Implementing public values in recommender systems and applying blockchain technology for the Nederlandse Publieke Omroep.

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19-04-2022

Introduction

The Nederlandse Publieke Omroep (NPO), is the national broadcaster in the Netherlands. They own a vast variety of smaller and local broadcasters and are prevalent in the Dutch tv and radio landscape. By law, the NPO is mandated to provide a diverse array of media, all serving a social purpose. This means that not only should the content be diverse, but it also should be of high quality and be accessible to all social groups in society. The NPO is divided into two layers; the NPO foundation and the public broadcasters. The former is the organization behind NPO, responsible for the division of airtime and the on-demand platforms the NPO provides. The latter are the broadcasters in charge of the actual production of content (Rijksoverheid, 2022). As the NPO is a state-owned company, they must abide by a set legal framework, such as not being able to make a profit off its activities. This brings complexity to their operations, as their commercial counterparts can exist outside of this framework and optimize their platform to conform to customer needs, often making them the preferred streaming service (Afilipoaie, Lordache, Raats, 2021).

As the NPO highly values innovation and wants to stay relevant and connected to their consumers, their organization has posed the challenge of re-innovating their recommender system on their streaming platform, NPO Start, as well as seeking a purpose for NFTs within their ecosystem. A recommender system assists consumers with their choices. NFT's are unique online entities that can be traded and/or sold. It is important for the recommender system to improve to meet consumer needs, while staying objective and pluriform, offering consumers different views from different creators. The NFTs could bring a great sense of innovation to the NPO that their competitors have not yet adopted, and drive consumer loyalty through heightened engagement.

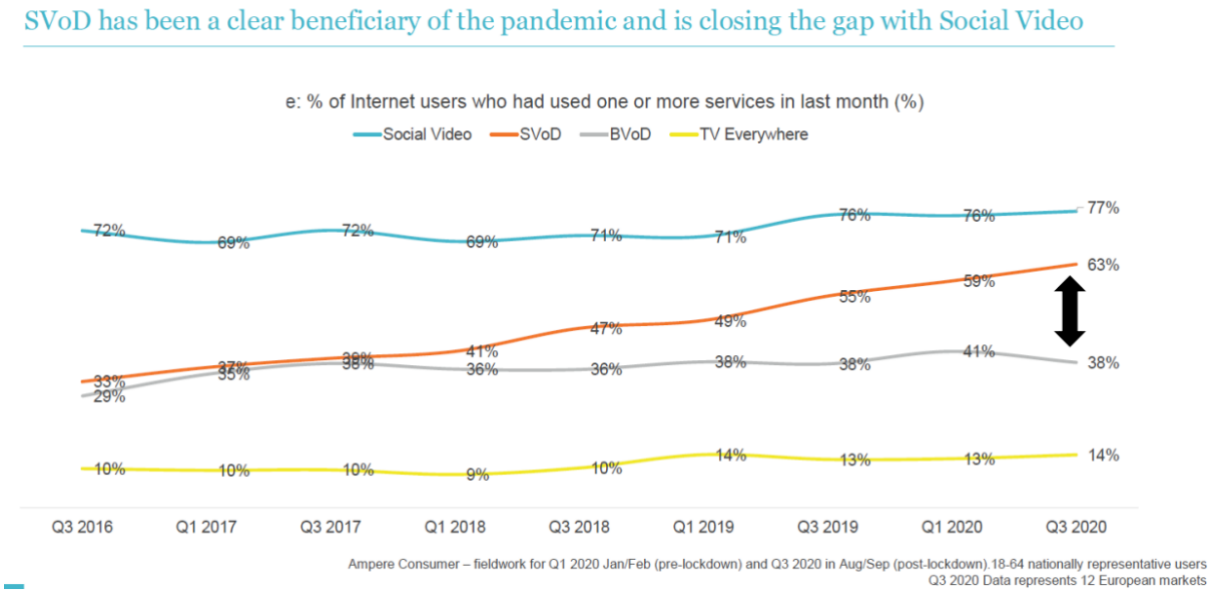
The first part of this document will describe the workings and application of a newly designed recommender system within the NPO and discusses the validation through testing and the results and point for further discussion. The second part explains a new business stream based on NFTs, and how, without monetary incentive, brings extra value to their streaming platform. This both with the main focus of answering the leading research question; to what extent can implementing the new technologies of a recommender system and NFTs help the public broadcaster NPO to better compete with commercial streaming services such as Netflix?

Context

The research process takes place in Utrecht, the Netherlands. The target groups investigated in this research are Zoomers (generation-z) between the ages of 18-24 and Millennials (generation-y) between the ages of 36-42. This takes into account the pluralistic (multicultural) society and different norms and values. With the shift from central platforms to the individual, there are challenges and opportunities to reach and engage the end user. Interactions and actions are more personal and ethical, the user decides. Channels and services are tailored to users' media use. It is important that this is accessible, findable and recognizable.

Problem Definition

NPO, being public media, wants to incorporate one of its core values, pluriformity, into all of its channels, including the creation of original content. NPO broadcasts content from thirteen broadcasters along with added content available on their streaming platform, NPO start. Through the briefing of NPO, a myriad of challenges came to light. For example, research by NPO (2020) shows that 40% of the visitors on NPO start do not find anything to watch and leave the platform. In addition, as many as 98% of visitors leave the platform after one consumption. Leaving them to cope with issues such as consumer loyalty and engagement.



As can be seen in fig 1. above, TV everywhere has fewer users than subscription video-on-demand (SVod) and broadcast video-on-demand (BVoD). This has incentivized public

broadcasters to focus on innovation, and making sure their services are compatible with those of their competitors. From these preliminary insights, the following research question has been formulated: to what extent can implementing the new technologies of a recommender system and NFTs help the public broadcaster NPO to better compete with commercial streaming services such as Netflix? In this whitepaper, a two-part solution containing both a new recommender system and the possible implementation of NFTs will be researched and evaluated.

Recommender systems and public values

What are recommender systems?

Recommender systems (RS) are widely used software tools that provide users with items that are predicted to most likely be of interest to them (Burke, 2007; Resnick et al., 1994). The term *item* denotes what the system is recommending to the user (Ricci et al., 2015). The definition ranges from online content like movies (e.g. Netflix, Amazon Prime), music (e.g. Spotify), videos (e.g. YouTube), websites (e.g. Google), to physical products (e.g. Amazon), to services (e.g. Booking.com), jobs (e.g. LinkedIn), and people (e.g. Facebook). An RS is in place to assist the user in finding an item by presenting them with a selection of items that are likely to attract their attention out of a large and incomprehensible dataset. To adequately assist the user in this process, data about the user and their behavior are being collected to make better predictions about them in the future.

The purpose of this approach is to increase user satisfaction by optimizing the user experience. Much of the literature in academia, as well as commercial companies focus on increasing the accuracy of item prediction by personalizing the RS through data feature engineering (Burke, 2007; Gong, 2010; Gorgoglione et al., 2019; Li et al., 2013). It is, however, now well established that the accuracy of an algorithm only moderately accounts for the user experience in RS (Knijnenburg et al., 2012). Knijnenburg et al. showed that subjective system aspects and experiences are indispensable for explaining an RS user experience.

In contrast to commercial companies that aim to maximize profit, public service media like the NPO has different objectives. Their interest lies in informing the public and providing them

with unbiased information and diverse political opinions (Council of Europe, 2022). Therefore, tweaking the algorithm to keep the user in the same loop of content or topics they are already interested in could be contradicting the values that the public service media is set out to follow. The following chapter talks about how values relate to an RS and how it can be designed with and for the stakeholders by unifying their needs and interests to optimize the user experience.

How do values relate to recommender systems?

To design an RS that optimizes the user experience, important values and stakeholders were mapped in a value-sensitive design workshop with Marlies van Steenbergen. By visualizing values and stakeholders in a grid, the harms and benefits to the direct and indirect stakeholders were made more visible in the design process. The values that could be identified for the NPO are:

- Pluriformity
- Enjoyment & Satisfaction
- Privacy
- Autonomy
- Equality
- Public Debate
- Accurate Recommendations
- Transparency
- Diversity

The direct and indirect stakeholders that could be identified for the NPO are:

- Creators
- Users
- Commercial Partners
- Government
- Broadcasters
- Society
- Data Scientists

The pluriformity of the media offers by the creators and broadcasters, as well as the enjoyment and satisfaction of the user and society stuck out as important factors in creating an RS for NPO Start. Pluriformity in this context is defined as offering a range of diverse content to the public sphere with

the intention to strengthen the local language and culture, help inclusion and societal cohesion, foster democratic processes, and reflect diversity in opinions and worldviews. At the same time, enjoyment and satisfaction of the user and society are indispensable for keeping them engaged and keeping up with the for-profit competition. NPO Start is already doing a good job providing pluriform content on its broadcasters. To translate this pluriform aspect into the RS and keep the selection of content balanced for the user, the content pieces on NPO Start will be categorized by theme to give the user easy access to different providers of content about the same topic. With this approach, users will have the possibility to choose the theme they are interested in (autonomy) while choosing from a broad range of content producers (diversity).

In order to start the design process, two conflicting user groups with different needs and expectations were identified to make sure to create an RS that suits a variety of stakeholders' needs. The first user group that was identified are Millennials (older Gen Y) between 36 – 42 years old. The second user group are Zoomers (older Gen Z) between 18 – 24 years old. Through interviews with both groups, information about where and why they use NPO has been gathered. Zoomers mostly experience NPO content on social media (e.g. YouTube, Instagram, TikTok, Facebook, etc.) and most commonly on a mobile device (e.g. Smartphone) to look for entertainment, actuality, convenience, intellect, and accessibility. Millennials, on the other hand, mostly access NPO at home from their TV (on demand), with their provider (e.g. KPN, Ziggo), their laptop or computer, or from their NPO application to look for intellectual conversation, culture, trustworthiness, accessibility, respect, and actuality.

Designing for recommender systems taking values into account

Process

Based on the previously mentioned values (pluriformity, privacy, enjoyment, satisfaction, etc.), concepts for a new recommender system for NPO Start were developed. Actively keeping in mind the two defined target groups: Zoomers and Millennials. Each target group has different needs and preferences. At the base of the developed concept for each target audience is the core focus that drives the content generation for the recommender system. Then, two different concepts were designed for each target group, which were tested and iterated upon. Each concept has been differentiated to fit the needs of the target audiences. To validate the

assumptions made about the preferences of each target audience, both concepts were tested on both target audiences.

Core Focus

The core focus of the developed recommender system is providing users with a variety of world views and journalistic insights. The driver behind this concept is the Tegenlicht Archief van de Toekomst algorithm, owned by VPRO. This algorithm goes through media made for television and categorizes and splices the content into smaller chunks, even within episodes. The algorithm provides labels of a societal nature. The implementation of this concept will only include journalistic shows and institutions. This will provide the target audiences with an omnifarious supply of opinions and angles served to them in an arbitrary order.

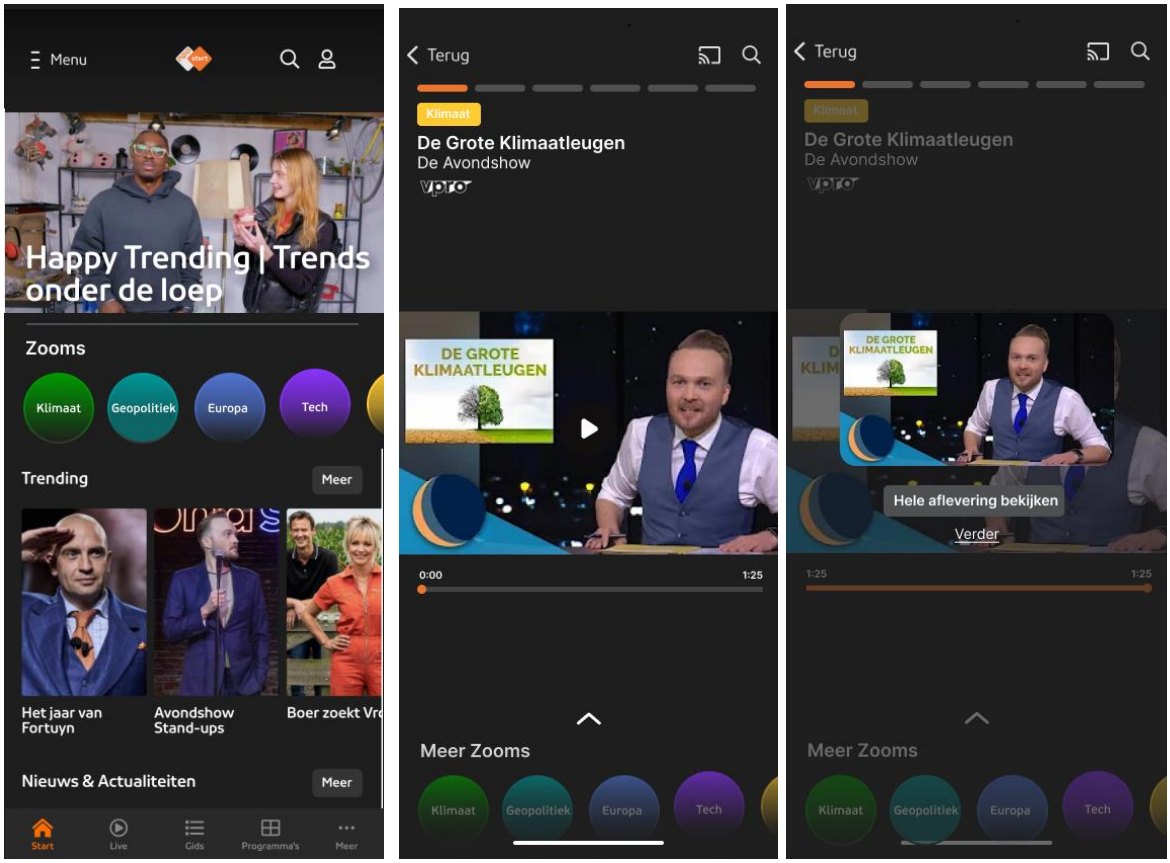
The content will be NPO-owned television content in widescreen format, but can also be content made specifically for 'story' functionalities within other applications (e.g. NOS Stories on Instagram or TikTok). The goal is to turn slow content into shorter and consumable content for the fast and digital-savvy generations. The clips will be labeled by one or more of the following themes:

The topics will be presented in so-called *Zooms*, comparable to story functionalities in other social media. The users select a topic of a *Zoom* they are interested in from the home page and will be provided with short content based on that topic. The *Zooms* will be 10 to 15 minutes long and will consist of several clips of 2 to 4 minutes of different shows and broadcasters. This will conform to the pluriform standards within NPO Start where users are provided with various world views.

Application Concept Generation Z (18 - 24 years)

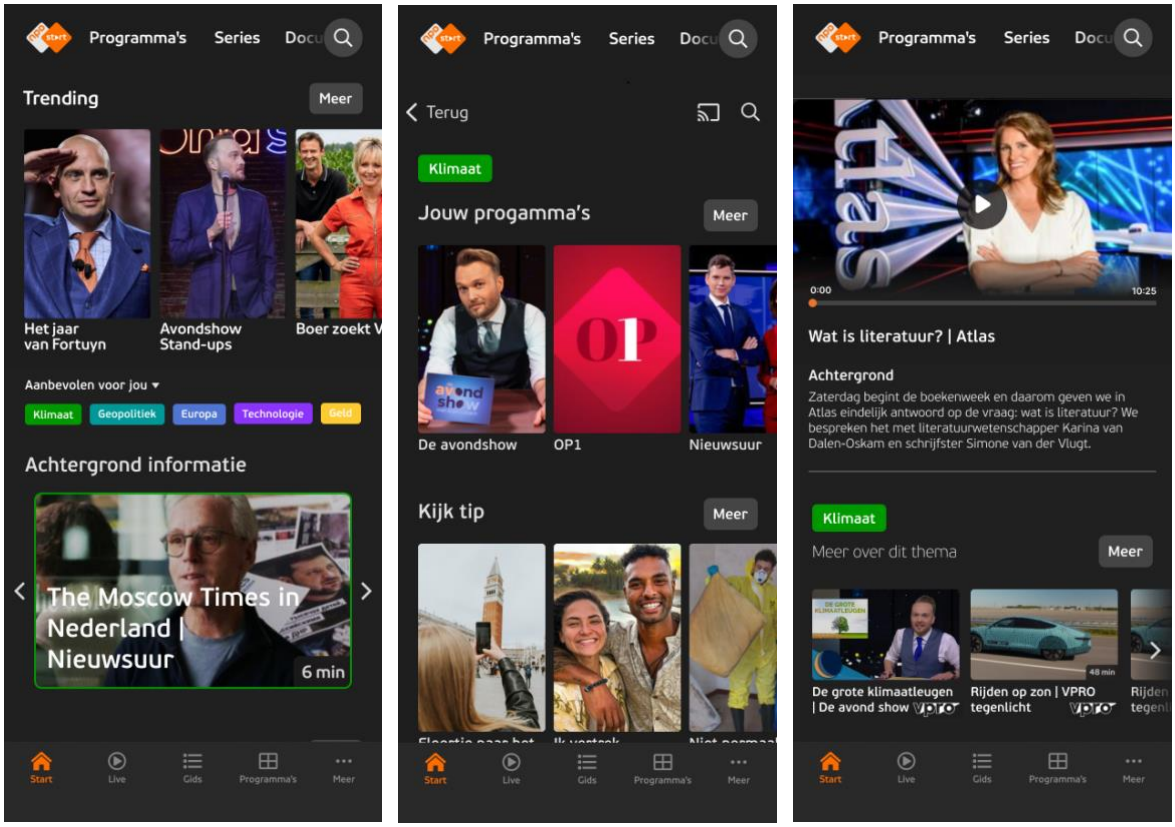
Primary research has shown a strong preference of Generation Z to use the mobile phone as channel, hence the choice of a mobile-first approach when designing the recommender system. In this case, the concept has a focus on making the content consumable through *Zooms* that each address a topic. Based on the viewing history and labels of each program and video, the topics that the user watches the most are automatically displayed.

Several iterations were made to bring this concept to life, each with a different take on how to best show the snippets of content and foster the pluriformity NPO is known for. These iterations can be found in the appendix. Through research, interviewees unveiled that they would be very interested in seeing different opinions, as opposed to the familiar digital environments they reside in. The target audience additionally stated that they currently only consume television shows like “Wie is de Mol?” and “Boer zoekt vrouw” on NPO start, but that they do share an interest more serious content as well, especially fast-paced journalism. For the final iteration and the proposed solution to the problem, inspiration was taken from the ‘story’ modus often used in applications that are also used by the audience. The aim of ‘story’ modes is to present content in a snackable format that also offers quick multi-media interactions like video sharing, switching to other videos, and quick filtering through content. This feature is implemented to provide users with said fast journalism, simultaneously allowing them the option to consume entire episodes of shows, if desired.



Application Concept Millennials (36 - 42 years)

For the millennials, the mobile phone was also selected as initial research reported it as the preferred device of consumption. Again, a mobile-first approach was deployed to design a recommender system. The concept for this target group focuses on showing longer videos that dive deeper into a vast array of topics. The user automatically receives recommendations of longer videos linked to several topics based on viewing history. This is displayed in a way known to NPO Start users, namely a tile-based layout. In addition, programs are also recommended according to an already familiar recommender system, seen in big competitors like Netflix, etc. This has been devised to focus on the content of the recommendations on display.



Validation

Each concept was tested two times. A total of six (n=6) individuals were gathered to test the concepts. The first test was conducted with each corresponding target group. The first iteration ensured that both concepts were validated with both target audiences. This showed that each concept came across as clear and straightforward. Few adjustments were made to better match the design to the needs of the two target groups (See appendix A). The validated concepts were clear to the user groups but were unclear when implemented together. Therefore, for the second iteration, the concepts were tested again with both target groups. The results of these tests were interesting. For example, the Zoomer respondents indicated that they preferred the ‘Zoomers’ design. When testing both concepts with the Millennial target group, it turned out that they also preferred the ‘Zoomers’ concept over the one designed specifically for them. However, feedback was provided regarding an option in the *Zooms* that would allow them to continue watching the longer video. For the new design, this was adjusted and it became the final concept. This fits both target groups and is therefore accessible to multiple generations.

What is the added value?

The final concept has several unique selling points that increase the added value of the concept. The concept creates a unique NPO platform in which users can move around the application in a user-friendly way. The content they are shown is filtered by subjects the viewer often watches or likes. Besides the accurate way of recommendation, this also contributes to maintaining the privacy of the user, because every video or program already contains a certain tag proved by the algorithm. Thus, the recommender system can already make a recommendation based on this, and little or no personal data is needed. Based on testing and the iterative process, a concept that appeals to multiple generations and meets their needs was developed. Also, the concept and especially the subdivision into topics provide more transparency about the NPO content. This is because a user can quickly find out which shows, or videos, are linked to a topic they find interesting and which broadcaster produced it. All in all, this ensures a recommendation not only on viewing behavior but also on content.

Discussion

The conducted interviews gave an insight into what users of different generations seek within recommender systems and what they need when it comes to pluriform content. An assumption that was debunked was that the older generation needed more information about certain topics. They indicated they preferred the fast content concept initially proposed for the younger target audience. The younger audience was more interested in journalistic content than initially assumed, which led to a more concise concept. However, it should be considered that these designs were tested on a total of six people. For a more representative result, this concept should be tested even more extensively, either by literature and/or UX methods. Besides the number of test persons, it is also important to test the concept in further research with people of different cultural backgrounds, lifestyles, and religions. This is because the pluralistic society and diversity are values that serve as principles of NPO.

NFTs and the NPO

What are NFTs?

The non-fungible tokens (NFT) market saw a booming growth at the beginning of 2021, with the market volume exceeding two billion USD, ten times more than the previous year (Team, 2021). NFTs can be defined as goods representing digital assets, ranging from artwork to music, as well as in-game items. Encoded in smart contracts, they exist on the blockchain and are commonly bought with cryptocurrency (Nadini, Alessandretti, Giacinto et al., 2021). Common forms are texts, videos, and GIFS, although images are currently the most popular form (Phillips, 2021).

NFTs originate on the Ethereum blockchain but have since branched out to numerous other networks (Lounge, 2020). NFTs come with a certificate describing the uniqueness of the piece, therefore making them interchangeable, scarce, and indivisible, adhering to sole ownership (Evans, 2019). This interchangeability is an important difference and distinguishes them from other forms of digital assets such as cryptocurrency, which are interchangeable (Rajan, 2022). They are often organized in collections, which share similar features. These collections fall within categories; Games, Metaverse, Art, Other, Utility, and Collectibles (Nadini, Alessandretti, Giacinto et al., 2021). This research has focused on collectibles. An example of this is the immensely popular NFT collectibles CyberKongz, displaying monkeys, with a volume traded of nearly 140 million USD (Kresimir, 2022).

What can public broadcasters do with NFTs?

Currently, public broadcasters are under huge pressure to innovate and 'keep up' as commercial competitors such as Netflix take center stage with constant modernization and by creating their own content (Raats & Evens, 2021). Commercial streaming services are able to promote certain popular shows and analyze behavioral data, a bias the NPO cannot allow to exist within their platform (Evens & Donders, 2018). Introducing NFTs would be an extraordinary innovative step in Public Broadcasting, and NFTs do come with beneficial attributes the NPO can make strategic use of. One of these beneficial attributes is the conversion of assets into digital ones, which can help with streamlining processes, creating driving changes in ecosystems, and connecting users more to shows (Brock, 2022). Through the unique ownership that NFTs

allows, users can therefore grow to adopt a greater sense of brand loyalty (Umer, 2021). Especially Zoomers and Millennials would react great to that, as they fall in the top categories of people the most interested in using NFTs (Team Colormatics, 2021). Additionally, NPO puts great emphasis on its cusers' wants and their human values, such as diversity, inclusivity, and enjoyment, with one of their main goals being to increase their cusers' engagement (Verharen, 2022). This is another characteristic of NFTs, as they could help improve engagement for the NPO, as NFTs are a form of new interactivity, and could help the NPO foster active attitudes (Kang, Lu, Guo, et al., 2021). Overall, this is of value to the NPO, as they are continuously competing with bigger streaming services such as Netflix and Videoland, which do not seem to abide by the same rules.

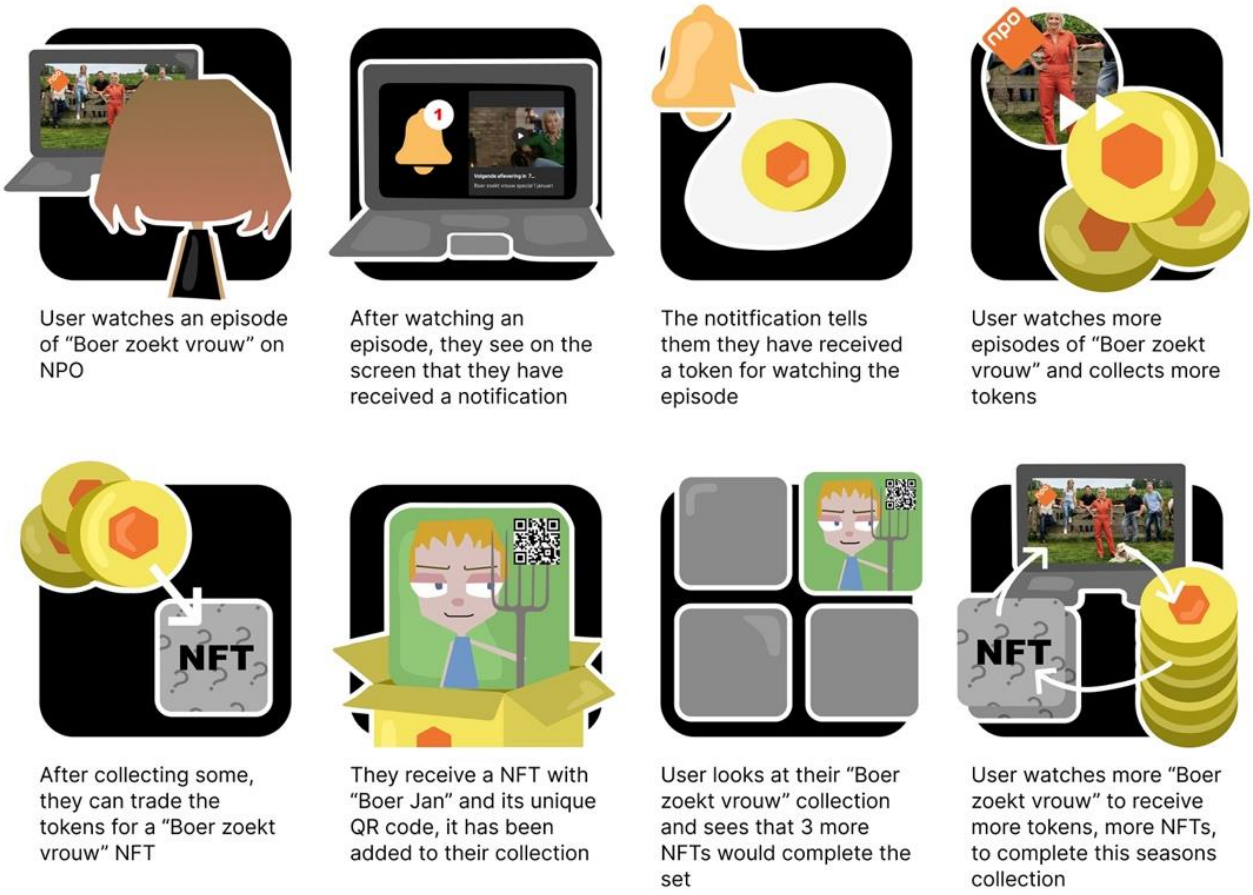
However, besides Netflix and Videoland, NPO does need to abide by some other rules, as the NPO is a government-led organization, introducing NFTs comes with some obstacles, specifically money and accessibility. The monetary benefits of trading and collecting NFTs are central to the appeal of entering the market (Nadini, Alessandretti, Giacinto et al., 2021). This cannot be translated into the ecosystem of the NPO, as the government restricts them from making a profit. In addition, the aspect of rarity has to be implemented mindfully within the NPO, as their main values of equality and accessibility should prevail. So, within the broadcasting space of the NPO, NFTs could be a way to finally compete on a higher level with commercial streaming services, although the restrictions introduce some hurdles.

Process

These important values and rules were a constant topic of discussion during the brainstorming sessions. Despite NFTs' attributes, it proved to be quite a challenge for the team to combine them together with the NPO's strict rules of money and accessibility since those are features of NFTs. This led to lengthy brainstorming sessions involving a variety of approaches, including mind mapping, gap filling, drawing, quick ideation, and general brainwriting and -storming. Finally, the use of a remote room, bringing the entire team together and employing multiple techniques ensued in a successful diverging and converging process that resulted in the birth of a strong concept. A concept that encompasses both the NFTs′ attributes and the NPO's values.

Proposed solution

To increase engagement and stimulate loyalty, within the confinements of the government's regulations, this whitepaper introduces a loyalty program using tokens and collectible NFTs. This new proposed scheme within the NPO connects its value of innovation with important human values such as inclusivity, accessibility, and connectivity. As the NFTs cannot hold monetary value, we aimed to create value within the ecosystem of the NPO, through motivation based on the desire to collect and engage. By taking these several values, users and NPO's, into account throughout the whole process in a principled and comprehensive way, values became requirements, and out of that, a value-sensitive design could be made. In practice, this means users can earn tokens by watching shows on NPO's streaming platform. The tokens are easy to earn, as to create accessibility for all NPO's viewers. These tokens then can be used to acquire NFTs of NPO's popular shows, such as "Boer zoekt vrouw". As users watch more, their token count increases, to then be traded for an NFT. This will be an image of the show, for instance; 'farmer Jan and his pitchfork', each with its own unique QR code. To incorporate an aspect of interactivity into collecting the NFTs, the NFTs will be divided into collections, of which the user can collect all items. This can be of a certain season, character, or sequence of events. With this system, users are rewarded for watching a show on NPO, helping them go from only consuming to being able to participate. The storyboard displayed below shows a detailed retelling of the user interaction.



Testing

Conceptual testing

What do you know about NFTs?

1 “No idea.”

2 “Well nothing. I know you can buy it and it's digital art. But I don't understand the point of it.”

3 “Nothing at all”

4 “not a lot, basic knowledge is there, I know what it is”

5. I heard the term before, but not really sure what it entails

What are your expectations for NFTs?

1 “I don't know, very much out of my league.”

2 “That it's a bit unclear, with bitcoin I can understand investing in another currency but with NFTs I can't really understand what you do with it.”

3 “None”

4 “The NFT marketplace is going to increase, however, I am not sure if it will prevail.”
5. It sounds very “bitcoin-y”, I think it has something to do with money and digital things, expectations I am not sure”

What could NFTs be used for?
1 “I think it works just like a cookie.”
2 “I don't know about that.”
3 “No idea.”
4 “Possibly art and investments.”
5. “Getting money online? Collecting of digital things?”

Proposed idea Used for Loyalty program/explain our case/show example NFT
How do you feel about NFTs at the NPO?
1 “Great, it seems very useful, you can see very easily which programs you have seen often. Is youthful though.”
2 “Well, I don't really see the value of it.”
3 “I have no idea how it could be beneficial”
4 “NFTs might be important because public service media already buy stock photos, or photos from photographers”
5. “ I like it, I see the potential. I see it working on certain kinds of people, but I’m not sure it would work on me, maybe only in the beginning. Or for certain shows that I am really obsessed with”

How would it affect your behavior on NPO?
1 “You connect more with the programs in question. It can make you watch other programs. You then get a different way of watching, it is actually a kind of reward and gadget.”
2 “It stimulates people to watch longer.”
3 “I would watch more of my favorite series, but I’d probably watch them anyway
4 “I would still collect them”
5. “I do not know. I do kind of like it when programs try to make me more invested. I think it would have a positive impact.”

Would you engage in NFT trading?
1 “No, I have no need of it.”

2 “No, haven't looked into it yet.”

3 “No, I would not”

4 “No.”

5. “No, I don’t think so”

Added value

The added value of NFTs is, that it can influence the way of consuming. The respondents of testing the NFT concept indicate that this will influence their behavior. As a result, more use is made of NPO and more programs are watched.

Discussion

Respondents to the NFTs will change their viewing habits by watching more frequently or by watching different shows. The interviews were conducted with individuals who knew little or nothing about NFTs. Despite not seeing the added value of NFTs at NPO, it appears that the majority do find NFTs on NPO interesting. Indeed, it can have a positive effect on the way viewers consume. As well, respondents unanimously agree and have no need to trade NFTs. Additionally, implementation of NFTs at NPO could be a way for many users to get in touch with the idea through an accessible way. It is possible that this will evolve into a more comprehensive concept over time, one that includes NFT trading, exhibiting, and other features. This of course depends on how the use of NFTs is received among many, pluralistic users.

The future of NPO regarding both technologies

These new technologies being included into the NPO have a wide range of viability, as have the results. The recommender system proved useful, enhancing users' attention spans and general engagement, particularly among younger audiences. The NPO would find it simple to implement this technology because the recommender system does not agitate or adjust away from the content that the NPO presently provides. It would function as an interactive sidebar widget, with users having the option to react to it. As a result, it may be quickly adjusted when needed without affecting the main layout of the NPO watch page. Since it is more interwoven with NPO's content and consumers have demonstrated less interest in the concept, the NFT concept would be slightly more advanced to implement. Changes and adjustments based on

possible feedback would be more difficult to do when included and used by a group of users, as users and their obtained tokens and NFT's would already be present, potentially affecting the process. As a result, the NFT concept poses a greater challenge for the NPO, namely motivating people to use it and adapting to their changing needs. That is not to argue that modifications are required immediately, but these technologies are rapidly evolving.

Experts and predictions agree, with the expectations that these technologies will only improve in the future. Recommender systems are a prominent area in study right now, with researchers focusing on how to improve the technology for better application (He, Parra, & Verbert, 2016). More enhanced user control, better adaptive interfaces, greater understanding of human aspects, the addition of digital nudging, the incorporation of time components, and improved transparency are all things to consider (Calero Valdez, Ziefle, & Verbert, 2016). However, adding neural networks and deep learning is the most important talked about next step in recommender systems (Olkhov, 2021). Deep learning and neural networks have been all the rage in recent years, and it appears that they could be used to improve recommender systems even further. Deep learning may expertly remove flaws in recommender systems' matrix factorisation, so enhancing the user's choice, whilst neural networks are specifically built to help better the data for sequence and time, thereby boosting the advice's relevancy (Olkhov, 2021). The addition of these new aspects to the NPO recommender system could open up a slew of new possibilities for the organisation. More and more opportunities to learn from and react to their users. It would make the platform more dynamic, accurate, and personable, resulting in a stronger link with the user and a more justifiable reward each time.

Looking at the other technology, experts believe that NFTs will begin to play a larger role in the mainstream in the next years, noting that it is only the beginning (Ante, 2021). *"We're already seeing early use-cases of NFTs being used as event tickets, software licenses, fan club memberships, or otherwise tied to interactive experiences,"* says Alex Atallah, co-founder of OpenSea (Dossett, 2022). The entertainment sector, in particular, is anxious to try out NFTs in their daily operations. They will be used in future work on immersive 3D digital worlds and game tools in general (Dossett, 2022). Others, on the other hand, believe that the future of NFTs is fungible, stating that it is difficult to create a workable environment with only unique tokens (Wong, 2021). New ideas for addressing this issue are already in the works, with the goal of merging them with social tokens to create a more community-centric participatory approach (Wong, 2021). This is consistent with the NPO NFT concept, which includes both

components. This allows NPO to go with the flow of technology while still meeting its needs and desires. It aids in maintaining relevancy and communication with its users. Furthermore, being able to leverage a popular technology will provide NPO a competitive advantage over other streaming services that are falling behind. As a result, NPO will receive more support, particularly from younger generations who are more likely to invest.

NPO could go much further with these technologies in the next ten years, when other alternatives, such as the metaverse, will be available. The metaverse, a virtual-reality world in which users can interact with a computer-generated environment and other users (Team, 2022), is a hotly debated plan. The metaverse technology is expected to appear in the next 10 to 15 years. In that scenario, recommender systems and NFTs will play an important role and will act as recurring building blocks (Silver, 2021). The psychical world would merge with the virtual, allowing the system to make show recommendations while strolling around or adorn your virtual home with NFTs from the shows. There are numerous potential for NPO to claim this metaverse as its own. NPO has proven to be able to adapt to their users' needs and goals, as well as the technology that this necessitates, making them a formidable force to be reckoned with even outside of the metaverse.

Conclusion

Due to thorough theoretical and applied research, we were able to offer the NPO with the potential implementation of an updated recommender system and the installation of NFTs, with the goal of increased engagement and consumer loyalty. Both of the defined target audiences gave us insightful feedback, and both preferred a design based on 'story' type content, catching their attention with quick videos while remaining neutral in its recommendations to ensure pluriformity and allowing them to easily dive deeper into the topics at hand. The NFTs can help the NPO boost engagement and consumer loyalty by providing interactivity and collectability, and by creating value inside the NPO ecosystem, they can become a creative approach to outperform commercial competitors while staying within the confines of the law. Both technologies give new insights and value streams that the NPO can quickly capitalize on and apply to assure the Netherlands' continued existence of a neutral, trustworthy, and diversified media network.

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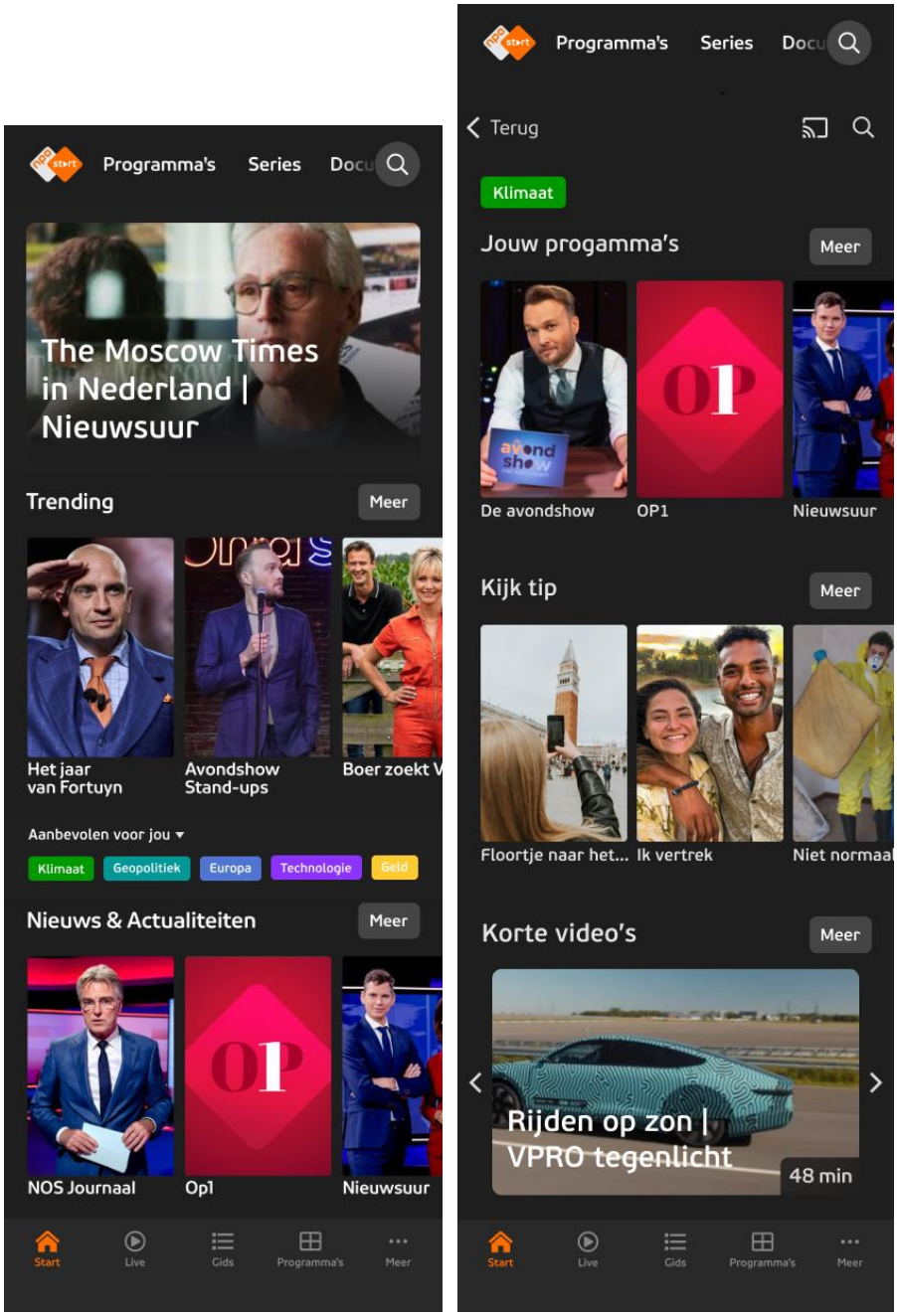
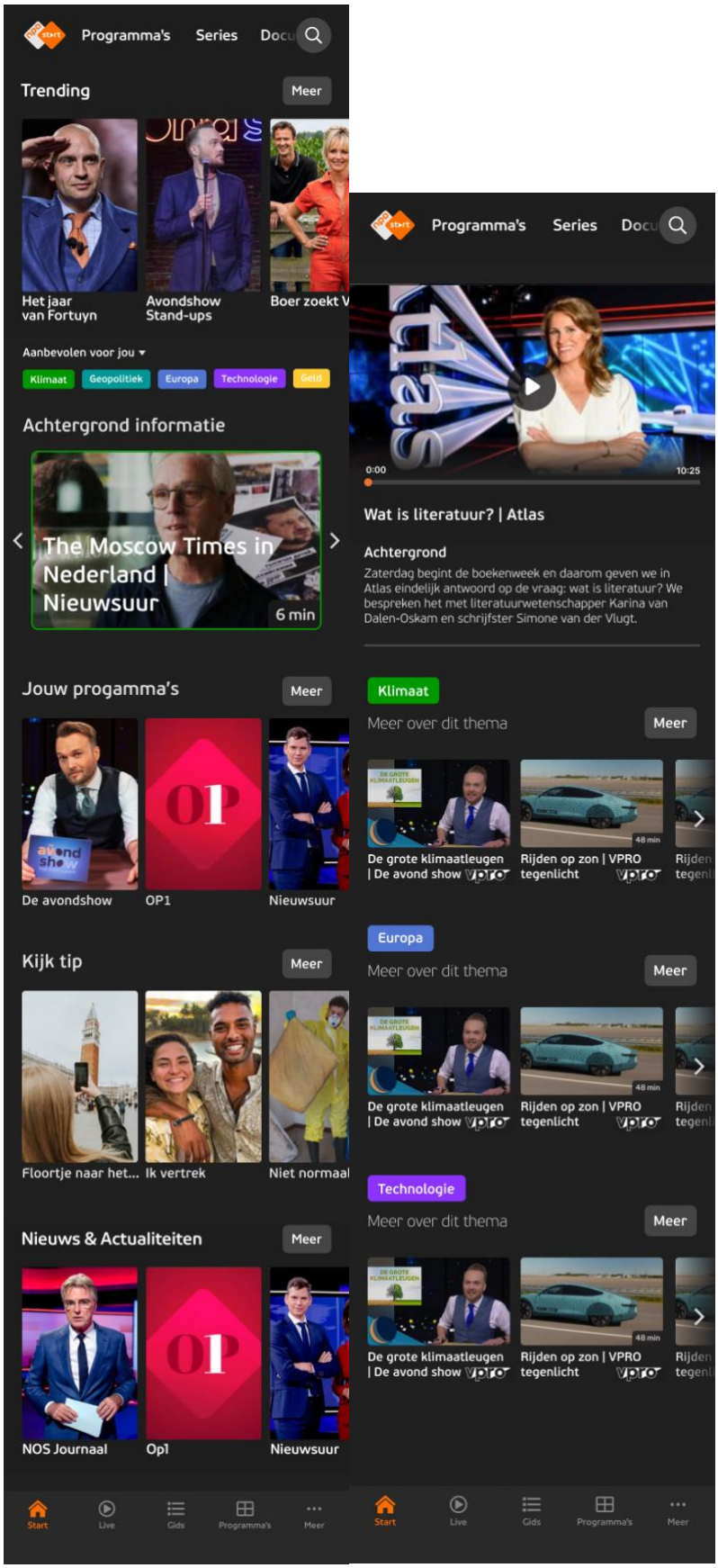
Appendix

Millennial Concept iterations.

Iteration 1:

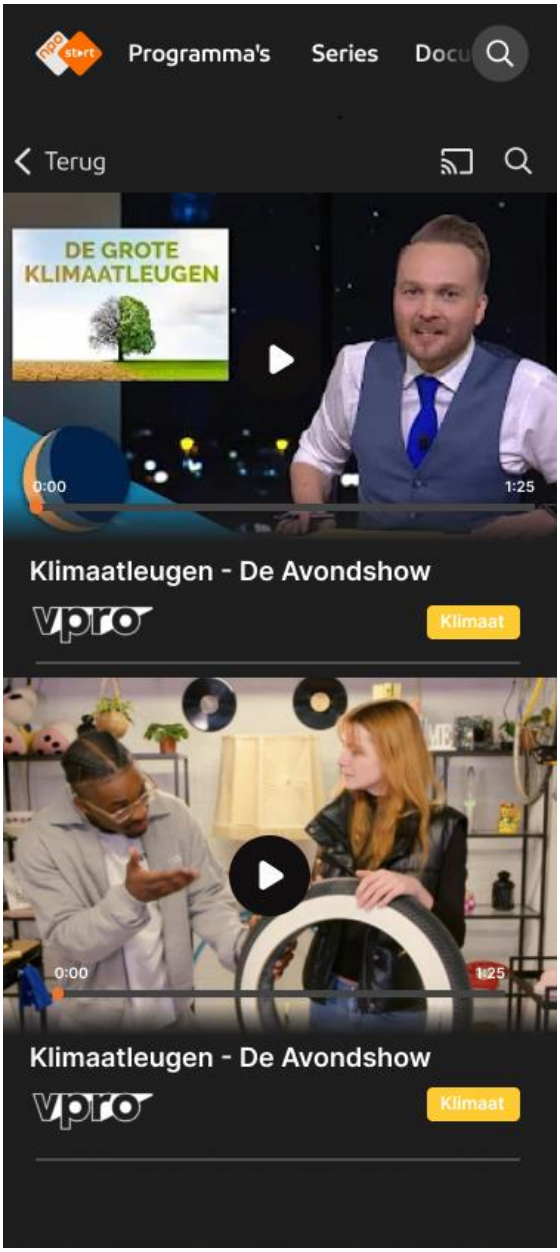


Iteration 2:


Programma's
Series
Trending
Meer
Het jaar van Fortuyn
Avondshow Stand-ups
Aanbevolen voor jou
Klimaat
Geopolitiek
Europa
Technologie
Geld
Achtergrond informatie
The Moscow Times in Nederland | Nieuwsuur
6 min
Jouw progamma's
De avondshow
OP1
Nieuwsuur
Kijk tip
Floortje naar het...
Ik vertrek
Niet normaal
Nieuws & Actualiteiten
NOS Journaal
Op1
Nieuwsuur
Start
Live
Gids
Programma's
Meer
0:00
10:25
Wat is literatuur? | Atlas
Achtergrond
Zaterdag begint de boekenweek en daarom geven we in Atlas eindelijk antwoord op de vraag: wat is literatuur? We bespreken het met literatuurwetenschapper Karina van Dalen-Oskam en schrijfster Simone van der Vlugt.
Klimaat
Meer over dit thema
De grote klimaatleugen | De avond show
Rijden op zon | VPRO tegenlicht
Europa
Technologie

Zoomer Concept iterations

Iteration1:



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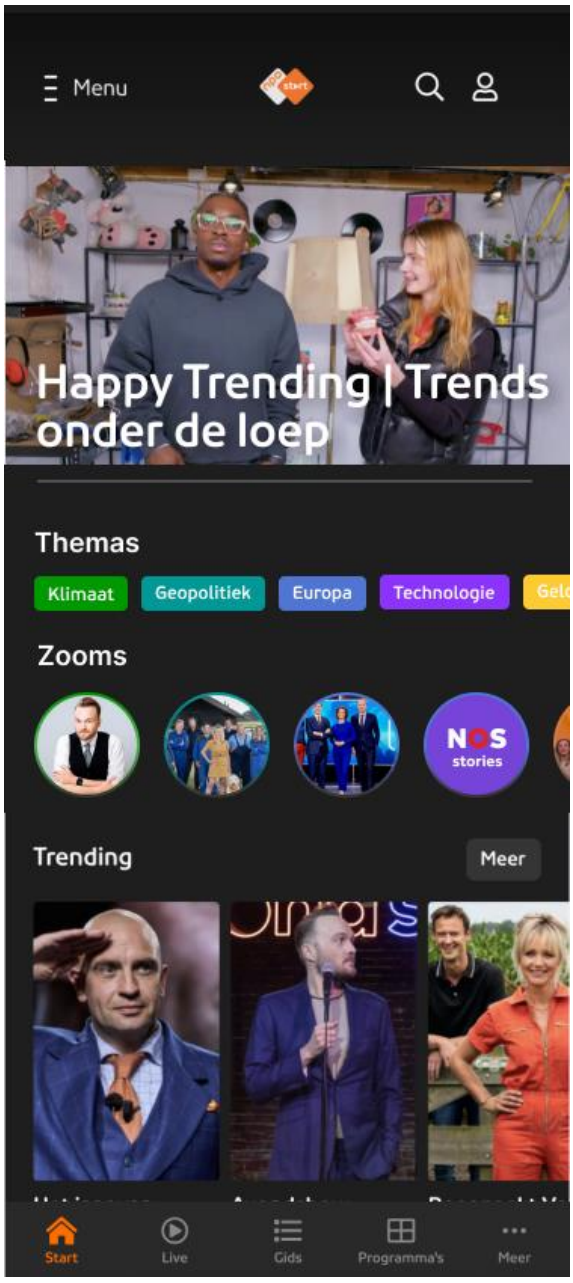
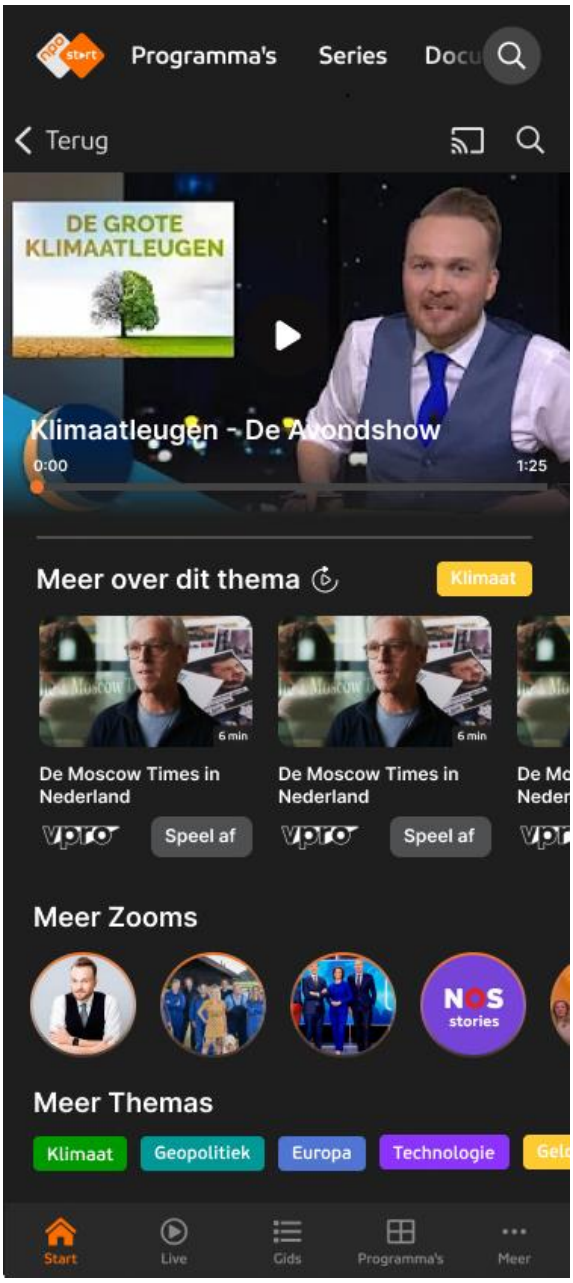
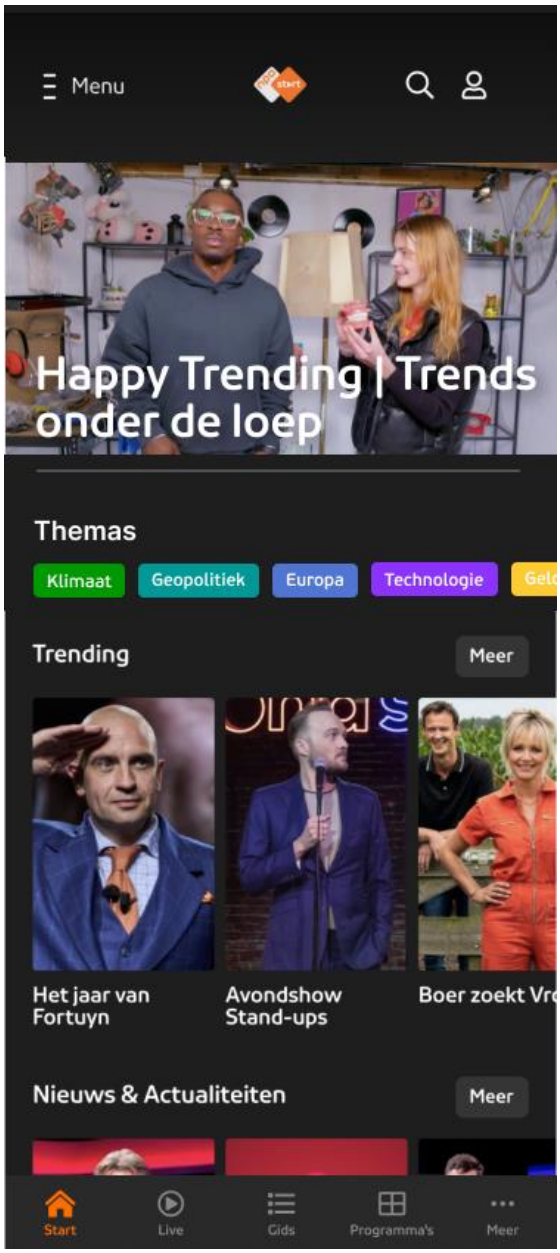
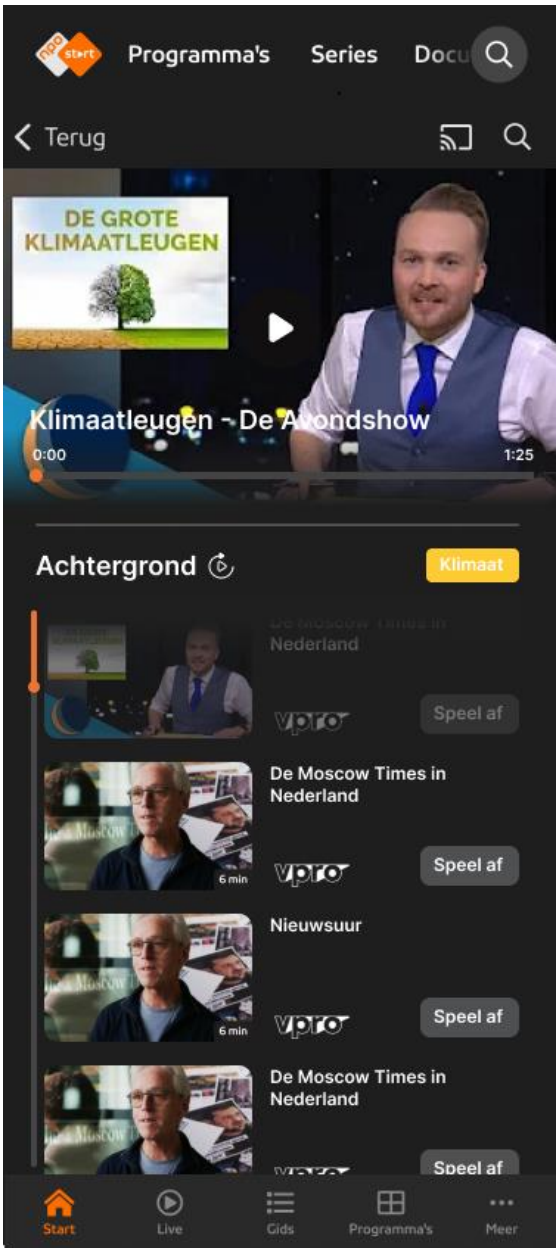

Menu
Happy Trending | Trends onder de loep
Themas
Klimaat
Geopolitiek
Europa
Technologie
Zooms
NOS stories
Trending
Meer
Start
Live
Gids
Programma's
Meer


Programma's
Series
Terug
DE GROTE KLIMAATLEUGEN
Klimaatleugen - De Avondshow
0:00
1:25
Meer over dit thema
Klimaat
6 min
De Moscow Times in Nederland
Speel af
Meer Zooms
NOS stories
Meer Themas
Klimaat
Geopolitiek
Europa
Technologie
Start
Live
Gids
Programma's
Meer

Iteration 3:


Menu
Happy Trending | Trends onder de loep
Themas
Klimaat
Geopolitiek
Europa
Technologie
Trending
Meer
Het jaar van Fortuyn
Avondshow Stand-ups
Nieuws & Actualiteiten
Meer
Start
Live
Gids
Programma's
Meer


Programma's
Series
Terug
DE GROTE KLIMAATLEUGEN
Klimaatleugen - De Avondshow
0:00
1:25
Achtergrond
Klimaat
Nederland
Speel af
De Moscow Times in Nederland
6 min
Speel af
Nieuwsuur
6 min
Speel af
De Moscow Times in Nederland
Speel af
Start
Live
Gids
Programma's
Meer