ONDC Innovation Hackathon

Notes to the Hackathon Participants

1. This document is the primary document of reference for the ONDC Integration Hackathon.
2. Please go through the details carefully and raise your queries before **4 PM** on **1st July 2022**.
3. Please post your queries in the [Discord channel](#).

1. Instructions to Participants

Participants are requested to follow these instructions that will be applicable during the Innovation Hackathon.

a. Participants are required to use their own device (laptop, mobile phone, etc.), with internet connectivity.

b. Use of software components, including web services, available under Open Source License will be preferred.

c. Participants must use Open Data Sets.

d. Participants can make their own assumptions which should be clearly called out.

e. [Github repository link](#)

f. **Communication channels:**

   - [Discord](#)

   - **Check In calls**

   - [Submission Sheet](#)

g. **Issue resolution**

2. Overview of Challenge Statements

Innovation hackathon challenges attempt to address real-world problems in digitizing the agri value chain, so as to make it more inclusive, with the goal of bringing in a wider cross-section of society into the mainstream of digital agriculture.

These challenges include the following:

- *Challenge 1 - Develop a prototype that allows contextualized search for a farm input that results in relevant product details.*

- *Challenge 2 - Develop a prototype for fast digitization of catalogs and lifecycle management of the digital catalog.*

- *Challenge 3 - Develop a prototype for determining the optimal available price for farm produce.*

- *Challenge 4 - Develop a prototype for "Easy Farmer Experience" that can offer an intuitive interface to farmers and / or integrate with visual interfaces, such as Whatsapp / Signal / Telegram, and/or text interfaces such as SMS to cater to farmers in limited resource settings or with low technological know-how.*

- *Challenge 5 - Develop a prototype for load & route optimization to determine one or more lot sizes for an optimal truck load and an optimized route between farmers & consumers to ensure timely delivery of farm produce.*

- *Challenge 6 - Develop a prototype for quality assessment of farm products throughout the value chain.*

3. Challenge 1 - Match product to purpose

Description
The objective of this challenge is to develop a prototype that allows contextualized search for a farm input, for a specific purpose, that results in relevant product details. Farm input products can include essential inputs such as seed, fertilizer, farm power, chemicals such as herbicides, pesticides, fungicides, etc. or other inputs. Each farm input product can have one or more purposes, e.g. a pesticide that contains active ingredients best for use against specific pests.

Requirements
The requirements for this challenge are defined below:

1. Define a search grammar, using a combination of conjunctive normal form (CNF) and backus naur form (BNF), that can be used to match product to purpose. This should cover search queries such as the following:

    a. Input for preserving soil moisture;

    b. Pesticides providing protection against pests during plantation & harvest;

    c. Inputs to improve dairy productivity;

    d. Organic fertilizer for horticulture;

2. Define a schema that can be used to identify farm & dairy input products, based on their purpose. The schema should include a set of attributes, including but not limited to the attributes defined below:

    ● Product details - name, description, image, contents, benefits, side-effects (if any), eco friendly or sustainability quotient, pricing (based on slab structure or equivalent);

    ● Purpose details - standard list of purpose codes & matching of one or more purpose code with a product;

    ● Usage details - standard list of usage codes & matching of one or more usage codes with a product. Usage details could include how the product could be used (e.g. sprayed through drones, manually sprayed from tractor, etc), minimum quantity for use (either fixed or in some proportion, etc);

3. Develop a prototype using which a user can input a search criteria (using the grammar defined above) and see one or more search results that match the entered criteria. The prototype should support at least one of the following Indic languages - Hindi, Telugu, Tamil, Marathi, Gujarati, Bengali, Kannada;

4. Challenge 2 - Digital Catalog creation and maintenance

Description
The objective of this challenge is to develop a prototype for fast digitization of catalogs and lifecycle management of the digital catalog.

Requirements
The requirements for this challenge are defined below:

1. Define a schema (appropriate for at least 10,000 products) for an online catalog for farm & dairy products, that includes a set of basic attributes including but not limited to the attributes defined below:

   ● Farm details - farm name, location i.e. GPS coordinates or equivalent;

   ● Product details - for the purposes of this challenge, a product includes the following attributes - ID, name, pack size, description, price, image, quantity, grading, variants, perishability;

   ● Logistics criteria - may be defined at a product level and provide options such as - logistics needs, cold chain requirements, ideal delivery turnaround time;

   ● Payment criteria - may be defined at the store level and includes options such as the following - cash, UPI, Rupay vouchers, Kisan credit card, etc.;

2. Develop an intuitive interface, using text or voice or image input or a combination of these, for digitizing a product that is grown in the farm. The solution should focus on ease of use and convenience for the farmer. This may work in either of the following ways:

   ● Take a photo and auto-label or scan machine readable codes (e.g. QR code);

   ● Add entry through voice to text conversion of voice input;

   ● Add text entry and supplement with an image;

   ● Any combination of the above or using any other intuitive mechanism;

3. The intuitive interface developed in (2) above should support:

   ● Digitisation of at least 100 farm & dairy products in 30 minutes;

   ● Populate the digitized catalog in the schema defined in (1) above;

   ● Using any one of the following Indic languages - Hindi, Marathi, Telugu, Kannada;

5. Challenge 3 - Optimal Available Price

Description
The objective of this challenge is to develop a prototype for determining the optimal available price for farm & dairy produce.

Requirements
The requirements for this challenge are defined below

1. Create a dynamic pricing model (using formal programming language) for specific category, such as green vegetables / fruits / dairy produce, that accepts inputs such as weather, market data feeds, seasonality, supply & demand in specific locations, whether perishable item, quantity in inventory, etc. to determine the optimal price for one or more products in the category;

2. The pricing model should compute the price for the product, at varying levels of granularity (e.g. once per day, at a specific time, etc.), incorporating different input parameters leading to different outputs;

3. Generate test data for at least 10 different items, clearly defining the relevant inputs and the dynamic price as the output.

4. Develop a prototype that implements the model and provides end points for accepting different inputs and configuring the model variables to derive the dynamic price based on the inputs.

5. Define a prototype with an intuitive interface using which a user can input data (from the test data set above) and compute the optimal price;

6. Challenge 4 - Easy farmer experience

Description

The objective of this challenge is to develop a prototype for "**Easy Farmer Experience"** that can offer an intuitive interface to farmers and / or integrate with visual interfaces, such as Whatsapp / Signal / Telegram, and/or text interfaces such as SMS to cater to farmers in limited resource settings or with low technological know-how.

Requirements

The requirements for this challenge are defined below:

1. Create a prototype that enables the farmer to manage their produce, using an intuitive interface, in a narrowband environment (e.g. 2G) with feature phones or equivalent devices. Farmers should be able to prepare a catalog, add images and product details, update inventory, manage prices with discounts / offers, accept, process & fulfill orders, manage order history;

2. The prototype should have an intuitive interface in the form of a standalone app or integrate with existing visual interfaces such as Whatsapp / Signal / Telegram and / or text interfaces such as SMS;

3. Provide a guided UX to a buyer who is not tech savvy so that at any stage of the transaction flow, they're aware of what they have done, what needs to be done next and how.

7. Challenge 5 - Load and route optimisation

Description

The objective of this challenge is to develop a prototype for load & route optimization to determine one or more lot sizes for an optimal vehicle load and an optimized route between farmers & consumers to ensure timely delivery of farm & dairy produce.

Requirements

The requirements for this challenge are defined below:

1. Create a model (using formal programming language) for load management to determine one or more lot sizes for an optimal vehicle load to minimize the operational costs related to moving goods through the logistics supply chain;

2. Develop a prototype that implements the model and provides end points for accepting different inputs and configuring the model variables to derive one or more lot sizes based on the inputs;

3. Given a set of locations (GPS points or equivalent) in a map, create an algorithm that optimizes the route along the given set of locations, based on specific criteria such as time taken, distance covered, and with due consideration for other constraints such as road closures, diversion of traffic, etc;

4. Develop a prototype that implements an open source map and provides end points for accepting an array of location coordinates and generating the optimal route;

5. Develop an intuitive interface that allows an user to enter input variables (truck capacity, start & end location coordinates), for which the following output is generated - 1 or more lot sizes, optimized route between the start & end location coordinates;

6. Develop a prototype to help track the farm produce from source to destination across the logistics supply chain.

8. Challenge 6 - Quality assessment

Description

The objective of this challenge is to develop a prototype for quality assessment of farm products throughout the agri value chain.

Requirements

The requirements for this challenge are defined below:

1. Define the parameters for quality assessment / assaying for various categories such as fruits, vegetables, grains, dairy and animal produce, using standards set by DMI & others and followed by eNAM and others;

2. Define a quantitative quality grading scale to assign quality score to various categories of farm products based on the parameters defined above;

    a. Develop a prototype for assessing quality using text attributes (e.g. determine shelf life using attributes such as picked date, weather, no. of days stored, firmness, etc.) and (optionally) visual attributes through image processing / machine vision algorithms. The prototype should assess quality for one or more categories of farm products using a combination of text and visual attributes, with facility to integrate external data and (optionally) image feeds to support validation of quality of farm & dairy produce;

3. Develop an intuitive interface that allows a user to enter input variables such as category of farm & dairy products and for which the output generated includes the quality assessment parameters and the quality score;

4. Using the quality assessment prototype above, create an automated mechanism to validate and verify the quality of the farm produce that passes through the value chain from farmer to the end customer, thus facilitating traceability of the produce quality across the value chain while creating a robust & singular source of truth for quality validation of produce.

9. Evaluation

The evaluation process is defined below:

1. To qualify for an award for a challenge, a participant needs to comply with the following:

    a. Use of Software components, including Web Services, available under Open Source License is preferred;

    b. Use of Open Data Sets, as may be required, for executing the challenge;

    c. Preferably complete all requirements, marked as mandatory, for the challenge;

2. A participant submits their response, for **each challenge**, for evaluation as follows:

    a. Provide access to a fork of their source code base (including source code, dependencies and data sets used) **as of the completion of the hackathon**, in the form of a pull request, to the ONDC GitHub repo (participants should name their branch as <teamname>-"Challenge"<No> e.g. team "ABCD" submitting response for Challenge 1 will create a branch "**ABCD-Challenge1**";

    b. Fill up the submission sheet with the required information such as the following:

        ● Challenge for which submission is made, requirements completed;

        ● Information (if any) that could help with better understanding of their submission;

        ● Short video which demonstrates a prototype of their submission;

        ● Other information required in the submission sheet;

    c. All submissions must be licensed under an OSI approved license;

3. The inspection of the claim will be, based on verification of the submission, by the Hackathon evaluation team, who will accordingly accept or reject the submission.

4. A shortlisted set of submissions will be presented to the jury along with the evaluation report.

5. The jury will review the shortlisted set of submissions and the evaluation report and decide the awards as per the criteria defined below.