Open Cities: Jamaica
Hackathon
June 24, 2023

About the Hackathon

The Hackathon will take place on Saturday, June 24, 2023 from 9am - 4pm at Mona School of Business and Management, UWI Mona under the theme **Smart Solutions for Sustainable Communities: Open Data, Drains and Solid Waste Management.**

About the Hackathon

- The Hackathon will consist of six (6) teams of 4 - 5 persons each.
- Each team will consist of a developer, facilitator and programme participants
- Teams will be chosen by the CSOD administrators and contact information sent out ahead of Saturday
- A participant briefing, including the primary datasets and challenge ideas, will be shared at least 24 hours before the Hackathon to allow for pre-planning
- At the end of the Hackathon on Saturday, teams will be required to make a 5-minute oral presentation to the group about their product
- Teams should bring at least one working laptop to the event

Background

- The [Humanitarian OpenStreetMap Team (HOT)](#) has partnered with Mona School of Business and Management (MSBM), through its [Caribbean School of Data (CSOD)](#) project, in a capacity-building collaboration that seeks to develop youth mapping capabilities and an open mapping community in Jamaica and the wider Caribbean.

- The [Open Cities: Jamaica project](#) is one component of the partnership that looks at how community mapping data can be used to address issues related to solid waste management, flooding and the gullies.

About Open Cities: Jamaica

A SECTION OF BARNES GULLY - WOODFORD PARK
JAMAICA, W.I.
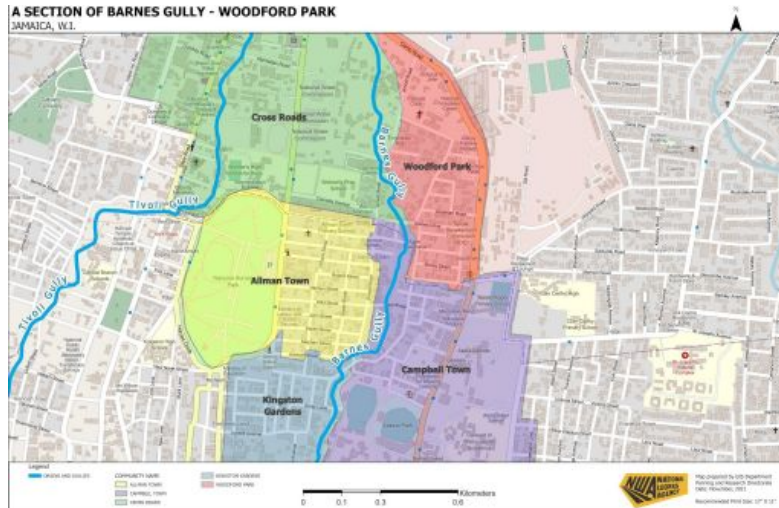
- The project recruited participants from Allman Town and Kingston Gardens, St. Patrick's Rangers, and graduates of existing CSOD programmes.

- Participants were trained and participated in a field mapping exercise, mapping in Allman Town and Kingston Gardens along the Barnes Gully and the surrounding areas.

- The data collected will form the main dataset for the Hackathon.

Hackathon
Challenge Details

Deliverables

- Each team can choose from the categories of challenges listed (or a combination) to define their problem statement
- The deliverables for the hackathon are **at minimum** a mock-up of the app and an accompanying presentation.
- The presentation should include:
  - Group Name
  - Problem Statement
  - Product (how it addresses the problem statement, how it works, target, etc)
  - Associated costs and timeline

Structure of Problem Statement

Problem Statements answer the following questions:

- Who are the target users?

- Why does the problem matter?

- How does my mapping solution solve this problem?

Categories of Challenges

- **Solid Waste Management:** About 25 - 30% of Jamaica's solid waste is improperly disposed of, often ending up in the waterways which leads to other challenges.

- **Community Engagement:** Communities that are proximate to the gullies both play a role in and are affected by any issues arising from clogged waterways.

- **Disaster Preparedness:** Blocked drains can increase the risk of flooding and increase the likelihood of adverse effects from natural disasters

- **Public Awareness:** Educating the public on their impact on proper waste management is important for sustainable change

- **Open Database:** There is a need for a centralised database of information related to solid waste and waterways.

Possible Approaches

Category	Community Engagement
Problem	Communities are a key voice in the maintenance of proper waste management and also in understanding the barriers. There should be a systematic and ongoing approach to include community-driven solutions
Solution	Community Engagement App
Description	An example application can provide a platform for community engagement, allowing residents to report waste buildup incidents and participate in cleanup efforts. The data collected can inform waste management strategies and policies and prioritise cleanup efforts in high-risk areas.
Target	Government agencies (e.g. NSWMA), Community Residents

Possible Approaches

Category	Disaster Preparedness
Problem	In the instance of a natural disaster, residents should have real-time information on not just the location of, but the capacity and status of nearby shelters. Coordinating agencies, in turn should have a quick way to disseminate changing information to a wide audience.
Solution	Shelter Notification app
Description	For flood-prone areas, being able to quickly identify shelters, proximity from one's currently location and the status is helpful for both those seeking shelter and the agencies coordinating the response. This mobile app can build on the ODPEM map of shelters by providing dynamic and real-time information.
Target	ODPEM, Community Residents

Possible Approaches

Category	Solid Waste Management
Problem	Some communities are inaccessible by traditional garbage collection vehicles. However build-up of waste and improper disposal of waste can leave areas at risk for flooding as well as health issues.
Solution	Waste Disposal Routes and Optimizations
Description	An application can use OSM data to optimise waste collection and disposal routes, ensuring that waste is collected and disposed of properly. This can help reduce waste buildup in gullies and prevent negative environmental and human health impacts.
Target	Government agencies (e.g. NSWMA, NWA, ODPEM), Community Residents

Possible Approaches

Category	Public Awareness
Problem	Individual habits and practices are an important component of proper waste management. Thus by educating residents on their role in proper waste management, it can lead to behavioural changes which can prompt systemic changes.
Solution	Public Education Campaign
Description	This application can use OSM data to raise awareness about the importance of proper waste disposal and the negative impact of waste buildup in gullies. It can also provide educational content on waste management best practices and recycling initiatives.
Target	Residents (while the focus communities were in Allman Town, the created product can and should be able to applied to other places)

Possible Approaches

Category	Open Database
Problem	There is a lack of open, centralised and updated database that help with the tracking of sites of waste build-ups, flood regions, etc.
Solution	Historical Data App
Description	An application can use OSM data to track and analyse historical waste buildup data, and identify trends and patterns in waste generation and disposal in different areas. This data can help waste management authorities make informed decisions on waste management strategies and policies.
Target	Government agencies (e.g. NSWMA, NSDMB, NWA, ODPEM), Community Residents

Resources

- The datasets for the Hackathon can be found at:
  https://drive.google.com/drive/folders/11pk34C94MwGHWrFh-559BHoJyHbvTJCk?usp=sharing **(Make a copy and download!)**
- Other helpful datasets may be found here:
  http://opencaribbean.org/dataset?groups=jamaica
- The OpenStreetMap API is a web public API; the endpoint is located at http://api.openstreetmap.org/.You can find the OpenStreetMap API portal/homepage [here](#). If you need Openstreetmap API support, you can visit developer support [here](#).

- Review the full list of OSM software libraries available and grouped by application use and type [here](#).
- Watch the following [tutorial](#) to determine exactly how applications can be created using OSM data.

Resources - Programming Language

Some of the commonly used programming languages for OSM-based applications include:

- <u>Python</u>: There are several Python libraries available for OSM data, such as osmnx, geopandas, and osmapi.
- <u>JavaScript</u>: The OpenLayers and Leaflet JavaScript libraries are commonly used to create interactive maps that display OSM data.
- <u>Java</u>: The Osmosis tool is written in Java and allows developers to extract OSM data and manipulate it using Java code.
- <u>Ruby</u>: The Ruby on Rails framework has several gems, such as osm-rails and leaflet-rails, that enable developers to use OSM data in their applications.
- <u>C++</u>: The libosmium library is a C++ library that allows developers to work with OSM data.
- <u>Go</u>: The go-osm library is a Go package that provides an interface for working with OSM data.

Resources - Sample APIs

- <u>Overpass API</u>: This API provides a powerful query language for searching and retrieving OSM data. It allows you to specify complex filters and retrieve data within a specified area or along a specific route.
- <u>OSM API</u>: This is the official API for OpenStreetMap and allows you to perform basic CRUD operations on OSM data. You can use it to create and edit OSM objects such as nodes, ways, and relations.
- <u>Leaflet</u>: This is a popular JavaScript library for interactive maps, and it also includes support for OSM data. You can use Leaflet to display OSM data and add markers, lines, and polygons to the map.
- <u>Mapbox</u>: Mapbox provides a suite of APIs and tools for working with maps and location data, including OSM data. You can use their APIs to search for places, retrieve directions, and perform geocoding and reverse geocoding.
- <u>osm2pgsql</u>: This is a command-line tool that allows you to import OSM data into a PostgreSQL/PostGIS database. Once the data is in the database, you can use SQL queries to retrieve and analyse the data.

Hackathon
Day of Event Details

Agenda

8:30am	Registration, Breakfast, Meet and Greet
9:15am	Welcome, Introductions and Instructions
9:30am	Teams Working
12pm	Lunch Break (Judges arrive during the lunch period)
12:45pm	Announcements & Housekeeping
1:00pm	Teams Working (Judges can move about, preliminary notes)
2:00pm	Teams Pitching and Judging (15 mins per team: 10 min pitches, 5min Q&A)
3:45pm	Announcements and Prizes
3:55pm	Closing remarks

Expectations

- Participants are expected to be respectful of each other, the judges, the organising team, and the competition in general
- Participants are expected to comply with the rules of the Hackathon
- The judges' decision is final
- Team prizes should be shared equally among team members
- No alcohol or illicit substance is allowed on the premises nor is to be consumed during the event

Presentations

- Teams will have 10 minutes for an oral presentation followed by 5 minutes for Q&A
- A judging criteria has been included for reference
- A cash prize of US$800 will be awarded to the 1st place team, US$600 to the second place team and US$400 will be awarded to the third place team
- The winning team will also be provided with some initial funding to develop and implement their product

Judging Criteria

Criterion	Description
Use of OpenStreetMap (related apps/APIs)	Scale: 0 - 20 Maximum marks for use of the OpenStreetMap platform
Open Data usage and usefulness	Scale: 0 - 20 Maximum marks for effective use of the provided dataset and incorporation of additional datasets, where needed
Community accessibility	Scale: 0 -20 Maximum marks for design to take into consideration community feedback and input
Commercial Potential	Scale: 0 - 20 Maximum marks if the product has commercial viability and can be adopted for wider use
UX/UI	Scale: 0 -10 Maximum marks for the appeal of the user interface and ease of use
Presentation	Scale: 0 -10 Maximum marks for clarity of presentation, how compelling the presentation is, and keeping within the time limit

CARIBBEAN
SCHOOL
OF
DATA

**For information about
the Hackathon, contact:**

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