



open**SAP**

e-Grains Storage App

Using Sensors over internet

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Story

Story

According to recent survey by Rome based Food and Agriculture Organization globally one-third of the food produced is wasted costing the world economy about \$750 billion. Among the Asian countries, India and China were the worst culprits causing loss of 1.3 billion tonnes of food every year with the main reason being poor storage facilities of the grains. As per World Health Organization guidelines, a minimum of 250 gm food grains is required per person per day to survive. Imagine how many people can benefit if we can save that 1.3 billion tonnes of food.

Though we have now cold storage facility available to preserve food but according to study done by Indian Institute of Management (Premier Institute of India), only 10% of food produced gets cold storage facility in India. The government does not have enough warehouses because of which the hard work of farmers is wasted as they end up keeping the grains at a place where it is affected by moisture and rodents. Establishment of a cold storage requires huge investment, which is not feasible.

IoT can play a part in this big problem by monitoring the places where the grains are kept. We can have a mobile app, which is connected to the sensors at storage locations that monitor temperature and moisture level. Threshold parameters for them can be customized based on the grain type. Once the moisture level increases beyond a threshold, an alarm could be set via IoT to mobile APP. The other issue is that the supervisor does not know when the rodents attack the grains. For this, we can have a kind of motion sensor or a weight sensor where some grains will be kept and once the rodent eats the grain, weight sensor will trigger the alarm so that appropriate measures are taken. In addition, the project can be extended by monitoring the moisture content in the fields so that water is used judiciously for irrigation purposes.



Persona

Persona Template –



Ramesh

Storage Supervisor

I don't like that every morning I have to visit different food storage locations to verify that conditions are viable for food storage as well as to check if rodents are not eating the stored food.

About

- 45 years of age, with export of food grains as main business
- Very hardworking person but cannot manage the time as he has to physically visit each food storage location so as to assure that it is not getting spoiled.
- Very difficult for him to keep track of all locations
- Is extremely happy with the idea of automating food storage monitoring using IoT.
- Better management of actual time spent in visiting storage locations. It will be amazing if I can monitor all locations from one place.

Responsibilities

- Every day I have to visit the storage to check conditions are viable for food storage
- I need to keep monitoring for rodents and accordingly act.
- Additionally I have to monitor if water is sufficient in the fields.

Needs

- It is hard for me to visit each location due to time constraint.
- I need a screen where from I can monitor the conditions inside any of my storage.
- I need to track the attendance of staff at those locations.

Main Goals

- I store the grains of farmers so that they can sell it when they get good price in market.
- Help the farmer to live a financially secure life.
- Change farmers life by introduction of technology
- Make food storage monitoring affordable for average farmer.

Pain Points

- Want to know real time information.
- Food wastage by rodents.
- Travelling is a pain as stores are at different places.
- Visit actual fields to monitor the conditions for the future crop.



Point of View (PoV)

Point of View

As a **Storage Manager**

I need a way to **store my food grains**

so that **it is neither spoiled by external conditions nor attacked by rodents and I can sell it in market when I get a good rate.**

UX Journey



ACTIONS	Open the office	Look into the location address where he wants to visit	Leave to visit the storage location	Reach the storage location	Evening back to office
MINDSET	Does a small prayer in office.	Ah again today will be hectic day have to cover lot of locations	I wish I had a genie who could update me status of each location	Not again, the assistant has forgot to switch on ventilation. Thank God I visited else, everything would have got spoiled.	Could not cover planned locations due to high traffic. No worries tomorrow will leave early to visit all places.
FEELING	😊 😊 😊	😞	😞	😞 😞 😞	😊
TOUCH POINTS	Office Building	Location File	Car/Public Transport	Storage Building	Office Building



Prototype

The prototype uses sensors, which will monitor the temperature and humidity of the storage locations. In addition, there will be weight sensors placed where food is intentionally kept to detect rodents. The sensors through internet will send the information to the App where the Supervisor will get the real time data for the storage locations. The Supervisor no longer needs to visit the storage locations manually and always has a real time data under the fingertips. Since the food storage conditions are monitored on real time data, the supervisor can keep the food for longer time and can sell only when the market conditions can fetch him good money. Also the wastage of raw food can be reduced to a large extent.

The App will have main screen where the Supervisor can:

- View the Map of the locations where one of the threshold has reached crossed and Supervisor action is required.
- Use the inbuilt analytics based on the data collected by the sensors.
- Search for a particular storage location and get its details on runtime.
- Customization where the supervisor can input the sensor parameters based on a particular grain type or location.
- Alert box where the Supervisor can see real time alerts based on the input received from the sensors.

Apart from these options, the App can be enhanced with options like:

- Install moisture sensors in the fields to monitor if watering is required.
- Using bar code sensors get real time availability of space in different storage locations resulting in effective utilization of the storage location space.
- Use finger print sensors to monitor the attendance of the storage workers

Below is the link where the mockup screens can be viewed:

https://standard.build.me/api/projects/4af34f582d68202a0cd4449e/prototype/snapshot/latest/index.html#/14775421848538217_S0

(Note : Currently BUILD has issues with screen resolutions, so the screens will look much bigger, actual screens are on next page of this document).

Next page are the mock up screens:

e-GRAINS Mockup Screens

