

PROMOTING SUSTAINABILITY THROUGH GAMIFICATION

CONTEXT

Science Centre Singapore promotes learning and creativity in science and technology, through imaginative and enjoyable experiences. Active spaces within the Science Centre cover about 34,000m², with 240 staff. Annually, it receives about a million visitors.

Science Centre Singapore drives science education initiatives that are inspirational, experiential and accessible. These creative learning experiences are presented through: (1) exhibitions that illustrate and contextualises science in everyday life, (2) programmes that provide hands-on experimentation and various events and (3) promotional activities that bring science closer to all. They engage the community and people of all ages on various science topics, including sustainability and future technology developments.

Plans for the development of a new Science Centre in the vicinity of the Jurong Lake District (JLD) are underway. Like the current centre, it will continue to play an important role in providing exciting educational experiences within JLD, with the added focus of aligning itself to Singapore's Green Plan for urban sustainability through its infrastructure and education promotion. As part of JLD, Science Centre aims to play an active role in creating a purposeful and sustainable environment for those living, working and travelling within JLD. It aims to serve the larger network to capture and convert environmental data through gamification into an inspirational and educational showcase that prompts residents and visitors of JLD to adopt more sustainable practices.

Science Centre Singapore is keen to explore a gamified, dynamic, and reliable system for data collection from multiple sources that can provide interpretive and predictive analysis based on environmental parameters and recommendations to encourage visitors to adopt sustainable practices. The current Science Centre faces challenges in sourcing and integrating data from energy/water/waste sources, as data collection and analysis are performed manually with limited capabilities and integration. The current system also does not allow for visitor participation or external contributions. While the new Science Centre will operate with a Building Management System, it needs to be paired with a system for analysis and visualization.

This sector-wide challenge is supported by the Urban Redevelopment Authority (URA) and Smart Nation & Digital Government Office (SNDGO) for the development of sustainability and smart nation initiatives within Jurong Lake District.

PROBLEM STATEMENT

How might we design a system that promotes interest to monitor and manage sustainability-related information from multiple sources for visualisation and to encourage sustainable practices?

WHAT ARE WE LOOKING FOR?

Science Centre Singapore is looking for a gamified solution that individuals can use to track, monitor and manage their environmental data, water, energy, & waste data, home utility data, and individual commute, recreation, consumption, food/shopping data. This proposed solution should be fun and engaging to attract users, to achieve the following outcomes:

- Increase interest among users for tracking of sustainability-related environmental data.
- Promote better understanding and usage of sustainability data
- Nudge users towards adopting sustainable practices to reduce their carbon footprint

The solution should include the following features:

- Data collection and integration. The solution can seamlessly collect and integrate various data sources from Science Centre, JLD and users to facilitate data sharing and exchange.
- Interactive data analysis and recommendation tool. The solution is able to provide a simple visual representation and tracking of multiple aggregated sources of data. It should provide interactive insights into users' lifestyle and environment, to measure and track their current sustainability efforts. It should also provide recommendations such as alternative actions that support and encourage more sustainable behaviours.
- Real-time Data and Gamification. The solution should allow for better exchange of real-time data among the various stakeholders within JLD, for user engagement improvement and benchmarking of sustainability efforts. It should also twin the gamification of the Science Centre engagement and provision of real-time environmental data for JLD, to create a fun and engaging learning experience.
- Continuous learning and engagement. Stakeholders and participants should feel incentivised to incorporate sustainable practices including using JLD's walking paths, making sustainable personal choices, and carbon reduction by reducing water/energy/waste. The solution should promote science education and encourage ownership in sustainability practices for visitors by providing an experiential learning tool that extends beyond their visit to the Science Centre.
- Remotely accessible digital platform. Users should be able to remotely access the solution and data anywhere.

Overall Performance Requirements

The solution should meet the following performance criteria:

- Standardised. The solution should provide ease of adoption by multiple users to share their environmental data with each other, while ensuring personal data protection. The data will be aggregated from multiple sources including companies (Science Centre Singapore and other JLD stakeholders) and individual users (home utility, recreational activities) within the JLD and potentially South West District.
- Scalable. The solution needs to be plug-and-play and scalable within JLD. Tests will be run in the current Science Centre and potentially implemented in the new Science Centre (2027).
- Experiential and Educational. As users interact with the solution, the scientific aspects are easily digestible and accessible with applicable recommendations that make science and sustainability more relevant to their lives
- Environmental Stewardship. The data captured is eventually used to encourage participants to adopt more sustainable practices, and provides a snapshot of how JLD is tracking and adopting sustainable metrics
- Visual. The user interface should be easy to understand by users of varying science knowledge. It should also be goal-oriented and provide personal relevance to users. The user interface should facilitate users to stay informed on and adopt sustainability practices with ease.
- Child-like, not Childish. The experience provided by the solution should help visitors of all ages feel engaged with the material, and prompt discovery and curiosity.
- Continuous Engagement. The solution should keep all stakeholders engaged continuously and in a simple, fun and gamified manner.
- Real-Time. The solution should be able to monitor and manage environmental data from multiple sources, which includes water, energy, and waste data, home utility data, and individual commute, recreation, consumption, food/shopping data.

There are no restrictions on the geographic location of the problem solvers who may choose to apply to this challenge. However, the prototype needs to be demonstrated in Singapore at the Science Centre and within JLD.

Proposals that are non-digital or combine digital and non-digital components which address the challenge statement are welcome too and will be assessed accordingly.

POSSIBLE USE CASES

1. Incentivised to adopt more sustainable behaviours. Jane, a resident of JLD has read about the new JLD's walking paths. She is curious about trying them but has not had the chance to do so yet. With the new solution, she is able to see her current carbon footprint based on her personal habits and utilities. The solution provides her with recommendations on how to reduce her carbon footprint further, and emphasises the potential for her to do so simply by using the walking paths. Each time she uses the walking path, she earns a token. She is incentivised to use the walking paths whenever she can, so that she can earn more tokens that may be exchanged for a reward at the Science Centre or other locations within the JLD.
2. Science Centre Singapore can be experienced throughout JLD. The invisible environmental data is now more accessible, visible, and relatable in JLD. Every visit to a JLD facility provides Jane with a new learning experience. When visiting Science Centre and various other facilities and buildings in JLD, Jane is able to look at a visual in the building, and get a better understanding of what information such as kilowatt-peak, kilowatt-hour and carbon dioxide equivalent mean. Climate science is no longer fearful for her because the data is contextualised and is easy to understand. Jane's curiosity about this newly gained knowledge is piqued, and she goes home exploring more information with her family members.
3. Sustainability performance tracking (Optional). As the model sustainable mixed-use district of Singapore, JLD aims to meet higher sustainability targets that are above our national target. The system would be able to allow us to visualise and track the sustainability performance of the district through aggregating data from stakeholders and individuals and help guide policy or strategies to close the gaps.

WHAT'S IN IT FOR YOU

- SGD50,000 of prize money for each winner of this challenge (see Award Model)
- Access to IMDA's innovation consultancies (e.g. Design Thinking, Digital Storytelling, UI/UX) and PIXEL corporate innovation facility (e.g. hot-desking, project studios, ARVR, usability, 5G test labs) for prototyping and commercialisation
- Co-innovate with Science Centre with access to their expertise, facilities, and human resources in developing the solution, and potential for solution to be commercialised at the new Science Centre (2027)
- Contribute to JLD's sustainability efforts and towards the collective green ambitions of the district, with profiling opportunities and potential to scale successful solutions within the district

EVALUATION CRITERIA

The evaluation process shall take place over 2 stages. Proposals shall be evaluated based on the evaluation criteria below for the first stage. Thereafter, shortlisted proposals shall be subjected to a second stage evaluation in the form of an interview / pitch, and the scoring shall be based on a re-defined assessment criteria for the selection of the challenge finalist(s).

Solution Fit (30%)	<u>Relevance</u> : To what extent does the proposed solution address the problem statement effectively?
Solution Readiness (30%)	<u>Maturity</u> : How ready is the proposed solution to go to the market? <u>Scalability</u> : Is there any evidence to suggest capacity to scale?
Solution Advantage (20%)	<u>Quality of Innovation</u> : Is the solution cost effective and truly innovative? Does it make use of new technologies in the market, and can it potentially generate new IP?
Company Profile (20%)	<u>Business Traction</u> : Does the product have user and revenue traction? <u>Team Experience</u> : Do the team members possess strong scientific/technical background?

AWARD MODEL

30% of the prize money will be awarded to each selected finalist at the start of the POC/prototype development process. The remaining 70% will be awarded after completion of the POC/prototype solution, based on milestones agreed between Problem Owner(s) and the solver. Prize money will be inclusive of any applicable taxes and duties that any of the parties may incur.

Note that a finalist who is selected to undertake the prototype development process will be required to:

- Enter into an agreement with Problem Owner(s) that will include more detailed conditions pertaining to the prototype development;
- Complete an application form with IMDA that will require more financial and other related documents for potential co-funding support.

Teams with public research performers are required to seek an endorsement from their respective Innovation and Enterprise Office (IEO) and submit the IEO form together with the proposal.

SUBMISSION GUIDELINES AND DEADLINE

The proposal should include the following:

- 1 deck of slides in pdf format explaining the proposed solution, how it addresses the problem statement and meets the desired performance requirements. To include information such as the proposed cost model, data inputs, system that the proposed solution will run on, potential benefits, and the team's implementation plan.
- Video or pictures (300dpi) of any prototype or simulation, if applicable.
- Track record of the company/ CV of the team.

All submissions must be made by **21 April 2023, 1600 hours (SGT/GMT +8)**. Problem Owner(s) and IMDA may extend the deadline of the submission at their discretion. Late submissions on the OIP, or submissions via GeBIZ, will not be considered.

Please visit <https://www.openinnovation.sg/challenges> to sign up for this challenge.