

SMART EMISSION PROJECT

RADBOUD UNIVERSITY NIJMEGEN

INTRODUCTION

The award winning Smart Emission project has been implemented between 2015 and 2017 in the Netherlands by a consortium of Dutch knowledge institutes, government, ICT and sensor companies together with the citizens and the municipality of the city of Nijmegen. The main purpose of the project was to monitor, visualize and communicate a real-time data on the 'environmental footprint' of the city of Nijmegen, whereby the total entity of data collection was being conducted by voluntarily participating citizens. Thus, 34 compact, low-cost and advanced sensors to measure the air quality and noise pollutions were developed and distributed among the participants to be placed at their homes. Overall, the project was a good example of the concept and application of monitoring environmental qualities in cities and regions with the help of 'citizen science'. Although the project is completed, currently around 26 citizens are still actively engaging in the project through data gathering and monitoring. A group of students from Radboud University have conducted a study and interviewed eleven participating citizens to gain insights into their experiences with the project. Below the results of this study are presented.

EXPECTATIONS OF THE PARTICIPANTS

Most of the interviewed participants became engaged with the Smart Emission project through different channels: current or former jobs related to the topic, acquaintances or an advertisement in a local newspaper. Overall the main motivation for most the participants to take part in the project was their interest in the environmental state of the city they live in. Thus, most participants expected to receive information about the possible outcomes that could be derived from the data that they have collected. This is mostly for the purpose of gaining insight in the living conditions in close proximity of their homes.

TECHNICAL FINDINGS

During the project, most of the interviewed participants were able to read the data collected by the sensors through a variety of available and easily accessible applications. As a result of data monitoring, the participants could see that the noise conditions in close proximity from their houses were exceeding the permitted levels. Also, during special events such as the Four Days Marches in Nijmegen many sensors recorded very high noise levels. These observations they found to be very interesting as it could be verified their sensors worked very well to effectively collect data. At the same time, there were also few participants mentioning that they did not measure any striking values besides the measurements that took place during these special events. Therefore, their expectation to actively measure significant values was only partially achieved.

PARTICIPANTS' EXPERIENCES AS BEING A PART OF RESEARCH PROJECT

Most of the interviewed participants were very positive about the established relations between them, the municipality of Nijmegen and Radboud University. The participants believe that the dissemination of information about the sensors and the responses to their questions were answered rather efficiently by the research team of Radboud University. In addition to this, over the course of the implementation of the project, the University have organized several meetings for the participants to provide the necessary information about the project. Also, in relation of role of the municipality, participants were happy that in case of a technical problem that would be reported to the municipality, the sensors would be repaired within a few days. As a result, many involved citizens felt that they were being actively involved in the project.

" I really enjoyed participating [...] I enjoyed having one of these sensors in my front yard. I also had the feeling that this was a complex research trajectory "
participant

Nevertheless, some participants also mentioned that at the beginning of the project there were frequent meetings between the sensor holders and representatives of the University. However, these meetings became less frequent as the project proceeded over time. Most participants would have preferred these meetings to have continued, in order to stay in touch and in this way keep the project more alive among the partners. Additionally, according to the participants their experience of the level of involvement in this project was also depending on the way in which they were familiar with the idea of Smart Emission project. For example, some participants with technical background were able to work more efficiently with the sensors compared to the people that did not have this kind of knowledge. This determines the feeling of being involved as a participant, because some participants wanted to be more involved by deriving more data from their sensors, but they did not have the technical knowledge to do so.

PARTICIPANTS' EXPERIENCE OF RECEIVING RESULTS

Initially, most citizens that were involved in the project joined, because they wanted to know more about the living conditions in their city. However, there were also participants whose expectations related to receiving results about the environmental state of the city of Nijmegen was not, or only partially accomplished. This is the result of multiple factors. For example, the deviation between the collected data was in some cases too large to provide reliable outcomes. However, all sensor holders were also aware of the fact that the Smart Emission project was a pilot project. Thus, for those involved the data reliability was not a major issue as the feeling of engagement in a research project appeared to be also important.

CONCLUSION

To conclude, the participants were also asked if they had any suggestion for improving the Smart Emission project in the future. Two suggestions were mentioned by almost all participants. First, they want to see improvements in the way in which the data is currently being visualized. Many participants indicated that they have experienced various issues to understand the data. Some of the data reading applications seem to be too complicated to visualize the data. This is partially because most participants lack the knowledge to analyse the data themselves. Therefore, the applications should give a clear and simple overview of the results. Second, many participants would like to see even more accurate and reliable data.

Overall, this joint endeavour between the Radboud University, the municipality of Nijmegen and the citizens has led to a resourceful pilot project, in which the citizens' participation has led to an increased feeling of engagement in a scientific research as well as receiving data about the living conditions in the city in terms of measured air pollution (NO₂, CO, CO₂, O₃), sound and vibration. All participants indicated that the feeling of engagement through citizens science was one of the biggest assets of the project. Finally, by conducting a research about the Smart Emission Project many different challenges appeared, ranging from collaboration to technical aspects. However, this give also the opportunity to highlight it and thereby improving it, which was an important objective of this research.

While citizens and experts now have 24/7 data of their local environment in their own hands, the second phase of "Smart Emission" is being launched in 2019 to further develop the concept an application of monitoring environmental qualities in cities and regions with help of citizens and sensors, through "citizen science".

Want to know more about this project?

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