DELIVERABLE 5.4
Case Study 1 Participatory stories report

DESCRIPTION OF THE DELIVERABLE

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SUMMARY

Deliverable 5.4 – Case Study 1 (VRT) Stage 1 – provides an overview of the outputs of Stage 2 of Case Study 1 in the ParCos project, which is led by VRT in Brussels, Belgium. It is the output of related task in Work Package 5 (WP5) - Case Studies and Communications. This report contains an introduction to ParCos, describes the purpose and role of this deliverable, and describes the set-up of the Belgian case study. This deliverable also includes how the results of these case studies will help develop the different ParCos outputs (e.g. ParCos Storyteller and ParCos Trainer Package). It is an updated version of deliverable 5.1, which is published in April 2021 (month 16 of the project), this extended version integrates the outputs and learnings from Stage 2 of this case study.

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INTRODUCTION

Deliverable 5.4. (D5.4) provides an overview of the outputs of Case Study 1 in the ParCos project, which is led by VRT in Brussels, Belgium. The deliverable describes the actions taken to complete related Task in Work Package 5 (WP) – Case Studies and Communications of the ParCos Project. This report explains how the three case studies worked together and the design and the results of the Belgium case study are explained in more detail, including how the various ParCos tool were used for this. For this we build on the results of stage 1 of the case studies, described in the previous deliverable 5.1, *"data and content report",* published in April 2021 (month 16 of the project). We further analysed the experiments that were described in that deliverable, and we also set up new experiments to gain more insights regarding knowledge on how we can represent data as a public broadcaster in an engaging way. The result of this is an overview of learnings that we can share with stakeholders within VRT and similar organisations. The purpose is that this will help them to deliver news and educational content in a more participatory manner to help them fulfil their social mission by reaching an audience less familiar with data interpretation, including children.

PURPOSE OF THE CASE STUDIES

This deliverable sits within WP5 'Case Studies and Communications' which is being conducted over a 30-month period (June 2020 to November 2022). There are 3 case studies within the ParCos project in three different countries – Belgium, Finland and the UK.

As shown on Figure 1, ParCos is developing participatory design models, methods and tools which are being tested within three case studies in Belgium, Finland and the UK. Each case study has a different focus, in terms of the science topics and the group of participants it is working with, but the learning is then brought together and feeds into the creation of the ParCos models, methods and tools.

Participatory design of models, methods and tools

Activities: participatory design amongst key stakeholders, including team members, external experts, content creators, the public of the participatory science stories and case study 'problem owners. (T4.1). Includes iterative reflection and design.
Outputs: ParCos Curator (D2.3), ParCos Storyteller (D3.2), ParCos Data Explorer (D6.2)

Training

Activities: instruction on using ParCos Curator, ParCos Storyteller and ParCos Data Explorer for interpreting and finding stories in data and creating participatory science stories (T4.2)
Outputs: ParCos Trainer (D4.2)

Case studies

Activities: Case studies (T5.1, 5.2, 5.3). Undertaking case study activities as outlined in figure 5
Outputs: ParCos case study reports (D5.1, 5.2, 5.3)

Evaluation

Activities: evaluation of Case Studies and their outputs (T3.3). What is the impact of stories on a) those who make them b) those who engage with them as audience?
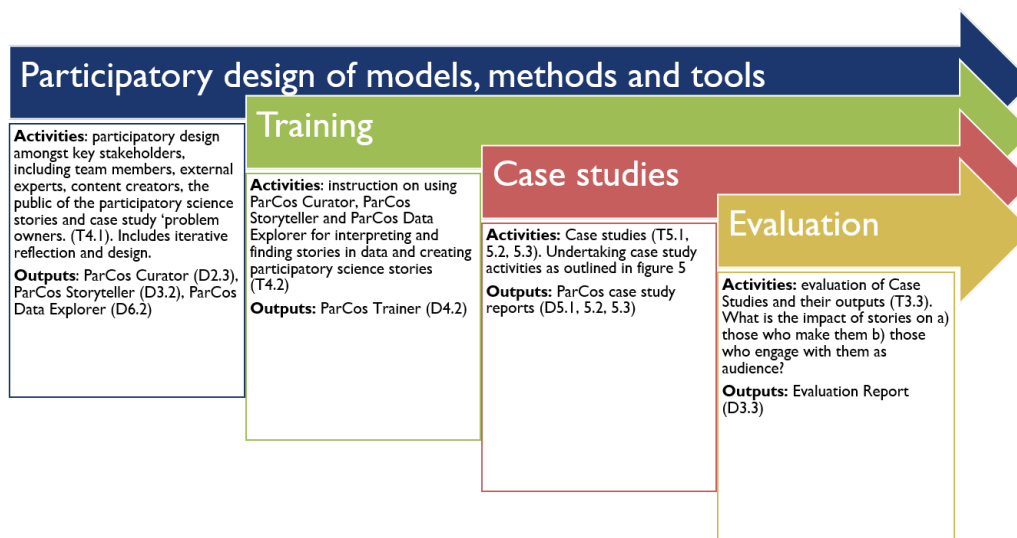**Outputs:** Evaluation Report (D3.3)

Figure 1: Overview of the ParCos Methodology

A brief summary of the three case studies, as they were initially conceptualised, is provided below:

Case Study 1: (1) design explorations based on weather or astronomical data to guide innovative storytelling in broadcasting (Belgium) to reach a diverse audience and (2) design explorations to implement participatory storytelling techniques in online news outputs.

Case Study 2: local communities, collecting and using data to address issues of importance to them, and communicating findings in personalised, intelligent, and accessible ways including using immersive technologies (UK)

Case Study 3: science in schools, looking at how schoolchildren can use the research data generated by universities and contextualise it to their own context and use through and share with others through documentaries (Finland)

The purpose of this deliverable is to report on the Belgian Case study, and it is a follow-up document to deliverable D5.1. that was specifically about stage 1 of the case study, using the right scientific methods for data collection depending on the local context.

In this deliverable the case study is further elaborated, applying the principles of the trainer package (D4.3, D4.4) for creating participatory science stories to reach a diverse audience. We also provide more information about how the Storyteller is used and how the results of the case studies are subsequently used to optimize this tool (D3.3). An analysis of the results is also described in the final evaluation framework (D3.6).

BELGIAN CASE STUDY SETUP

OBJECTIVES PARCOS

The design of the Belgian Case Study setup is based on the three concrete objectives defined within the ParCos project. We outline each object

O1: To increase trust in science outputs through making underlying evidence and its interpretation more transparent.

In the case study 'More Weather Tomorrow', we expose storytelling design strategies to engage audiences to interpret data for themselves by deploying a familiar yet scientific science item, I.e. the weather forecast. In the case study 'Star Listener' we studied how the storytelling approach in more complex science stories, such as those that need citizen input to forward the science, can engage a wide audience. Both examples were able to reveal the underlying data of the science story to the audience.

O2: To improve interaction between different science stakeholders through participatory approaches to science communication.

In the case study 'Star Listener', audiences were invited to contribute their analysis of star sounds to forward the work of the scientists. We investigated how we can engage an audience that is typically not interested in citizen science.

O3: To develop pedagogical approaches and to deliver teaching of new practices for communicating science to both professional and non-professional users.

In several creative sessions with students (in the arts but also in sciences), time is taken to explain the ParCos Storyteller and request their feedback and suggestions for improvement. These collaborations have also been further analysed in order to optimize the ParCos Trainer Package.

SUBOBJECTIVES VRT

As a public broadcaster, VRT has the mission to inform, inspire and connect all (Flemish) citizens. Therefore, the VRT case study aims to identify ways to present data via media in an engaging way and encourage broad and varied audiences to interpret the data for themselves. Because there are several aspects to this goal, we have divided this into several subtasks which we will discuss further below.

1. **Engaging audiences with varying levels of data literacy through storytelling**
2. **Reaching a diverse audience with data stories**
3. **Supporting scientists to tell (data)stories**
4. **Supporting media/newsmakers to tell data stories**

1 – ENGAGING AUDIENCES WITH VARYING LEVELS OF DATA LITERACY THROUGH STORYTELLING

The first aspect that we want to study is how to reach audiences with varying levels of data literacy. We want to study techniques to help an audience for whom interpreting data is still very unfamiliar, in this case more specifically children surrounded by their families. Therefore, we designed new ways to present a large dataset at the More Weather Exposition (Ostend (BE), summer 2021), which was an event for families organised by VRT themed about the weather.

As described in D5.1 we invited students Media & Information design of LUCA School of Arts to explore innovative approaches for data and science storytelling, in the context of the course 'Data Stories'. This assignment ran for 7 weeks (4 hours a week). The rapidly created designs were tested in small-scale user tests with the target audience, both by students as by ParCos researchers.

Figure 2 – Example of a prototype of a participatory design installation created during the design course; that visualises the average temperature during one year in a colour

We presented an open dataset on weather conditions as rainfall (precipitation) and temperature in Belgium over the past 100 years, supplied by the Royal Metrology Institute of Belgium. We assumed that weather data are a good starting point to learn more about data, as it is data that is already actively present in people's daily lives, in the form of weather forecasts. At the start of this design challenge, we presented the first version of the ParCos Storyteller (as presented in Deliverable D3.3) to the students and challenged them to make use of the data storytelling techniques we had identified. We also asked them to provide feedback to optimise this tool.

After the final presentation of the designs made during the course, we chose to continue working with Kyo Schelfhout, one of the students to further develop a digital interactive weather forecast based on the user's birthday. He developed it as part of his bachelor's thesis, building on the ParCos methodology (ParCos Storyteller, ParCos Trainer Cards).

This was then presented at the MeerWeer expo (Figure 3), where we executed user research (interviews, observations). Because we were able to draw some interesting conclusions from this, we have written them down in in a paper "More Weather Tomorrow" (https://doi.org/10.1145/3505284.3529972), that we presented at the ACM International Conference on Interactive Media Experiences (IMX '22) that took place on June 22-24, 2022 in Aveiro, Portugal where it won the best paper award.

More Weather Tomorrow. Engaging Families with Data through a Personalised Weather Forecast
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https://doi.org/10.1145/3505284.3529972

Presented at the ACM International Conference on Interactive Media Experiences (IMX '22)

Winner of the best paper award

References: Appendix 1

Figure 3 - Close-up of application on touchscreen (left), father with two children interact (middle, left), touchscreen set up at the cafeteria (middle, right) and two persons interacting (right).

Introduction

Today's greatest challenges, such as global warming and the Covid-19 pandemic, cannot be fully grasped in everyday life as the significance of the related data remains abstract to a certain degree [1]. To understand what the presented data mean, citizens need additional support and guidance [23]. The ability to read, interpret and understand data related to different topics is therefore considered key to participate in an increasingly data-driven world [38] as it allows citizens to comprehend governmental issues, participate in civic debate [10], and take informed decisions. Furthermore, it strengthens their inclusion as well as resilience in future society. The pandemic has shown us that datafication is accelerating, and that such data literacy skills are more urgently needed - especially in a media context [22]. Among others, data representations are used by different media to present policy impact and are deemed crucial for instructing people's behaviour [30]. Studies have shown that infographics, such as the "*flatten the curve*" example used during the Covid-19 pandemic, can cause non-expert audiences to elaborate more than when using purely textual and visual messages [17]. However, audiences are not as data literate as media producers expect them to be, causing misconceptions that might lead to a decrease of trust [22] or the spread of misinformation [9].

Data-driven storytelling techniques offer a reliable and engaging approach to enhance data literacy skills [4, 12, 29], but media organisations are not widely adopting these approaches. It requires a too progressive shift within the organisation in terms of content, production tools and presentation platforms [34]. As journalists and documentary makers are accustomed to aggregating data into video stories, the inclusion of interactive data representations in video offers a more accessible way for media producers to transition to data storytelling [15]. Another advantage of video is the presence of story characters that viewers can relate to, which makes them empathise with the shared thoughts, and triggers critical reflections on those experiences [21]. These feelings of empathy and consideration can be stimulated even more when you personalise stories based on the viewer's situation. [8]. Personalised data videos thus offer an entry point to engage both media producer and viewer with data. Despite this, their design and particularly the relation to their context are still relatively under-explored [8]. For example, in documentary film and journalism, storytelling entails more than the story as an object, it also includes the elicitation and construction of the objects in situ [21]. This construction (including the decision to engage or not) depends on the context, such

as the audience, purpose, and location. Storytelling emphasises the performance it entails, such as a social experience that involves retelling with slightly different interpretations [21]. However, few studies have explored how different settings, such as a screen at home or a physical installation at an exhibition; and related social aspects, such as interacting with children, family or friends, facilitate engagement with personalised data stories, and in particular, how this affects critical refection.

In this paper, we present the design and evaluation of a personalised data video story in the form of a weather forecast that invites children and their families to interpret historical temperature and precipitation data. As we encounter weather data every day in various formats (e.g., weather apps, news bulletins, etc.), we chose to work with this familiar data set in order to address a broad audience [19]. More specifically, the design of our personalised data video focused on both children and adults in order to encourage families to experience the data video together, and thus collectively make sense of it. We describe the implementation of an application that facilitates a personalised weather forecast on a touchscreen, which was showcased at a 2-month temporary interactive exhibition on weather, organised by a family television channel. We executed a comparative study with the same application at home, for which we each invited 19 (groups of) participants. Next to this, we conducted an in-the-wild study at the exhibition for 5 days. We sought to explore how the external context and internal story design influenced their narrative engagement, emotional commitment and contemplation. By looking at our findings through the lens of traditional video storytelling techniques, we present 5 design recommendations to connect the design of data representations for open exploration to the performing character of video storytelling. Challenges such as global warming and the Covid-19 pandemic need to be addressed collectively; social dynamics are thus invaluable for experiencing, interpreting, and sharing data stories. Therefore, we believe our findings contribute to the understanding of how data videos elicit collective consumption and sense-making of data.

Related work

Data-driven storytelling techniques are already well-studied to inform the design of data visualisations for a broad audience [29]. These studies focus on data stories that are distributed via online platforms or newspapers, while other forms of popular media, such as television, are often overlooked - despite their potential to reach a highly diverse audience [11]. Scholars have been exploring the role of video in data stories [2, 15], and more particular novel interactive distribution means, such as responsive video technology [8], which is also being studied in television contexts (e.g. [37]. One of the benefits of data videos is their ability to emotionally engage viewers with characters that act as participants in the data story, e.g. [8] or as presenters, e.g. [15], which triggers refection [8] and stimulates data exploration [5].

Next, (interactive) television and data videos are often consumed together with others. In data storytelling, scholars recently explored how design can further stimulate collaborative analysis, data reflection and social discussion [25]. Others explored the specific setting of classrooms as a way to collectively analyse data through personalisation [36] or layered story design [18]. In television and film, the genre of family film often takes the form of animated film or video and has mastered the ability to connect with children and adults simultaneously

[20]. Before video streaming platforms were omnipresent, television channels, and especially public service media channels, directed the programming of their Saturday evening to families, with the goal of establishing social interaction between them through game shows and comedy. Similarly, museums are also involved in designing narratives for family experiences [41], which might be exploited in data exploration contexts as well [35].

More Weather Tomorrow

In general, we are accustomed to encounter weather data; we consume weather forecasts and consult weather data applications on a daily basis [19]. Moreover, weather forecasts are often consulted in a family context, e.g., when to decide what to wear or what to bring along for activities and are also part of everyday conversations with familiar strangers [16]. Here, current meteorological data, including temperature, wind direction and speed, amount and type of precipitation and hours of sunshine [14] are interpreted by weather presenters or journalists, who add meaning to the data and present their interpretations in an informative story.

The goal of our personalised data video installation was to engage families in interpreting weather data together and reflect upon the meaning of their interpretation without a particular goal in mind, such as adopting a certain mindset towards climate change. We deployed a storytelling approach to guide viewers through this open exploration, which we will elaborate on in the following part. We will separately discuss (1) external story design factors that storytellers take into account, such as location and time of day of story exposure, and (2) internal story design elements, such as the deployment of three acts. Yet note these factors are dependent on each other and cannot be seen separately.

External Story Design

External elements that impact story design include context [21], which is provided in this study by the family exhibition 'More weather tomorrow' (translated from the Dutch phrase 'Meer Weer'). The title of the exhibition is based on the catchphrase from a weather presenter of the family television channel Eén in Belgium. The exhibition aims to inform families about different weather phenomena, such as durability and climate change, through playful didactic installations. It ran for 2 months during the children's summer break and was located at a popular summer venue.

The physical installation that consisted of a 43-inch touchscreen on a pedestal, was presented at the end of the exhibition, in the cafeteria. Overall, the exhibition covers 10 interactive installations and a trajectory of 40 large-scaled photo backdrops that allowed visitors to take spectacular photos of weather-related phenomena (e.g. in a thunderstorm but also outside a spaceship) as a way to encourage them to read facts about these phenomena.

In the cafeteria, 4 installations competed for attention with our installation, as well as other surrounding stimuli such as a bar area, people and non-digital signage.

The producers were aware that the application was designed and developed as a research product with the aim to gather real- world insights [24]. Apart from our application, the youth news and weather forecast were not represented at the exhibition. Instead, the regular,

adult-oriented weather forecast of the main family television station was visually apparent. The producers were convinced that this application could deliver an added value both in terms of educational goals as in the visual presence of the youth news, including the weather forecast. Therefore, we were able to collaborate with the youth news journalists who provided feedback on our ideas and aided the overall story design and deployment of storytelling techniques, which we will discuss in the next section.

Internal Story Design

The story that was shown on the display (i.e. internal) followed a traditional three-act structure, i.e. begin, middle and end. We made sure the data video was not heavily author-driven, as this could diminish the qualities of data representations as a mirror of the objective truth [8]. Instead, it should facilitate different reader-driven possibilities to think or reflect upon the data by interacting with it [31].
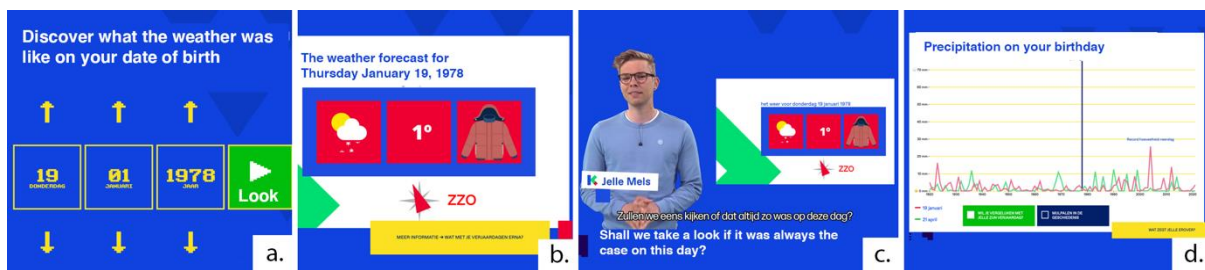

Figure 4- Entry form for birth date (a), weather forecast for that date (b), the weather presenter in a video still (c) and evolution of precipitation data for that date (d). Titles are translated from local language to English and included in a different typeface than the original application.

The Beginning - a Personalised Infographic Animation. Setting the scene.

The application uses the same design language of the existing (linear) youth news weather forecast that is aired every day on the children's channel via broadcast television, their streaming platform and their website. The square shapes, bold colours and dynamic motion design are typical for this brand and are therefore recognisable for a large audience. The graphic design exposes the context in which the story will take place, i.e. the weather forecast of the youth news, and sets expectations for the events that will follow.

The Hook. The application asks to "*discover what the weather was like on your date of birth*", complemented with 3 large squares with which people can manipulate the showcased year, day, and month by clicking the arrows or selecting the date numbers via a calendar pop-up. Then, it calculates the weather forecast for that exact day, which is made visual through a metaphorical slot- machine animation, followed by the display of the result in 3 pink squares (see Fig. 4b). This result is presented as an infographic via a series of icons that depict the overall weather from sunny, cloudy, raining a little, raining a lot or snowing, the temperature in a number of degrees Celsius, to the items you would need that day, including an umbrella, a raincoat, a t-shirt, a sweater or a coat. The direction of wind is also shown below the squares. The infographic is identical to that of the daily youth news weather forecast, which

we consider as a comprehensible entry point as it is similar to other weather applications or newspaper graphs.

The middle - Personalised Videos and Line Graphs. Zooming out

A weather presenter often explains the underlying reasons for the past, current and future conditions of the weather and their individual data points, by zooming out to present the bigger picture [21]. This part of the story is split into a second and third act (since the beginning is the first act), in which the complexity of the data representations increases.

Second act - After the infographic result is shown on the application, a button pops up in the right corner, allowing the visitor to learn more. An appropriate video is loaded based on the outcome of the birth date. Here, the presenter of the youth news, i.e. Jelle welcomes the viewer with its familiar presence, increasing interaction and trust [13]. Then, Jelle says, for example: "*When you were born, people were wearing raincoats. Shall we take a look if this has always been the case on that day?*", after which a line graph unfolds with historical precipitation data from the respective birth year up to 2020.

The line graph is more complex to interpret than the infographic in the beginning, particularly for children. Yet, at the age of 12, children can have the same interpretation skills as the lay adult audience, while children between 9-11 years old are able to understand graphs that are not bound to judgements on volume [32]. A line graph is still complex for children as it requires them to understand concepts such as *'larger than'*. On the other hand, it looks familiar, which is also a quality that supports a broad audience to engage with data representations [27]. The line graph is complemented with three buttons: (1) a query button that indicates *"Do you want to compare with Jelle's birth date?",* which reveals a second line based on the evolution of weather on the 20th of April, and (2) a stepper button *"What with the days before you were born?"* that progresses the line graph to the start count of the data set in 1920. When this larger period is shown, an additional query button allows the visitor to activate relevant milestones in history, such as the invention of television, in order to add context to the time spanning the data set. A third (3) button allows the viewer to continue to temperature data.

Third act - Jelle takes over the screen in video. Once more, depending on the outcome of the weather forecast of your birth date, he will present a particular insight that you could have gained from the chart, e.g. "*It was raining more on the day of your birth than on the same day in the subsequent years. But what about the temperature?*" The application continues to show a line graph that presents the historical temperature data since your birth year. Then, the same order of query and stepper buttons as in the previous 'act' are shown with an additional query button in the end "*How did the weather evolve*", which reveals a trendline. The latter is even more complex to interpret as most dates only show a slow ascendant line.

The End - Personalised Concluding Video and Call-to-Action.

Resolution Finally, the forecast ends with a concluding insight of Jelle, depending on the historical temperature data. For example, he says "*The temperature at your birth date has increased over the years. That is caused by the climate change, about which you can learn more at this exhibition*".

As our application is based on the birth date of the viewer, we needed to prepare for different 'plot twists'. Therefore, we recorded 10 different videos with Jelle; a practice that was novel to the youth news producers. These videos were edited in Adobe Premiere Pro and After Effects. Depending on the outcome, one of 5 videos in WebM (or .mp4, depending on supporting browser) was dynamically loaded. The line graph that followed was implemented with D3.js. Other features such as the stepper and query button, and the unfolding of the graphs were implemented using HTML, JavaScript and Jquery. Titles and labels were also made available in a second local language, which viewers could select in the beginning of the application (before entering their birth date). As a result, the video of the presenter would also be subtitled (see Fig 2.c).

The historical data that were fed into the application was retrieved from an open-source data platform; a crucial aspect for our design goals as people need to be able to find the source data. However, public service media have their own data licenses and typically deploy data that are not openly accessible. We thus needed to defend our choice for open data, which demonstrates that to truly incorporate data representations that encourage open exploration in mass media channels, agreements with existing data delivery services also need to be revisited.

Methodology

We conducted two studies, following a mixed-method approach: 1) a comparative study of the experience at the exhibition versus at home, and 2) an in-the-wild study at the exhibition. Ahead of these studies, we evaluated the performance of the personalised weather forecast in a pilot study to identify potential issues with story flow and data interpretation. Semi-structured interviews with 8 participants (all younger than 23 y.o., with 4 participants younger than 14 y.o.) allowed us to refine the graphic design. This also motivated us to add 2 extra points to the graph, i.e. the wettest and warmest birthday over the past 100 years, to allow viewers to immediately spot outliers.

Comparative study

We executed a comparative, between-subject design study with 19 participants per condition, i.e. at the exhibition (CE) or at home (CH). We adapted the application to be experienced online, via the web browser, and changed the story accordingly (i.e. no reference to the exhibition was made). We were aware the interaction modality shifted from only touchscreen to either touchscreen (on a tablet) or a mouse and keyboard (on a computer). As we aimed to relate to realistic settings at home, both in terms of distribution (i.e. via online platforms) and consumption (i.e. via personal and varying devices), we optimised our

application for this experience. The study procedure was identical in both conditions. After consuming the data video story, participants completed a 7-point Likert questionnaire that included engagement measures commonly used in the domain of film and television to reflect on the role of storytelling on emotion, narrative engagement and contemplation [3].
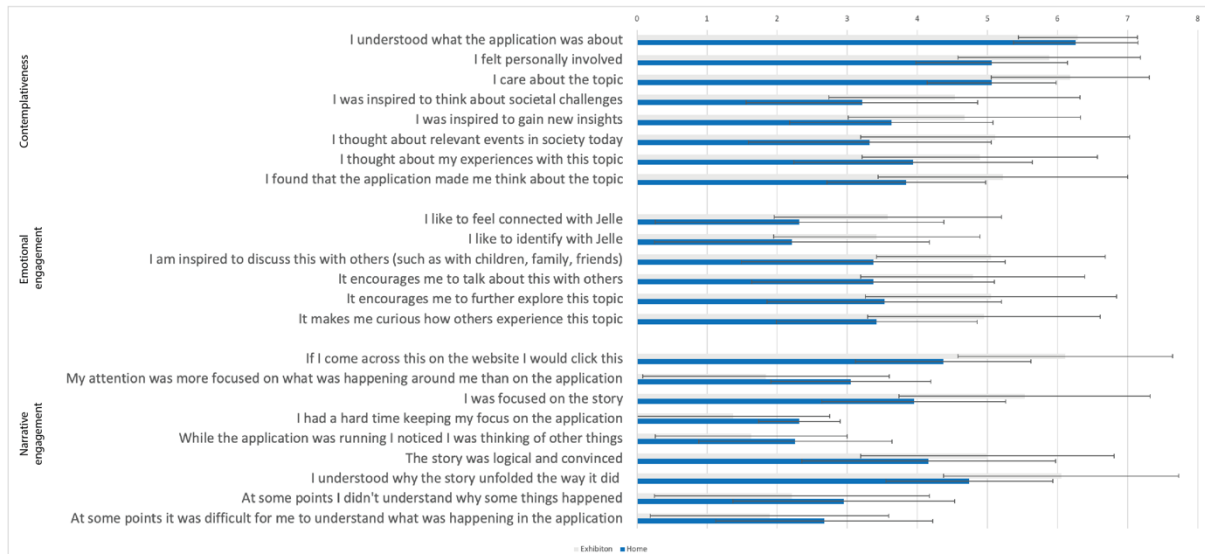

Figure 5- Experiences when testing the application

Contemplativeness scale. The first 9 questions (see Fig.5, top) were intended to measure the level of reflective thinking triggered by the application through a contemplativeness scale. [3]. Questions included the level of involvement and the amount of new insights gained by the users.

Emotional engagement scale. The next 6 questions aimed to gain insights in the emotional engagement with the characters, i.e. the presenter of the youth news [3]. This was further explored through discussions with other participants (see Fig.5, middle).

Narrative engagement scale. The last set of 8 questions (see Fig.5, below) mapped the subjective experience of participants through the narrative engagement scale [6]. This scale aims to examine how external distractions affected the amount of focus the user had and how the narrative structure influenced the flow.

Open questions and demographics We asked the participants 4 open questions in which they could formulate their discoveries ("*What new information did you discover?", 'What did you remember?, "How confident are you with interpreting data representations in popular media?", "What did you already know about this subject?").* Finally, we asked their demographic data, such as their age and their relation to those that accompanied them.

Two hypotheses guided this study:

H1. Participants report higher levels of narrative engagement at home than those at the exhibition. We expect that the busy environment of the cafeteria, i.e. where other visitors are walking and talking out loud, would distract viewers from consuming the full data story. We

also expect that more social interaction and collective data interpretation with family members would occur at the exhibition than at home, where they are also more distracted from narrative construction, similar to studies in sport video stories [42].

H2. When emotional engagement of participants is high, social refection is triggered. We assume that when viewers engage with a data story together with family or friends, they reflect on the relevance of the presented data in relation to their family, community or society as a whole, and discuss it with them. Furthermore, we expect viewers to be more emotionally engaged with the topic at the exhibition, since it immerses visitors in a specific atmosphere.

For the condition at the exhibition (CE), we recruited 19 adult participants at the entrance of the exhibition. The sample existed of an adult with at least one child younger than 10 years (N = 10), at least one child between 10 and 16 years old (N = 4), with children older than 16 (N = 4), or alone (N = 1). We asked them to test the full application after which they were given a tablet computer to fill in the post-survey. On average, this participation took 4 - 6 minutes of time, for which they were rewarded with a drink coupon at the cafeteria.

For the condition at home (CH), we invited viewers of the Flemish youth channel Ketnet via the broadcaster's recruiting platform, i.e. VRT Pilootzone. After the participants at home tested the application they were asked to complete the post-survey. On average, filling in this questionnaire took 3 - 4 minutes. Participants in this condition were not rewarded. We explicitly asked the 19 participants to test the application together with family members, including at least 1 child younger than 10 years (N = 6), children older than 10 years (N = 4), or with people older than 16 years (N = 1), yet some tested it alone (N = 6). There were also participants of the study who did not answer this question (N = 2). We wanted to ensure that the application was tested with a child, so our recruiting efforts were focused on the associated target audience through the youth channel and its branding. Participants also first confirmed their ability to test it with a child (as we could not invite children directly due to ethical issues). Despite this, at the end of the test, 6 participants reported to have tested it alone. Potentially, the children dropped out during the testing; a situation that also happened at the exhibition.

<u>In-the-wild study</u>

The aim of this study was to gain insight in the spontaneous behaviour of groups of people that engaged with the application, observe the social interaction around the physical installation and gather honeypot effects [40]. We organised participant observations during 5 days (when the exhibition opened at 11am till closing time 6pm) randomly spread over the last 4 weeks of the 2-month set-up, including one Tuesday, Thursday, Saturday and two Fridays. On those 5 days, 2 researchers were alternating their presence in the cafeteria to manually log engagements with the application. The observer was seated at a table of the cafeteria, 3-4 meters away from the installation, and wrote down the number of visitors that halted, whether they engaged and for how long, their behaviour, and their conversations.

There was a sign that informed visitors of the installation of possible observations taking place.

The actions and conversations of 30 groups and 8 individuals were described in detail. The groups were mainly parents and children (N = 15) and parents and grandchildren (N = 9). There were also groups of children (N = 3) and other compositions (N = 3). The researcher present approached 10 of those groups that had spontaneously engaged with the application, to report on what they had discovered, in order to collect their open and spontaneous responses. On average, these interviews took 3-4 minutes.

Analysis

Quantitative results

We conducted a Cronbach's alpha test that revealed both scales are consistent (alpha home = 0,81, alpha exhibition = 0,98). For all those questions the mean and standard deviation for the two conditions (CE = Conditon Exhibition, CH = Condition at home) were calculated and compared. For specific questions, a Wilcoxon Rank-Sum test was used to determine if the difference was significant.

Qualitative results

The reported insights coming from the open questions in the post-survey were independently coded by two researchers, including the main author, according to the types of visualisation insights triggered by personal data [7]; *'detail'*, when referred to specific data points, *'trend'*, when reporting data changes over time and *'data summary'*, when summarising all data. *'Self-refection'* includes different subtypes, such as connecting data presented to uncaptured data, contradicting with existing knowledge or confirming existing knowledge. Also the type *'data comparison'* includes several subtypes, such as comparing with other data, or bringing in external data for comparison. Then, the resulting codes were discussed by the main author and another researcher, until they reached an agreement. In the coding and the discussion, we observed how insight formulation differed between conditions. Therefore, our analysis included whether they were written in a distant and factual manner, personal or social (i.e. when data points of at least 2 persons were explicitly mentioned). The in-the-wild observation annotations were analysed independently by the main author and a second researcher (who was not present at the exhibition) via open coding [33], resulting in 21 thematic codes that were refined by two authors in 3 iterative sessions. Because of this, certain tendencies were discovered, which contributed to the results and discussion section. Overall, it should be noted that not all entries were considered insights. In both conditions, participants also made comments on the design, e.g. *"The subtitles of the presenter were not accurate"* or shared opinions about what they discovered "*It was interesting*", or, "*I did not learn anything new*". We would also like to point out that the analysis was performed in the local language, and then translated to English.

Results

Quantitative results

Visitors of the exhibition typically spent 2 minutes and 39 seconds using the application (i.e. median of all times the application was started during the 2 deployment months (N = 6,497)). The median time spent with the application in CH was 1 minute and 14 seconds. The median is chosen here instead of the mean, to exclude participants who closed the application immediately or not at all. In terms of their experience with interpreting line graphs, 5 participants in CH reported they have experience with interpreting line graphs, 2 answered that this was not common in their daily lives and 7 did not fill out this open question. In CE, 6 participants reported to have experience interpreting graphs while the others were not that familiar with charts and statistics.

The participants in both conditions indicated that they generally understood what the application was about (CE: Mean = 6,29, SD = 0,89, CH: Mean = 6,26, SD = 0,85) and they were mainly motivated to explore the application as they cared about the subject (CE: Mean = 6,18, SD = 0,92, CH Mean = 5,06, SD = 1,13). As shown in figure 6, all parameters of the contemplativeness scale scored higher for the exhibition condition. The participants who were present at the exhibition felt more involved (CE Mean = 5,88, SD = 1,08) than the participants who tested the application at home (CH Mean = 5,06, SD = 1,30). On average, CE participants also thought more about the societal challenges related to the topic than in CH (CE: Mean = 4,53, SD = 1,65, CH: Mean =3,21, SD = 1,79).

At the exhibition, participants were inspired to talk about the evolution of weather data with others (such as family, friends,...) (CE Mean = 5,05, SD = 1,88), which was significantly less at home (CH Mean = 3,37, SD = 1,63) according to the Wilcoxon Rank-Sum Test (p=0,01078, significant p < 0,05). In addition, they were also more encouraged to further explore the topic (CE Mean = 5,05, SD = 1,67), while this occurred less at home (CH Mean = 3,53, SD = 1,79).

The emotional engagement that was triggered by the presenter proved to be neutral in both conditions; participants hardly identified themselves with him (CE mean = 3, 42, SD = 1,96; CH mean = 2,21, SD = 1,47). There was one exception: children under the age of 10, who participated under supervision of their parents, felt more connected to the presenter and his ideas than other participants (mean = 4,25, SD = 1,92).

Participants at home found it less logical and convincing (CH Mean = 4,16, SD = 1,81) than at the exhibition (CE Mean = 5,00, SD = 1,81). Participants of CH were also more distracted by their surroundings (CH Mean = 3,05, SD = 1,76), which was significantly different for the participants at the exhibition (Mean = 1,84, SD = 1,14), according to the Wilcoxon Signed-Rank Test (p=0,03318, significant p < 0,05).

	Condition Exhibition	Condition Home
Detail	6	8
e.g. "It was cold on the day I was born"		
Trend	7	4
e.g "We saw that our birthdays got warmer and warmer over the years"		
Self reflection		
Insights based on personal info other than birthdate		
External context	10	0
e.g. "Our mom always told us that it was raining a lot when I was born, well that is not true"		
Contradiction	1	1
e.g. "The temperature on the day I was born was not correct, it was much warmer than the application revealed"		
Confirmation	3	0
e.g. "It is true that it does not rain that much in August, actually the weather has always been nice on your birthday"		
Comparison		
By factor	1	0
e.g. "There was a clear difference between the forecast of our 2 daughters, but one is born in the summer and the other in the winter"		
By time	3	2
e.g "The temperature at my birthdate stayed more or less the same, while the hottest day was already some years ago"		
Against external data	1	3
e.g "My birthday is warmer because of climate change"		
Data summary	2	1
e.g. "Climate change causes the temperature to increase"		

Figure 6- Different types of insights obtained by the participants

Qualitative results

As shown in Fig.4., CH participants were more focused on reporting insights as details (CH N = 8 (out of 21); CE = 6 (out of 30)) e.g. "*It was cold on the day I was born*" - CH P12, while at the exhibition, more people talked about trends e.g. "*We saw that our birthdays got warmer and warmer over the years*" - CE P11 (CE N = 7 (out of 30, CH N = 4 (out of 21)). In terms of self-refection, CE participants often made comparisons with the external context e.g. *"Our mom always told us that it was raining a lot when I was born, well, that is not true*" - CE P15 (CE N = 10), while this did not occur with the insights formulated by the participants at home (CH N = 0).

We observed 5 times when an individual or a part of a group started testing the application and then invited the rest of the group to join e.g. a child to a parent *"When were you born? We can have a look what temperature it was then"* - CE P8. The family experience was also mentioned by 7 CE visitors as a reason to sustain their engagement e.g. *"I found it very exciting. I am also very interested in the weather. And I try to pass that on to my son"* - CE P6.

CE visitors (N=7) retold the data stories to family bystanders after they finished using the application, for example sharing with each other when the rest of the group was seated in the bar e.g. *"Look it was often cold when you had your birthday"* - CE P15, *"I saw that it was 20° on my birthday"* - CE P13.

The exhibition was targeted at a young audience, whose knowledge of graphs and data is sometimes limited. When asked what she thought of the graphs, a 10-year-old girl replied: "I do not even know what graphs are" - CE P2. We noted 4 occasions in which (grand)parents explained to their children the meaning of the different lines. One father mentioned: *"I explained them how the temperature changed of the years, the trend line is a good simplification to show that the temperature has gotten warmer and warmer"* - CE P16. In another occasion, a grandfather reported: *"I have worked in a school myself and I find this a good way to teach them how things have changed."* - CE P11. We also saw this dynamic when the digital skills of the grandparents were limited or when they were not that interested in

news e.g. *"I think that those kids know more about it than us, they watch the news at school"* CE P2.

We interviewed 9 visitors who took photos of the personalised weather infographic for family or friends at home, after which they expressed to share it with others *'as proof'* (N = 5), or as an interesting fact for family members who were not present (N = 2).

In CE, 10 interviewed visitors reported their discoveries in a story that departed from a hypothesis or previous experience, e.g. *"I expected this [...], contrasted with the data (and its evolution)*, e.g. *"but then [...],* followed by a conclusion *"so it was true"* or action, e.g. *"I am going to send mom a photo of this"* - CE P16.

At CE, some (N = 8) made hypotheses that were based on previous experiences or existing knowledge e.g. *"I think it will be cold on my birthday"* - CE P18 or on family stories e.g. *"I heard it was very hot the day Aunt (name) was born, it was apparently a heat wave then"* - CE P19. We noted in 5 occasions that these hypotheses were formed while queuing. In CH, 3 participants indicated they departed from a particular assumption or existing knowledge based on memories.

CE visitors also entered other episodic dates than birthdays, such as summer holidays, wedding dates and when loved ones died, which they then compared with their memory of the event.

Discussion

Our findings reveal how external and internal story design elements support data engagement.

Unpredictability of the environment encourages families to engage longer with data

In contrast to our hypothesis (H1), participants were overall more engaged with the narrative at the exhibition, than at home. Before- hand, we expected that the loud atmosphere and the vicinity of several other interactive applications at the cafeteria would not keep their attention to the story, yet participants at home felt more distracted by their environment than at the exhibition. The time spent per condition also indicates that the external stimuli at home were more distracting. Moreover, the cafeteria environment allowed visitors to invite others, who were not involved from the start, to join the experience. For family members who were already experienced with interpreting data, the unfamiliar and unpredictable surrounding provided an additional layer of challenge in the activity at hand and encouraged family interaction [20] and engagement with the data.

Design recommendation 1: Data video storytellers should consider external environmental conditions, such as time and location, as an additional narrative layer for those who are familiar with the main story line. Since television and media nowadays are mainly experienced on-demand, it is difficult for storytellers to predict how and when their story is experienced, in contrast to traditional linear stories that families may enjoy together on Saturday evening.

To overcome this, we imagine storytellers could include cues that encourage young viewers to engage their parents in the data experience, by requesting their participation and as such, trigger family interaction. We also believe that designing for family interaction would be more effective when it can be experienced at devices best suited for family consumption, e.g. a television screen on which the application can be experienced via a streaming platform. Future work could further explore the role of the distribution platform in data engagement and exploration, for example by creating interactive (video-based) data stories for television.

Connecting data to memories support refection

Our insight analysis revealed insights in both conditions equally grasped the context of global warming. However, the contemplativeness scale per condition indicated that participants at the exhibition contemplated more about societal challenges related to the data topic than at home. We thus overestimated the role of social discussion in reflecting on the social relevancy of the topic. The exhibition environment did not contribute to emotional engagement with the topic. Instead, social discussions on existing factual knowledge, memories or family stories, often formed the starting point for participants' discoveries. As discussed in the results section, the hypothesis formulated by the participants in both conditions helped them to draw conclusions from the data. We therefore believe linking data to memories is a strong narrative device to trigger data refection. Our memory is story-based, which can be triggered through touchpoints. In traditional video story- telling, such touchpoints are typically provided as a way to make the audience relate to the characters [39]. In this case, the data video story provided memory touchpoints that connected the viewers with the data, facilitating refections in a personal or social manner.

Design recommendation 2. Memories form a compelling narrative device to encourage refection. Data video storytellers should consider establishing a connection between the episodic memories of their intended audience and the data. Here, data should not only be considered as an end point, they are a medium to share personal or social experiences [26].

Connecting data to memories support retelling

Reported insights that are complemented with memories form fun data exploration points - whether they turn out to be true or not - to be shared with others who also may recall the occasions. Our findings revealed how visitors retold the data story from their own point of view to their family, and even to us, researchers. These stories would often start with a personal hypothesis based on a memory, followed by the actual data and a reflection on its meaning. Thus, the episodic memory formed the basis to retell the data story. Our findings also show that both participants and visitors were encouraged to enter other episodic dates, such as summer holidays, wedding dates and even dates when loved ones had died, which they then compared with the objective data. We found several visitors took photos of the personalised weather infographic of family or friends at home, and shared it via social media. The episodic memory thus forms a good basis to retell the data story.

Design recommendation 3. Sharing practice encourages humans to retell the data story, thereby describing data points and insights. As a result, data story (re-)tellers are familiarised with data. Designers of data video stories could consider including elements that respond to memories or other social discussion points, such as famous persons, to facilitate the retelling of data stories.

A familiar presenter establishes trust and encourages data exploration

At the exhibition, we learned how the presenter's presence and call to explore the data became an additional nudge to interact with the line graphs. For (grand)parents, the inclusion of the familiar youth news presenter established trust, and made them encourage their children to further engage with the application. In addition, when participants recognised the presenter when others were using the application, they also became driven to find him themselves through the entire data video story. Including a familiar character, such as a presenter, in a data story formed an additional motivation to explore the design for those who relate to them (similar to the presence of famous actors in movies), which appealed to a subset of the audience. It forms an additional incentive to sustain data engagement. In addition, a familiar news presenter is a particular way to establish trust in the information that is conveyed, which is a strategy already used in the fight against disinformation [13].

Design recommendation 4. When aiming to engage children with data, including a familiar or popular character in the story design can form an additional entry point for data engagement

Exchanging data-literacy skills supports family interaction

We observed moments of inter-generational learning by passing on data literacy skills at the exhibition. Such inter-generational learning also occurred from children to their (grand)parents. The integration of different levels of data visualisation complexity allowed a data-literate audience to connect to the data video story and be triggered to pass on their knowledge. Storytellers that write family films are already experienced in designing stories that connect both to children and adults through different narrative layers that meet the needs for knowledge of each type of viewer, i.e. adult or child [20]. This is in line with recent findings on integrating layered storytelling approaches for data analysis in collaborative learning contexts [18].

Design recommendation 5. Data video storytellers that aim to engage families should consider this connection to different data literacy levels, next to the more traditional narrative layers of the internal story design that were discussed in design recommendation 2, 3 and 4.

Limitations

Often in media design, effects are topic-related, causing them to be difficult to generalize [28]. However, our study demonstrated how personal and social connections to data, such as important event dates, memories and affection for particular characters, can form powerful entry points for data engagement. These design recommendations are relevant for other topical data sets. For instance, we imagine graphs that depict Covid-19 cases related to

personal (e.g. first ill person in the family) or social events (e.g. first party with limited people) are a way to draw people in and interpret data. Similar scenarios can be thought of for other news data, such as elections, financial news and sports data, to name a few.

Conclusion

In this paper, we present the design of an interactive weather fore- cast that reveals historical data of temperature and precipitation by means of personalised video storytelling techniques. Through a comparative study in a home and family exhibition environment, and an in-the-wild study at the exhibition, we learned that family interaction supports social refection on the data presented, and that environmental conditions affect data engagement. Furthermore, our findings suggest that establishing a connection between data and memories is a compelling device to foster engagement with data, and support retelling of data stories, and that a trusted, familiar presenter can help overcome reticence with more complex types of data representations. These findings suggest that professional data storytellers do not only need to consider the narrative, internal story design but also the external conditions of story consumption.

References – Paper More Weather Tomorrow

Appendix 1

Dissemination learnings

In addition to the scientific output, we also communicated about this to a larger audience by making a video about this setup https://www.youtube.com/watch?v=o_K1g6xLuvo&t=2s as shown in the video stills in figure 7. In this video we also briefly explain the purpose of the design research to a large audience.
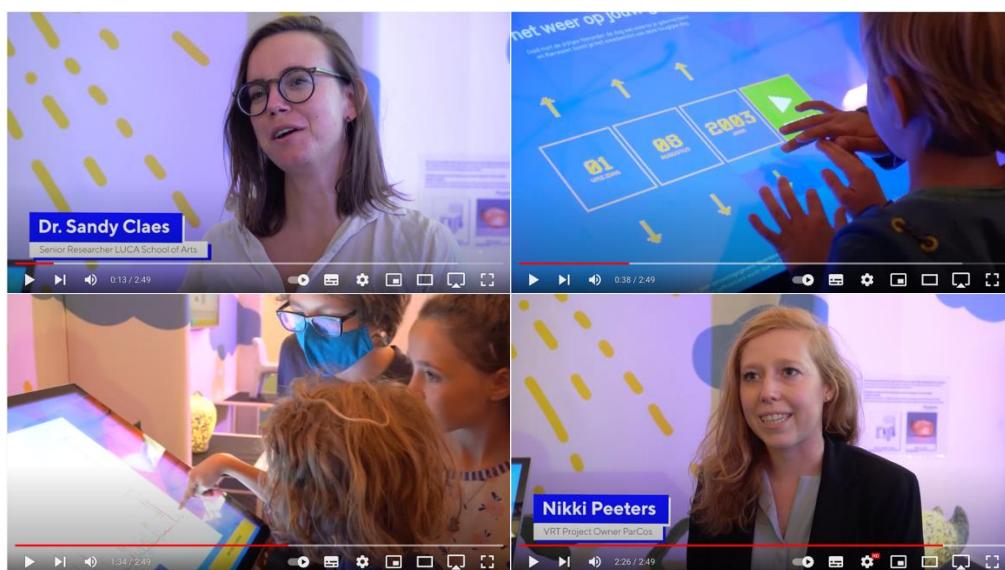
Our learnings were shared with the makers of the EDUBox, the educational box developed by VRT Innovation and VRT NWS. With these educational kits they try to make difficult societal topics accessible to a wide range of (young) people in cooperation with expert partners. Examples of topics from previous EDUBoxes are data, artificial intelligence and fake news. These kits often contain data (visualisations) and the learnings of the More Weather Exposition can help to present these data to a less data literate audience.

2 – REACHING A DIVERSE AUDIENCE WITH DATA STORIES

Our second goal was to study how to deliver complex, scientific stories to a wide and diverse audience, thus not only those who are already interested or actively seeking information about (science) data.

We selected a news item that presents a short story on astronomical citizen science data. Here, citizens are invited to listen to sounds that were made by the vibrations stars make, which allows scientists to discover new stars. The news item explains shortly how it works, why it is relevant and how they can participate. Space, as a theme, appeals immediately to a wide audience, yet – due to the fact this story is more complex, this specific astronomical data only appeals to a limited group of people who already have an interest and deeper understanding of science, and more specifically space.

We departed from the concept of situatedness. In information visualization research, situating visualizations in (semi-)public spaces has proven to be a successful strategy to reach a varied audience. If we can encourage a wide audience to engage with this science story by placing it in public space, it may also help them overcome the overwhelming feeling of trying to understand data and charts. In addition, it may even encourage them to become more critical of news articles that contain scientific claims and numbers.

The resulting public installation was presented at Knal! Festival (Leuven (BE), winter 2022), a city-wide festival that combines art and science in various events with the big bang as the main theme. The festival is organised by Kunst Leuven.

The goals of the study were twofold. We (1) studied the design of the physical installation and how an audience with less interest in science stories engage with, and (2), we investigated the digital content that served as call-to-action.

Citizen Science platform as departing point for our ParCos design
The specific installation had the goal to present astrophysical research about the sound of the stars in an interactive way. Many people think that astronomy is mainly focused on visual observation, but you can also listen to the stars. Some stars actually vibrate; they reverberate like giant gongs. We cannot hear these sounds directly, but we can find out about the changes

in light from the stars. These, in turn, can be converted into audible sounds. Thus, it is possible to recognise a star by the timbre or the sound of its vibrations. Within astronomy, there is a true explosion of data thanks to the new generation of space telescopes. Can the human ear be used efficiently to analyse the data flow within this field? This is the research question that lies at the heart of the citizen science project AstroSounds, set up by KU Leuven, Hogeschool UCLL, PXL Music and the Planetarium of the Royal Observatory of Belgium.

AstroSounds is a call to everyone, young and old, to help advance science by listening to stars and classifying them based on their timbre and pitch. The AstroSounds team is investigating to what extent the human ear can distinguish types of stars and can help analyse new (star) data in the future.

"*With AstroSounds, we want to demonstrate that our hearing is a very powerful instrument that can also be used for scientific research*," says Katrien Kolenberg, astronomer at KU Leuven. "*Stars like our sun are gigantic balls of gas, with different properties that give rise to different sounds when we convert the data to sound. By letting a large audience listen to different types of stars without prior knowledge, we can find out how powerful the ear is for data analysis. We might even be able to hear some of the subtle differences between stars more easily than we can see them! With this approach, we also make science more inclusive*."

At this festival, we want to encourage citizens to actively participate in this and invite them to identify stars themselves. The installation has the goal to present a difficult scientific subject in an understandable way for all passers-by and visitors of the event.

Installation
For the design explorations of the installation, we worked together with students Media and Information Design of LUCA School of Arts (in Belgium) in the same way as with the More Weather Exhibition as described above. During the atelier 'Data Stories', coordinated by dr. Sandy Claes, they explored different artistic ways to present the dataset in an innovative an interactive way for a diverse audience.

In the same way as with the More Weather Expo, the design process was organised in different phases. In the first phase, a wide variety of ideas were presented, and different formats were explored. These include for example a walk in the city, a picture book, candles, and various formats that can help create an interactive installation.

Figure 8 – Different artistic explorations (Online Citizens Science platform, Candle as metaphor for the different life stages of stars and an informative walk about stars)

Gijs Ipers, one of the students that participated in this course, decided to optimize his concept during as an intern in the project AstroSounds. He designed a physical installation with an online citizen science platform where people could find more information about the research.

Together with the scientists involved in the AstroSounds project, we held a workshop to collect their ideas about the installation and about their needs to communicate their research to the general public (figure 9).

These insights were also shared with KU Leuven, because together we can deduct from this workshop what the communication needs are from the scientists and these insights can help KU Leuven to improve the ParCos Trainer Package (D.4.3, D4.4)
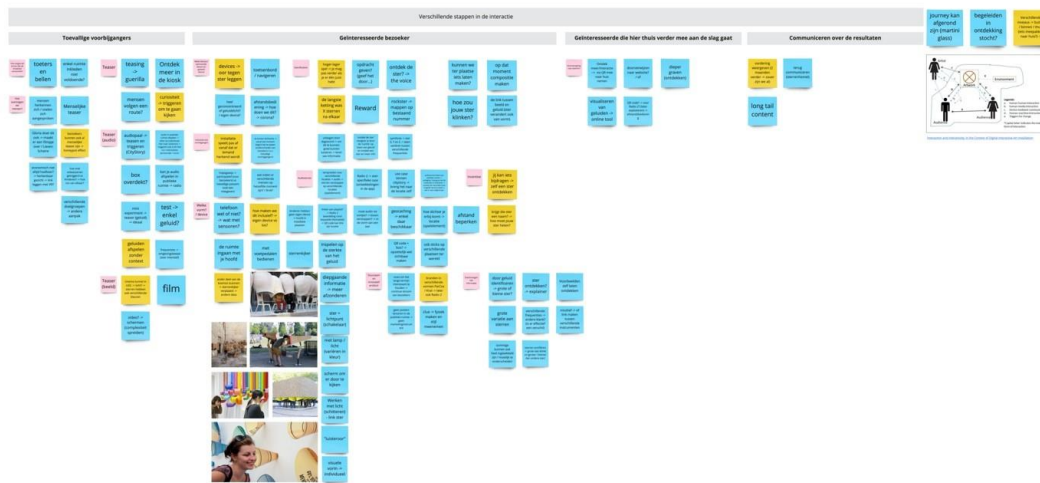

Figure 9 – Workshop about what challenges there are with regard to communicating the research to the general public
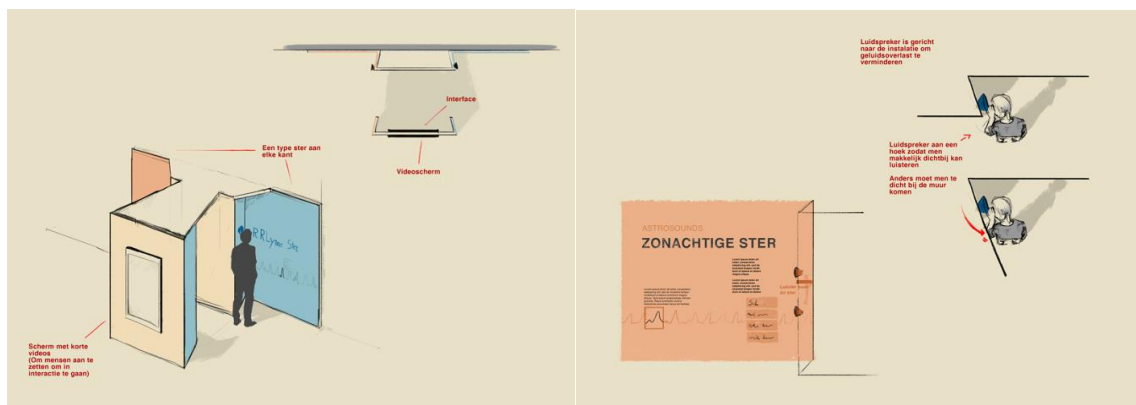

Figure 10 – Design sketch (installation), made by Gijs Ipers

The installation (figure 10) was designed as an intermediary object between the audience and the online platform. It had the goal to inform them about the topic and invite them to participate in the research, both on site and through the online platform. For VRT as

broadcaster it is an interesting challenge to explore new ways to reach a diverse audience in their familiar environment.

As of January 11, 2022, the physical installation was placed for 2 consecutive months in the Tweebronnen Library in Leuven, as part of the KNAL! City Festival (figure 11).

Figure 11 – Installation placed in the library

Content on displays as call to action
To arouse the interest of passers-by, we also wanted to investigate how to design hypershort stories for the displays that were part of the installation. In fact, we aimed to explore how vertical video content on public displays can inform and engage people in science stories. As part of the project, VRT worked together with students of LUCA School of Arts to make scientific information more transparent and visual (figure 12). The results are 7 short, animated videos that are shown on public screens in the Bib Leuven Tweebronnen. The function of these films is to make the scientific research more visible and to invite passers-by to test the installation.

Figure 12 – Workshop with LUCA Students as part of the collaboration between the students and experts at VRT

Figure 13 – Screenshots of the videos made by the students to invite passers-by to test the installation

The videos were played on 2 different displays, one in the hallway to the installation and one attached to the installation.

Figure 14 – The displays: display 1 (left) in the hallway to the installation and display 2 (right) attached to the installation

We observed over 600 passers-by, interviewed them, and asked them to fill out a survey about which content they would prefer. We also compared this with more traditional explainer videos in the style of our news brand, with and without logo. We learned the newsbrand established trust. Although the brand is not always visually noticed by visitors, they perceive it as a news story through overall visual colour design. Furthermore, we learned the use of cartoon characters attracts an audience that typically would not engage with science stories. Similar, the location of presentation contributes to the appeal of an audience that typically does not engage with science stories (I.e. not reading science stories in newspapers or online, not watching science tv shows or going to sciences musea).

These insights have contributed to the further development of the ParCos Storyteller and it is the intention that these learnings help science communicators to reach a more diverse audience. We also published a video, in which we explain why it is important that scientists and communicators share insights about their work to reach a wider audience. This video was shared on the communication channels of the ParCos project and on the VRT's LinkedIn profile (+ 65.000 followers).
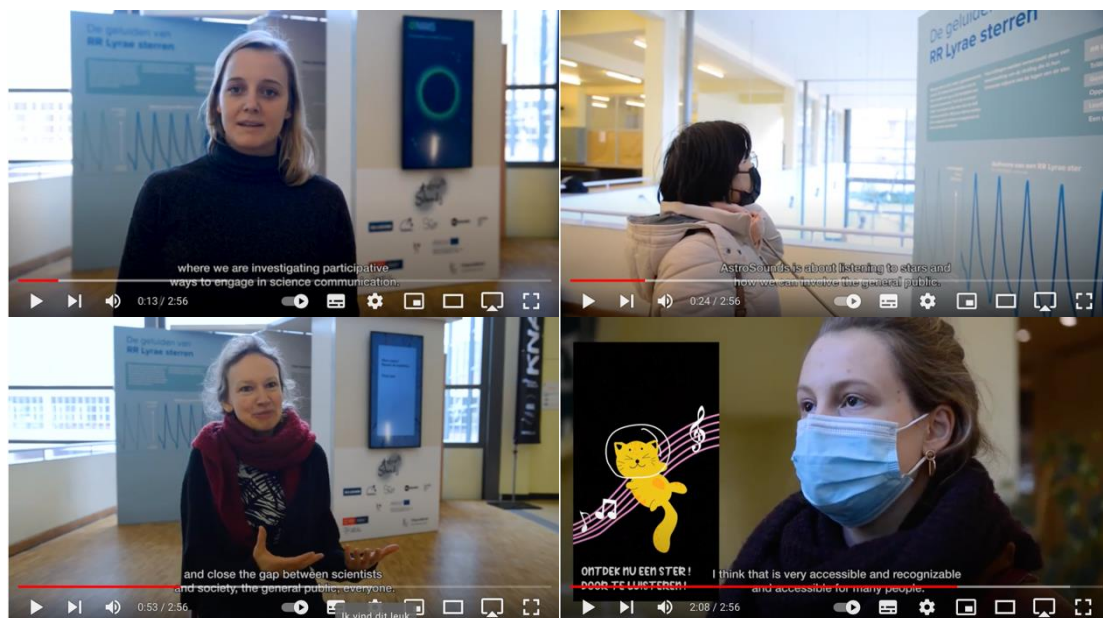

Figure 15 – Video "Engaging citizens to become "star listeners" published at the ParCos YouTube channel - https://www.youtube.com/watch?v=M3WBHu7DiNA&t=106s

3 – SUPPORTING SCIENTISTS TO TELL (DATA)STORIES

Our third goal is to also support scientists to reach audiences through data storytelling. Besides the cooperation with the scientists to develop the AstroSounds installation as discussed above we were also involved in the course "science communication and outreach" of the Catholic University of Leuven and we shared in-house knowledge about science communication in a vlog.

Involvement in the course "science communication and outreach" of KU Leuven

For this we have taken on an expert role in the course "science communication and outreach" taught by Dr. Katrien Kolenberg at the Katholieke Universiteit Leuven to about 150 master students in science, with a variety of backgrounds *(figure 16).*
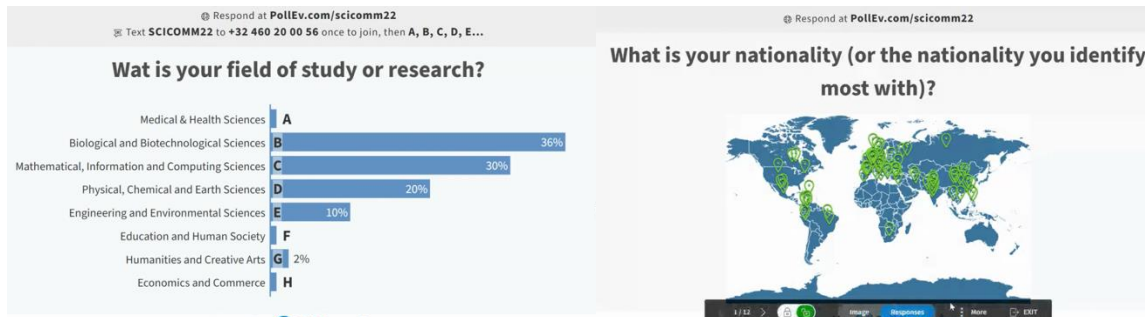

Figure 16 - Characteristics of the participants of the science and outreach course (field of study or research and nationality)

On February 16th 2022 we have given a 20 minutes introduction to the ParCos project and the ParCos Storyteller and we have suggested space as subject for their assignment. For this course they had to present a scientific (data) story through a medium of their choice (poster, game, blog,…).
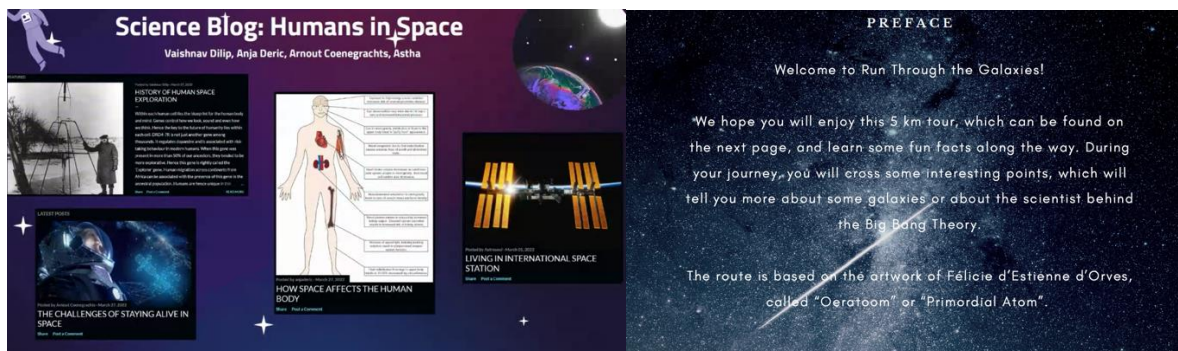

Figure 17 – Examples of the outputs created during the "science communication and outreach" course (Science blog (left, informative run,…)

On Wednesday March 30 2022, a total of 41 science communication projects spanning different media and themes were presented. 9 Of these projects had space and data as subject and were reviewed by us as external expert, examples of this are shown in figure 17.

These students are well acquainted with the scientific method but translating it into a creative output for the general public was new to most of them. Tools such as the Storyteller and the Trainer package could be interesting methodologies for this.

Vlog "Science communication at Flemish public broadcaster VRT"

Within the ParCos project, we also created a vlog with insights from VRT experts, which was also published on the ParCos YouTube channel *"Science communication at Flemish public broadcaster VRT" https://www.youtube.com/watch?v=ilfTud94COU&t=133s.* In this video,

science communicator Jacotte Brokken speaks with leading voices at VRT about the role of science communication and interaction to help people communicate science stories in an engaging and transparent way.

For this she interviewed Katleen Bracke (Editor-in-chief University of Flanders), Koen Wauters (science journalist), Tim Van Lier (education expert VRT) and Karen Donders (director of public affairs VRT).

Figure 18 – Vlog "Science communication at Flemish broadcaster VRT" published on the ParCos YouTube channel with interviews with Katleen Bracke, Koen Wauters, Tim Van Lier and Karen Donders

4 – SUPPORTING MEDIA/NEWSMAKERS TO TELL THEIR DATA STORIES

A fourth strategy to make data more accessible to a wide audience is by working together with the media makers and journalists within VRT.

Inspiration session and workshop with (future) newsmedia designers
We organised an inspiration session and workshop for young creatives and experienced newsmedia designers and journalists of VRT NWS to think about new participatory ways of communicating science. On the 9th of May 2022, 18 students of Media and Information Design from LUCA School of Arts visited the news department of VRT (I.e. VRT NWS) for a workshop with 6 creative newsmedia professionals. The concrete goal was to brainstorm in a collaborative way how current visual representations of science and data in a news context can be made more engaging.

Before the brainstorm session started, there was time to get familiar with each other's work methods, challenges, and experiences. Everyone presented and clarified their previous work, and there was time to ask questions and engage in discussion. In addition, the ParCos project

was presented, including the Storyteller, which inspired the audience to think of new ways to represent data.

Figure 19 – Workshop

The challenge

The participants of the workshop were challenged to redesign an article previously published on the website of VRT NWS in groups of 4 to 5 people. The combination of experience, expertise, and creativity resulted in interesting proposals and inspiring discussions.
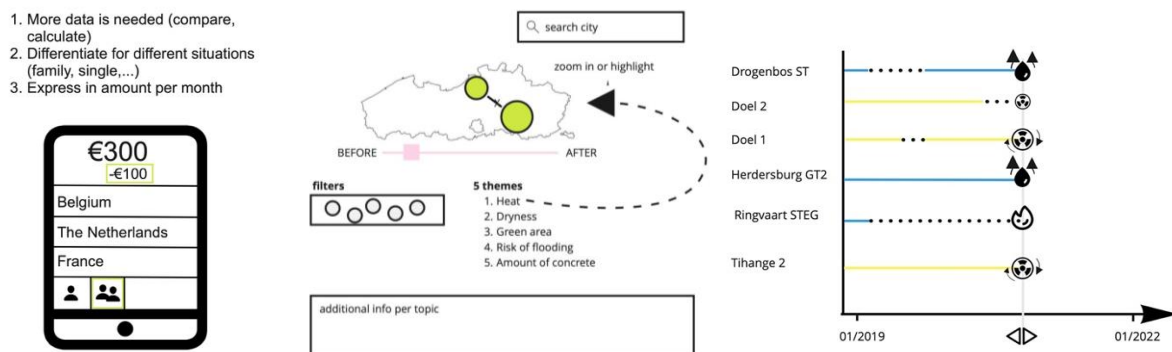

Figure 20 – Outputs created during the workshop (the energy calculator, interactive climate map and comparison of different power plants)

Group 1 – The energy calculator

The subject of the article of the first group was a comparison of how neighbouring countries are tackling the rising energy prices. Instead of complicated graphs, they designed a calculator to calculate the impact of different measures in the different countries for different situations (such as in a family context).

Group 2 – Interactive climate map

The second group worked on an article titled: "Where in Flanders will you feel the impact of climate change?" To visualise this, they made an interactive map, on which 5 different parameters (heat, danger of flooding, etc.) could be represented.

These topics were also further explained; you could zoom in on the situation and evolution in your own neighbourhood. This could then be supplemented with information or stories of citizens.

Group 3 – Comparison of different power plants

The third group made an interactive visualisation of the different power stations in Belgium, with an indication of when they were down. The conclusion from this was that gas-fired power stations fail more often than nuclear power stations.

The results were presented to each other and to other news professionals, after which the students were able to take a look behind the scenes of VRT NWS with a tour. The results of the workshop will be used to improve and strengthen the Storyteller.

Research tools dataviz

In addition, we also conducted research to digital tools and workflows that can be used by the VRT NWS department to publish data stories. The data stories that were published in the past were often tailor-made, with the news department now wanting to switch to a system and methodology to create more (participatory) data stories.

The data stories that were published in the past were often tailor-made, but because this requires a lot of work, there is now a need to roll out a system and methodology to create more efficient (participatory) data stories. Because various parties are involved, we have made a state of the art presentation to show what the possibilities are.
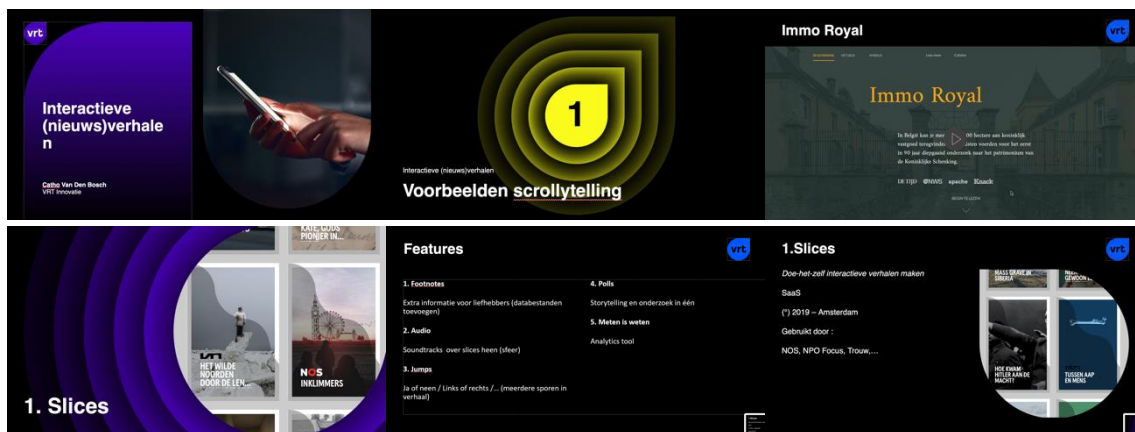

Figure 21 – Presentation tools for interactive data stories

We have also discussed those tools with our software developers to explore what the possibilities would be for personalisation and data visualisation. In addition, it is also

We also did a comparative analysis of articles from other news organisations to explore different storytelling techniques (figure 20, 21) with a focus on personalisation and data representation.
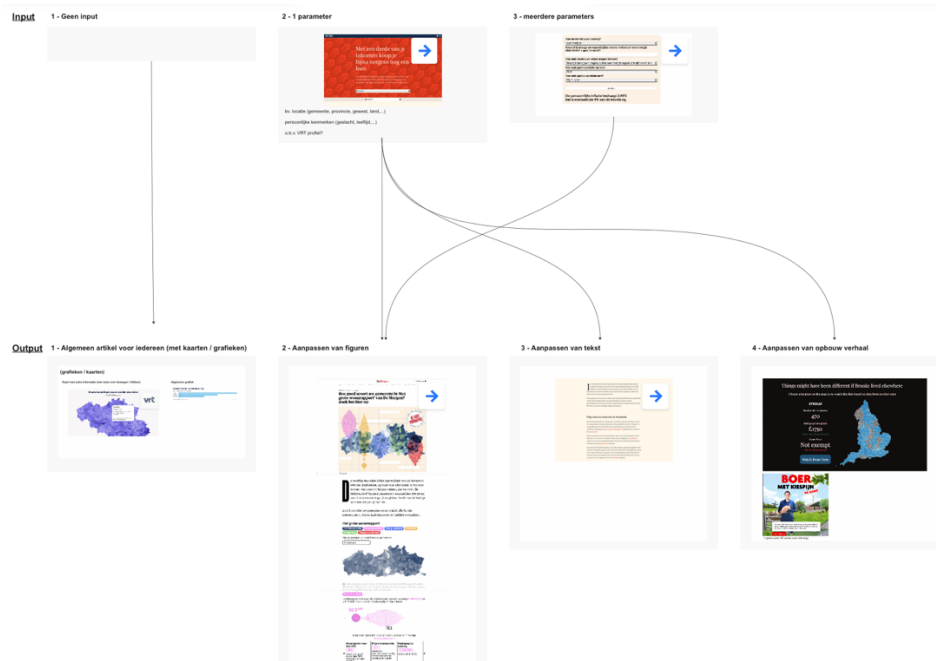
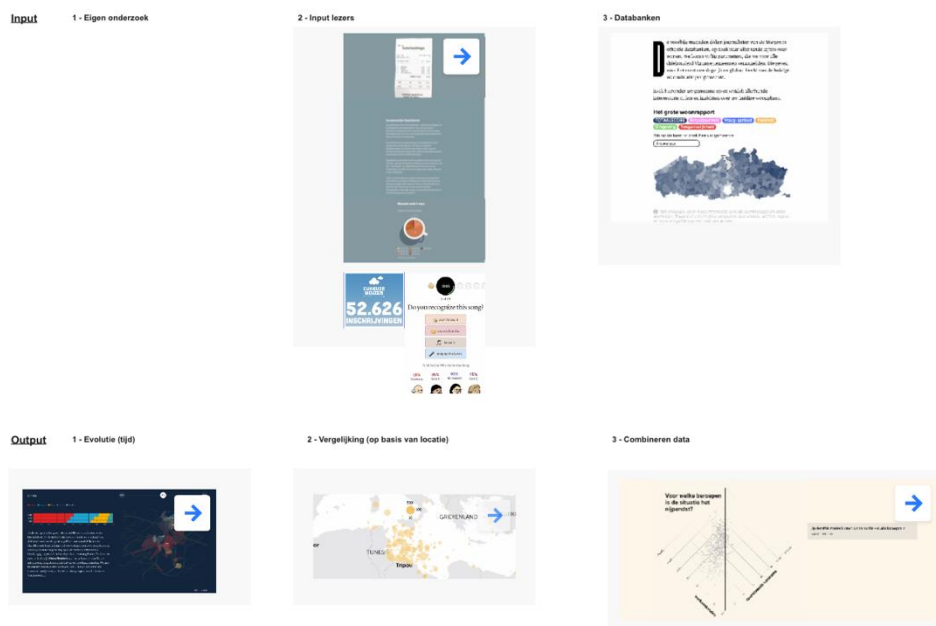*Figure 22 -Analysis of the various personalisation options of a story*

Figure 23 - Analysis of different data inputs in a story

These outputs are then used as input for a series of 3 workshops with journalists (dedicated to investigative journalism), digital creatives (working for the news department) and researchers at the innovation department to determine which of these techniques could be applied in the development of new (participative) data stories.

The intention is to transform this input together with the storytelling techniques defined in the ParCos storyteller into a methodology that can be used as a guideline in the development of such stories in the future in the news department.

CONCLUSION

Deliverable 5.1 – Case Study 1 (VRT) Stage 1 – provided an overview of the outputs of Stage 2 of Case Study 1 in the ParCos project. We presented three concrete ParCos objectives that fed the design of the case study setup, which resulted in four subtasks, I.e. (1) designing science data stories that are understandable for audiences with varying levels of data literacy, (2) reaching audiences that otherwise might not engage with science stories, (3) supporting scientists to create science stories that are engaging for wide audiences and (4) supporting (news) media professionals in creating engaging science data stories. For each of these subtasks, we have undertaken several explorative actions. We have reported on their finding in this deliverable.

APPENDIX 1: REFERENCES

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