

Eindhoven designs, volume seven

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Eindhoven designs
volume seven

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MICROSOFT DESIGN EXPO 2013: PRELUDE

“Increasingly we live in a world alive with sensors and data. The big data, sensor networks and transparency movements have left us with a supply-side glut of potential useful free data that is lying fallow. How can we use this to improve life, local community and the world at large?” (From: Guidelines for Microsoft Research Design Expo).

In November 2012, we were invited to participate in the annual MSR Design Expo 2013. For the Expo, each year Microsoft invites six to eight leading design schools to set up a competition between student design teams in their school and to send the winning team to the Microsoft Faculty Summit in Redmond, to present their work along with the winning teams of the other schools.

This year’s theme was “Making Data Useful: Improving your Life, Community and World”. The guidelines requested student teams to come up with proposals about how “data might make for a better and more community oriented place to live”. The proposals should be grounded on a thorough understanding of users and be refined on the basis of feedback from the users. Prototypes should tell the story of the process and highlight the solution.

In our Master program, each year we organize a four-week course titled “Designing for the User Experience”, which aims to guide students in extending their expertise in the different aspects of human-centered design. This year, the MSR Design Expo posed an excellent opportunity to contextualize the contents of the course. For the occasion, the course was extended to six weeks, and the eighteen participants, making up five teams, started to work on the design contest.

The Industrial Design education of TU Eindhoven focuses on the design of intelligent systems, products and related services in a societal context. The education program lets students build competence in key areas for design, in a learning-by-doing approach, teaching them to integrate these key expertises in a coherent and effective design process. According to state of the art views on Industrial Design, key areas involve the arts, the social sciences and the engineering disciplines. Thus, our students seem optimally equipped to participate in challenges such as the MSR Design Expo.

The course kicked off with a symposium around the topic of (big) data, to sensitize students to the topic. Other activities in the course were meetings and workshops about user experience theory and methods for user research and data analysis. Most time was spent on building an understanding of how data could be made useful for people, developing concepts and collecting feedback from different parties, both experts and users, in an iterative manner. Feedback was also provided by Jakob Nielsen and Anton Andrews, who acted as liaisons on behalf of Microsoft, and who visited our department at two different moments in the course.

The different teams chose different topics within the broad field of (big) data, including how to make data about energy consumption useful to people, how to use mobile telephones to connect co-located youngsters instead of separating them, how to enrich data about the family history, how to use data about the socio-emotional development of children to support healthy child development, and how to use personal data from social media to create meaningful personalized fortune cookies.

At the end of the six weeks, the different teams presented and demoed their work to a jury who decided which team was the winner and was going to present their work at the Microsoft Faculty Summit. Although there were differences between the teams, overall we were impressed by the results, and the jury had a hard time coming to a decision. In the following chapters, we present brief overviews of the work of the different teams. The final chapter gives an impression of the MS Faculty Summit and of the performance of the winning team at the Summit. Enjoy reading and seeing!

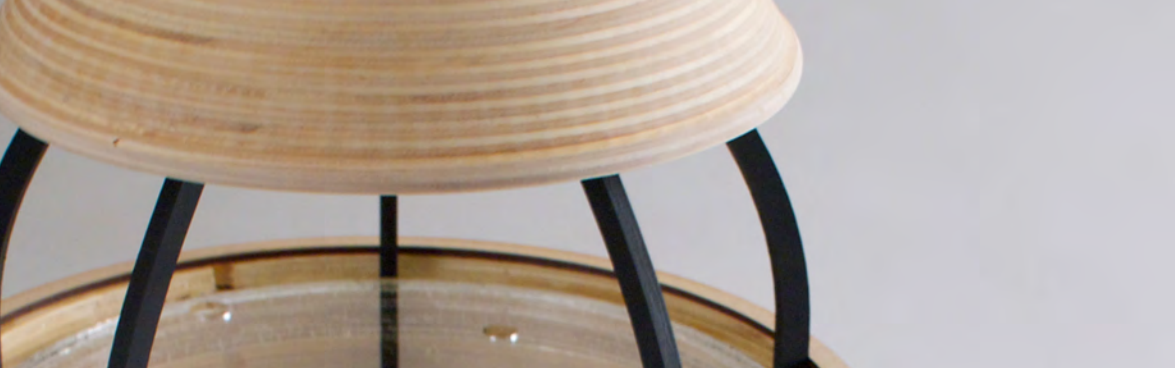
We want to thank the students who participated in the contest in our department for their efforts and hard work, and the staff members who participated in different roles, giving lectures and acting as experts. A special word of thanks goes to Jakob Nielsen, Anton Andrews and the other MSR people involved in the organization for their commitment and enthusiastic support.

Berry Eggen
Jacques Terken
Department for Industrial Design of TU Eindhoven
User-centered Engineering research group

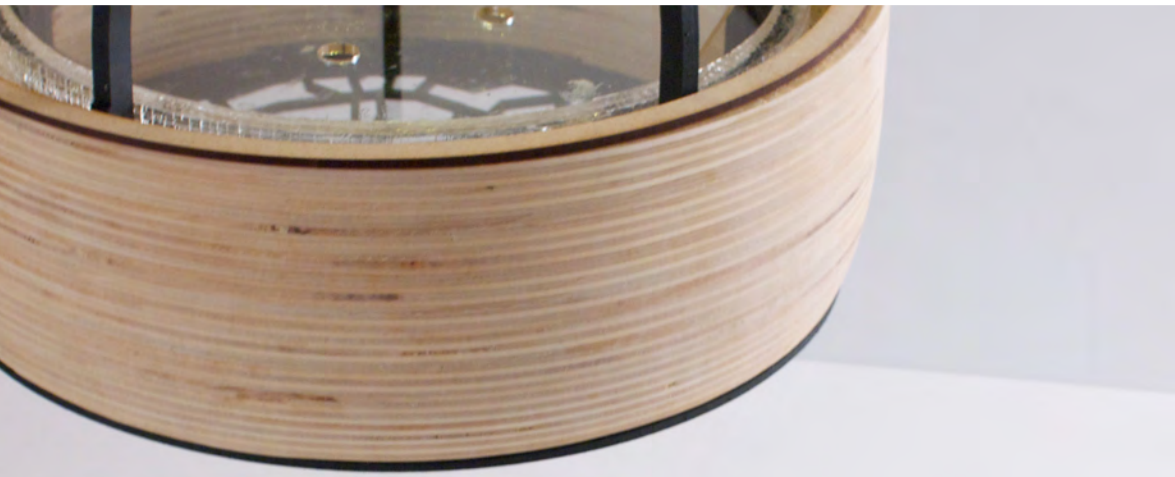
Now you see it, now you don't

as information & communication technology becomes increasingly mature, the technology itself **can, need, will** fade to the background of human activities becoming far less obtrusive than is the case today

e.g.: **Weiser**; Norman; Redstrom; ...; **Eggen**



AMP



Smartphones are ubiquitous, providing permanent access to remote people and to an enormous amount of information. It becomes hard for people to resist checking their phones continuously. This behavior is annoying when we want to spend quality time with our friends. This distraction may harm people's social wellbeing, as was confirmed by our own user research. However, people who were interviewed also clearly indicated that removing their phones from everyday social life would not be an option.

In many instances, the on-line information available to people may in fact bring value to conversations. The challenge for the team was to find ways to bring on-line data into the conversation without eliminating the Smartphone.

Koen Beljaars, Ken Giang, Leonie Tenthof van Noorden, Tamás Fejér.

CONCEPT

AMP enables you and your friends to explore interesting events in the city of Eindhoven. A lamp that creates a dynamic shadow of the city of Eindhoven on the table embodies the AMP-concept. The shadow ripples at the location where new tweets and photos are generated by the city and its people. AMP also includes an App that gives you instant access to the real-time location-based information. By placing your Smartphone on the ripples' epicenter, this information can be accessed. AMP invites you to share your phone and brings friends together instead of separating them.

The lamp amplifies the social interaction by bringing relevant information to the conversation; meanwhile it enables tangible interaction with objects that are already present in the shared physical space. Together with the application, AMP integrates 'city data' in an aesthetically pleasing way in the context.





PROCESS

Starting conversations with many people, the team gained a better understanding of how Smartphone usage can sometimes be extremely destructive in people's daily social life. The explicit action of putting your phone on the table as a way to disconnect from your online world was inspiring for the whole team. The beauty of this simple gesture became one of the main drivers for this project. Nowadays many photos and tweets on the Internet are tagged with location data. This online content is actually creating a living digital map of a city, which allows people to see current events and explore new places around them. This dynamic data set was investigated in the development of the AMP-concept.

During the design process many physical prototypes were made by the team to explore the context and the design possibilities. In this way, an interactive lamp was designed together with a Smartphone application, which can communicate with each other. During the development of the final prototype, many versions of the lamp were created. Each time, the lamp became more advanced, refining the overall experience with the system we envisioned. To create a dynamic light effect, the lamp includes a thin layer of water and a grid of vibration motors in it. By making vibrations in the water, ripples will appear on the shadow map of the city of Eindhoven. Next to the lamp, the Smartphone application was created to allow users to explore what is happening at different locations of the city. The materials and the shape of the lamp were chosen carefully to fit seamlessly into a bar or restaurant, where people are having dinner or drinking coffee.



Families embody a collection of social values and stories that have been shared over generations. Currently, a change in the sharing of these values and stories can be observed. Old generations tend to share their experiences mouth to mouth, while enjoying a cup of coffee. Younger generations have raised the act of sharing to a new level, sharing their personal life in a continuous way through social media. By correlating factual family data like origin and ethnicity with personal stories we want to provide a platform to enrich and conserve family history in a way where both young and old can participate. Our goal is to provide a tool that allows you to share and browse through stories from the past and stir the conversation between young and old.

Pepijn Fens, Job Huberts, Mitchell Jacobs,
Attalan Mailvaganam.



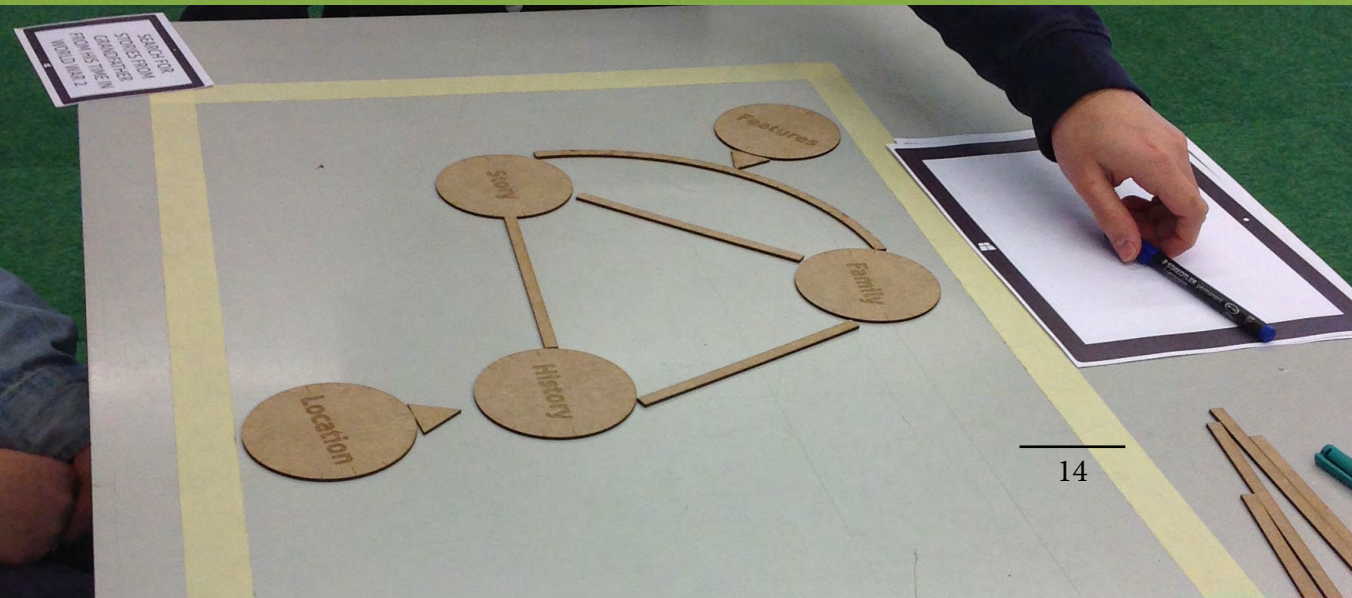
CONCEPT

The Roots system takes a tangible approach towards exploring family history. Roots consists of four modules, a base, and an application. The four modules represent Family, History, Location and Story, respectively. These are the modules that can be used to explore your family stories. Adjusting the different levels of granularity of each of the modules influences the data shown on screen. The family module is used to select a starting point for your journey. Is the story related to yourself, or is it about your aunt? In the history module, adjusting the level limits the stories to a particular time frame. The location module is used to browse through locations related to the stories. And finally, the story module is used to select the right type of story; this can be video, audio and/or written text.

ROOTS

PROCESS

Roots was developed through a reflective and transformative design process, using feedback from end-users and experts to give direction to the concept development process. Starting from a vision of making family data matter, the concept of a personalized artifact was developed. This artifact would gather personal data, combine it with data from relatives and create family timelines. After discussing this concept with several experts and a few end-users, the idea moved towards creating a central point of interaction within a family. Think of a big wooden dining table. The particular table shows all kinds of traces, each trace with its own story. Family members would possess a token with which they could trigger these stories at the central point of interaction. The idea of a central point to share stories appealed that much that we decided to elaborate on that and position it in a public context like a museum. What if you could not only connect your own family stories, but could frame them in a broader context? How did major events like war or crisis influence your family? From discussions with people representing our target group we learned, however, that going to a museum forms a high threshold. Moreover, building such a public system would be more complex. We, therefore, decided to take the design challenge back to the family inner circle. Instead of providing people pre-selected bits of data, we decided to create chunks of data which can be browsed by people with the help of a haptic controller. In this way, people can explore their family history and historical events related to their family. During user involvement sessions parameters were defined. By adapting these parameters on a haptic controller, people can adjust the information that appears on screen.



From the moment a child is born, data is generated that is directly related to the child's development. Think, for example, about all the photographs that are taken to highlight important milestones when we grow up. The benefit of collecting such data becomes evident at a later moment in life when they bring back sweet memories of the past. This data collection continues when we go to elementary school. Within the 14,000 hours that a child spends at school on average, it generates different data sets related to its physical, cognitive and social development. From a child's perspective, however, it is not immediately clear what the personal benefits of these data sets could be. We started our project from the idea to give back meaningful data to those who generated it, the children in our case.

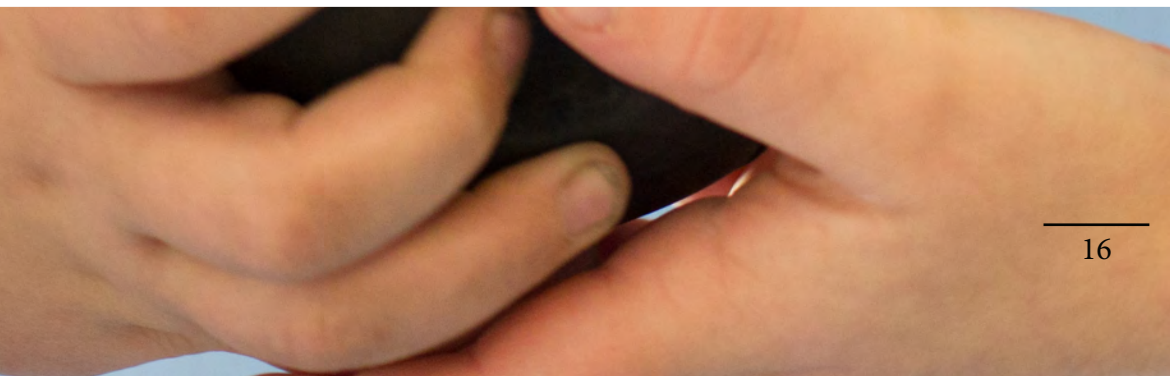
Freek de Bruijn, Hanneke Hooft van Huysduynen,
Gustavo Ostos



CONCEPT

The Luna concept uses data that relates to the physical, cognitive and social development of children. This data set is based on test results and questionnaires that are administered during the time children spend at school. Luna is a personal object, a hemisphere that children can use throughout the elementary school period. Each child has a Luna in its drawer, which can be used to team up with another child to form pairs. Luna's will light up in one of four different colors based on existing data about the development of the children. During special play activities, children have to search for a companion whose Luna lights up in the same color. When two Luna's and thus two children have been connected, the lighting becomes brighter, the Luna's form a ball and the children can use the ball to play a game. Two games are proposed which focus on social development through cooperation, negotiation and improving skills such as problem solving. Using this system, the children will get to know each other better as they have to cooperate during the play activity. In this way, new friends can be made!

FILII



PROCESS

This concept was established through an iterative design process, starting by specifying the target group and context. Next, desktop research was conducted concerning the several developmental stages of elementary school children. The decision was made to focus on cognitive and physical developments. We assumed that more data are needed by teachers to effectively adapt regular play activities to the developmental needs of the children. We designed a game which can be played on the schoolyard, measuring children's cognitive and physical performances. Teachers and children were involved in the design process to provide feedback. This way we found out that there is already quite some information available to teachers about cognitive development and there is simply no need for more. The decision was made to shift the focus from generating data towards using existing and validated data from regular questionnaires filled in by children and teachers. The question became how we could make use of these datasets. From discussions with teachers we learned that in order to give meaning to the raw data, the system should be augmented with personal observations that only teachers can provide. The addition of such an interpretation layer proved too ambitious for our 6-week project. As a consequence, we decided to shift focus from monitoring child development to social interaction. These insights form the basis of Luna.



We all know the reasons why we should save energy: it's better for the environment and for our energy bills. But in our daily lives it is difficult to stay aware of our energy consumption. Smart energy meters give us insight into our energy usage. However, it is hard to see what the presented data mean. Reading and understanding the numerical and graphical data is difficult, not much fun and not engaging. Moreover, the graphs often fail to provide an overall picture of how well people are dealing with energy compared to others. As a result, people indicate that the motivation for monitoring energy use often is missing. We want people to have fun in monitoring their energy usage without telling them how to behave. Play can lead to more involvement and awareness around the energy theme, and might stimulate people to undertake action, working towards a more conscious and environmentally responsible society. That is why we created Prospera.

Nick Hermans, Karin Niemantsverdriet,
Thomas van de Werff, Bart Wolfs



CONCEPT

Prospera, a game for tablet and Smartphone, makes you more aware of the environmental impact of your behavior, by displaying the direct effects of your home energy use on your own virtual planet. Your goal is to make your planet stand out in the galaxy. You can shape your planet any way you want. The created environments allow different animals to emerge. These animals can evolve into different species when the planet's climate conditions are optimal.

Your real-life home energy usage is reflected in the game as environmental conditions. Electricity usage defines the rhythm of day and night, whereas the water levels and world temperature will depend on your water and gas usage. You can play with these climate changes to manage the way your animals and planet evolve. By comparing your planet to other planets in your galaxy (your friends, family, neighbors and comparable households) you can discover your own energy profile in a playful way.



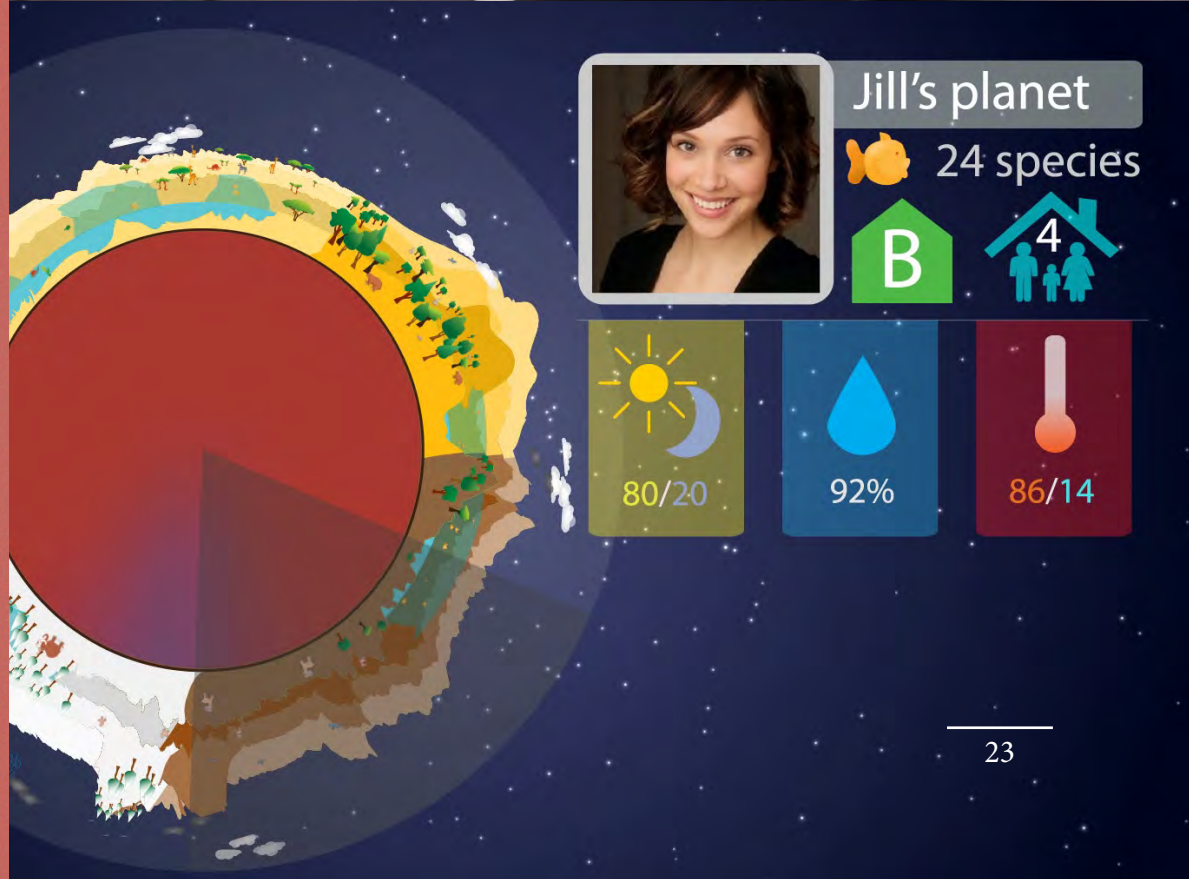
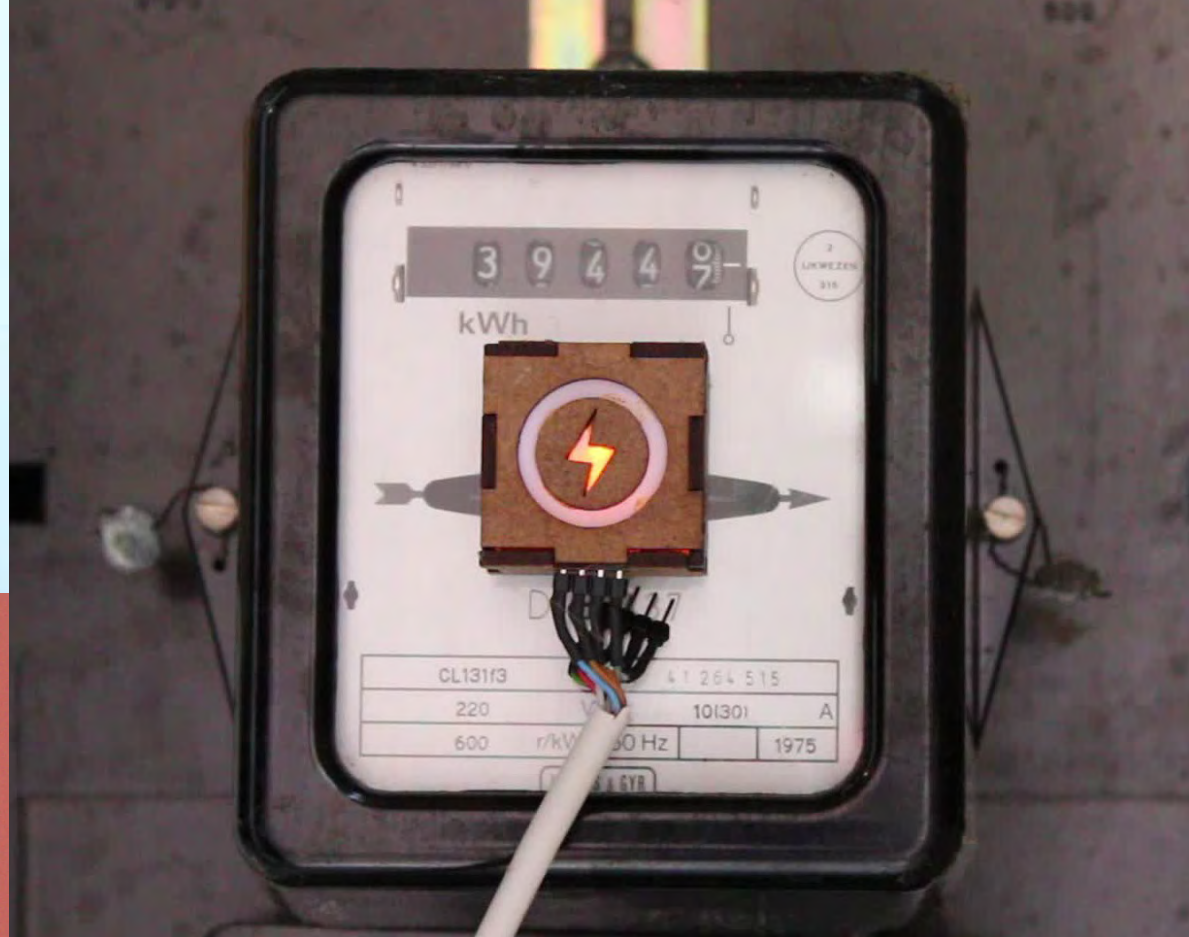
PROSPERA





PROCESS

Creative sessions, physical ideations and user involvements helped to explore concepts of energy flows and usage at home. This led us to our central challenge: How can we make people more aware of their energy usage in a playful way? Scenarios of ideas around energy awareness were created and brought before the target group to find opportunities in societal contexts. In the meantime, sensor probes were installed in two households to sample and monitor energy use, in order to understand how energy is used on a daily basis. This serious activity of energy monitoring should become more engaging, which led to the development of a game. Weeks of creative sessions, prototyping and acting-out followed to develop many game mechanics and scenarios, which were discussed with potential users to obtain feedback and to fine-tune the game. The final game design, Prospera, was tested in two different ways. A simplified game was built to test fun-factors and long-term user engagement. From the user confrontations we concluded that the expressive and social factors of the game had the engaging fun-factor we were looking for. Secondly, sensors were installed in home meter boxes to collect energy data. This data was brought back to the users through a visual of a planet, where the energy usage influenced the climate on that planet real-time. It showed that the direct feedback and real-time insights led to more awareness on energy usage. People started to play around with their electronic devices to see the effect and actively reflected upon their usage. In some cases this even led to a behavior change. Even though Prospera is not fully functional yet and the long-term effects have not been tested thoroughly, we believe that with Prospera a new, valuable approach to energy awareness is given that is worthy of further exploration.



The amount of personal data that you generate every day is enormous. Think about the time you spend on Facebook, emailing, watching videos and visiting webpages, and that is just on your Smartphone. Big Data can be a gold mine for statistical analysis. But as insightful as correlations and percentages may be, sometimes a simple story turns out to be more meaningful. A fortune cookie contains a message that can be poetic and mysterious. Often, the messages in fortune cookies are not really saying anything. Sometimes however, the message really fits the situation you are in, which makes it seem more meaningful. We were wondering if we could design a system that delivers a message that every time is just right for you.

Bert Bogaerts, Maxim Sakovich, Hanna Zoon

SIBYLLA



CONCEPT

We developed Sibylla, a public printer that gives you back your big data, in a small and meaningful way. Like a ritual, an opportunity to reflect, a surprising insight, or food for thought. The final prototype is a printer, shaped as a sparkling irregular icosahedron. On its surface appear QR codes. When scanning the code with a Smartphone, an app uses personal data as a key to search a larger dataset, to find surprising pieces of information that are relevant to the person and the moment. This information would then be printed on paper and folded into a small keepsake envelope. Chosen from among thousands of data points, this piece of information seems special, almost like an oracle. And when it is presented at the right time to the right person, it is like magic.

PROCESS

The process of designing Sibylla consisted of fast iterations including user involvement. The early concept was evaluated with the Co-Constructing Stories method. This user input helped us decide creating a physical shape and a keepsake output, and gave us an idea of how users would feel about the balance between data and privacy. We visited Ryoji Ikeda's data-visualization exhibition and a workshop, and had interesting discussions with the Brainport-based design firm 'Afdeling Buitengewone Zaken'. From these, we got a strong sense that the visitors and clients of both, appreciated the mystery in the designs, and had no desire to find out exactly how it worked. An informal questionnaire was used to see how people from different ages and educational backgrounds use social media and what kind of information they would like to get from our system. We validated the kind of associations users from our target group would make with the shape of our physical prototype by making use of free word associations with a wide range of people. And for the final evaluation, we again used the Co-Constructing Stories method to see how a user would incorporate our final concept into their everyday life.



FINALE: MICROSOFT FACULTY SUMMIT 2013

Friday, May 17, the five TU/e teams pitched their projects and demoed their final prototypes before a 'local' jury consisting of Miguel Bruns, Jun Hu, Sander Mulder, Jacques Terken, Ronald van Tienhoven and Berry Eggen (Chair). The jury set out to select the winning team that would best represent our department at the Design Expo in Seattle. The projects were assessed using the following set of criteria taken from the Microsoft Design Expo briefing: interdisciplinary collaboration, originality, practicality, design point of view, design validation & user feedback, degree of finish, presentation skills, and design process. The Jury had a difficult time deciding on the winner as the projects were all of equally high level and therefore came very close. Data Farmers won the tickets to Seattle!

Design Expo is part of the Microsoft Research Faculty Summit which is held annually at the Microsoft Conference Center in Redmond, Washington, United States. More than 400 academic researchers from all over the world join Microsoft researchers to discuss the future of computing. Our team was part of this gathering that took place July 15-16, 2013.

The team and their supervisor were treated with an excellent on- and off-campus program. Tours were organized to various Microsoft Research divisions including Xbox and the Envisioning Centre. On Sunday, our Microsoft liaison, Jacob Nielsen, took us to the Hurricane Ridge where we enjoyed the superb panoramic views of the Olympic National Park. Besides the well-organized social program, most efforts were spent on the

preparations and the actual presentation of the project. The presentation was fine-tuned in a series of dry runs on location and the AMP installation was set up at the demo hall. On Tuesday morning, the Data Farmers presented AMP at the Faculty Summit's DemoFest with great success. The physical installation drew the attention of many visitors including press. One of the highlights was an interview with the Seattle Times. The personal 'summit' of our visit was the plenary presentation of AMP in the conference's main lecture hall on Tuesday afternoon, together with the other teams from Israel (Interdisciplinary Center), India (National Institute of Design), UK (Northumbria School of Design) and Mexico (Iberoamerican Design Dept.) and the design departments of NYU, CMU, UCLA and the University of Washington, all from the United States. Leonie and Ken explained the concept and Koen and Tom gave a live demo on-stage. After the presentation, a panel consisting of Bill Buxton, Durrell Bishop and Anthony Dunne provided a constructive and positive critique of the concept and the design process. The team was awarded the Best Product Concept.

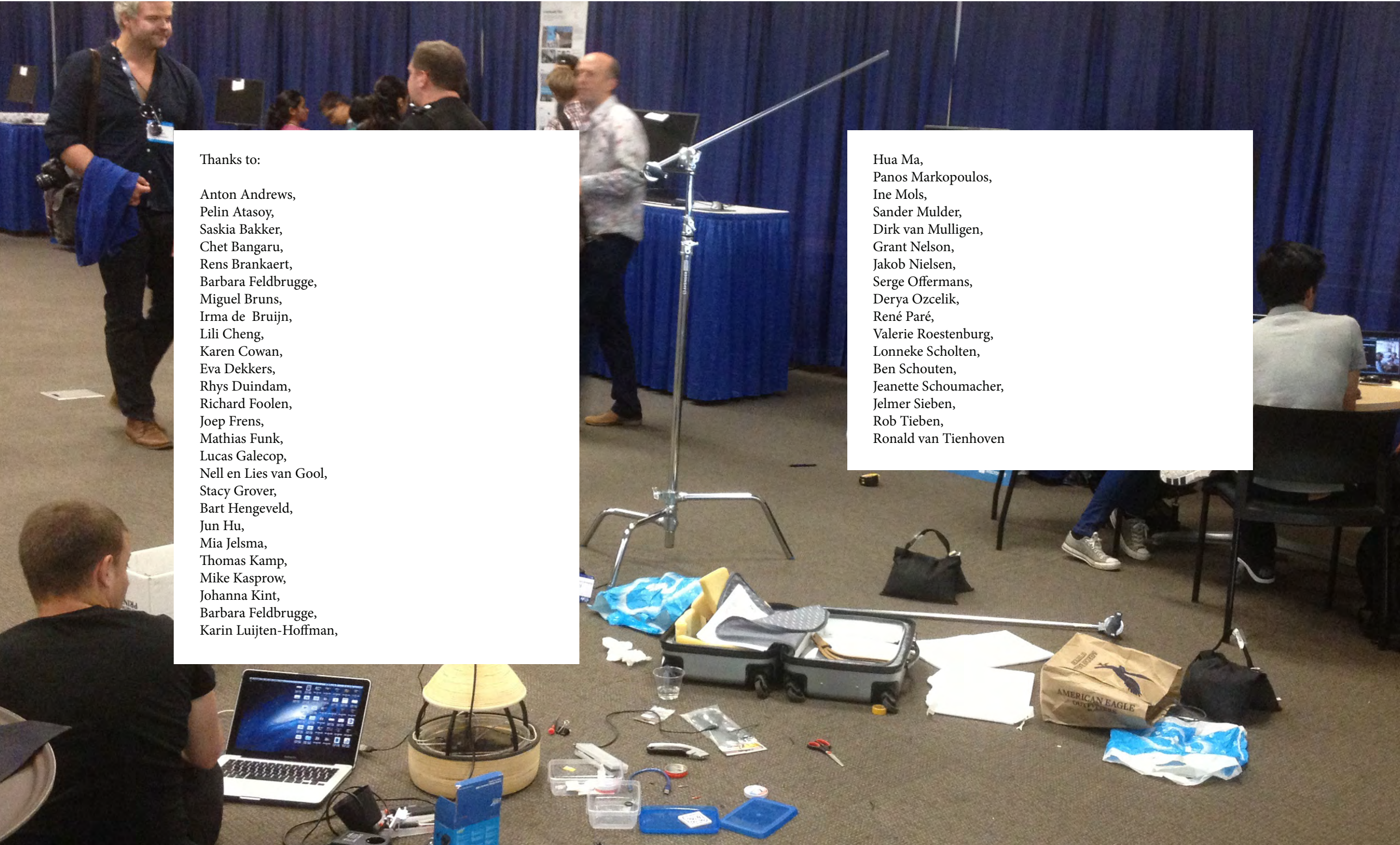


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