

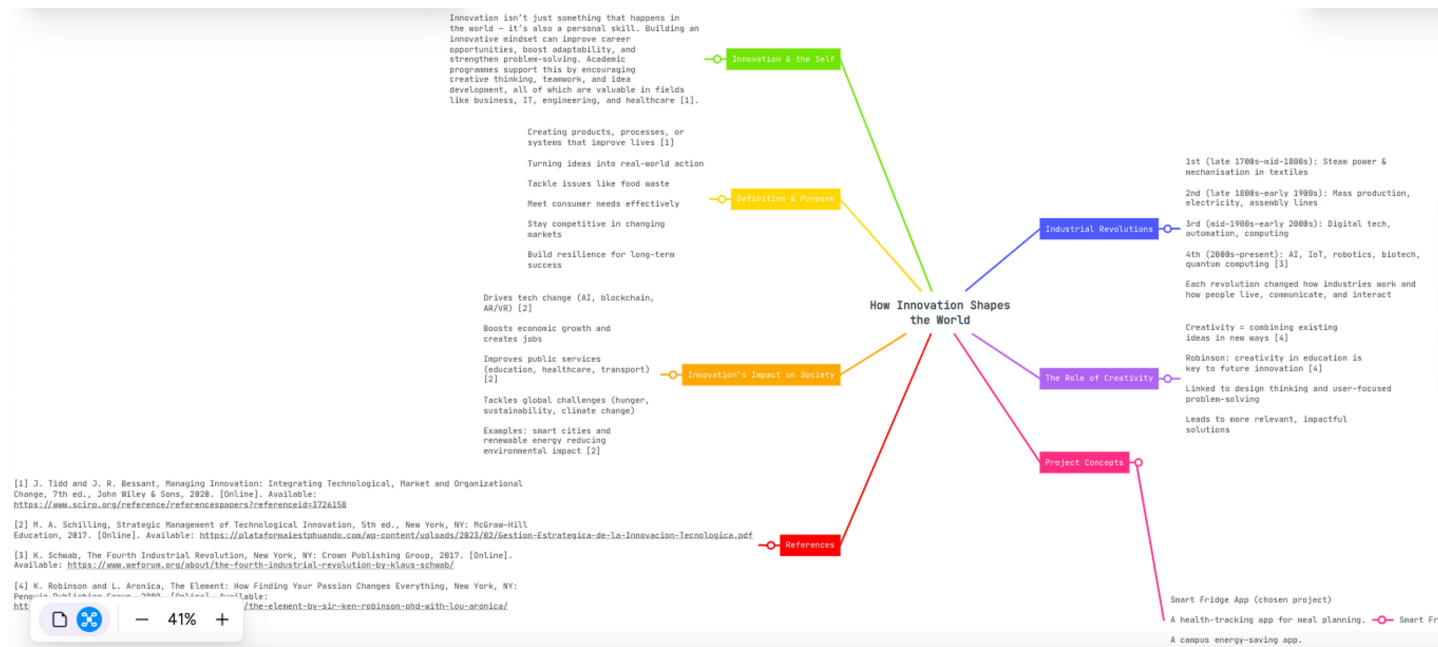
Q1

Thursday, August 14, 2025 7:12 PM

Innovation has always played a big role in shaping how society develops and how individuals live their day-to-day lives. From simple inventions like the light bulb to complicated systems like the Internet of Things (IoT), creative ideas have driven progress and solved real world problems. In technology, innovation isn't just about inventing something new, it's also about improving existing systems.

Here's a link for my mind map in Mindmeister.

<https://mm.tt/map/3751404611?t=RXxeacd6tA>

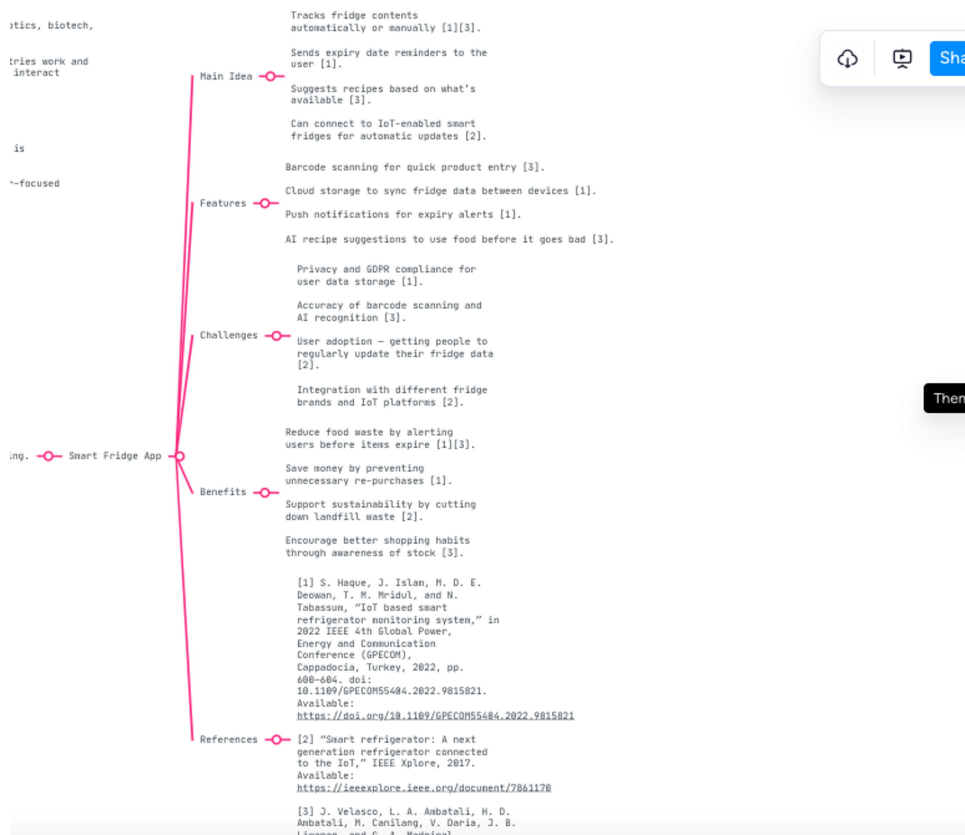


Q2

Friday, August 15, 2025 9:45 PM

Smart Fridge App – Project Idea

The Smart Fridge App is designed to help households reduce food waste and save money by keeping track of items stored in the fridge. Users can log products manually or through barcode scanning, while IoT-enabled fridges can update the app automatically. The app sends reminders before items expire, suggests recipes based on available ingredients, and provides shopping insights to encourage sustainable habits. By combining convenience with environmental benefits, the app supports smarter food management for everyday life.



Q1

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Aim:

To design and evaluate a Smart Fridge App that helps users track food items, reduce waste, and improve kitchen efficiency through simple and effective technology.

Objectives:

1. **Check Usability** – Look at the app's design and layout to make sure it's easy to add items, check expiry dates, and get notifications without confusion.
2. **Test Key Features** – See how well the app handles barcode scanning, expiry tracking, recipe suggestions, and cloud syncing between devices.
3. **Review Technical Performance** – Check the app's speed, stability, and reliability in everyday use.
4. **Gather User Feedback** – Ask potential users what they like, what they don't, and what they'd want added.
5. **Ensure Privacy and Security** – Make sure the app follows GDPR rules and handles user data safely.
6. **Compare with Competitors** – Look at other food tracking and smart fridge apps to find new ideas and stay competitive.

Q2

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For this project, a pragmatic research philosophy makes the most sense. Pragmatism focuses on finding solutions that work in real life, rather than sticking strictly to one method [1].

Since the Smart Fridge App needs both user opinions (qualitative data) and performance data (quantitative data), a mix of research methods will be used. This approach will help answer questions like:

- “Do people actually find expiry reminders useful?”
- “How much food waste can the app reduce?”
- “Which design makes people use the app more often?”

Q3

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To research the Smart Fridge App, I'd use a mix of free and academic search tools:

Search Tools:

- **Google Scholar** – For finding a wide range of academic papers quickly.
- **IEEE Xplore** – Great for research on IoT, sensors, and mobile app development [2].
- **Scopus** – A large database covering technology, business, and environmental science (good for food waste studies).
- **ResearchGate** – Useful for finding papers and sometimes contacting the authors directly for extra details.
- **MDPI Journals** – Open-access scientific journals like *Energies* that publish IoT and smart kitchen research [4].

Search Strategies:

- Use **Boolean operators** to combine keywords:
- "smart fridge" AND IoT AND "food waste"
- "kitchen automation" AND "mobile app" AND usability
- "expiry tracking" AND cloud syncing
- Apply filters for the last 5 years to keep the research current.
- Look at reference lists in good papers to find more sources on the same topic.
- Bookmark relevant sources early to avoid losing them later.

References

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- [1] J. W. Creswell, *Research Design: Qualitative, Quantitative, and Mixed Methods Approaches*, 5th ed. Thousand Oaks, CA, USA: Sage, 2018.
- [2] S. Haque, J. Islam, M. D. E. Deowan, T. M. Mridul, and N. Tabassum, "IoT based smart refrigerator monitoring system," in *2022 IEEE 4th Global Power, Energy and Communication Conference (GPECOM)*, Cappadocia, Turkey, 2022, pp. 600–604. doi: 10.1109/GPECOM55404.2022.9815821. Available: <https://doi.org/10.1109/GPECOM55404.2022.9815821>
- [3] J. Velasco, L. A. Ambatali, H. D. Ambatali, M. Canilang, V. Daria, J. B. Liwanag, and G. A. Madrigal, "Internet of things-based (IoT) inventory monitoring refrigerator using Arduino sensor network," *arXiv preprint*, Nov. 2019. Available: <https://arxiv.org/abs/1911.11265>
- [4] C. A. U. Hassan, J. Iqbal, M. S. Khan, S. Hussain, A. Akhunzada, M. Ali, A. Gani, M. Uddin, and S. S. Ullah, "Design and Implementation of Real-Time Kitchen Monitoring and Automation System Based on Internet of Things," *Energies*, vol. 15, no. 18, p. 6778, 2022. doi: 10.3390/en15186778. Available: <https://www.mdpi.com/1996-1073/15/18/6778>

Q1

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Making the Research Trustworthy and Ethical

When researching for the Smart Fridge App, it's important that the results are trustworthy, consistent, and fair, while also making sure participants are treated ethically.

Validity – This means making sure the research is actually measuring what I want it to measure. For example, if I want to know if expiry date reminders help reduce waste, I should ask clear questions about that topic and avoid anything that could be misunderstood [1]. Doing a small test run first will help spot problems early.

Reliability – This is about getting consistent results if the research was repeated. To help with this, It's important to make sure everyone gets the same survey format and instructions, and that usability tests are done under similar conditions.

Generalizability – I want my results to apply to more than just one small group. That means including people of different ages, household sizes, and tech skill levels. I'd also aim to have a mix of participants from different places rather than just friends or classmates.

Ethics – Since the app would deal with user data, privacy is very important. All participants should know what the research is for and agree to take part (informed consent) [2]. Their data will be stored securely, and they'll have the right to stop at any time. No misleading information should be given, and GDPR rules would be followed.

Q2

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For the Smart Fridge App, the plan is to use:

1. **Online Surveys** – To find out what features people want, how they currently track food, and how often they waste it.
2. **Usability Testing** – Letting people try a prototype to see if it's easy to use and where they get stuck.
3. **Short Interviews** – To get more detailed opinions on what works and what doesn't.
4. **Competitor Reviews** – Looking at other smart fridge or food management apps to see their pros and cons [3][4].

Pilot Survey

Before doing the full survey, I'll test a short version with 5–10 people. This will check if my questions make sense and whether anything important is missing.

This will cover:

- Age and household size.
 - Current food management habits.
 - Comfort with using mobile apps.
 - Which features they'd like in a smart fridge app.
- I'll also ask for open feedback so I can improve the survey.

Q3

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Analysing the Results

Quantitative Analysis (numbers-based)

- **Descriptive statistics** – average number of notifications people want per week.
- **Frequency counts** – how many people prefer barcode scanning over manual entry.
- **Before-and-after comparison** – how much food waste changes after using the app.

Qualitative Analysis (words-based)

- **Thematic analysis** – Looking for common themes in interview answers, like “easy to use” or “needs better alerts.”
- **Content analysis** – Reviewing competitor app reviews to see what users praise or complain about most [4].
- **Observation notes** – Writing down what people do during usability tests, especially where they seem confused.

Conclusion

By using clear questions, testing my survey first, and combining both numbers and written feedback, I can get reliable, useful results for the Smart Fridge App. This approach will make sure the app solves real problems, works well for a range of people, and meets ethical standards.

References

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- [1] S. Haque, J. Islam, M. D. E. Deowan, T. M. Mridul, and N. Tabassum, "IoT based smart refrigerator monitoring system," in *2022 IEEE 4th Global Power, Energy and Communication Conference (GPECOM)*, Cappadocia, Turkey, 2022, pp. 600–604. doi: 10.1109/GPECOM55404.2022.9815821. Available: <https://doi.org/10.1109/GPECOM55404.2022.9815821>
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- [3] J. Velasco, L. A. Ambatali, H. D. Ambatali, M. Canilang, V. Daria, J. B. Liwanag, and G. A. Madrigal, "Internet of things-based (IoT) inventory monitoring refrigerator using Arduino sensor network," *arXiv preprint*, Nov. 2019. Available: <https://arxiv.org/abs/1911.11265>
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Example - Data Collection Method

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Goal:

To test whether the survey questions are clear and relevant before sending the main survey to a larger group.

Section 1 – About You

1. **Age:** Under 18 / 18–24 / 25–34 / 35–44 / 45+
2. **Household size:** 1 / 2 / 3–4 / 5+

Section 2 – Current Habits

3. **How often do you throw away food because it's gone off?** (Never / Rarely / Sometimes / Often)
4. **How do you track what's in your fridge?** (Don't track / Check manually / Use a notes app / Use a food app)

Section 3 – Tech Use

5. **How comfortable are you with mobile apps?** (Very uncomfortable → Very comfortable)
6. **Which features would you want?** (Expiry reminders / Barcode scanning / Recipe suggestions / Shopping list / Cloud syncing / Voice input)

Section 4 – Feedback

7. **Were any questions unclear?**
8. **Anything you think should be added?**

Engagement

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Apply

Take sometime to think of **appropriate questions** to this scenario. Keeley is attending an interview for a job at UWTSD as a trainee librarian. Imagine that you are the person interviewing her. Can you...

- Think of a **qualitative question** that would give you some data on her librarian skills?
- Think of a **quantitative question** that would reveal relevant data on her suitability as a person who knows about books?

Use the skills you have developed in this topic to further your own research. Remember to also use the **library database** to identify suitable research methods for your subject area. Ask your tutor for some recommendations.

Qualitative question: “Can you tell me about a time when you organized a large set of digital resources and made sure others could access them easily?”

This shows her skills in organization and problem-solving, similar to managing a database in computing.

Quantitative question: “Roughly how many cataloguing systems or databases have you used in the past year?”

This gives a clear number to measure her experience, like asking how many programming tools someone has used



Reflect

Describe the last time you felt as though you were being creative. For example, you might have been painting, playing a musical instrument, sewing, or cooking. **How did it make you feel?**

The last time I felt creative was when I adapted a traditional Persian meal into a vegetarian dish. Normally the recipe included meat, but I wanted to make something that was more suitable for me and my lifestyle. I experimented with different herbs, spices, and vegetarian alternatives to recreate the same depth of flavor that the dish usually has.

I felt creative because I wasn't just copying a recipe, I was transforming it into something new that still respected its cultural roots. At first, I was worried it wouldn't taste right, but the process of experimenting was exciting. When the meal turned out good.

For me, cooking like this is similar to problem-solving in computing. When you program, you often need to adjust parts of the code to make it work in a new situation, just like substituting ingredients in a recipe. Both require imagination and logical thinking, and both give you satisfaction when the final result works out.



Reflect

Sometimes students will say that their subject **does not require** an understanding of quantitative analysis. However, qualitative data **will appear in every medium**. Taking your subject as a trial, use Google and type:

"Quantitative research of _____"

What results do you see? Note these down in 'My notes' for future reference.

When I searched for "Quantitative research of computer science", I found studies that used numbers to measure student performance, error rates in programming, and success rates of online vs classroom learning.

This shows that quantitative research is widely used in computing to measure things like speed, accuracy, and efficiency. Even though computing also relies on qualitative feedback,

numbers are essential for proving how well something works.

Reflect

What graph or chart would be best to describe the correlation between **academic success to students** **reading age results?**

Why would you use this?

Make sure to note down your reasoning for future reference.

The best type of graph to use for this would be a scatter plot. This is because it shows the relationship between two variables clearly. If we put reading age on the x-axis and academic success (for example, test scores or grades) on the y-axis, we would be able to see whether there is a positive, negative, or no correlation.

I would use this because it doesn't just give us overall averages like a bar chart would, but instead lets us see the individual results of each student. This makes it easier to identify trends, outliers, and possible patterns. In computing and data analysis, scatter plots are often used when trying to find relationships between two sets of data, so it links directly to how we analyze data in real-world contexts.



Consider the quote by Aristotle:

“The aim of art is to represent not the outward appearance of things, but their inward significance.”

Is this something you agree with?

I agree with this statement because art, is more about expressing meaning than just copying what something looks like. A painting or design might not be realistic, but it can still communicate feelings, ideas, or deeper truths.

In computing and design, this is also true. For example, a website or app might look simple on the outside, but what really matters is how well it reflects the needs of its users. Good design isn't just about appearance, it's about usability, accessibility, and meaning. In this way, both art and computing aim to capture the deeper significance behind what is being presented, not just the surface.