AUGUST – DECEMBER 2022 SEMESTER 5

SOFTWARE ENGINEERING LAB TASKS
Professor-in-charge: Dr. Jayashree R

Team Detangle [Project team]

Name	SRN
DIVIJA L	PES1UG20CS134
DHATHRI GURRAM	PES1UG20CS141
GAURAV DNYANESH MAHAJAN	PES1UG20CS150
JALLURI HARSHITHA DEVI	PES1UG20CS173

Problem Statement – 2:

In line with the four pillars of DevOps – Collaboration, Tools, Scaling and Affinity, your team has to come up with innovative solutions to tackle social issues such as child safety for example (each team is free to choose their own topic based on social issues). This will be done using techniques such as Crazy 4s and S.C.A.M.P.E.R. You are then required to provide a list of tools for an end-to-end technical solution for the best idea you generated. You are also required to provide information regarding scaling in terms of teams, Infrastructure, workload, organization and complexity.

Crazy 4s:

1) Open a new text editing document.

2) Set a timer for four minutes.

3) In these four minutes each participant is required to come up with four rough ideas as solutions for the problem. You can note your ideas down as small points instead of entire sentences.

4) At the end of four minutes, you are required to discuss your ideas with your teammates to come up with the best possible solution.

NOTE: This can be extended to Crazy 6s or Crazy 8s with six minutes for six ideas or eight minutes for eight ideas depending on team size.

PROBLEM : FOOD CRISIS AROUND THE WORLD

Crazy 4s:

1. Support domestic food production and redistribution of excess food.

2. Use of eco-friendly fertilizers, insecticides, pesticides and weedicides.

3. Establish living wages for workers on farms, in processing facilities, and in supermarkets.

4. Stabilize and guarantee fair prices to farmers and consumers by re-establishing floor prices and publicly owned national grain reserves.

5. Promote a return to smallholder farming. On a pound-per-acre basis, family farms are more productive than large-scale industrial farms. Because 75 percent of the world's poor are farmers, this will address poverty, too.

S.C.A.M.P.E.R:

In order to further improve your ideas ideated using Crazy 4s, use this technique. Answer these following questions as a team to improve your idea.

Substitute: What can I substitute to make an improvement?

Combine: What ideas, features, processes, or components can I combine?

Adapt: What processes, features, or components should I adapt?

Modify: What can I make larger or make smaller?

Put to another use: What else can it be used for? Who else could use it?

Eliminate: What would happen if I removed a feature or part of it?

Reverse/rearrange: How can we rearrange the current status for an improved solution? What would happen by reversing the process?

Substitute: 2

Usage of natural fertilizers such as vermicompost, kitchen scraps, manure etc.

Combine: 3 and 4

Establish living wages for workers on farms, in processing facilities, and in supermarkets and Stabilize and guarantee fair prices to farmers and consumers by re-establishing floor prices and publicly owned national grain reserves.

Adapt: 1

Every household should adapt the process of domestic food production. Cultivating our own food can not only help increase food production, but also helps in reducing the expenses on food and reduces the chemical intake(fertilizers, pesticides etc.).

Modify:

Modification not required for the above practices.

Put to another use:

The above measures are also effective in reducing

- Soil pollution as the chemical content in the soil reduces.
- Water pollution as there is no discharge of pesticide and incecticide contaminated waste which is harmful for the aquatic life.

Eliminate: 2

Eliminating step 2 can result in the usage of chemical fertilizers to grow crops that are potentially contaminated with harmful chemicals that can be life threatening if consumed.

Reverse/ Rearrange:

The rearranged steps:

1. Support domestic food production.
2. Promote a return to smallholder farming. On a pound-per-acre basis, family farms are more productive than large-scale industrial farms. Because 75 percent of the world's poor are farmers, this will address poverty, too.
3. Use of eco-friendly fertilizers, insecticides, pesticides and weedicides.
4. Establish living wages for workers on farms, in processing facilities, and in supermarkets.
5. Stabilize and guarantee fair prices to farmers and consumers by re-establishing floor prices and publicly owned national grain reserves.

By rearranging the steps, smallholder farming will also follow chemical-free practices.

<u>Technical Solution:</u>
An app that collects surplus food from people when they inform and distributing it to the needy or that could be shared to ensure that the food doesn't get wasted.

<u>Tools required:</u>

Flutter, firebase etc.

<u>Scaling in terms of</u>

Infrastructure - Horizontal scaling can be used when high availability of servers is required.

Workload – Workload scaling could be in terms of scaling up the number of teams across the organisation. Also, workload scaling in terms of scaling up the disk space or a faster CPU. Performance is a major advantage of scaling up.

However, scaling out workload through parallelisation can also be implemented which is slower but steady.

Organization - Investing in people and culture, and reaching out to people in correct time will help in successfully scaling the organization.

Complexity - Keeping the app simple and easy to use will help a lot of people use it efficiently.

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