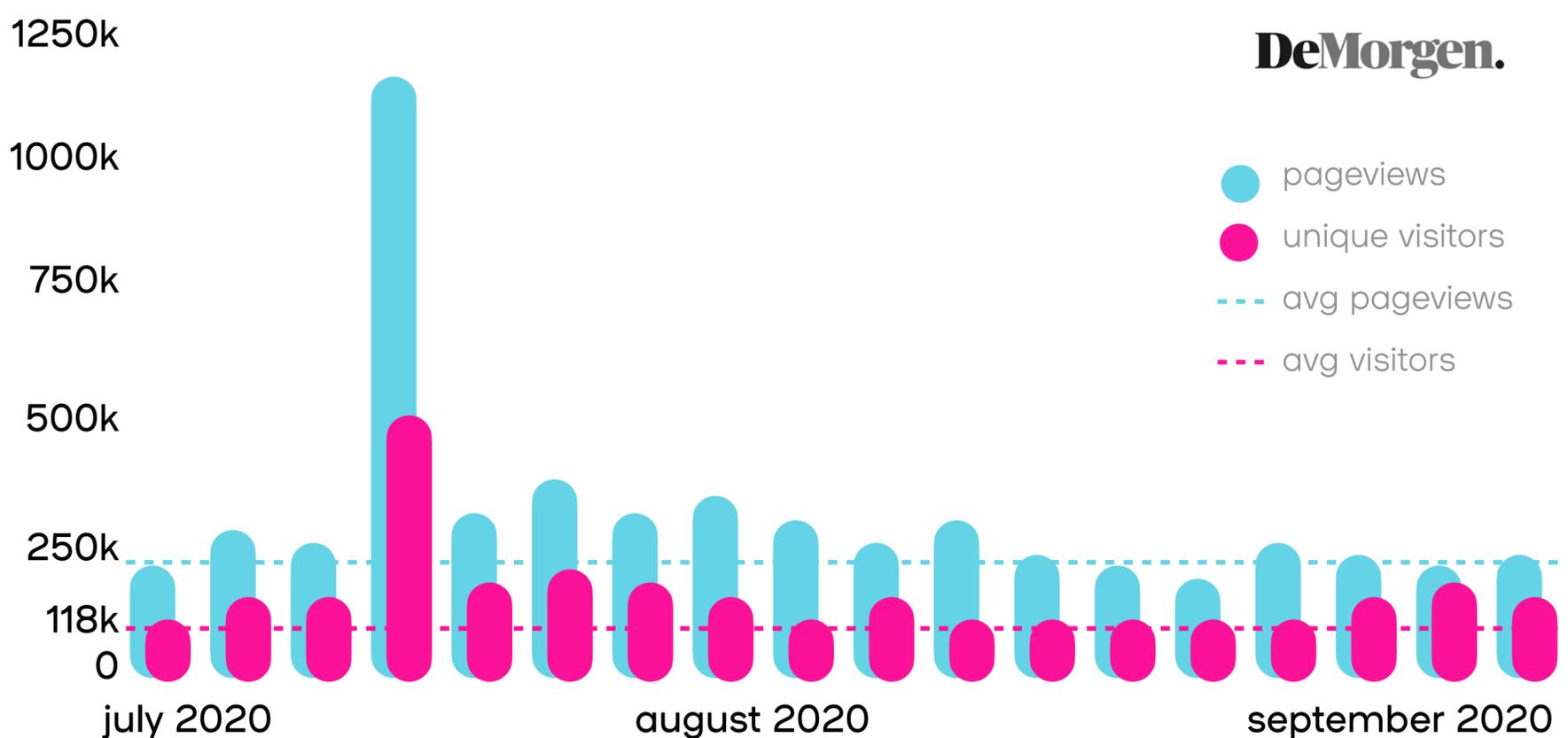


introducing the players

● DeMorgen.

A commercially-driven quality newspaper from Belgium. Part of the rich portfolio of dpg media - one of the largest news publishers in the Netherlands & Belgium, with over 30 news brands - regional as well as national.

De Morgen has a clear brand identity. They offer an insightful look at the news at home and abroad, and report with an open mind about what is going on in society and in the world of politics, culture and media. The editorial team consists of top journalists who make a difference with reporting that reaches deeper but is also accessible and human. With its own news, investigative journalism, sharp opinions and high-profile interviews, the newspaper is more firmly on its feet than ever.



They are mostly focused on social media platforms and have a strongly formatted approach to covering the news in order to make it as attractive as possible to the easily distracted millennial and Gen Z audience.

some numbers

4k

average monthly
pageviews per
article (April 2021)

8m

online visits per
month (to website
and apps)



246k fans



101k followers



74k followers

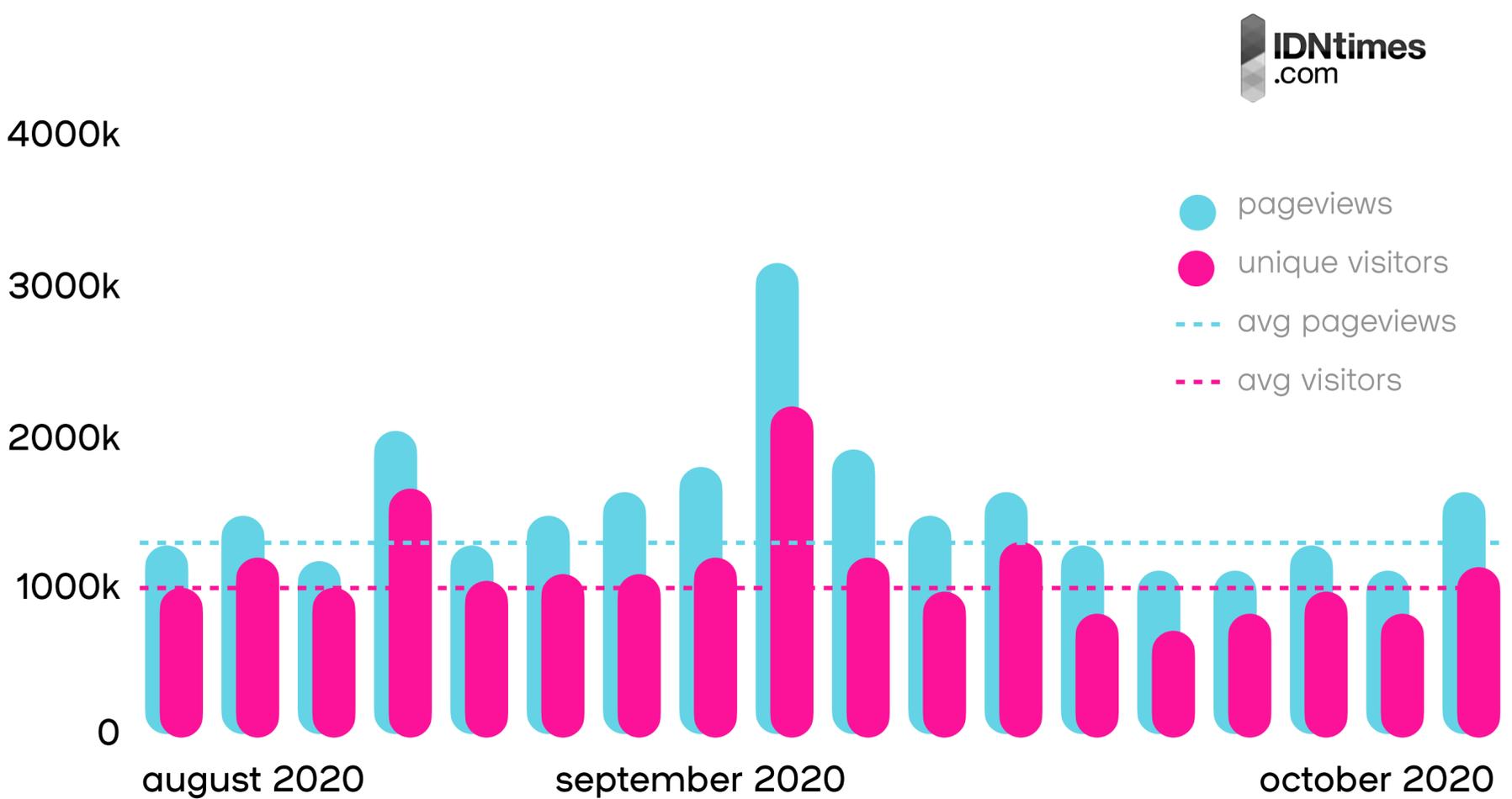
focus in project

The business goal for DeMorgen is to bring in engaged & loyal visitors and convert them into subscribers (behind a paywall). They were therefore keen to learn more about the story coverage before the paywall and identify opportunities for conversion, so for Triple N we were mainly focused on understanding the 'for free articles-approach' and to see how a different balance of user need articles could help their content commissioning methodology.

introducing the players



IDN Times is a multi-platform news and entertainment digital media company for millennials and Gen Z based in Indonesia. Their vision is to democratise access to accurate, balanced, useful, and positive information and ultimately, to become the voice of Millennials and Gen Z in Indonesia and to make a positive impact on society.



They are mostly focused on social media platforms and have a strongly formatted approach to covering the news in order to make it as attractive as possible to the easily distracted millennials and Gen Z audience.

some numbers

2.2k

average monthly
pageviews per
article (April 2021)

50m

online visits per
month (to website
and apps)



1.7m fans



407k followers



2m followers

focus in project

Learn more about the story coverage on their social platforms and how it helps to engage with their specific audiences. Additionally, they were curious to see if they could make a connection between topics and the specific user needs and demonstrate if and how the newsroom could benefit from this approach - and whether levels of engagement and average page views increase as a result.

peaky blindness

What all three of these graphs show is a lack of sustained - or even incremental - growth. Those sharp peaks in attention quickly fall back to average levels and highlight the fact that articles get published, read, then forgotten.

While this is the nature of news - at least to some extent - it highlights the fact that opportunities to nurture engagement are consistently being missed: follow-up articles are not being utilised to capitalise on those spikes of attention, and satiate readers' interest.

The engagement journalism trailblazers at Hearken are quick to point out that audience data tells a different story: readers start to gain interest at the point that many newsrooms lose it. More evidence of that disconnect, if you needed it.

Times are hard for publishers right now, and attention is a scarce commodity. Newsrooms need to be more aware of opportunities to break through the noise, and be ready to seize them when they manifest themselves.

This isn't a criticism of these three newsrooms.

On the contrary: the fact that we see the same patterns appearing at all three proves our point: this strategy is endemic. It's the norm. It's what we've always done.

But as we all know: if you do what you've always done, you'll get what you've always got.

What we proposed to these three clients - and what we're outlining now in this whitepaper - is a helping hand and a fresh approach.

The results speak (and peak) for themselves.

Read on...



immediately identifiable issues

immediately identifiable issues

1 audience growth stunted

Before we started the research projects itself, we looked at the most recent 1000 articles published by each of the three clients, from which we made an analysis.

This showed us their average pageviews, the number of articles they typically publish every day, the amount of unique visitors, and many more additional insights.

Since these three clients had already been using smartocto for a long time, we were also able to benchmark it with historical data in order to see if the output of the investigated period of time was in line with the data we already had.

With all three clients we noticed a common pattern: sudden peaks in engagement fell away almost immediately. The net gain or increase of readership over time was in fact negligible. The growth newsrooms hope for seemed absent from our data.

immediately identifiable issues

2 stumble upon news = stumbling block

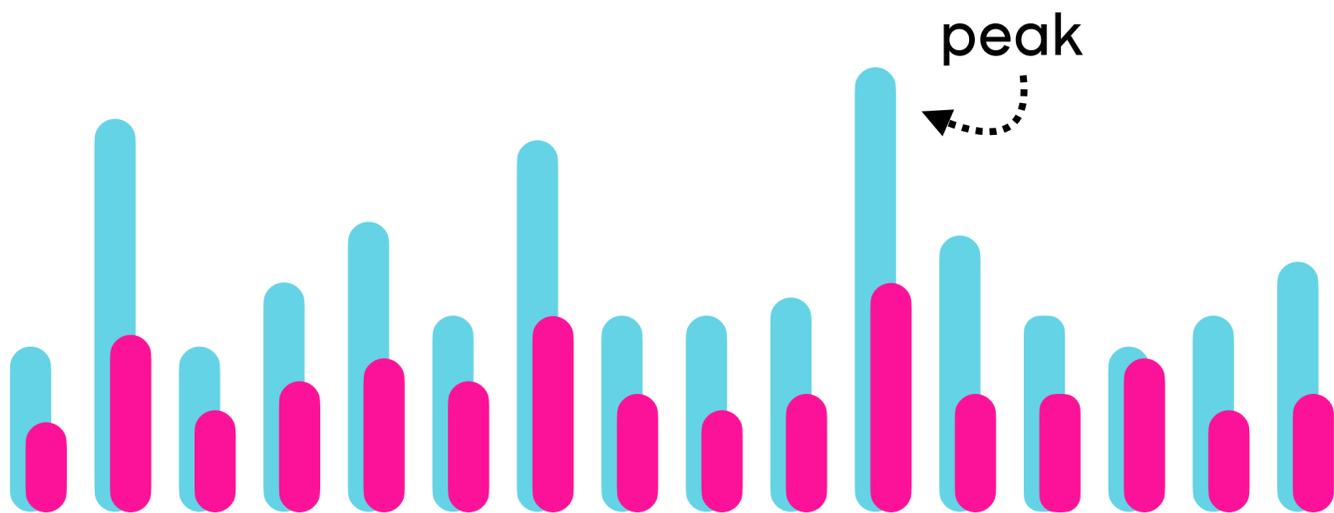
Newsrooms tend to create news articles about things that audiences aren't aware of. It's what we call 'stumble-upon news' and it's what we all tend to associate with news: bulletins, updates and push notifications. In short it's the news we get when we log on to a publisher's front page.

This is news by interruption rather than search, and while there's nothing wrong with this approach, the problem is that often these interruptions are not followed up. This is exactly what we see in the graphs: articles frequently break the average, but after the initial peak of page views across the site, the average pageviews and unique visitors returns to normal.

The 'stumble-upon' news strategy does nothing for growth or sustained engagement - and these are two things newsrooms constantly tell us they strive for.

immediately identifiable issues

3 case in point: coffin in the woods



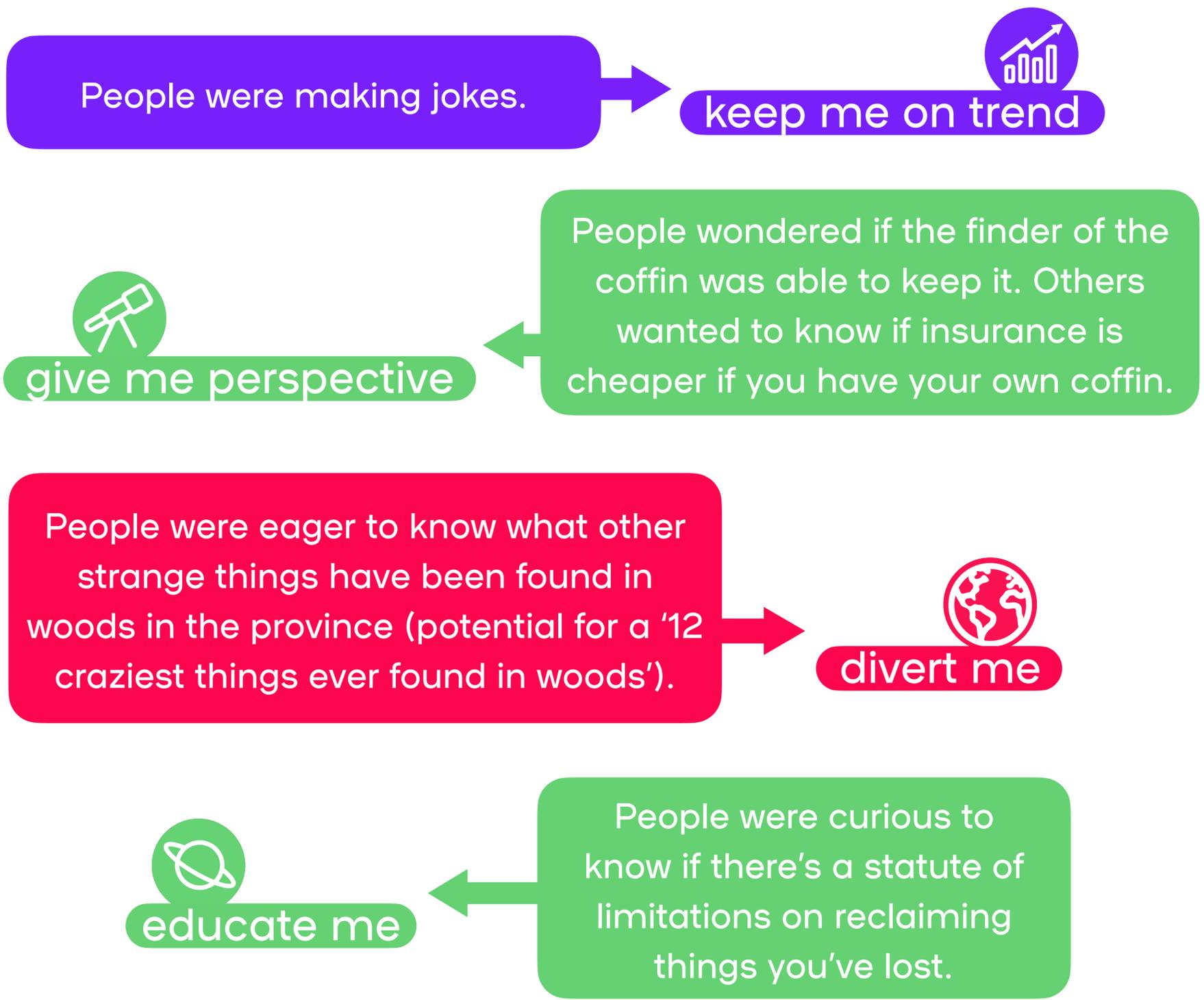
The largest peak in the Omroep Brabant graph is a prime example of what's driving this project.



At the end of August 2020, they published an article about a coffin that was left in some woods somewhere within the province. Two women found it while out walking their dogs and reported it.

The article took the form of a standard 'update me' story with a quote from one of the women and some basic facts about what and where it happened.

The story got a huge amount of traffic and there was a huge reaction to it, particularly on social media, where the comments kept mounting up. But Omroep Brabant didn't follow it up.



But, as with all the other examples of articles generating these massive peaks, nothing happened.

This is why the peaks look like peaks: there's a thirst for articles that goes unsatiated. Average pageviews and unique visitor levels drop all the time after a peak.

It's because newsrooms don't adjust their story output based on the insights the audience is giving them.

This particular example has been discussed with the newsroom at Omroep Brabant and this led to them identifying a newsroom-specific target for the Triple N project: making use of a better balance of user need stories (less over-production of Update Me articles) to make sure the audience is serviced better in their search for relevant news coverage.

immediately identifiable issues

4 mudbloods

Another challenge we faced was the fact that the user needs model had - up until this point - been a theoretical model.

Which means it works... in theory.

In reality, things are almost never so easily and simply categorised. It's rare to find a story written from a single user needs perspective - there's often some overlap.

Newsrooms might get creative and combine educational and inspirational components in their stories. They might try to divert us while keeping us updated.

Is this commendable? Absolutely. Does it make creating an actionable, useful and usable tool more difficult? You bet. Did that stop us? Of course not.

Clearly, for the algorithm to recognise the user needs we needed some adjustments.

We realised that we effectively had 'mudbloods' on our hands - and just as Harry and co understood, there's immense power to be found there. In fact, identifying this issue actually simplified the algorithm creation process.

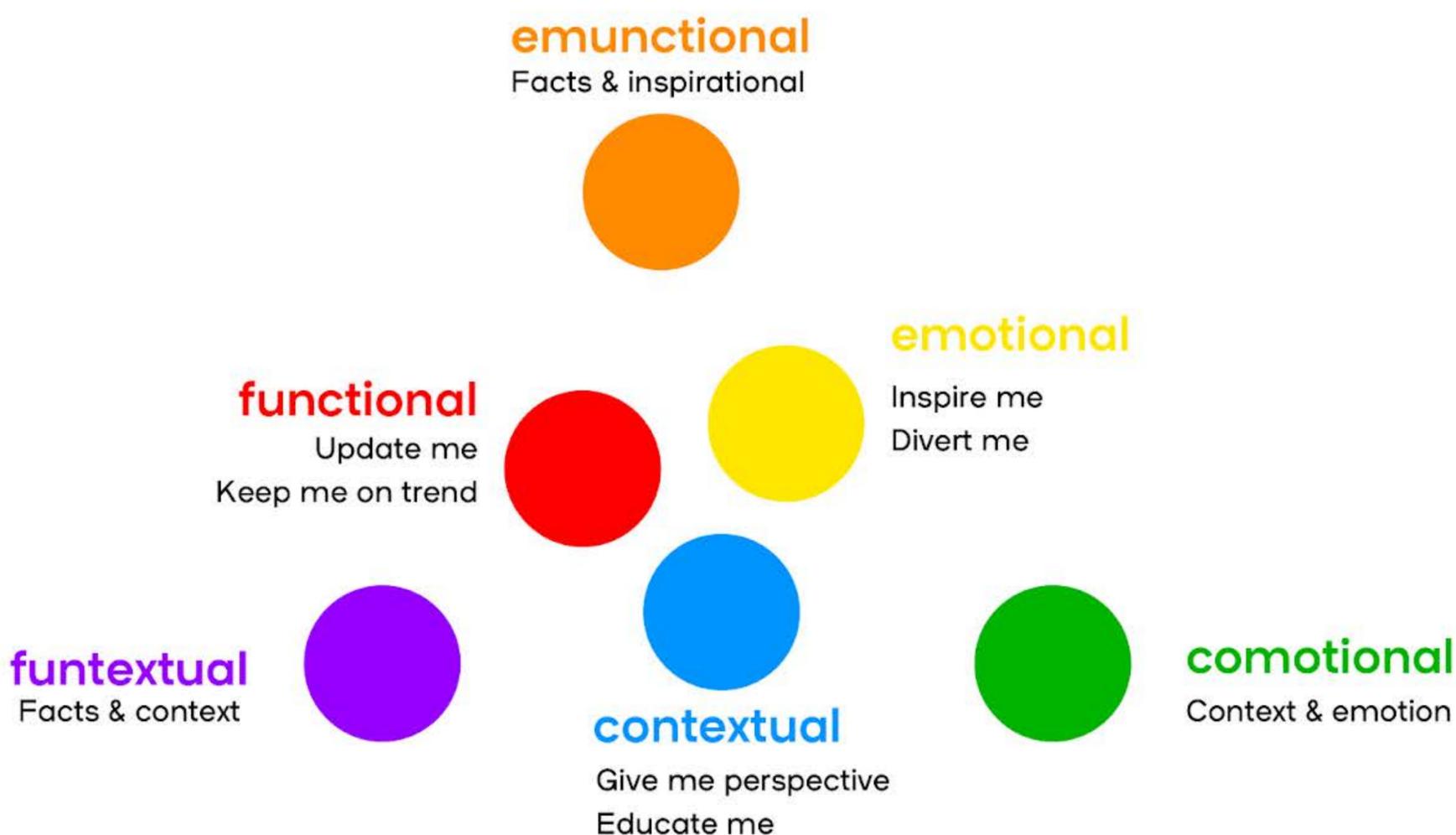
The first revelation came through our work with Omroep Brabant, where we realised that grouping articles into three sections, rather than the aforementioned six, was going to work best.

These broader groupings appeared as

contextual (Educate Me and Give Me Perspective),
functional (Update Me and Keep Me On Trend) and
emotional (Inspire Me and Divert Me).

From here we realised that if a 'mudblood' article combining functional and emotional aspects was published (which - in a moment of levity - we nicknamed 'emunctional' content) it seemed obvious that to get the broadest coverage of a story, any follow ups should address the user need not yet covered - in this case, the contextual type.

So, much like mixing primary colours, it was easy to explain and visualise how this approach might work in the real world.



This gave us a headstart from the beginning because not only was the algorithm trained very well, the accuracy of the automated recognition was recorded a very satisfying 92% in the first week.

In the next chapter we'll dive into this phenomenon a little bit more ...

how we
did it

how we did it

1 building the algorithm (flagging, building)

The main goal of the project as a whole was of course to create that special toolbox for newsrooms that facilitates the incorporation of the user needs approach into their daily workflows, offering guidance and support in the form of notifications. Our Chief Data Officer, Ilija Šuša, was doubtful at first.



"It looked promising, but at first I was skeptical that we'd be able to achieve the level of accuracy we'd need to gain our users' trust. It didn't take long to discover that this wasn't as big a problem as we thought - and in fact the algorithm performed exceptionally well across all our partner clients."

Ilija Šuša

He predicted that 95% accuracy would be the maximum, which is great in the world of machine learning, where 80% is the average. But he warned that even that wouldn't be enough in this case - 2 or 3 mistakes are enough to destroy the tool's credibility. Further on in the project, however, his doubts were not only assuaged, but he was actually surprised by how well the algorithm performed.

The first batch of notifications was tested by the Triple N participants, and it is performing as we had hoped it would. Building an algorithm, as it turns out, is all about layering.

● complications

Before you can suggest a follow-up with a certain user needs perspective, you need to know which user need the initial story was written to address. So that was the first step: creating an algorithm that is able to recognise user needs in stories.

The main challenge our data team faced was that this was something that had never been done before, and it would be no easy task.

The history of algorithm creation shows examples of story categorisation based on theme, topic, stylometry ([Computación y Sistemas, 2018](#), [Symmetry, 2020](#), [Hassaan Elahi & Haris Muneer, 2020](#)), or format ([Intercom: Revista Brasileira de Ciências da Comunicação, 2016](#)), but nothing similar to what we were trying to do. There were no resources to start with, no general direction to guide us. The team used existing techniques, but their problem was completely unique and new. We had to start from scratch, and the foundational data to train the algorithm needed to be created manually.

The team manually flagged no less than a thousand articles from each participating brand, categorising them by user

need, to create a good guideline for the algorithm and train it for future flagging. Students from the Breda University of Applied Sciences flagged additional articles to enlarge the data set even further.



Right away an issue presented itself: content usually doesn't fall neatly into one category, and one story was sometimes flagged differently by different people. If a human can't even do it, how can you train a machine?

Another issue popped up as well: as humans, they knew they were tasked with grouping the stories in one category. The algorithm did not, and would sometimes pick two, or none at all. And that threw everything off. For the 15% that was flagged wrongly by the algorithm, additional work was needed.



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For all you hardcore data nerds, here's a great blog post where we dive into the actual process of building the algo - including all the struggles we faced in the process.

smartocto.com/blog/how-we-built-news-user-needs-notifications/

● layer upon layer

The algorithm consists of many different parameters, like article length, publication time, author, or even certain words, that could give a hint about the type of article it is. But, "the algorithm that recognises user needs is just one layer", Ilija explains. "We put additional layers on top of the algorithm, another set of rules that can handle the inaccuracy."

First, they decided to narrow the six user needs down to three categories: functional (Update me, Keep me on trend), contextual (Educate me, Give me perspective) and emotional (Divert me, Inspire me).

That made it easier for the added layer on top of the algorithm to increase flagging accuracy. It uses two techniques:

- 1** If the article is flagged into multiple categories, we set priorities depending on the specific use case (notification) and use one with the highest priority as the main categories.
- 2** If the article is flagged in two categories, we know for sure that it doesn't belong to the third. This is important info that could be used for some use cases.

This is just what was needed to make everything work. Ilija is proud: "The results now are much better than expected. It's evolved from something I didn't trust to what I think is a great job. It's now a finished product, all that's left is promoting it and convincing users of its benefits."

● the algorithm in the newsroom

For now, notifications are the primary product to have come out of the 'news, needs, notifications' project. These will give editorial teams a new perspective on the commissioning of content, because it actively shows them how many stories they write for each of the categories and will make it easy to identify when the balance is off.

Every newsroom has their own configuration of the algorithm, related to their newsroom's specifics. For example, words like 'accident' or 'police' likely indicate an update. If the title changes often, it's likely a liveblog, so 'Update Me' as well. Something created for and published on Facebook could be 'Divert Me'. If it's behind a paywall, it may be a more elaborate piece like 'Give Me Perspective' or 'Educate Me'. And if it's published in the evening, when people tend to like to read longer, uplifting things, that could be 'Inspire Me'. The tips also use input from external sources, such as Facebook reactions.

What notifications will (and will not) pop up also depends on the configuration. You could in theory get multiple

notifications for the same recommendation, but newsrooms can also choose to only receive one notification per story, for example. But it will only ever send the same notification once. We built all possible mechanisms into the tool to configure it for optimal usefulness to the end user.

Some examples of the notifications that our project participants are currently testing:

Event

The story has been shared on Facebook a lot, with lots of interaction



Notification

- **Many Likes:** Create a Divert Me or Inspire Me story to capitalise on its popularity
- **Many Comments:** Create a follow up that offers context or explanation
- **Many Shares:** Create a follow up on the same topic

The amount of Facebook interactions is above average for this story



- **Love:** People are connected, create a follow-up that provides context
 - **Wow:** People are impressed, create a follow-up that's emotional or personal
 - **Haha:** This is funny, create a Divert Me follow-up
 - **Sad:** People are touched, create a follow up that provides context or explanations
 - **Angry:** People are angry, create a follow up that shows all sides to the story
-

Event

Notification

The story was popular yesterday, and continues to attract engagement, but no other stories on the topic have been published yet

This story is still attractive to your audience. Create a follow up from another user need perspective

The story had at least 100 000 views and 1000 interactions on social media

This is a big story, can you create an 'Educate Me' follow-up?

A short story is very well-read, but short

This story is very popular, but it's very brief. Can you create a more in-depth follow-up, for 'Educate Me' or 'Give Me Perspective'?

● next steps

The data team had two months to prepare, analyse, research and implement the algorithm, which is a very short amount of time for a project of this complexity. There's still room for improvement, but the results are more than sufficient for this phase and we proved that we could do it. The algorithm is as good as it can be - the quality of the notifications depends on the additional layers.

So far there are nine notifications that can be used on a daily basis, and they are all on story level. Now that the algorithm is in place, it can be expanded on to include business goals and content strategy. Reports can also be added, to be sent daily or weekly. These show different statistics on the user needs and go beyond the story, also dealing with website, sections, topics, authors and referrers. At the moment they are created manually, and sent in a PDF. Based on our users' feedback we will automate these and create graphs, as well as create new notifications if desired.

● eight notifications & explanations

Exceptional Loyalty Percentage Link Clicks

This story lives up to expectations. Involve your audience even more with a follow-up from the user need <NAME USER NEED>.

* if an article gets more than X-pageviews within a certain timeframe (i.e. in the morning between 06.00 and 12.00) and the link clicks from social for this article also reach a particular threshold the notification will go off.

Exceptional Pageviews & Engagement

This was a big story, is a follow up from the user need <NAME USER NEED> possible?

* This story has extraordinary amount of pageviews and social interactions on your own shared posts.

Exceptional Twitter Usage

This story is getting attention. Create a follow up that provides more context.

If the attention keeps going and the engagement-ratio on Twitter is high another notification is sent out stating:

This story is still attracting a lot of attention on Twitter. Write a Give Me Perspective follow-up or involve an expert.

* The interaction on Twitter for the tweet(s) sent by the publisher is high, compared to previously sent tweets.

High Facebook Engagement



"Love": Your audience feels involved in this story. Provide more context on the topic.



"Wow": People are impressed with this story. Is there an emotional or personal story possible?



"Haha": Your audience finds this story funny. Create a Divert Me follow-up story.



"Sad": This is an emotional story. Create a follow-up that provides more context.



"Angry": People express their anger at the story. Create a follow-up from the user need perspective of Educate Me or Give Me Perspective.

* The interaction by Facebook users based on the Emojis on posts for this story indicates the sentiment. The notification is sent depending on the ratio.

Negative Feedback

Many Facebook users hide this story on their timeline.

Explain why the story (in this form) is published.

* when a certain amount of negative actions (hiding from timeline, unfollowing) take place, this indicates that people are not liking the post. The user should check why this happens (subject, format, picture) and explain why they choose to make the post or write about the subject.

Still Going After Peak

After a major peak, this story continues to draw audiences for more than three hours. Create a sequel from a different user need.

* A story attracts people for several hours in terms of views. To keep people satisfied, the newsrooms need to make new content and link to it in the existing content.

Still Going After Peak Day

After a major peak, this story has been in the public eye for a whole day. Make a sequel from a different user need.

* A story attracts people for more than a day and it keeps on going in terms of views. To keep the audience satisfied the newsroom needs to consider to create new content and link in the existing content.

Well Read Short Story

This short story is well read. Do you have a story with more depth, details that have not yet been reported or interpretation by an expert?

* This story is short in terms of word count, but it's viewed to the end. Is there more information available to give to the readers?

Reports can also be added, to be sent daily or weekly. These show different statistics on the user needs and go beyond the story, also dealing with website, sections, topics, authors and referrers.

At the moment they are created manually, and sent in a PDF. Based on our users' feedback we will automate these and create graphs, as well as create new notifications if desired.



date 03 06 2021

Hello Tim,

Here's your daily list of user need related opportunities! Especially the story 'Stevige onweersbuien op komst na zomerse dagen' should get your attention since we see many opportunities to engage more with your audience on this story and topic.

Go crazy!
The smartocto team

user need related

opportunities

stories

🔴 Stevige onweersbuien op komst na zomerse dagen

Janssen-vaccin zorgt voor chaos bij priklocaties: 'Onterecht weggestuurd'

Het onderbeen van Dianne werd geamputeerd en dat bleek een opluchting

notifications

This was a big story, is a Keep Me On Trend follow up possible?

This story lives up to expectations. Involve your audience even more with an Educate Me follow-up.

This story has an extraordinary amount of pageviews and reading time. Get your audience more involved on social. Inspire me!

how we did it

2 zero measure & setup

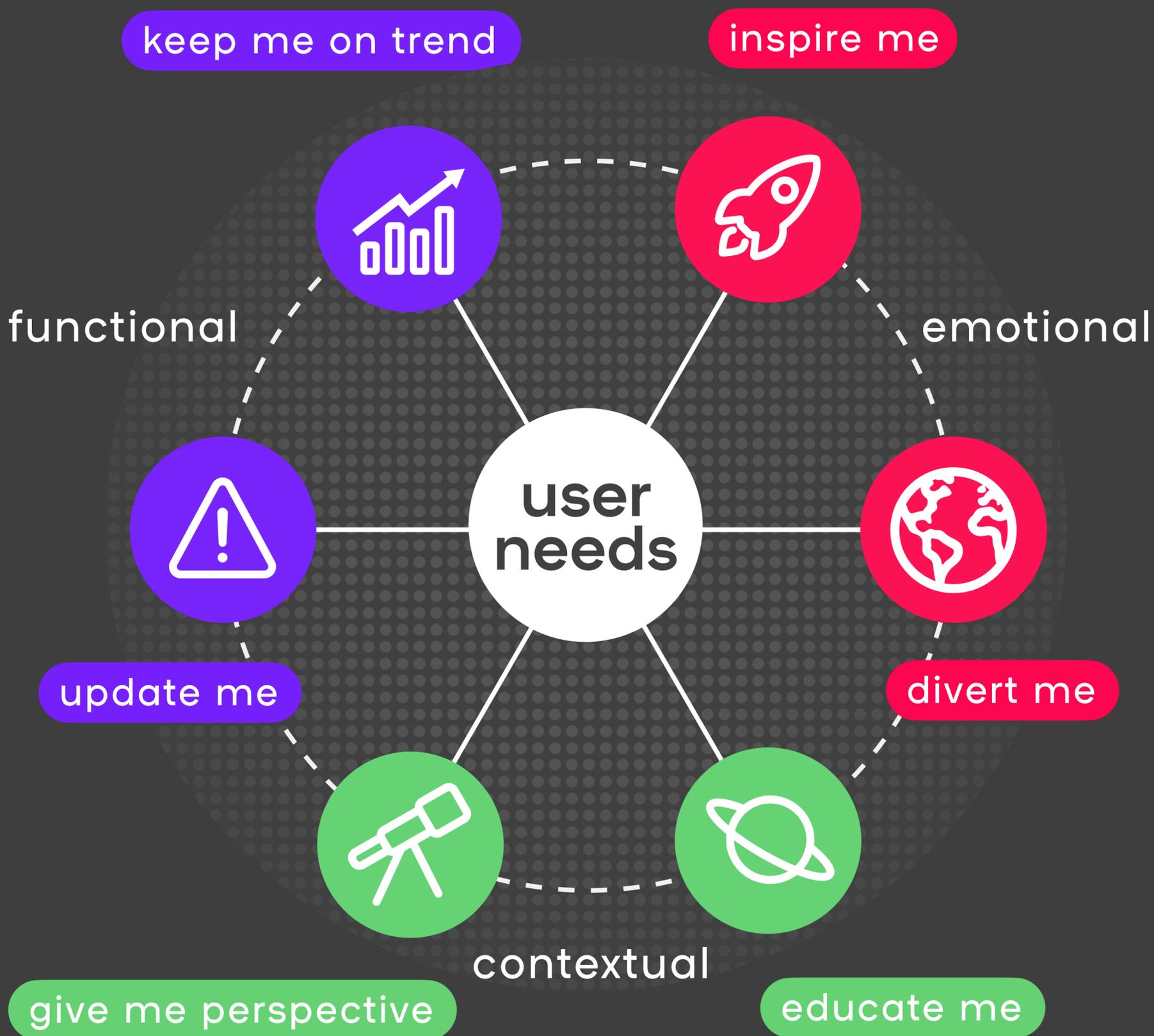
All three of the participating clients here faced their own challenges and joined the Triple N project to address their particular stumbling blocks.

Data analysis and consultations with each client led us to identify particular issues which needed addressing within the context of the project.



- ✓ A better mix of user needs in the output of stories
- ✓ Reduce production of Update Me articles (more than 70% is in this category)
- ✓ To help and train the algorithm we decided to narrow the user needs down to 3 instead of 6
- ✓ By making combinations of the user needs we created more overarching groups: functional (Update Me & Keep me on Trend), emotional (Divert Me & Inspire Me) and contextual (Educate Me & Give me Perspective)
- ✓ Since Omroep Brabant was the first client to collaborate with us on the project we needed to have fewer 'wrongly automatically flagged' articles and therefore we had to make combinations of the user needs.

user needs approach for covering the news

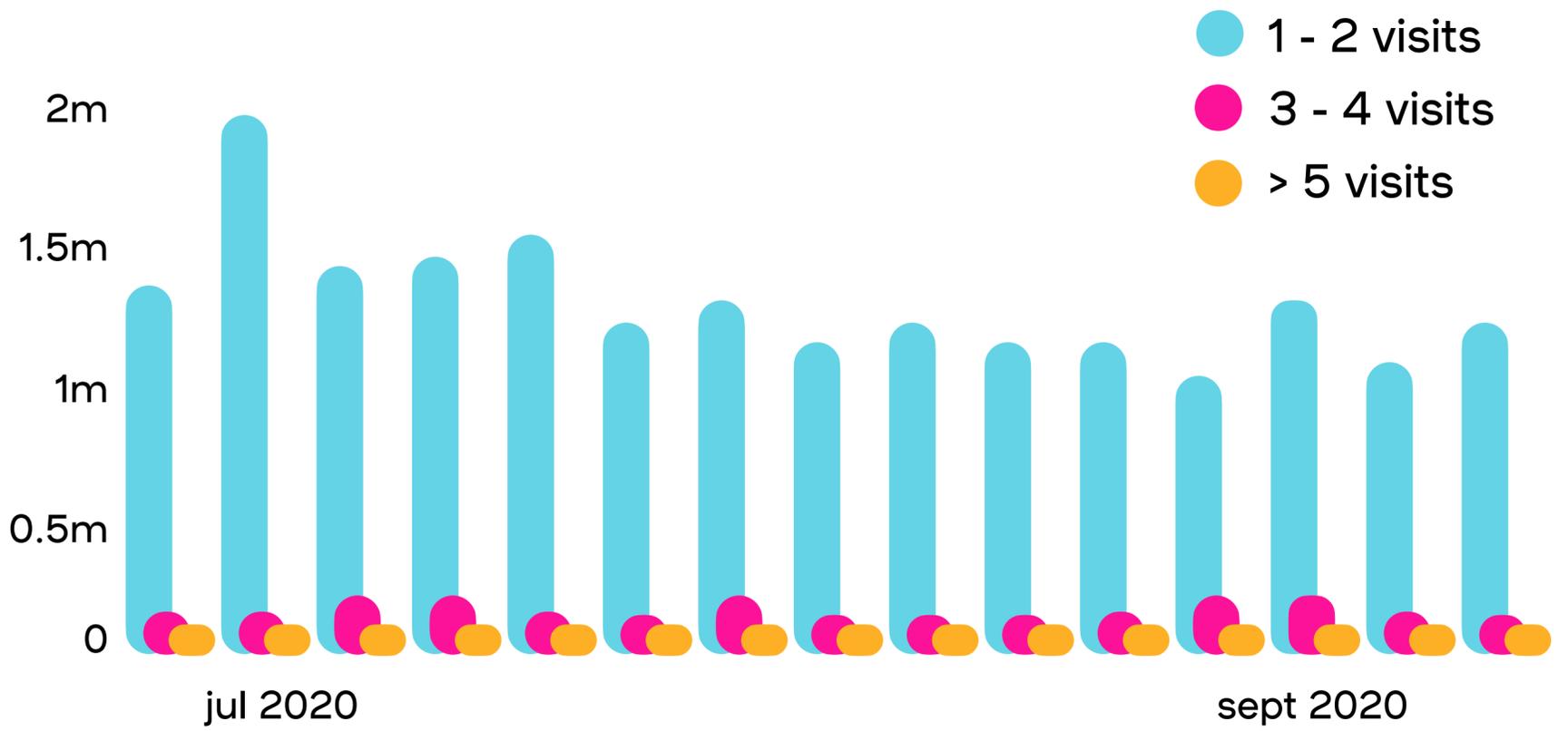


this user model was originally developed by the BBC

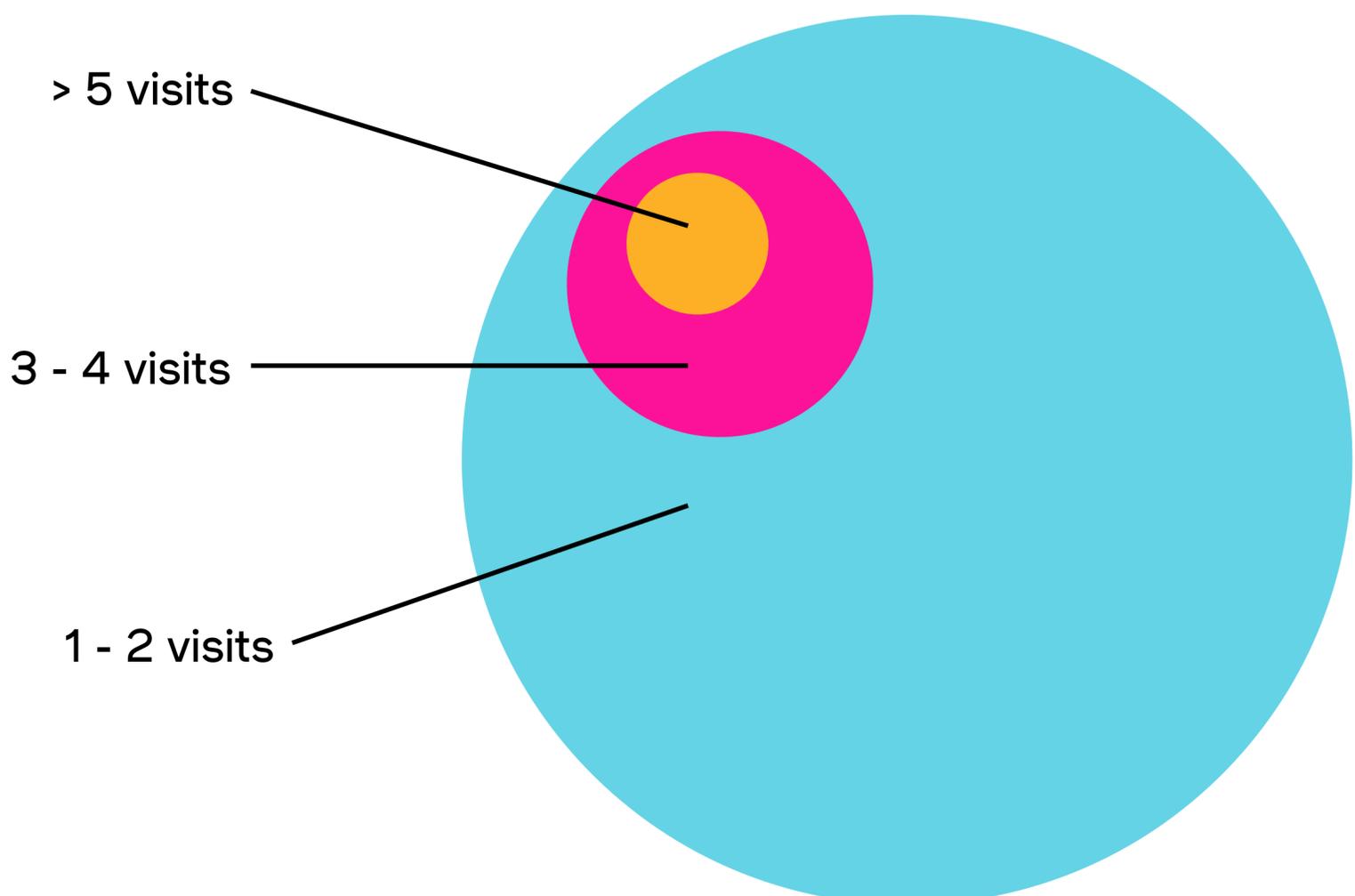


- ✓ To understand better which user needs resonate best with their specific audiences (Millennials & Gen Z)
- ✓ A large number of 'casual users' (people who only visit 1-2 times per month) should be engaged better, we want to understand how user needs can help doing that
- ✓ With the newsroom of IDN Times we facilitated a 'training' with their newsroom to help them recognise user needs better. With that information they were able to flag the articles themselves and with that we got all 6 user needs specified in the data. (We let the algorithm check the flagging afterwards as well and could match that with the functional, contextual & emotional sections resulting in 75% accuracy.
- ✓ To recognise the user need articles during the growth hack better, IDN Times decided to tag all the articles with the user need.
They also organise their stories on the website via www.idntimes.com/tag/update-me, www.idntimes.com/tag/educate-me etc
- ✓ Surprisingly enough, IDN Times produced the fewest number of Update Me articles because they had already figured out that it wasn't the most valued 'format' for their audience. We believe creating more Update Me articles on 'hard news' could be beneficial for their brand to improve their loyalty scores.

audience groups per visits

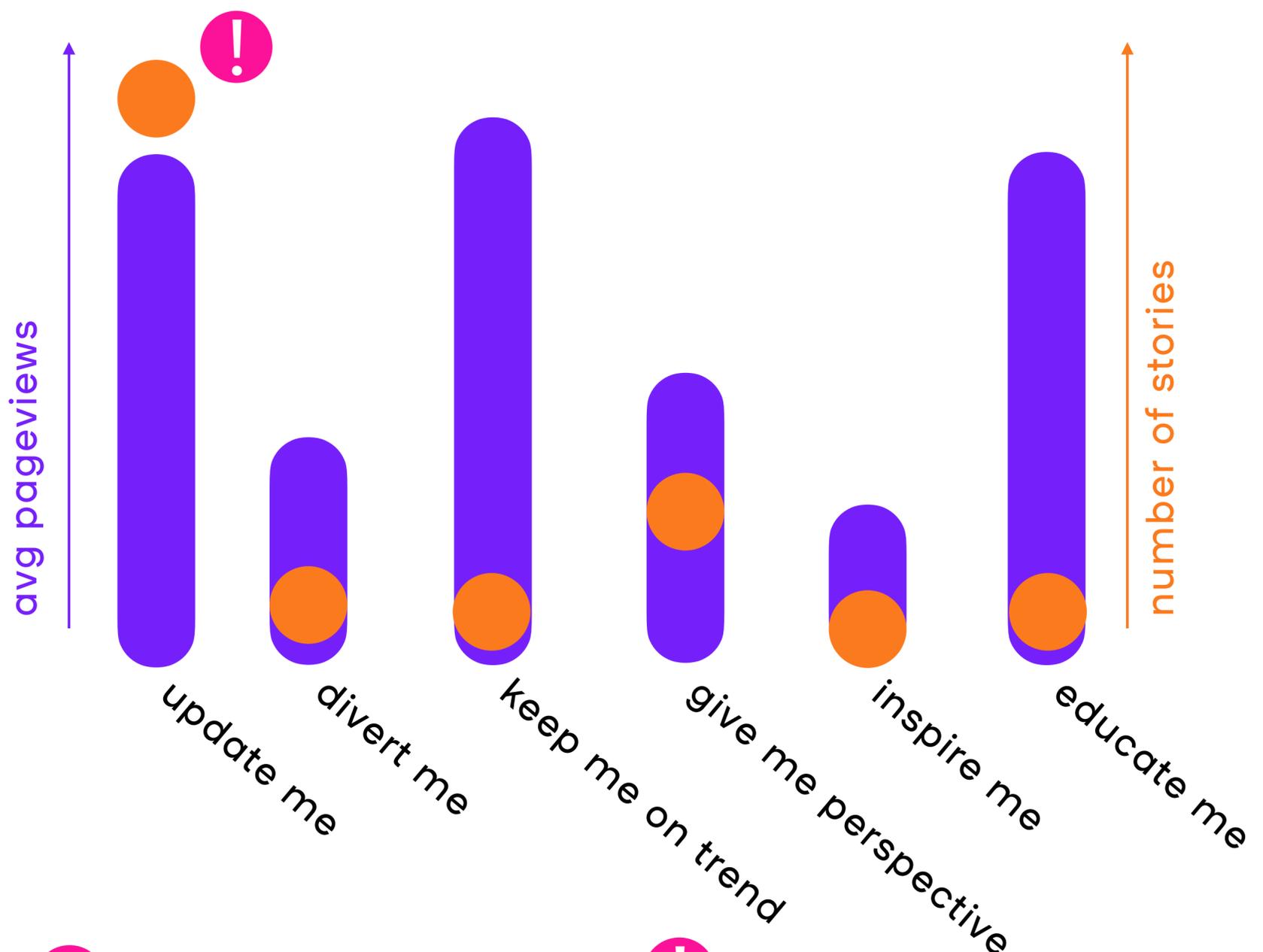


percentage of audience groups



DeMorgen.

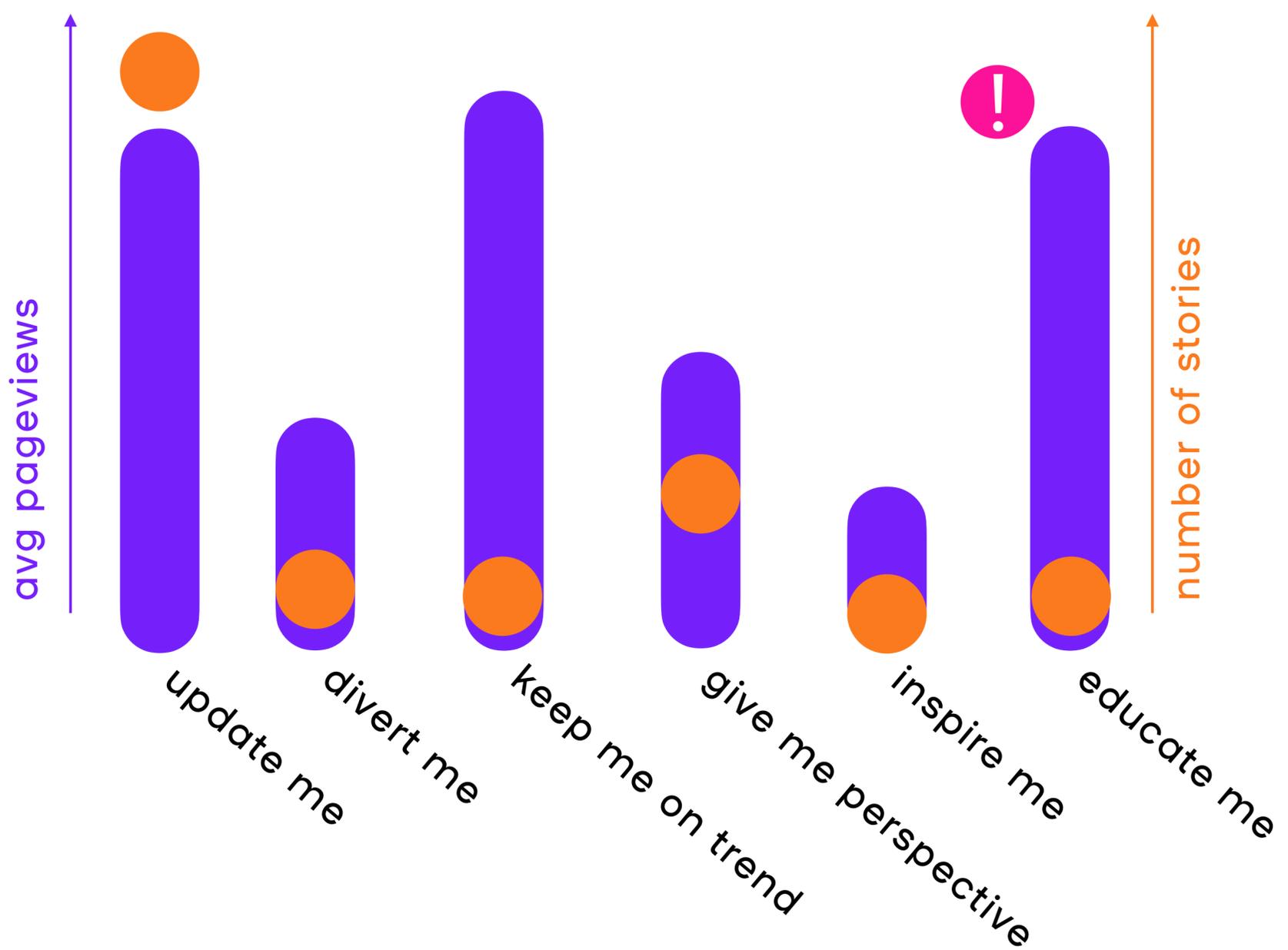
- ✓ For DeMorgen we decided to focus on a specific part of their content strategy. As a commercially-driven national newspaper, right now they are trying to build their online subscriber numbers as much as possible.
- ✓ Since DeMorgen is a quality journalism newspaper they already publish a lot of 'Give Me Perspective' articles - their journalists routinely explain and give context to the subjects and topics they cover.
- ✓ An interesting insight is that the range of articles before the paywall is much more diverse than behind the paywall (although they still have an overproduction of Update Me articles)



! 70% of stories are 'Update Me' but bring less than 10% of pageviews

! there is an opportunity to attract more people via 'Educate Me' pieces

- ✓ Since we want to get all the data from all the audiences they reach we focus on the free articles and the way more variety of user need stories will help them bring in the right audience to engage with and to eventually converse to an online subscriber.
- ✓ From our initial deep dive (the first 1000 URLs we scanned) we saw that although they fit the brand very well and are known to foster loyal audiences, Educate Me articles are not made a lot.



! Just 24 (<5% of total) free stories in 'Educate Me' bring 70% of the pageviews

! 'Educate Me' bring the highest % of SEO

how we did it

3 initial assignments

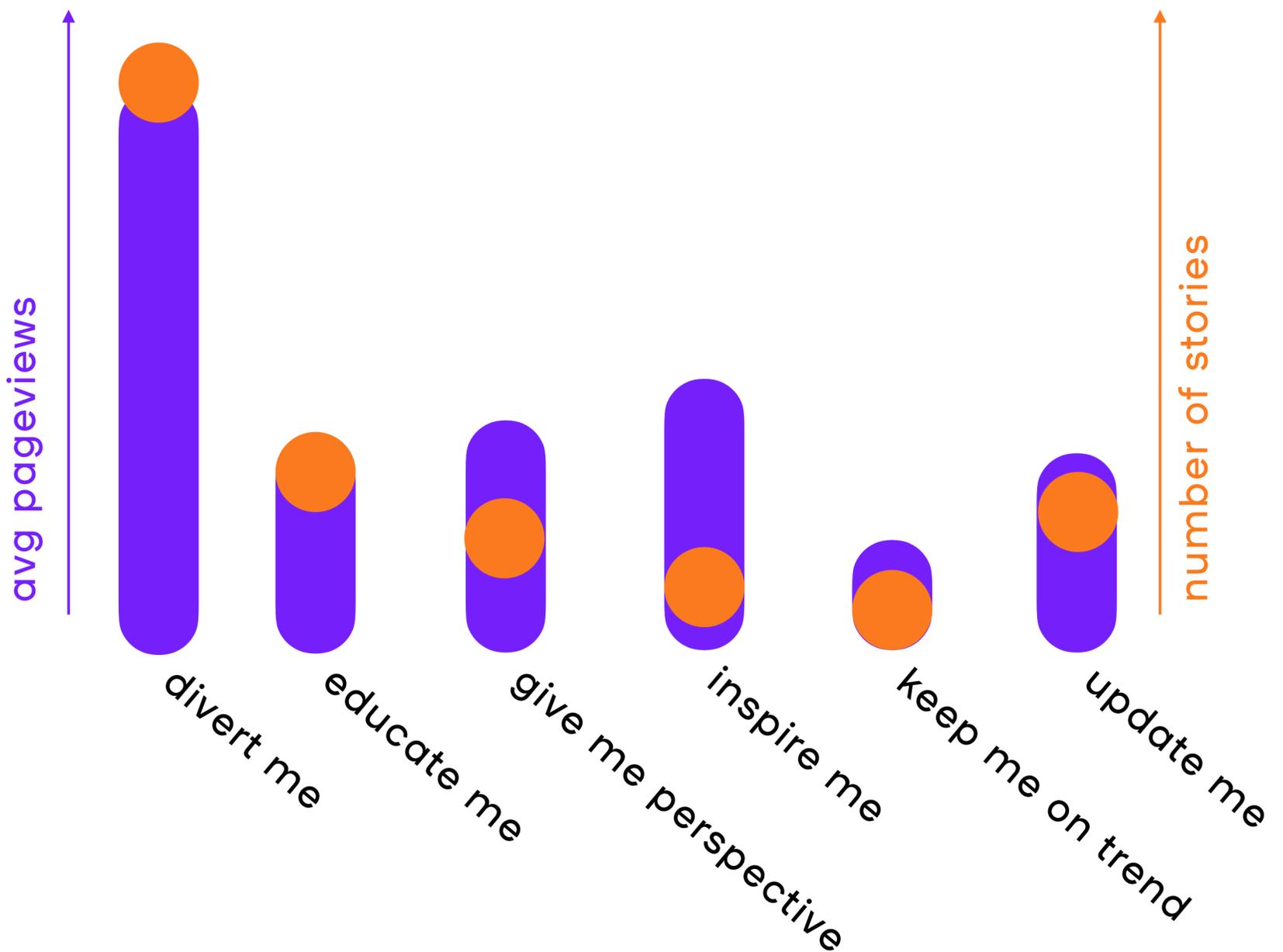
This is what we assigned the clients to do during their growth hacks:



- Get a better mix of user needs (related to the 3 main sections functional, contextual & emotional)
- **Keep Me On Trend** articles had the highest average pageviews. This is something Omroep Brabant should take advantage of. Create more of them.
- The fewest number of articles were produced from the **Educate Me** perspective, but they brought in the most loyal audience. Create more articles from this perspective.



- Better mix of user needs. There was an overproduction of **Divert Me** pieces: IDN Times should consider mixing the various user needs more and take a closer look to the topics they cover to see if there's a significant relation between them.



- Create more **Inspire Me** stories: Inspire Me stories have a higher engagement level as well, therefore it's a very promising user need to explore more.
- Learn more about and benefit from understanding the relation between topics and user needs.

DeMorgen.

- Create more **Educate Me** pieces, which were tremendously popular among non-paying customers. In addition to having the highest pageviews, they also brought in lots of search traffic.
- More **Divert Me** articles for non-paying readers: they bring a lot of traffic from social and the highest level of read depth, indicating intent.
- **Give Me Perspective** is top heavy - reduce the amount of articles to get in a better mix of user needs.

results

results

results for all clients

We went into the Triple N project with several hypotheses and this chapter is going to unpack the findings on each of them. They are meant to be as practical and as actionable as possible, so other media organisations can easily extract value from them by discussing or even applying their findings with their own output.

1 We wanted to create an algorithm that would identify different user needs.

Identifying user needs automatically opens up all sorts of useful avenues for publishers, editors, producers, business intelligence specialists, data scientists and even sales teams. User needs information can power many useful things - from tags inside content management systems to smart, actionable notifications sent by smartocto to your editors and reporters to finetune coverage.

This hypothesis was proven, but not fully - at the present state, the user needs algorithm is able to discern between three types of user needs, where Update Me and Keep Me on trend are united into one category - functional, as are Educate Me and Give Me Perspective - contextual, and Inspire Me and Divert Me - emotional.

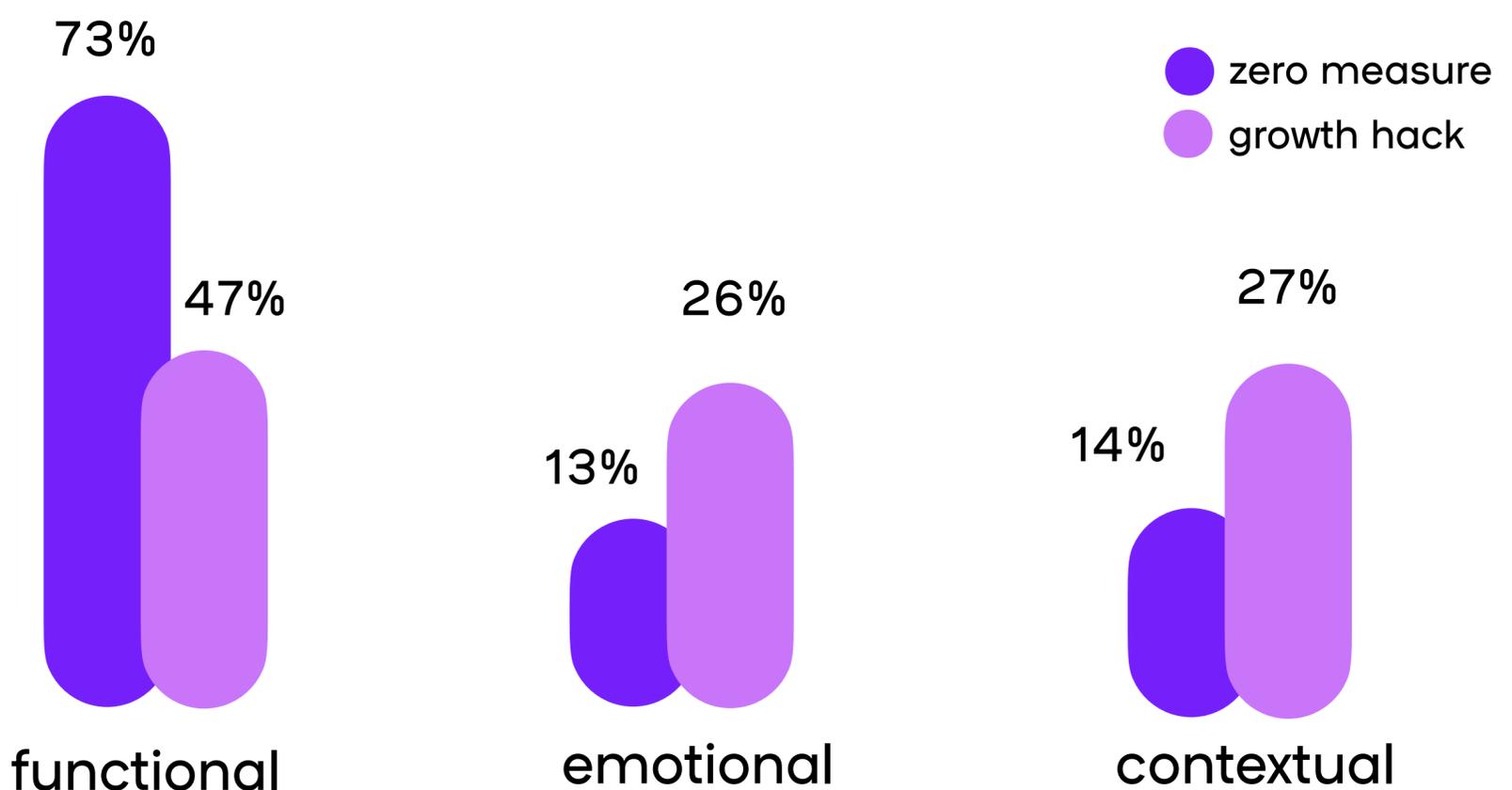
Automatically grouping content into three user needs buckets is a promising start, and a good base to build from, although achieving correct categorisation results with high confidence scores with all six user needs proved much trickier to achieve.

Smartocto's efforts to bring machine learning solutions to benefit publishers' workflow and ways of working should be seen through the lens of a wider trend in the sector to effectively introduce AI/ML into digital publishing. For more similar initiatives, go to JournalismAI (LSE's Polis and Google initiative) website, [curating most interesting use cases in media](#) - from ethics and newsgathering to automation and fact checking.

② We wanted to confirm ongoing **misalignment** within general output and user needs ratio based on audience engagement

We never doubted - based on extensive experience in other newsrooms across the world - that user needs-based commissioning is the right way for publishers to go in order to drive growth and engagement. What we know is that most newsrooms tend to overproduce Update Me articles, where in fact other user needs offered better returns on investment.

Having worked with our partners, we saw a better user needs mix once newsrooms adopted a user needs approach - and that also translated into better audience metrics. For example, Omroep Brabant tracked the changes before and after the growth hack:



Source: Omroep Brabant

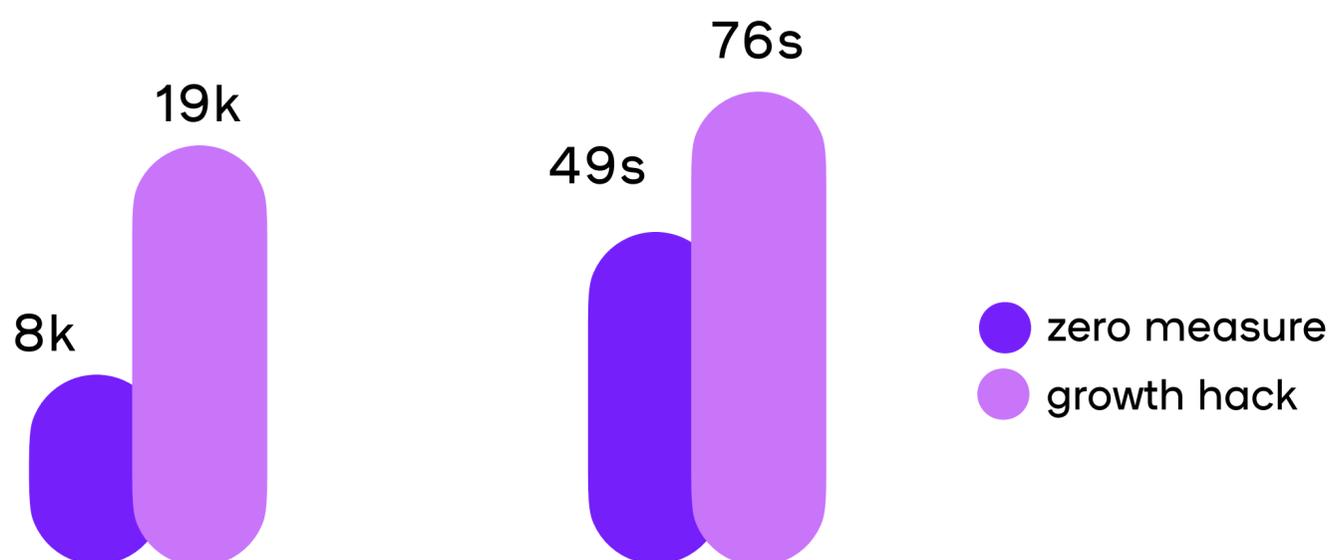
Specifically, we identified several potential areas for growth based on our 'zero measure' exercise, where we analysed three months' worth of data from each of the participating publishers. The picture was almost always the same: non-Update Me users needs offered better engagement opportunities. Those were passed on to newsrooms to build several growth hacks around.

③ We wanted to prove that once identified, user needs-based growth hacks will lead to better audience engagement, in both reach and engagement terms

In the case of Omroep Brabant, we suggested investing more time in Give Me Perspective articles that were identified as a growth opportunity during their zero measure analysis. And indeed, the average page views in that category rose from 8k to 19k per article, with an increase in read time from 49 to 76 seconds per piece.

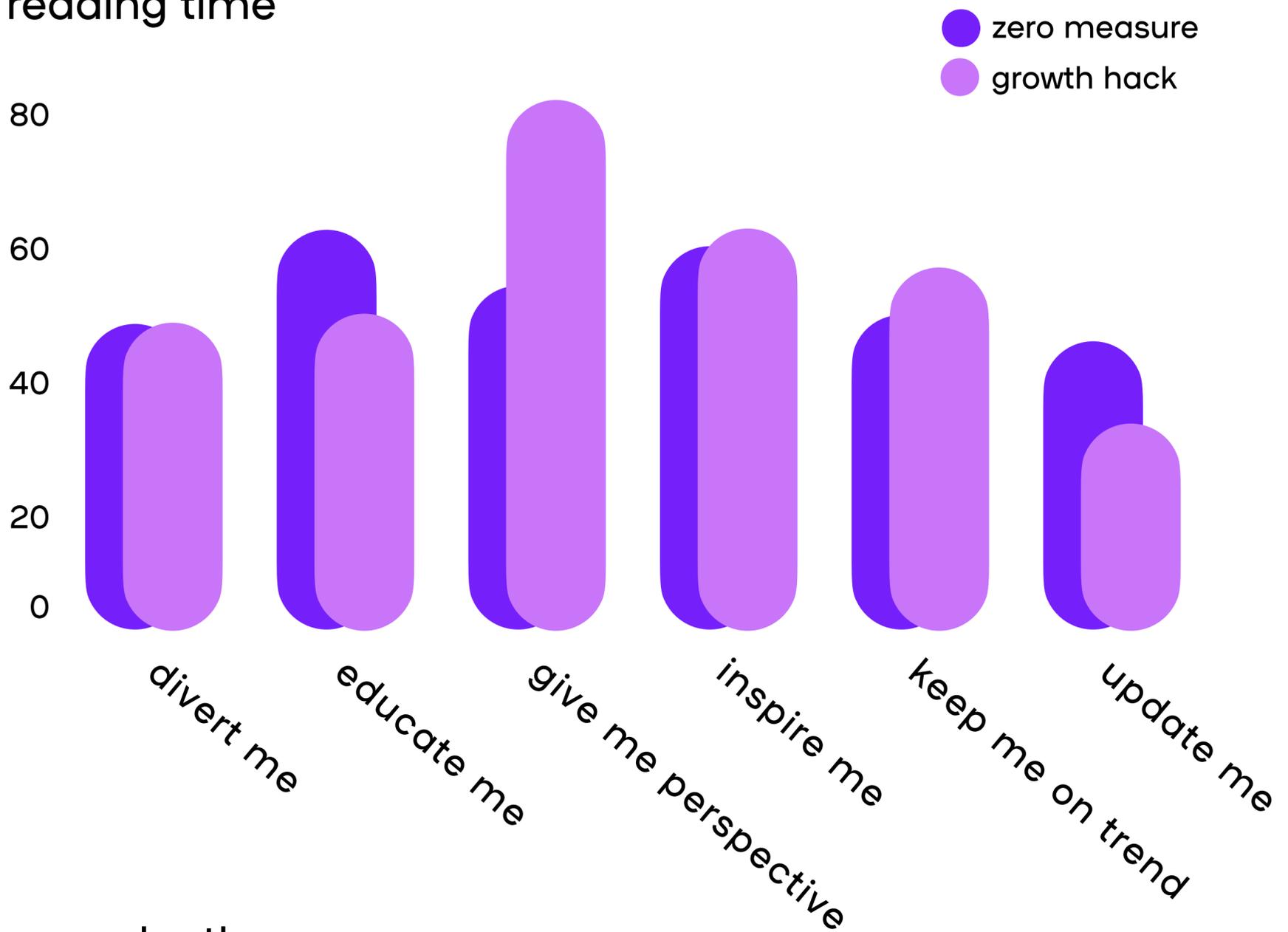
avg pageviews

engaged visitors

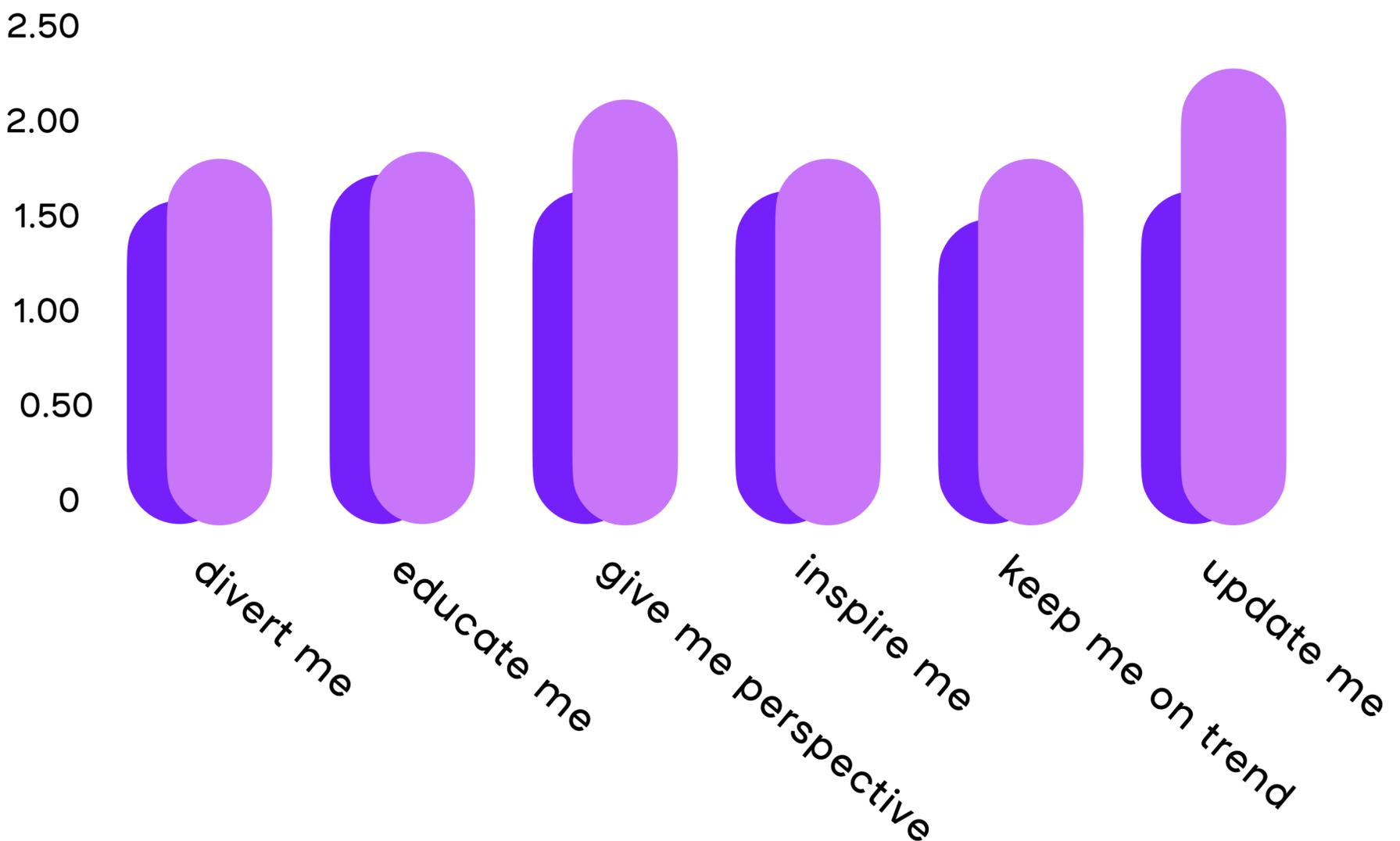


A more concentrated effort in applying the user needs methodology contributed to engagement growth (reading time, page depth and page views) across the board (apart from Update Me articles) as you can see on the slides below.

reading time



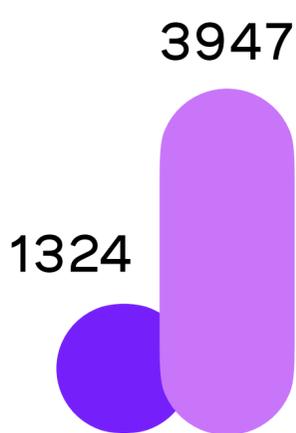
page depth



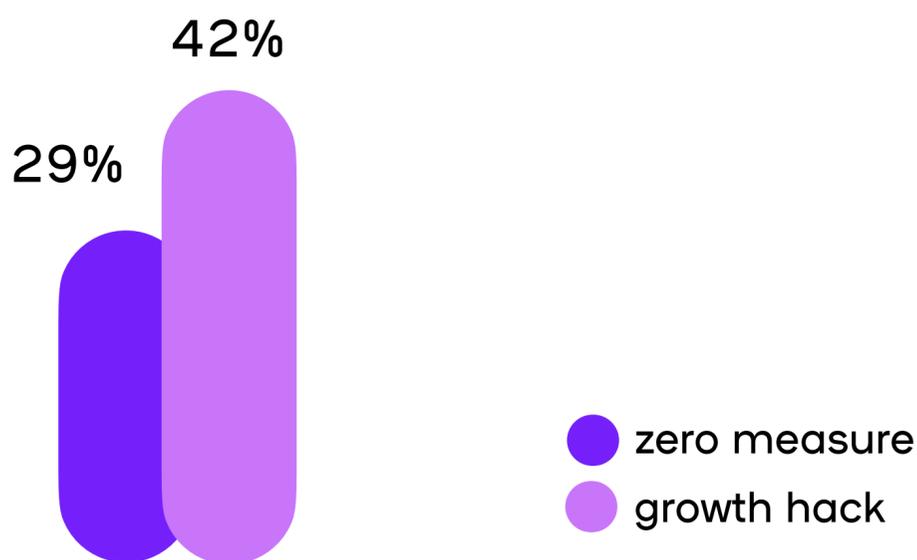
By producing more Educate Me articles (based on the hypothesis that it would bring more search traffic), Omroep Brabant achieved exactly that, driving its search referrals from 13 to 20%. Direct users seemed to enjoy more content satisfying this user need too, with internal traffic (i.e. readers who arrived at a given article from elsewhere on the website) to those stories growing from 9 to 60%.

In the case of IDN Times, a similar picture emerges. IDN Times bought into the user needs centric commissioning model and started tracking its production inside its CMS. Based on zero measure analysis, it was suggested that the website's audience would be interested in Keep Me On Trend stories and that focusing on that user need was proposed for their growth hack. The results confirmed the hypothesis - Keep Me On Trend articles grew in average page views per story and brought in more engaged visitors to the site.

avg pageviews



engaged visitors



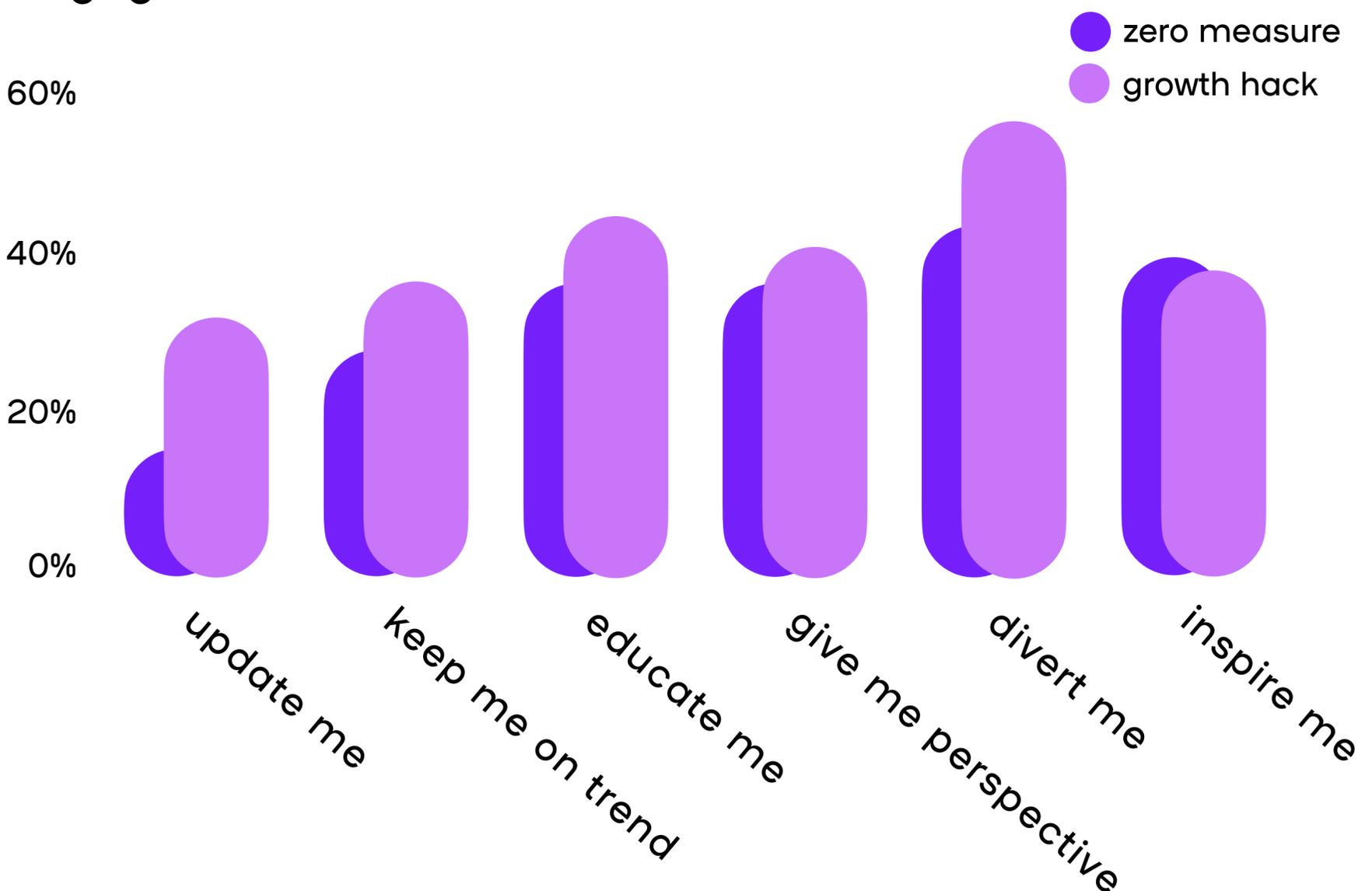
keep me on trend

keep me on trend

General diversification of content based on a variety of user needs (another recommendation of the zero measure analysis) also paid off, as seen in the table below, a better mix of articles resulted in substantial growth in loyal audiences.

	Zero measure		Growth hack	
User Need	% of Engaged	% of Loyal	% of Engaged	% of Loyal
Update me	17%	3%	33%	5%
Keep me on trend	29%	6%	38%	4%
Educate me	38%	10%	46%	8%
Give me perspective	38%	9%	42%	6%
Divert me	45%	8%	58%	4%
Inspire me	41%	5%	39%	8%

engaged visitors



4 newsrooms are stymied by their reluctance to accept and activate change management

Going into this project, we were aware that there was a gulf between the ideas which underpinned the News Needs Notifications foundation, and the reality of life in a newsroom.

There will - and should always be - a healthy conflict between editorial gut instinct feel of journalists, and the data-driven guidance issued from editorial analytics systems. The latter has become more nuanced, detailed and user-friendly. It's now easy to see, through simple and illustrative graphs and charts when a story needs additional attention, an alternative headline or better positioning. In the case of smartocto we go a step further to offer precise and predictive analysis as well as actionable notifications, which have enabled our clients to write better stories, identify and publish follow-ups or consider different perspectives and topics.

That said, these systems - while groundbreaking - break into a long-established creative process that's closely connected to journalistic autonomy. More work may be needed to bridge the gap between theory and reality.

As the saying goes: trust comes on foot and leaves on horseback. These things matter. The responsibility lies in part with newsrooms to facilitate and instigate the kind of change management required to take such a step, but SaaS solutions such as ours also have a responsibility to communicate with newsrooms in order to understand where these breaches in trust are occurring so we can proffer assistance during this process.



1 most interesting insights

- Even the most basic zero-measure analysis on its own can be illustrative - and transformative. Most newsrooms aren't aware of the imbalance of their content types when categorised by user need.



This is something all newsrooms can do right now. Take some time to look at the balance of user needs - is there a tendency to over-produce one type? Even just this information can be a huge eye-opener.

- The widespread 70% / 7% user need to engagement ratio has been changed across these three publications since adopting.



A better balance of user needs is beneficial - but there's no single 'right' answer. All newsrooms have a different brand DNA. Producing more 'Educate Me' articles might work for you, but not for your competitor. Find out which stories translate into the best engagement (and on which channels) and make these findings a key part of your strategy.

○ Growth hacks resulted in better audience engagement.



We organised growth hacks with our three clients. You can workshop this too. All you need is a benchmark of where you're at and a plan of where attention needs to be placed. We worked on a growth hack period of a month - the time period may vary, but you'll need sufficient data in order to be able to judge the efficacy of the strategy.

○ The three broad categories - Emotional, Functional, Contextual - created firstly out of necessity have proven to be a workable, simple and accurate assessment of how to broaden content commissioning and are an easy-to-follow prescription to diversify news coverage.



If you're finding it difficult for starters to analyse 6 different user needs (perhaps because your newsroom isn't familiar with the user need approach yet) try the Omroep Brabant plan of attack and combine user needs to make things less complicated - it's still a very useful way to start improving your story output.

- IDN Times and Omroep Brabant took full advantage of the learnings gleaned from the growth hacks and both came up with new ways to help their respective newsrooms or audiences with the impact of the user needs.

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octo

There's no one way to use user needs. What you do with this information is limited only by your imagination. The real low hanging fruit is in the following up of Update Me stories that already have a serious amount of impact. If the newsroom is able to stretch the interest of the audience by simply creating follow ups based on the user needs you'll see that more engagement, loyalty and reach will fall at your feet.

additional initiatives

At IDN Times they learned that their audience were in fact so connected to various user need stories that it made them decide to go further and create newsletters and even separate sections on their website. For each user need they've now created their own URL-section (i.e. <https://www.idntimes.com/tag/educate-me>) to present all the articles they've written from that particular perspective.

IDN TIMES

#RAMADAN TANYA JAWAB NEWS BUSINESS SPORT TECH HYPE LIFE HEALTH TRAVEL

Trending

10 Kebaya Ivy Batuta dari Klasik sampai Modern, Ningrat Dipandang!

EDUCATE ME



2 Juni 2021 | Science

6 Kenyataan Pahit jika Hidup di Masa Romawi Kuno



2 Juni 2021 | Life

5 Alasan untuk Gak Ragu Merintis Usaha Kecil-kecilan



2 Juni 2021 | News

Ini Deretan Tokoh Nasional yang Lahir pada Juni



2 Juni 2021 | Life

6 Cara Membangun Reputasi agar Orang Makin Yakin padamu

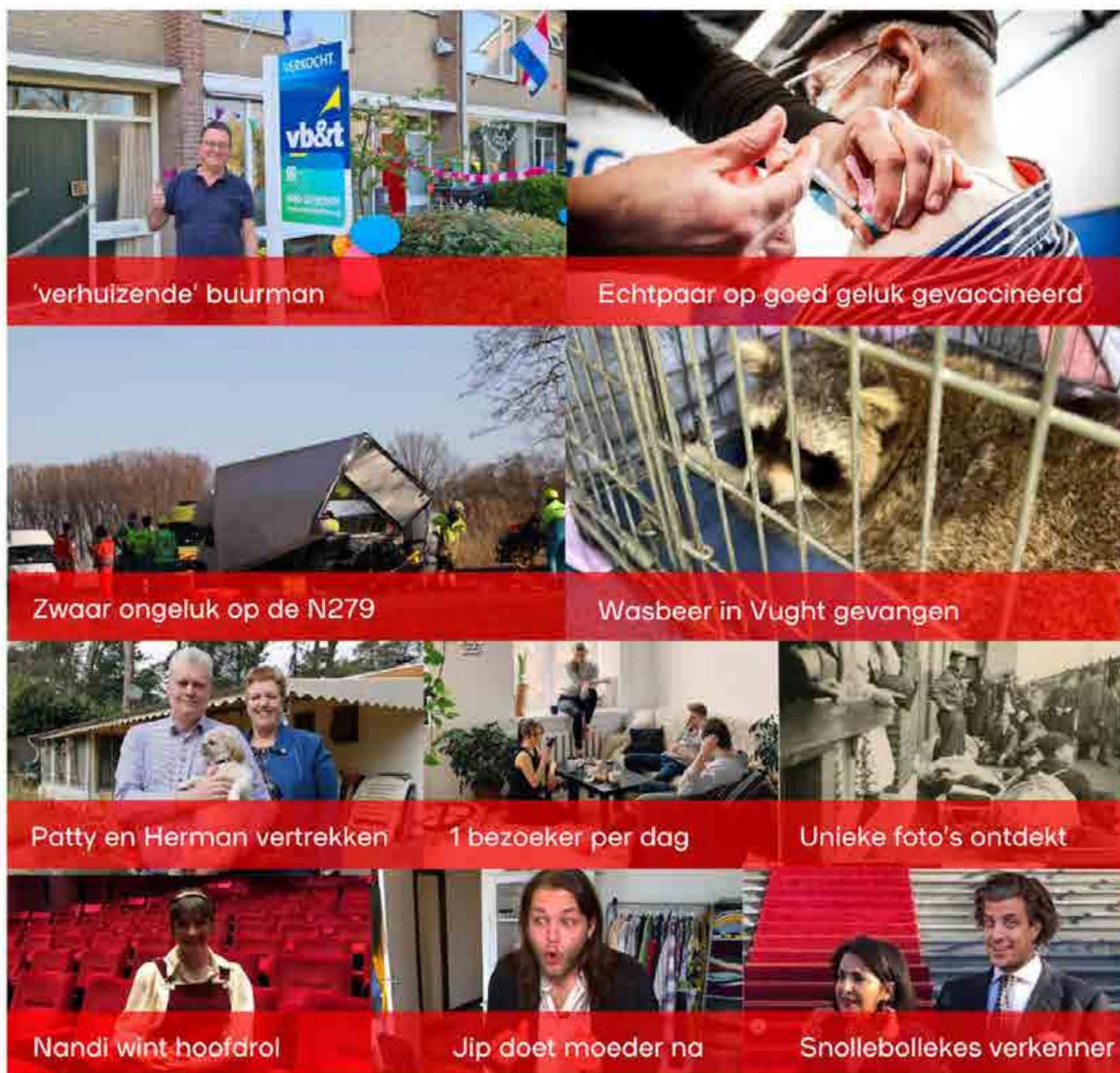


2 Juni 2021 | Food

5 Inspirasi Menu Makanan Nikmat dari Salmon dan Alpukat yang Istimewa

Omroep Brabant wanted to learn more about the way they use images that go together with the user needs. So they've created a 'moodboard' to look at the overall aspects of various images and if they could recognise a trend in the best performing photo's in relation to the various needs. This is still work in progress but it's of course a very interesting way to take the user need approach even a step further. One thing they noticed is that Emotionally labeled user need stories tend to have more (close) pictures of people. Which is maybe an open door but it helps to determine which photo goes best with which article.

Emotional user need Top 10



2 opportunities for further study / research

- Newsrooms need further help with change management.
- A great need for formats to be connected to user needs
- More work needs to be done convincing newsrooms about the necessity of follow-ups - and follow-ups addressing other user needs in particular.
- There's a definite relation between user needs & topics - and getting the insights and benefits from that are easy pickings.
- Notifications can always be more specific & precise - and a big part of that is ensuring that they're presented to the right people, with the right tip, on the right story, at the right time. We will continue to work to understand the flow of the newsroom better, and in doing so we'll become even more accurate with the actionable insights we deliver.
- Feedback is crucial. We want to understand what the impact of creating a follow-up based on a particular notification is.

Did it help support and bolster business goals?
How effective was it? We're always in search of clients who want to develop such a feedback-loop with us.

Maybe that's you!

final thoughts

final thoughts

The newsroom ecosystem is changing. Different ways of consuming news has forced the hand of publishers to quickly address the way their businesses are modelled, structured and delivered.

There have been numerous attempts to navigate a clear path through this new world, and some have been more successful than others. In our (both smartocto's and Dmitry's) conversations with numerous newsrooms over the past few years what has always been clear is that the commitment to deliver on the underlying function and premise of 'news' has not waivered. Even in the face of cuts and a dramatic change in distribution methods, publishers are committed to this.

This project was borne from the understanding of this new era: that newsrooms' central function must also reflect the users' changing patterns of behaviour and consumption - and all too often there has been a mismatch between the two.

By aligning a fairly unimpeachable approach to content commissioning with a data-backed system of notifications, it was our hope that we could demonstrate that it is possible to make the move towards a more efficient and efficacious output a realistic proposition - no matter the size, scope and remit of a publication.

Applying a user-needs-rich approach to your newsroom starts with opening lines of communication: between user and newsroom, between editorial and data, between management and bullpen. The zero measure reports we conducted at the outset here are fairly simple to conduct and are worth their weight in gold. As the adage goes: you can't manage what you don't measure.

This is the place for all newsrooms to start. The approach we've outlined above is easily transferable, and we encourage you to begin here, now. Even just knowing how your output is balanced can be transformative.

The notifications system that we created from these data sets and with the cooperation of Omroep Brabant, De Morgen and IDN Times have proven to be indispensable in taking those baseline readings and transferring them into a plan to improve output, engagement and efficiency.

At a time when everyone is under such scrutiny, this is an easy, transparent and effective way to better build the loyalty and support of your readers.

And ultimately, isn't that the point?

what the **journalists** have to say



"The user needs method helps us journalists to put ourselves in the reader's shoes. Of course we make the first news story anyway, but what do we do after that? Coming up with an original follow-up story becomes easier if you know in which directions you can think. The model helps to get the most out of a subject. We shoot less with blanks now: but rather approach a subject in several ways and come up with distinctive stories - and it works"

Marjanka Meeuwissen
commissioning editor @ Omroep Brabant

"The user need approach enables me to explore one single topic/event/story more widely - and it helps me to sharpen my creativity and my critical thinking. It adds excitement in the work process, since I know now that there will always be something more to dig out. In my opinion, the value of this approach lies in fulfilling the needs of users, not only a single user, but everyone as whole."



Bayu Dwityo Wicaksono
creative editor @ IDN Times

now
use
them!

actionable user needs

triple**n**

news•needs•notifications

smart**ct**

credits

big thanks to



DeMorgen.



Tim Zunneberg

Roy Wassink

Yogi Fadila

Renzo Veenstra

Sam Feys

Lody Trepels

Ton Mallo

and all the editors involved

the project people

Dmitry Shishkin

Bojana Soro

Em Kuntze

Dragana Trivanovic

Erik van Heeswijk

Ilija Susa

Jacqueline Woudstra

Marina Pantelic

Rutger Verhoeven

Ognjen Zelenbabic

Willem-Joop Lagarde

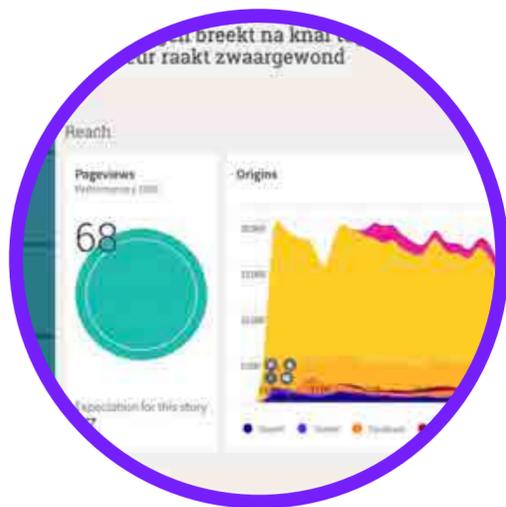
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smartocto **editorial suite**

supporting over 300 newsrooms

We imagine that smartocto is sounding pretty exciting to you now. If you want even more of this 'wow feeling' (and why wouldn't you?), here's some more info about the actionable features we're so well known for.

The best way to learn about all this is to sign up for a demo. We're more than happy to show you smartocto in action and answer any questions.



Realtime

story view on impact and engagement



Insights

reports builder and insights based on CPI



Tentacles

headline testing and notifications



Waves

modular bigscreen supporting multiple metrics



Smartify

making your systems predictive & actionable

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