GBBC Open Source Ideas:
The Future of Urban Living

Part II - Innovation Spotlight: The City of The Hague, Netherlands

27 April 2022

The Hague, Netherlands

Background

The city of The Hague has been inhabited for hundreds of years, becoming an official municipality and Royal Residence in the 1800s. The Hague's reputation as a hub for international peace and justice began in 1899 with the First Peace Conference and the establishment of the Permanent Court of Arbitration. Most famously, the Peace Palace "was officially opened in 1913 on the eve of the First World War. Home to the Permanent Court of Arbitration, it welcomed the Permanent Court of International Justice (under the League of Nations) in 1922 and is now the seat of its successor, the International Court of Justice, the principal judicial organ of the United Nations."[i]

The Peace Palace in The Hague

The Hague has since become home to a wide variety of international organizations, including Europol, Eurojust, the International Criminal Court, the Organization for the Prohibition of Chemical Weapons, and is the seat of the government of the Netherlands. According to an economic impact survey, "the presence of international organizations in The Hague and region directly and indirectly generates 40,000 jobs, and 11% of employment is directly or indirectly related to the international organizations."[ii] More than half of the city's "residents have an immigrant background (Western and non-Western) and this number continues to rise steadily. The composition of the population varies significantly depending on the neighborhood."[iii] The current estimated population of The Hague is more than 500,000 inhabitants; it is the 3rd largest city in the Netherlands by population, behind Amsterdam and Rotterdam.

Innovation Initiatives

During 2020, The Hague participated the annual Odyssey Hackathon launched in 2016, which is part of Odyssey's incubation program for corporates and governments. The program focuses on blockchain and AI solutions that bring emerging technologies to confront complex, multi-stakeholder societal challenges. The 2020 hackathon, the first all-digital event, was held in Odyssey's self-created and proprietary online mass collaboration metaverse called Momentum. It was joined by 2,500 participants from 60 countries that collaborated on 21 challenges in 100 curated teams. Over 95 prototypes were built within 48 hours, with the help of hundreds of experts ranging from government, corporate, and non-profit institutions. The winning teams received a total of €200,000 in cash rewards as well as additional support and funding to scale their solutions further. [iv]

Odyssey's Virtual Dashboard

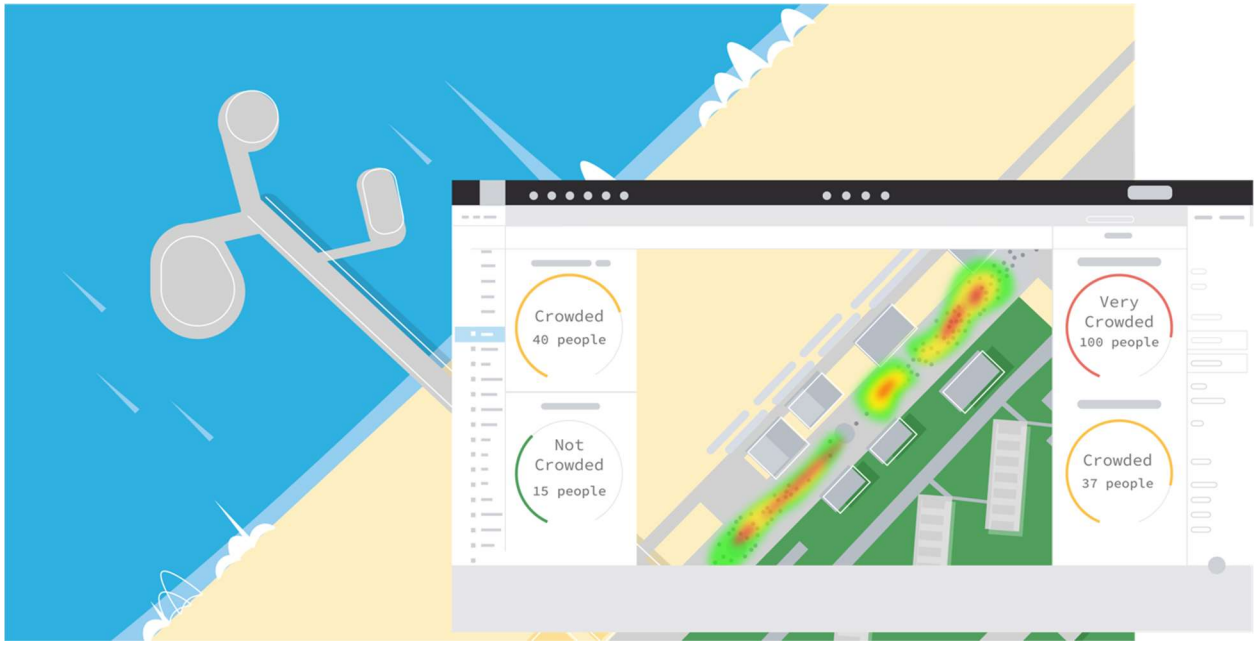
The Hague organized two challenges, combined in the Conscious Cities track, surrounding the Living Lab Scheveningen, The Hague's award-winning smart city initiative.[v]

One challenge was for **scalable and secure smart city infrastructure** and the other for **inclusive adoption of society in the living lab area.**

The objective was to co-create solutions to complex problems involving various stakeholders, while strengthening human connections to improve the impact of

solutions. This hands-on collaboration with teams over several months has inspired civil servants with new technologies and perspectives to address real societal problems. In 2021, the winning solutions have been developed, further bringing the innovations within the municipality's boundaries to launch into production and mature. For the scalable and secure living lab challenge, improving access to and governance of a public digital ecosystem, the winning solution was an event detection platform that measures crowd density, improving crowd management and emergency response while ensuring privacy with the help of computer vision AI algorithms.

For the second challenge, to drive inclusive adoption of a public digital ecosystem for citizens and companies, the winning solution would enhance engagement through a community-governed approach, using Self-Sovereign Identity (SSI) as a trust infrastructure in participatory budgeting projects, to allow co-creation and co-ownership of urban environments in order to balance needs across stakeholders.



Crowd Density Platform

Additionally, in 2021, the Hague held its fourth annual "Hâck The Hague" program in which "206 international professional and student hackers got the opportunity to hack the live IT systems, applications and websites of the municipality of The Hague & her suppliers to put their digital security to the test.

Participating hackers reported 125 vulnerabilities. Among those were: unsafe access to accounts, outdated software, the ability to inject malicious code into a website and an account that could be taken over completely."[vi]

This event is of strategic importance as digitization across sectors increases exposure to cyber risks, and hence the need to establish adequate safeguards for prevention and incident response.

Hâck the Hague Team Presentations

Blockchain Technology and The Hague

Where does blockchain technology fit in? In the context of increasing initiatives in support of innovation, particularly for a city as unique as The Hague in its identity as a global center for peace and justice, several attributes of blockchain technology make sense to explore. These attributes can be implemented to allow The Hague to further manifest its distinctive ethos in support of the common good around the world.

The transparency enabled by open access to data recorded on a blockchain can lead to increased accountability in support of good governance across organizations spanning both the public and private sectors. The immutability of data records is such that legally enforceable contracts, verified certifications, and any past activity cannot be modified retroactively. For instance, this provides the opportunity to enhance regulatory compliance and law enforcement through tools that detect and trace illicit activity, given that the history of all activity is permanently recorded and available.

Furthermore, blockchain allows for distributed and decentralized systems to enhance inclusion and resiliency of operations, as opposed to fully centralized systems where the risk of failure on the part of a central entity could have severe repercussions for everyone that depends on it. While biases may be, even unintentionally, embedded into algorithms or any processes of centralized networks, open systems can be operated to

improve fairness and equity. At an institutional level, fostering resilient systems could strengthen the impact of an organization's mission, while facilitating direct engagement with citizens and responsiveness to their needs.

In conjunction with the regulatory developments at a regional and European Union-wide level, as well as global best practices, blockchain implementations can be leveraged to enhance policy outcomes, strengthen rule of law, and streamline a wide array of activities to facilitate citizens' everyday lives. For instance, this could entail improving anti-money laundering/countering the financing of terrorism (AML/CFT) and cybersecurity safeguards, identity verification and privacy measures, ensuring faster settlement finality for more efficient and cost-effective transactions, or even clarifying questions like the legal enforceability of smart contracts.

Ultimately, the role of blockchain technology can be central in a city's transition to a smart city. The attributes described above can optimize and enhance maintenance of urban infrastructure, transportation systems, education, healthcare, security, and connectivity through access to information.

Blockchain Innovations in the Public Sector

For the city of The Hague, blockchain is a potential, yet not undisputed, component under the hood of a newly emerging decentralized identity infrastructure that is being tested for use in several municipal services by the Digital Innovation and Smart Cities department. As part of a broader push toward digital innovation, the city can lead by example in its own adoption of blockchain enabled solutions to pave a path toward a smart city infrastructure.

Debt Relief Pilot

The first pilot is in collaboration with the debt relief department, where an attribute is issued to citizens that are confirmed to be in need of debt relief. They can use this to signal to creditors that they cannot pay their bill at the required time but will be receiving financial help from the municipality. Thus, the creditor can decide to stop or pause the increase of the fine, preventing spiraling debt problems and limiting further negative societal consequences.

Participatory Budgeting Pilot

The second pilot is in the participatory budgeting domain, where inhabitants of a neighborhood are issued an attribute proving they live in a specific neighborhood, which grants them access to a third-party platform where they can vote on ideas submitted by

citizens for improving the neighborhood. A crowdsourced problem-solving model and locally-minded focus can be key to prioritize and address issues arising at a local level.

Several insights into the user experience of the technology have also been discovered here. The municipality has discovered that this type of decentralized technology has different requirements compared to simply procuring. Blockchain solutions involve a large number of stakeholders across different departments with different value propositions.

Blockchain Innovations in the Private Sector

Smart cities would involve widespread and strategic adoption of innovations, not just in the public sector but also among private entities, to enhance the effectiveness of collaborative problem-solving spanning across public interests, public-private partnerships, and private interests. Entrepreneurial endeavors have a significant role in solving city-wide problems, particularly impacting citizens and deployed with a user-centric lens.

Blockchain Startup Activity

The role of the private sector is key to incentivize the blockchain startup ecosystem, out of which many of the most promising solutions are incubated, tested, and implemented. For instance, ImpactCity[vii] is an ecosystem offering physical space and programming to bring together new impact-driven entrepreneurs, policymakers, experts, and investors in The Hague.

YES!Delft Digital Hub[viii] is an AI and blockchain focused ecosystem to support startups based in The Hague, acknowledging the city's status as home to major peace and security-driven international organizations. Its programming has supported over 50 startups in addition to corporate and public sector organizations exploring innovative solutions.

The Hague Tech[ix] offers programming and a coworking space along with a membership program, providing resources to develop the ideas formed out of the interdisciplinary connections made through BlockBar and its own labs and events. Through local and global partnerships, The Hague Tech can also facilitate access to markets.

There are number of blockchain startups[x] founded in The Hague, exploring a variety of use cases. For example, Tykn[xi] is a blockchain-based identity authentication platform targeting the needs of refugees. It aims to improve socio-economic inclusion while safeguarding privacy and security. Users retain control over their data.

Next Steps

Several additional use cases are being designed, as well as a municipal-wide governance model for dealing with decentralized identity technology. Furthermore, European Union policies regarding digital identity are helping to advance existing activities, promising a citizen centered digital identity where control over personal data is maximized and data processing is minimized. The municipality will continue to pilot innovative ideas and implement the successful tests.

In order to ensure success toward a smart city model, it is essential to adopt an integrated approach that aligns incentives across stakeholders ranging from public and private sectors, civil society, and individuals.

Further, the learnings and pilots from the city of The Hague can be used as model framework and knowledge for other cities and governments to leverage and adapt to their local communities.

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[i] https://www.denhaag.nl/en/in-the-city/introducing-the-hague/a-short-history-of-the-hague.htm
[ii] https://www.denhaag.nl/en/municipality-of-the-hague/the-hague-in-numbers.htm
[iii] Id
[iv] https://medium.com/odyssey-hackathon/winning-solutions-progress-update-f839bb7db7c4
[v] https://www.smartcityexpo.com/world-smart-city-awards-2021/
[vi] https://www.cybersprint.com/hack-the-hague-2021
[vii] https://www.impactcity.nl/en/
[viii] https://thehague.yesdelft.com
[ix] https://www.thehaguetech.com
[x] https://tracxn.com/explore/Blockchain-Startups-in-The-Hague
[xi] https://tykn.tech