Morgan Stanley

IBM Call For Code 2020

Track: Climate Change

Waste Segregation – Nip it in bud

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Content

Problem Statement

Our household waste contributes to about 70-80 percent of the total Municipal Solid Waste (MSW) generated in a city.

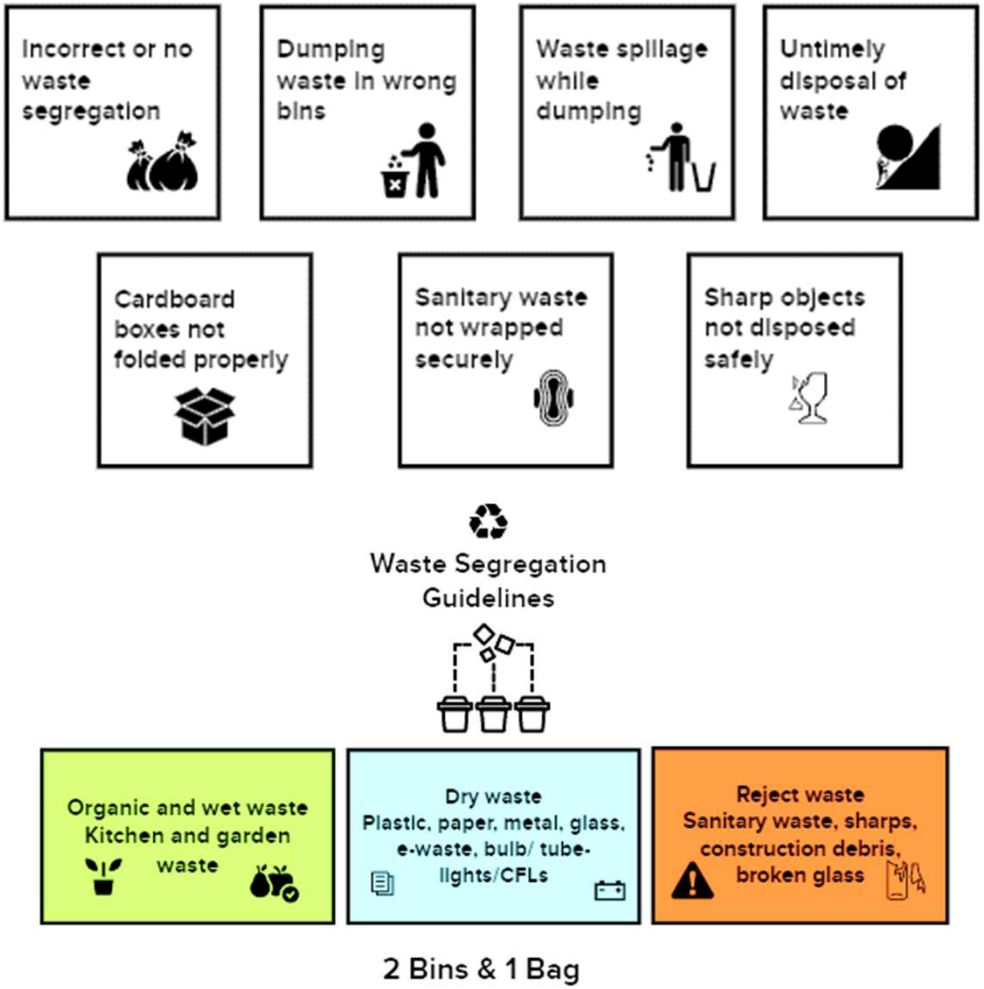
Unsegregated waste in the form of trash becomes hazardous quantity cause land pollution, and makes the soil toxic.

There is also a growing need to decrease the amount of wastes thrown in landfills because of the increasing problem on the lack of available lands to dump trash.

Waste segregation at source is the dire need of the hour. The best place to start making a difference is right in your own home.

In order to save our environment and to improve the quality of the atmosphere we live in, it's necessary that we make waste segregation a habit and not an obligation.

General issues seen with Waste Segregation at home



The idea

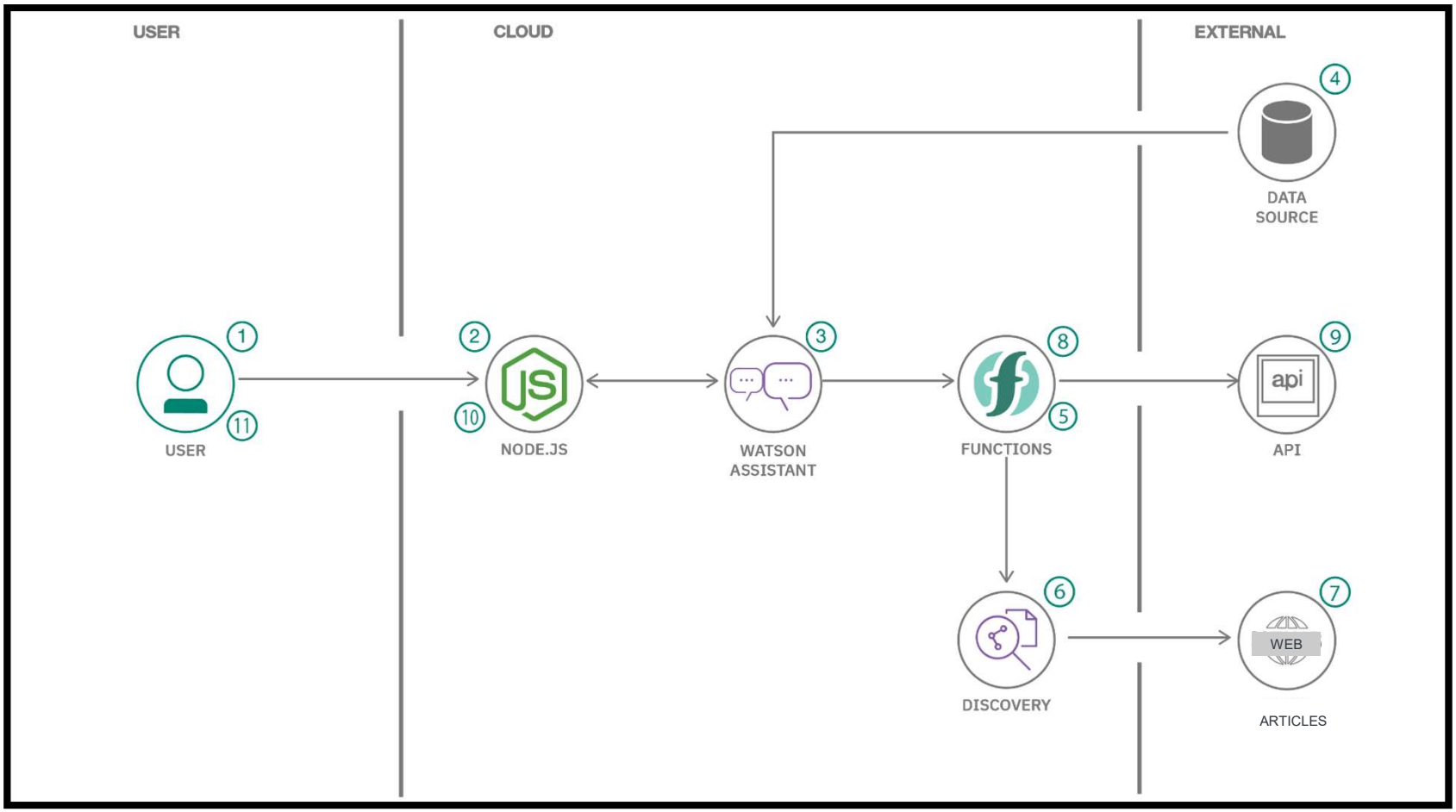
Using Watson Assistant, we will launch a ‘Nip it in the bud’ initiative where we will design a virtual assistant pre-loaded to educate and respond to common questions about waste segregation, scan the guidelines and articles using Watson Discovery, and create awareness with data from trusted sources.

With this Watson Assistant-powered communications starter kit, one can integrate a chatbot into the Call for Code solution in an IBM Cloud-hosted web server, using a Slack integration, or via a Node-RED dashboard.

It can:

- Educate, create awareness and respond by sharing consistent, accurate waste segregation guidelines
- Help citizens quickly and easily access the information through their channel of choice – voice, text, or collaborative tool
- Free valuable resources by automating answers to common waste segregation questions
- Dynamically update information with the latest developments and recommendations

Diagram


USER
CLOUD
EXTERNAL
1
2
3
4
5
6
7
8
9
10
11
DATA SOURCE
USER
NODE.JS
WATSON ASSISTANT
FUNCTIONS
API
DISCOVERY
WEB
ARTICLES

Solution Description

1. The user visits a website with the Waste Segregation chatbot and asks a question.

2. The Node.js web server calls Watson Assistant hosted in IBM Cloud.

3. Watson Assistant uses natural language understanding and machine learning to extract entities and intents of the user question.

4. The waste segregation FAQ is sourced from trusted data.

5. Watson Assistant invokes an OpenWhisk open source-powered IBM Cloud Function.

6. IBM Cloud Function calls Watson Discovery running in IBM Cloud.

7. Watson Discovery scans web and responds with relevant articles.

8. Watson Assistant invokes an OpenWhisk open source powered IBM Cloud Function.

9. IBM Cloud Function calls the Waste Segregation API to get statistics.

10. Watson Assistant replies to the user inquiry.

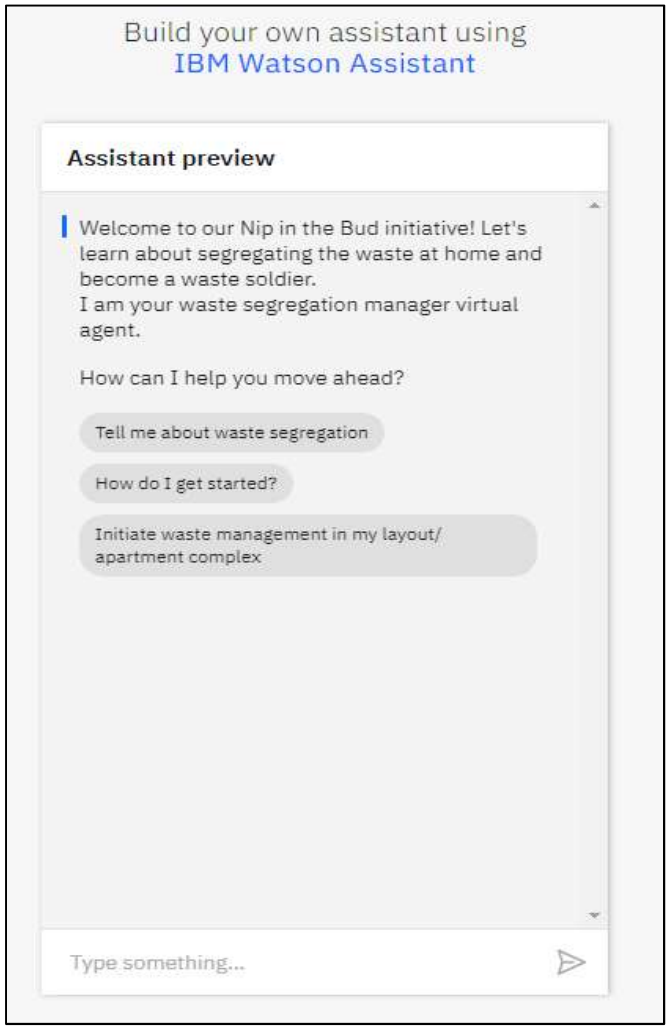
11. The Node.js web server displays the chat answer to the user.

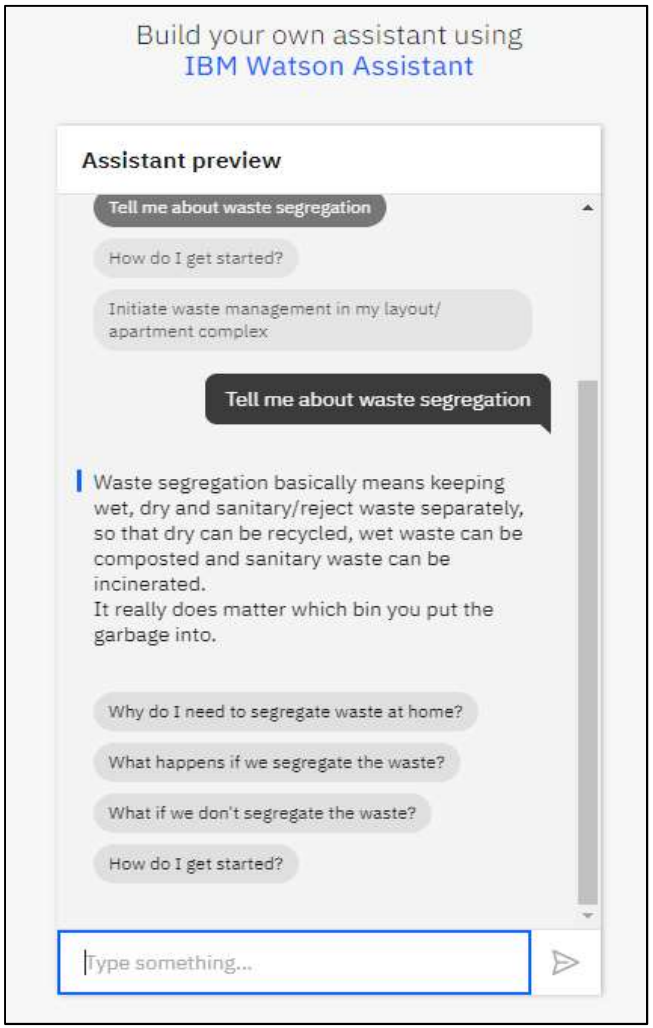
MVP 1 : Build Watson Assistant chatbot

COMPLETE

1. Built up the content to communicate with the users on Waste Segregation to -
    - Educate user on waste segregation
    - Importance of waste segregation at home and our responsibility towards it
    - What happens if we don't segregate the waste at source?
    - Different types of waste
        - Wet Waste
        - Dry Waste
        - E-Waste
        - Sanitary/ Reject Waste
    - Pre-requisites of waste segregation at home & steps to do waste segregation
    - Info on the management and disposal of different types of waste
    - Tips to Reduce Waste
    - Initiate waste management in a layout/ apartment complex
2. Registered for an IBM Cloud account
3. Created Watson Assistant **Waste Segregation Manager**, intents and dialog skills
4. Successfully asked the Watson Assistant chatbot some questions about Waste Segregation

Watson Assistant Waste Segregation Manager





MVP 2 : Integration of chatbot

1. Connect the chatbot to data sources via a Watson Assistant Webhook to query for dynamic data and to provide user with more information from web

2. Integrate the chatbot with Slack, a cloud-based messaging application to help people collaborate with one another

3. Integrate the chatbot with Node-RED to to enable voice commands