

City of Munich

ONEMUNICH



Encouraging Citizen Participation in Munich's Smart City Initiatives

Alphin Tom
Bálint Virág
Jonathan Fuchs

Introduction

The city of Munich challenged us to encourage citizens to participate in citizen science initiatives and data sharing to empower a sustainable smart city built on data. The key question at the heart of this challenge was: How can we motivate citizens to engage in data donation with the city? The city of Munich sought to enhance its urban planning and research capabilities by harnessing the collective intelligence and data contributions of its residents. Our team was tasked with demonstrating the benefits of data donation and finding incentives and digital nudges to encourage engagement, all while respecting privacy protection and addressing skepticism about data donation.

Our solution, the 'One Munich' platform, is a unified citizen engagement platform accessible through an app or website. The purpose of the platform is to enable the citizens of Munich to actively participate in city projects, provide feedback, donate their data while also having a one-stop access to essential city services, making them vital contributors to the city's smart planning and research efforts. We want to inspire our citizens to continue contributing by providing a fun, gamified experience where users can compete and progress on leaderboards while remaining anonymous if they wish. This report will explore our journey in this challenge and the innovative solutions that emerged to make Munich a data-driven, sustainable, smart city.

Problem Analysis and Literature Review

Diving into our challenge, we first needed to understand the city's needs. What kind of data are they looking for, and for what purpose? Also, we wanted to understand what challenges the city faces, hindering them from getting data from citizens and fostering interaction. Speaking to our challenge givers, a wide range of data would be helpful - both continuous and one-time data - for many different departments and projects. Further, they highlighted existing skepticism within the city administration on the willingness of citizens to support the city with their data donation. We conceded this into one sentence:

The city needs a flexible, scalable concept that activates citizens to share their data with the city in a secure way.

To solve this challenge, we first conducted a literature review of best practice examples of cities that implemented a successful citizen engagement project, possible incentives to motivate citizens to share data, and obstacles stopping

citizens from actively sharing their data. We utilized the best practices and incentives to design our question for the citizen survey, which will be explained in detail below. Our analysis found four main problems stopping citizens from sharing their data and engaging in city projects. Firstly, citizens need to receive adequate and timely feedback on their data's impact and its role in the decision-making process.¹² Secondly, citizens often lack the opportunity and time to contribute to such projects. This is especially true for women with many other obligations, so such participation does not fit into their daily lives.²³ Third, citizens were not aware of such projects; if they were, they were perceived as hard to use, thus discouraging them from utilizing them regularly. Lastly, privacy concerns played a significant role as people feared that their data sharing might affect their physical lives. For example, people feared that their data might be shared with other providers, such as health insurance providers, increasing premiums.³ However, this issue depends on the amount, breadth of data, and trust in the organization that collects it.³

Survey and Data Collection

To find out how to motivate citizen engagement in data donation, we recognized that asking Munich's residents themselves is crucial. We created a survey aimed at exploring their willingness to contribute data for the betterment of the city. Over 100 citizens from Munich participated, providing valuable insights. We designed the survey using Google Forms and distributed it to our network of students and coworkers.

The first part focused on recording demographic information. This information was essential for addressing potential survey bias and understanding the respondents' backgrounds. Notably, most participants were between 18 and 29, with a gender distribution of 60% women and 40% men. More than 70% held at least a bachelor's degree, indicating a demographic with a higher likelihood of openness to data donation than the city's average.

¹ Rovithis, E., Moustakas, N., Vogklis, K., Drossos, K., & Floros, A. (2021). Towards citizen science for smart cities: A framework for a collaborative game of bird call recognition based on internet of sound practices. arXiv preprint arXiv:2103.16988.

² Rotman, D., Preece, J., Hammock, J., Procita, K., Hansen, D., Parr, C., ... & Jacobs, D. (2012, February). Dynamic changes in motivation in collaborative citizen-science projects. In *Proceedings of the ACM 2012 conference on computer supported cooperative work* (pp. 217-226).

³ Pereira Campos, J. F. (2021). The dynamics of data donation: privacy risk, mobility data, and the smart city (Doctoral dissertation, University of St Andrews).

The second part of the survey delved into the respondents' opinions and attitudes toward smart city data collection. This section yielded several key findings.

Data Sharing: 60% were willing to share data with the city, in contrast to a lower 25% willing to share with private companies. Although our sample skewed towards highly educated youth, a report from Ernst & Young indicated that approximately 50% of Germans were willing to share data, showing proximity to the national average.⁴

Privacy Concerns: For those who were initially unwilling to share data, 60% indicated they would reconsider if their data privacy concerns were addressed through proper encryption and anonymization.

Incentives: The most substantial data-sharing incentive was better public services, with nearly 90% of respondents willing to share their data. Additionally, 70% were interested in personalized data insights, while about half considered financial incentives.

Time Flexibility: While willingness to share data is evident, time commitment emerged as a key factor. About 43% were willing to spend just 5 minutes a month, 29% up to 15 minutes, 14% up to 30 minutes, and only 4% up to an hour. This emphasizes the need for streamlined data donation processes to maximize citizen participation.

In conclusion, our survey revealed a promising openness among Munich citizens to donate their data for the betterment of the city, mainly when privacy concerns are addressed and incentives align with their needs.

Proposed Solution: 'OneMunich' 'Platform

OneMunich equips citizens with an engaging platform to collaborate with the government on city improvement projects. It includes four core modules:

- 1. Participation in City Projects:** This module enables citizens to contribute data, insights, and ideas to the city's ongoing projects and planning processes. For

⁴ Bertrand, A., McQueen, J. (2023). How can digital government connect citizens without leaving the disconnected behind?. Ernst & Young. Retrieved from: https://www.ey.com/en_gl/government-public-sector/how-can-digital-government-connect-citizens-without-leaving-the-disconnected-behind (Last access: 2023.10.16.)

example, citizens could share their energy consumption data to improve energy efficiency projects and avail customized insights to reduce their bills. Their contributions are anonymized and aggregated to inform city planning decisions and grant community sentiment insights without compromising privacy.

2. **Voicing Concerns:** This module empowers citizens to identify issues in their community and have them swiftly resolved. Citizens can report problems like potholes, missing pedestrian crossings, and more through the platform. Issue submissions are categorized and appear on a community map. Advanced filtering and sorting mechanisms allow citizens to engage in moderation by voting and commenting on issues. Reported problems are routed to the responsible department for validation and further resolution while citizens track progress via updates.
3. **Seamless City Services:** This module serves as a convenient "one-stop shop" for accessing existing city services directly through the OneMunich platform. Citizens can complete frequently used tasks like scheduling appointments, applying for permits, updating their addresses, and more without switching between multiple city websites and apps. Offering seamless access to key services helps drive adoption and habitual use of the OneMunich platform.
4. **Gamification:** Gamification techniques motivate continued participation across all aspects of OneMunich. These include points, achievement badges, leaderboards, challenges between neighborhoods, avatars, usernames, and more. Citizens can earn rewards for participating in projects, referring friends, giving feedback, and hitting key milestones. Leaderboards foster friendly competition between neighborhoods. Citizens select avatars and unique (but anonymous) usernames to represent themselves on the platform, lending a sense of anonymity. Gamification provides privacy, fun, and incentives for continued participation, making it a habit.

We interviewed citizens on the street and incorporated their feedback into iterations. Key findings were the desire for a simple, intuitive interface, emphasis on data privacy, and preference for project-based participation.

Conclusion

In this project, we addressed the challenge presented by the city of Munich: motivating citizens to engage in data donation for the advancement of a sustainable smart city. The 'One Munich' platform, our proposed solution, is a unified citizen engagement tool that encourages participation, data sharing, and access to essential city services.

Our survey results revealed the citizens' willingness to share data, especially when privacy concerns are addressed, and incentives align with their needs. These findings underscore the importance of citizen participation in building sustainable smart cities.

The 'One Munich' platform consists of four key modules: enabling citizens to participate in city projects, voice concerns, access city services seamlessly, and engage through gamification. It empowers citizens to contribute to ongoing projects, report community issues, access services conveniently, and stay motivated through gamified experiences.

Key Learnings:

1. Privacy concerns can be mitigated through proper encryption and anonymization, fostering greater data sharing.
2. Incentives such as improved public services and personalized insights significantly enhance citizen participation.
3. Time flexibility is essential, highlighting the need for a streamlined data donation process that fits into people's daily lives.

Next Steps and Future Outlook: Our next steps involve refining the 'One Munich' platform based on user feedback and continuously adapting to the evolving needs of the city. We plan to expand our outreach efforts to include a broader demographic, ensuring inclusivity. Additionally, ongoing data analysis will inform city decision-making, making Munich a data-driven, sustainable, smart city that thrives on citizen engagement.