AideaHub: Assignment 3 Report
CS3216

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Important links:

- Main README.md

Git Repositories:
- frontend: React frontend using Chakra UI
- backend: TypeScript functions deployed on firebase functions
- ai-backend : Python functions deployed on Google Cloud functions

Milestone 0 (Compulsory, not graded): Describe the problem that your application solves.

Project Ideation is an exhausting and difficult journey, which is plagued with various pain points. The most prominent pain points are:

- Lack of Project Ideation Framework:
  - Proven and tested project ideation framework is able to significantly make the process appear more daunting and exhausting, speeds up the whole process and improves idea qualities. Unfortunately, many do not have access to high quality project ideation framework, or even aware of them and how to use them effectively.
- Lack of Mental Energy
  - Project ideation is an exhausting process, where users often have to force our brain to generate novel and original ideas. In fact, oftentimes, users are required to go through this process multiple times to come up with various ideas before finally deciding on pursuing certain ideas.
- Lack of Inspiration
  - Project ideation journey is often filled with mental barriers (and procrastination which comes with it), preventing users from getting started on crucial project components.

Milestone 1: List down your 3 closest competitors and their pros and cons. Explain how your product is better.

Competitor Analysis:

- ChatGPT
  - ChatGPT is a language model-based AI developed by OpenAI. It is designed to generate human-like text responses and assist users in various natural language understanding and generation tasks
  - Pros:
    - ChatGPT holds significant market share and presence
    - ChatGPT is backed by OpenAI who has advanced research on AI model
    - ChatGPT offers free tier with great capabilities
  - Cons:
    - To complete a task, the user is required to prompt multiple times. Without prompt engineering knowledge, there is considerable chance of ChatGPT providing output which may not be in line with what the user wants at later stages of the task after multiple prompts
    - ChatGPT is not specialized for project ideation and thus, it may not provide the highest quality or the best services in this field. However, user may still use ChatGPT due to its significant market presence or for simpler project ideation
    - Without paying, ChatGPT 3.5 does not have access to any extensions/tools that it can use, such as searching online to do research.
    - Lack of specialized idea generation workflow
- ChatDev
  - ChatDev stands as a virtual software company that operates through various intelligent agents holding different roles, including Chief Executive Officer, Chief Technology Officer, Programmer, Tester, and more. These agents form a multi-agent organizational structure and are united by a mission to "revolutionize the digital world through programming." The agents within ChatDev collaborate by participating in specialized functional seminars, including tasks such as designing, coding, testing, and documenting. The primary objective of ChatDev is to offer an easy-to-use, highly customizable and extendable framework, which is based on large language models (LLMs) and serves as an ideal scenario for studying collective intelligence.
  - Pros:
    - ChatDev utilizes self-prompting framework: with a single prompt, ChatDev is able to complete multiple, sequential tasks

- - - ChatDev offers high customizability, allowing users to edit and create their own agent description, role and behavior as well as task phases and lifecycle
    - ChatDev team has rapid improvement and evolvement rate, with bi-weekly features updates
    - ChatDev is free
  - Cons:
    - ChatDev has no user-friendly UI, requiring users to set it up on their own local machine
    - For users to make use of customizability of ChatDev effectively, certain level of prompt engineering is necessary
    - The provided task lifecycles and agents by ChatDev team mainly focus on software engineering and not on project ideation
    - Lack of specialized idea generation workflow

- Cognosys
  - Cognosys is an innovative web-based AI agent, designed to simplify complex tasks through its features and an intuitive user experience. It leverages powerful models such as GPT-3.5 and GPT-4, (Cohere, Anthropic, and PaLM also coming soon) for superior conversational AI performance.
  - Pros:
    - Cognosys utilizes self-prompting framework: with a single prompt, Cognosys is able to complete multiple, sequential tasks
    - Cognosys provides a large variety of basic frameworks for different types of tasks e.g. market research, book summary etc.
    - Cognosys has great customizability with regards to agents roles and objectives, task lifecycle templates
    - Congnosys has easy-to-use and intuitive UI
  - Cons:
    - Cognosys provides a basic template, and is not specialized for project ideation
    - Cognosys is relatively expensive compared to other competitors in this field

Milestone 2: Describe your application briefly. List its objectives and the associated (major) user stories.

Aidea Hub aims to simplify Project Ideation processes, by addressing the most prominent pain points. This is achieved by providing:

- Proven and Tested Project Ideation Framework
  - Aidea Hub provides a proven and tested project ideation framework, which was developed after spending countless hours on research and interviews with industry experts in the field of project ideation, including Donn Koh - Co-Founder of Stuck Design.
- More Effortless Idea Generation Process
  - Powered by Generative Artificial Intelligence (AI), Aidea Hub will generate all important milestones of project ideation journey including basic idea, competitive landscape, product cycle, business model, and many others. All of these are now one prompt away, instead countless excruciating hours.
- Idea Inspiration
  - Aidea Hub provides means for users to obtain idea inspirations by allowing them to browse and search for popular, interesting and creative ideas. This is done by allowing users to publicize and share ideas generated using our application and implementing a voting system which makes popular ideas more visible.
- Idea Sharing
  - An extension to the pain points, Aidea Hub wants to allow users to share their generated idea to online platforms where they can find other people who are interested in working with them to pursue the idea.

Associated User Stories
- As a user, I want to generate ideas effortlessly (one prompt away instead of spending countless hours), so I can save time and energy and move forward to next crucial processes quickly.
  - As a user with a tight deadline to meet, I want to be able to generate ideas quickly without sacrificing quality of ideas
- As a user, I want to generate a detailed idea (covering many milestones), so I can have a long-term perspective of the ideas with greater depth and width
  - As a user who is a project manager, I want to generate a detailed idea (covering many milestones), so I can make an accurate plan and timeline for my team
  - As a user who is a project leader, I want to generate a detailed idea (covering many milestones), so I can weigh the pros and cons of the ideas more accurately
  - As a user who lacks domain knowledge in some aspects of ideas (e.g. product lifecycle), I want to a detailed idea (covering many milestones) to help me in this aspect
- As a user, I want to be able to have proven and tested project ideation framework to help me generate ideas of higher quality

- ○ As a user who lack domain knowledge in project ideation, I want to be able to use proven and tested project ideation framework to generate ideas of higher quality
  - ○ As a user who lack domain knowledge in project ideation, I want to be able to use proven and tested project ideation framework so I can generate ideas more effectively (compared to generating ideas without any framework or guidance)
  - ○ As a user who lack domain knowledge in project ideation, I want to be able to use proven and tested project ideation framework so I don't have to spend time and effort to reinvent the wheel
- ● As a user, I want to a feature to provide idea inspiration, so I am not stuck for too long (and end up procrastinating)
  - ○ As a user, I prefer popular, creative and interesting ideas to have higher visibility
- ● As a user, I want to be able to share my ideas, so I can find people who are interested in working with me on this idea
  - ○ As a user, I want to be able to share my ideas, because the ideas are innovative and I feel that people should know about it
  - ○ As a user, I want to be able to share my ideas, because I find them cool and worthy to be shared

Milestone 3: What's your secret sauce / moat? Elaborate on your strategy to prevent competitors and big players from cloning your app and its features?

- Proven and Tested Idea Generation Framework
  - From our research on proven and tested idea generation framework from various books, lectures, online resources including CS3216 lectures and notes, we created the following basic template for project idea generation below
  - Afterwards, we conducted an interview with industry expert, Donn Koh - Co-Founder of Stuck Design, to refine our template further using his insights
  - Through this framework, we are able to ensure our generated results are of higher quality compared to others without effective framework
  - Since this framework is not revealed to the public, competitors are not able to copy it easily and are required to generate them themselves.
- Multiple Idea Generation Methods
  - We provide four methods to generate ideas from which users are able to choose which one they prefer the most. The four methods are:
    - Root Cause
    - Improvement over Bad Ideas
    - Improvement over Existing Ideas
    - Wildcard Idea
  - This allows for variation of results and options for users
  - Similarly, these methods are not revealed to the public, competitors are not able to copy it easily and are required to generate them themselves.
- Self-Critique Capabilities
  - For each of our result we perform the following 3 steps:
    - Ideate: Pass the user prompt to an ideation LLM n_ideas times, each result is an "idea"
    - Critique: Pass the ideas to a critique LLM which looks for flaws in the ideas & picks the best one
    - Resolve: Pass the critique to a resolver LLM which improves upon the best idea & outputs only the (improved version of) the best output
  - This allows for a better ideation results, especially compared to competitors without self-prompting capabilities
  - Similarly, this self-critique chain is the result of various research and testing and is not revealed to the public, and thus competitors are not able to copy it easily and are required to generate them themselves.
- Community

- Through platforms such as reddit and discord, we aim to create a community for our application where users are able to share their generated ideas and find others who wish to pursue the same ideas as them, provide feedback to our platforms, and populate ideas inspiration pages.
- Such a community will not be easy to replicate.

Basic Template for Project Idea Generation

Phase 1: Product Strategy

- Idea Generation, Problem Space
- Competitive Landscape
  - Google plugin
    - Need to get all competitors
    - Need to get key features of competitors
- Product Capabilities
  - From chosen idea
  - Multi agent?? (A: idea guy, B: devil advocate)
    - A->B->A
- Moat
  - From the competitive landscape determine moat

Phase 2: Go-To-Market

- Product Lifecycle & Product-Market Fit
  - From chosen idea
  - Multi agent?? (A: idea guy, B: devil advocate)
    - A->B->A
- Scoping
  - From chosen idea
  - Multi agent?? (A: idea guy, B: devil advocate)
    - A->B->A
- Business Model
  - From chosen idea
  - Multi agent?? (A: idea guy, B: devil advocate)
    - A->B->A

Phase 3: Design

- Branding your Product
  - From chosen idea
  - Multi agent?? (A: idea guy, B: devil advocate)
    - A->B->A
- User Experience

- - - From chosen idea
  - Multi agent?? (A: idea guy, B: devil advocate)
    - A->B->A
- User Interface
  - From chosen idea
  - Multi agent?? (A: idea guy, B: devil advocate)
    - A->B->A

Milestone 4: Describe your target users. Explain how you plan to acquire your target users.

Our application primarily targets university students who aspire to start a project for:
- Academic Assignments
- Hackathons or Competitions
- Personal Projects
- Student Clubs Projects (e.g. NUSSU, GSDC, etc.)
- Projects for Public Welfare (e.g. for environmental cause, privacy issues cause, etc.)

Assumptions:
- Most university students are often required to or willing to start a project for various reasons mentioned earlier (e.g. hackathon, personal project, etc.)
- Most university students are often busy with course schedules and various commitments and thus would benefit from being able to generate ideas quickly
- Most university students may not be aware of proven and tested project ideation frameworks (with the exception of those pursuing a career in this field)
- Most university students may not have domain knowledge in some aspects of project ideation (e.g. marketing, product lifecycle) and will benefit from project ideation services which can help them in this aspect
- Most university students tend to be more price-sensitive compared to older age groups, thus we should price our product accordingly
- Most university students often encounter mental blocks when trying to come up with ideas and would benefit from inspiration platform
- Most university students may want to share their ideas to find people who are interested in pursuing their ideas with them

Plans to Acquire Target Group

1. Collaboration with University Clubs:

- University clubs, such as NUSSU (National University of Singapore Students' Union) and GDSC NUS (Google Developer Student Clubs NUS), often have a strong influence on their members and can provide an excellent platform for promoting Aidea Hub. Here's how to leverage this strategy:
    - Partnership Benefits: Offer special benefits to club members, such as discounted premium access to Aidea Hub or exclusive content/resources related to project ideation.
    - Workshops and Seminars: Collaborate with university clubs to organize workshops, webinars, or seminars on project ideation. These events can introduce students to Aidea Hub and provide valuable insights.

- Competitions: Sponsor or co-host project ideation competitions or hackathons with university clubs, where participants use Aidea Hub for idea generation. This can generate buzz and interest in your app.

2. Social Media Marketing:

- University students are active on social media platforms, making this an effective way to reach them. Here's how to approach social media marketing:
  - Visual Content: Create visually appealing content that showcases the app's features, benefits, and success stories. Use images, videos, and infographics to engage your audience.
  - Regular Updates: Maintain an active social media presence (e.g. Instagram, TikTok) with regular posts and updates. Share tips, user testimonials, and industry news related to project ideation.
  - Engagement: Respond promptly to comments, questions, and messages from users and potential users. Encourage user-generated content by running contests or challenges.

3. Word of Mouth:

- Word of mouth can be a powerful marketing tool among university students, who often rely on recommendations from peers. Here's how to stimulate word of mouth:
  - Referral Program: Implement a referral program that rewards users for referring their friends to Aidea Hub. Offer incentives like premium access or merchandise to motivate referrals.
  - In-App Sharing: Make it easy for users to share their achievements and ideas generated through Aidea Hub on their social networks. Add social sharing buttons within the app.
  - User Success Stories: Share user success stories and testimonials on your website and social media. When students see others achieving their goals with your app, it can encourage them to try it.

4. Campus Ambassador Program:

- A campus ambassador program involves recruiting enthusiastic students to represent your app on their campus. Here's how to make this program effective:
  - Selection Process: Choose ambassadors who are passionate about project ideation and your app. They should be well-connected on campus and able to influence their peers.
  - Training: Provide ambassadors with comprehensive training on the app's features and benefits, as well as marketing and outreach techniques.
  - Events and Workshops: Encourage ambassadors to organize events, workshops, and information sessions to introduce Aidea Hub to their fellow students.

- ○ Feedback Loop: Maintain regular communication with ambassadors to gather feedback on user needs and preferences, which can help you improve the app and its marketing strategies.

5. Pricing Strategy:

- Offering the right pricing strategy for university students is crucial to attracting and retaining them as users:
  - ○ Freemium Model: Consider offering a freemium model where students can access basic features for free and upgrade to premium for advanced functionality.
  - ○ Student Discounts: Provide significant discounts for students, as they are typically price-sensitive. Consider offering special student pricing or bundles for longer-term subscriptions.
  - ○ Trial Period: Offer a generous trial period for premium features so that students can experience the full value of the app before committing to a subscription.

6. Community Building through Reddit and Discord:
- Building a dedicated community on platforms like Reddit, Discord and Telegram can be a highly effective way to engage university students and promote Aidea Hub. Here's how to approach community building:
  - ○ Subreddit Creation: Establish a subreddit dedicated to project ideation, where students can discuss challenges, share success stories, and seek advice. Actively participate in discussions and provide valuable insights. Promote the subreddit on other university subreddits (e.g. r/nus, r/ntu) with engaging/clickbait posts.
  - ○ Discord Server: Create a Discord server focused on project ideation and invite users to join. This platform can facilitate real-time discussions, Q&A sessions, and collaborative idea generation.
  - ○ Telegram Channel: Create a Telegram channel to post updates and promotions to the application, to inform subscribers of deals and new features added to the application. The Telegram channel can be promoted via other university Telegram channels
  - ○ Engagement and Moderation: Appoint moderators or community managers to ensure a positive and respectful environment within these communities. Encourage users to share their experiences and offer solutions to common project ideation issues.
  - ○ Exclusive Content: Provide exclusive content, resources, or events within these communities to incentivize participation. This could include webinars, AMAs (Ask Me Anything), or access to expert Q&A sessions.
  - ○ Feedback Channels: Use these platforms to gather user feedback, suggestions, and feature requests. Show that you value user input by actively implementing improvements based on community recommendations.

- User-Generated Content: Encourage users to share their ideation processes, challenges, and outcomes. Highlight exceptional contributions and showcase the impact of Aidea Hub within the community.
- Announcements and Updates: Keep the community informed about app updates, new features, and upcoming events related to project ideation. This helps maintain interest and engagement.

Milestone 5: List down the features that should go into the MVP (your assignment deliverable). How did you decide on them? What are future features and expansions you can think of?

In crafting our Minimum Viable Product (MVP) for AideaHub, we've carefully selected features that are essential for providing users with a valuable and functional platform. Here's a breakdown of these features, the rationale behind their inclusion, and our vision for future expansions:

MVP Features:

1. **Idea Generation:**
   ○ This core feature serves as the foundation of AideaHub, enabling users to effortlessly generate project ideas through proven frameworks.
2. **Inspiration:**
   ○ Public idea access provides users with a wellspring of inspiration to overcome creative blocks and spark innovative thinking.
3. **Search:**
   ○ Empowering users to search for specific ideas ensures a tailored experience, helping them discover concepts that align with their interests.
4. **Past Ideas:**
   ○ Allowing users to revisit their previous brainstormed ideas fosters continuous learning and improvement, supporting ongoing creativity.
5. **Liked:**
   ○ This feature enables users to curate a collection of ideas they find interesting, making it easier to revisit and develop them further.
6. **Settings:**
   ○ Premium users can enjoy a personalized experience with customizable color schemes, serving as a token of our gratitude for their support.
7. **Payment:**
   ○ Subscription options are introduced for users who wish to access premium services, ensuring sustainability and the delivery of exceptional value.
8. **Sharing:**
   ○ Users can share their ideas, facilitating collaboration and networking, while also contributing to platform visibility and market presence.

Feature Refinement:

1. **Search (Refinement):**

- ○ Enhancing the search feature with a recommendation algorithm based on previous idea generation, liked ideas, and browsing history will provide users with more tailored and relevant results.
2. **Payment (Refinement):**
   - ○ While not initially included due to time constraints, future plans involve implementing top-up capabilities for users, enhancing their convenience.

Future Expansions:

1. **Beyond Text-Based Results:**
   - ○ We aim to diversify result formats beyond text, offering users the ability to generate outputs such as PowerPoint slides, Excel files, images, and more. These diverse formats will cater to various project needs, such as pitch decks and cost estimations.

By prioritizing these features for our MVP, refining user experience, and planning for future expansions, AideaHub is poised to evolve into an even more robust and versatile platform, continually meeting the creative and project ideation needs of our users.

Milestone 6: Come up with a monetization and pricing strategy (e.g. tiers and features). Explain why you think this pricing strategy is suitable for your target users and problem space. Explain the factors that influenced your pricing decisions, such as production costs, perceived value, competition, etc. It would be useful here to consider possible revenue streams of your product.

Our pricing strategy for AideaHub+ is designed to strike a balance between providing value to our users and sustaining the growth and improvement of our platform. Here's a breakdown of our pricing tiers and the rationale behind this strategy:
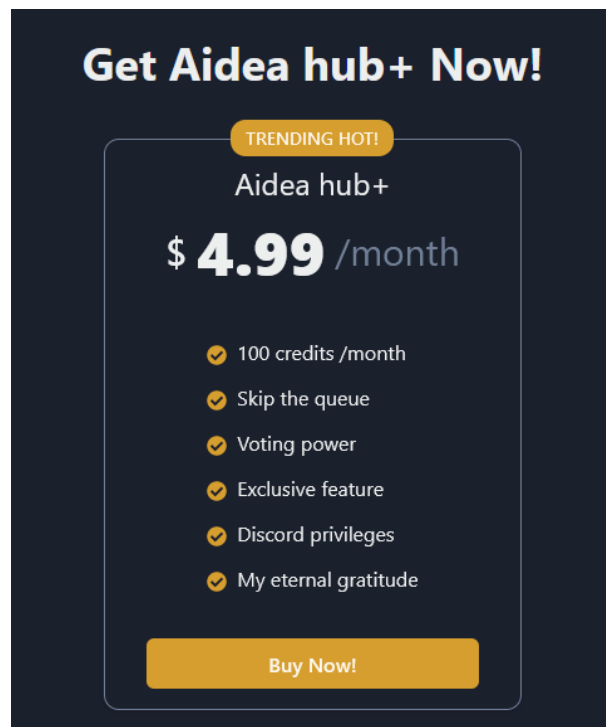
Pricing

AideaHub+:

- **Price:** $4.99/month

- **Features:**
  - **100 credits/month:** Credits are used to access premium features and services, such as generation of ideas with our AI, voting.
  - **Skip the Queue:** Priority access to ensure quick responses and idea generation.
  - **Voting Power:** The ability to influence the visibility of ideas within the community.
  - **Exclusive Features:** Access to advanced tools and functionalities.
  - **Discord Privileges:** Membership in our exclusive Discord community for networking and idea sharing.

Rationale:

1. **Understanding Our Target Users:** Our primary target users are university students with diverse project needs, including academic assignments, hackathons, personal projects, and initiatives for public welfare. These students often have limited budgets, making affordability a crucial factor.
2. **Balancing Affordability and Value:** We recognize that students need access to advanced features but must also manage their expenses. AideaHub+ strikes the right balance by offering valuable premium features at an affordable monthly rate of $4.99.
3. **Perceived Value:** The inclusion of features like skipping the queue, voting power, exclusive tools, and Discord privileges enhances the perceived value of AideaHub+. These features cater to the specific needs of students, such as quick responses for assignments and collaboration opportunities for club projects.
4. **Competitive Positioning:** Our pricing strategy considers the competition. We aim to provide a cost-effective solution compared to competitors while offering a unique set of features tailored to our target users' needs.
5. **Revenue Streams:** Our revenue primarily comes from monthly subscriptions to AideaHub+. Additionally, we plan to explore other revenue streams in the future, such as partnerships with educational institutions or offering specialized project consultation services.
6. **Sustainability and Growth:** The pricing strategy is influenced by the need to ensure the sustainability and growth of AideaHub. By generating revenue through AideaHub+, we can reinvest in the platform, develop more advanced features, and continue providing a valuable service to our users.

In summary, our pricing strategy for AideaHub+ is designed to be student-friendly, affordable, and aligned with the specific needs of our target users. It aims to strike a balance between offering premium features and sustaining our platform's growth and development. We believe this strategy will effectively cater to our users while ensuring the long-term success of AideaHub.

Milestone 7: Explain how you are using LLMs in your product and why LLMs are a good approach to meet the product's objectives.

Utilization of LLMs in the Product:

- Instant Idea Generation: LLMs are at the core of our product, driving the rapid generation of ideas. By feeding the LLMs with user inputs and preferences, our platform can instantly produce a variety of creative and relevant ideas tailored to the user's needs.

- Research Automation: Beyond just brainstorming, our LLMs are integrated with tools that enable online searching via platforms like DuckDuckGo and Wikipedia. This allows the LLMs to pull in current and relevant data, providing users with a more informed foundation for their ideas.

- Self-Reflection Facilitation: LLMs are also designed to prompt users with introspective questions related to their idea. This encourages users to reflect on the potential impact, scalability, and personal alignment with the idea, ensuring a more holistic approach to idea evaluation.

- In-depth Analysis: Once an idea is generated, LLMs further assist by conducting a deep analysis with a report. They come up with Product Strategy, Go-To-Market plans and Design plans, presenting users with a comprehensive report that aids in decision-making.

Rationale for Adopting LLMs:

- Efficiency & Speed: Idea generation, traditionally a time-consuming process, is exponentially sped up with LLMs. They can produce multiple ideas in mere seconds, aiding swift ideation sessions.

- Diverse Idea Production: LLMs, trained on vast datasets, ensure that the ideas generated are diverse, spanning various domains and perspectives, thus enriching the brainstorming process.

- Data-Driven Insights: The integration with online search tools means ideas are not just based on pre-existing knowledge. They are current, relevant, and data-backed, ensuring users are always informed.

- Objective Analysis: Human brainstorming can sometimes be influenced by biases or emotions. LLMs provide an objective analysis of ideas, ensuring that users get a balanced view of the pros and cons.

- Scalability: LLMs can cater to a single user or scale up to handle thousands simultaneously, making them an efficient tool for both individual creators and larger enterprises.

In summary, the use of LLMs in our product not only streamlines and enriches the idea generation process but also ensures that users are equipped with comprehensive, data-driven insights to evaluate and refine their ideas effectively. The blend of speed, diversity, and depth that LLMs offer makes them an indispensable asset to meet our product's objectives.

Milestone 8: Give two to three examples of prompts you used and explain how you designed them to be effective. What techniques did you use to improve the effectiveness of your prompts?

<u>Idea Generation</u>

```python
template = f"""
        Suggest 3 innovative ideas to solve the following problem, making sure to
consider the root causes of the problem.

        ###
        Problem: {problem}
        ###

        ###
        Desired format:
        Give me the ideas to solve the problem in a list format.

        For each idea, I want it in the following format:
        <Idea Name>:<One liner describing the idea>
        ###
        """
```

For idea generation, this is one of the prompts that we used. We used some techniques from the OpenAI FAQ page on how to do proper prompt engineering (Shieh, n.d.). Some techniques we used here:

1. Separating the sections with "###" to separate the instructions, context and format.
2. Articulating the format clearly by providing a desired format section

<u>Self-Reflection and Improvement of answers</u>

For idea generation and the majority sections of the report, where the content is generated, it will go through these 3 main steps. The prompts differ slightly for method 1's idea generation (generateIdea1) and the report generation (generateReflect). The following is for method 1's generation prompts.

1. Ideation: Pass the user prompt n times through the LLM to get n output proposals (called "ideas"), where n is a parameter you can set

```
(
    HumanMessagePromptTemplate,
    "Question: {question}\nAnswer: Let's work this out in a step by "
    "step way to be sure we have the right answer:",
)
```

2. Critique: The LLM critiques all ideas to find possible flaws and picks the best one

```
(
    HumanMessagePromptTemplate,
    "You are a CEO of your company tasked with investigating the "
    f"{self.n_ideas} response options provided. List the flaws and "
    "faulty logic of each answer options. Let's work this out in a step"
    " by step way to be sure we have all the errors:",
),
```

3. Reflection and improvment: The LLM tries to improve upon the best idea (as chosen in the critique step) and outputs it. This is then the final output.

```
(AIMessagePromptTemplate, "Critique: {critique}"),
(
    HumanMessagePromptTemplate,
    "You are a resolved tasked with 1) finding which of "
    f"the {self.n_ideas} answer options the CEO thought was  "
    "best,2) improving that answer and 3) printing the answer in full. "
    "Don't output anything for step 1 or 2, only the full answer in 3. "
    "Return the idea in the following format:"
    "<Idea Name (not more than 10 words)>:<One liner describing the idea (not
more than 50 words)>",
),
```

With this 3 steps, the output is usually improved from the original input. This was inspired by the generalized implementation of SmartGPT.

Milestone 9: Justify your choice of LLM and provider by comparing it against at least two alternatives. Explain why the one you have chosen best fulfills your needs. Elaborate on your choice of model parameters.

We tried to decide based on three main factors:
- **Ease of Integration & Deployment**: This factor evaluates how simple it is to integrate the model into applications and deploy it for real-world use.
- **Real-time Relevance & Update Mechanism**: Assessing the model's ability to provide current and relevant information.
- **Cost & Commercial Viability**: This factor considers both the direct costs associated with using the model and its commercial readiness, including stability and support.

GPT3.5 / GPT 4 (OpenAI):
- **Ease of Development**: GPT3.5 / GPT 4 offers more robust documentation and due to its popularity, there are significantly more online tutorials on using it
- **Ease of Integration & Deployment**: Offers a seamless API integration making it easy for developers to implement without major technical hassles. Integrates well with existing frameworks like LangChain.
- **Real-time Relevance**: GPT-3.5 or GPT 4 doesn't inherently have real-time data integration and will have the most outdated data as its cutoff date for training data is September 2021.
- **Cost & Commercial Viability**: Commercially available and stable, and offers relatively affordable prices.
    - GPT3.5 Turbo 4K context
        - Input: $0.0015 / 1K tokens
        - Output: $0.002 / 1K tokens
    - GPT4 8K context
        - Input: $0.03 / 1K tokens
        - Output: $0.06 / 1K tokens

Llama 2 (Meta):
- **Ease of Integration & Deployment**: Requires self-hosting, which can introduce technical complexities, especially for large-scale applications. Integrates well with existing frameworks like LangChain.
- **Real-time Relevance**: It doesn't inherently have real-time data integration and has somewhat outdated data, with a training data cutoff date of September 2022.
- **Cost & Commercial Viability**: Being an open-source and free model provides potential cost advantages, but the hosting costs would be a concern.

PaLM 2 (Google):
- **Ease of Integration & Deployment**: Offers a seamless API integration making it easy for developers to implement without major technical hassles. Integrates well with existing frameworks like LangChain.
- **Real-time Relevance**: It doesn't inherently have real-time data integration and has somewhat the most up to date data, with a training data cutoff date of February 2023.
- **Cost & Commercial Viability**: Commercially available and stable, and offers relatively affordable prices as well.
  - PaLM 2 for Text
    - Input: $0.0005 / 1K tokens
    - Output: $0.0005 / 1K tokens

Summary:

Overall we narrowed the choices down to PaLM 2 and OpenAI's GPT3.5 / GPT4 as ease of integration was important to us given the tight timeline. Between the two, while PaLM 2 had better real time relevance, it was not a dealbreaker as using frameworks such as Langchain allowed LLMs to integrate with tools to give LLMs access to the web. They both came close in the cost and commercial viability, but we decided to choose OpenAI as it was more established and had more examples on the web for both projects and prompt engineering techniques that we could learn from.

Among OpenAI models, we chose to use GPT-3.5-turbo over GPT-4 due to two main reasons: firstly, ease of development which we believe holds high significance in this project due to the tight deadline and secondly, cost concerns, as GPT-3.5-turbo offers relatively great output for its price and allows us to utilize more tokens on improving the content as well as generate larger output at a cheaper overall cost.

Milestone 10: Come up with a product name and create an attractive logo. Explain the meaning behind the name, the alternatives you've considered, and why this was chosen.

Product Name: AideaHub
Meaning behind name:
- Play on Words: "Aidea" is a combination of "AI" and "idea". It highlights that the platform generates ideas with the help of artificial intelligence.
- Signifies Centralization: The term "Hub" implies that this is a centralized place or platform. This helps suggests that AideaAHub is a primary destination for idea generation and sharing.

Logo:

- Symbolism behind logo:
  Bulb Symbolism: The bulb is universally recognized as a symbol of ideas and innovation, aligning perfectly with the core function of our app, which is idea generation.
- Color of Yellow: The color yellow is often associated with positivity, energy, and enlightenment. As the overarching shape, the yellow hexagon could symbolize the positivity and brightness that fresh ideas bring to the table.
- Enclosing Shape: The hexagonal shape enclosing the bulb can signify the "hub" aspect of the app, indicating a centralized place for ideas. It also resembles a nut, which together with bolts are fundamental components in assembly and construction. This could signify that the ideas from Aidea Hub are integral building blocks for projects, startups, or any endeavor users wish to undertake.

Alternatives You Might Have Considered:
1. Eureka: A historical exclamation of discovery, symbolizing sudden insights and innovative breakthroughs.
2. AIdeaGen: Merging "AI", "idea", and "generation" to spotlight the AI-powered idea creation process.
3. Idea Hub: Signifying a central gathering spot for collaborative idea generation and sharing.

"Aidea Hub" was actually derived as a mix of options 2 and 3. The choice of "Aidea Hub" over these alternatives was actually due to its simplicity and direct representation of the app's two core features: AI-driven idea generation and a hub for idea sharing.

Milestone 11: Explain choice of technologies for the following: UI, Database, Web Server, Hosting, Authentication, etc. and the alternatives you've considered.

In the development of Aidea Hub, we carefully selected a technology stack tailored to meet our project's specific requirements. Each technology choice was made after considering factors such as ease of development, scalability, community support, and our team's expertise.

User Interface (UI)
Choice: React
React was chosen as our UI framework due to its component-based architecture, making it ideal for building interactive, reusable and dynamic user interfaces. Its extensive community and resources such as npm libraries were also advantageous.

The alternatives we considered were Vue.js, Angular. However, due to our lack of familiarity and tight deadline, we opted for the UI framework which would allow for the fastest development.

Database
Choice: Firebase
Firebase was selected for its real-time database services, ease of use, and scalability. These features align with our platform's requirement for quick data updates and real-time user interactivity, for example when the idea is being generated and shown to the user in realtime.

Alternatives such as MongoDB, and traditional SQL databases like PostgreSQL were evaluated based on data structure and scalability requirements. However, due to the simplicity and ease of development using Firebase compared to the mentioned alternatives, we did not choose to use these alternatives.

Web Server
Choice: Netlify

In our platform's development, we opted for Netlify as the web server for its streamlined deployment, built-in CI/CD, serverless functions, and global CDN support, which are essential for quickly and efficiently generating and delivering ideas to users, as well as making it easy for us to deploy our web application.

An alternative considered was Heroku and Vercel for the deployment, however due to our familiarity with Netlify and the ease of deployment, we opted for Netlify.

<u>Hosting</u>
Choice: Google Cloud

For hosting, Google Cloud was chosen due to its scalability, reliability, redundancy, and integration with Firebase, which we use for real-time data management. AWS and Microsoft Azure were considered alternatives but were outweighed by Google Cloud's seamless integration and geographical distribution advantages. These choices align with our goal of creating a responsive and scalable platform for idea generation.

<u>Authentication</u>
Choice: Firebase Authentication
Firebase Authentication was adopted for its secure and straightforward user authentication, supporting various methods, including Google sign in, email/password and social logins.

Auth0, Okta, and custom authentication solutions using OAuth2 and JWTs were considered based on authentication needs such as single sign-on (SSO) or multi-factor authentication (MFA). However, due to familiarity and ease of using Firebase for authentication, we opted for the simplest option.
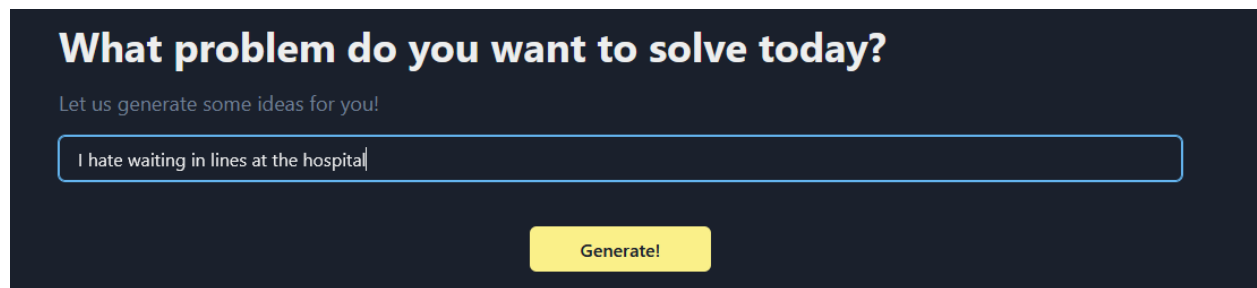
In conclusion, our technology stack was thoughtfully selected to ensure our platform's success, taking into account factors crucial for development speed, scalability, and user experience. As our platform evolves, we remain open to adapting and expanding our stack to meet changing user needs and technological advancements.

Milestone 12: Describe three common workflows within your application. Explain why those workflows were chosen over alternatives with regards to improving the user's overall experience in the context of an AI application.

<u>Choosing an Idea</u>
Our current workflow for choosing an idea is as follows:
1. User enters the problem they want to solve

User enters the problem they want to solve

2. App generates 4 ideas to solve the problem

Queue Management System Improved Idea

Smart Queue Management System with Predictive Analytics
Description: Implement a smart queue management system
that utilizes predictive analytics to estimate wait times based
on historical data, real-time patient flow, and staff availability.
Patients can receive personalized notifications and updates,
allowing them to plan their visit accordingly and reduce
waiting times. Full Answer: Smart Queue Management System
with Predictive Analytics: Implement a smart queue
management system that utilizes predictive analytics to
estimate wait times based on historical data, real-time patien...

Expand

Streamlined Department Collaboration Description

Develop a system that enables efficient collaboration and
communication between different departments within the
hospital. This would ensure smooth coordination, reducing
delays and eliminating unnecessary waiting time for patients.
Full Answer: Streamlined Department Collaboration: Develop a
system that enables efficient collaboration and communication
between different departments within the hospital. This would
ensure smooth coordination, reducing delays and eliminating
unnecessary waiting time for patients. Additionally, implement
a virtual queuing system where patients can register online a...

Expand

Enhanced Appointment-based Scheduling System Description

Implement a digital platform with an advanced appointment-
based scheduling system that considers patient complexity,
expected duration, and resource availability. This system will
optimize scheduling, reduce waiting times, and improve overall
efficiency in the hospital. Idea Name: Virtual Waiting Room
with Real-time Updates Description: Develop a mobile
application where patients can join a virtual waiting room and
receive real-time updates on their estimated wait times. This
eliminates physical waiting lines, reduces stress, and enhances
patient experience. Idea Name: Telemedicine Expansion for...

Expand

Enhanced Appointment-based System

Implement a digital platform for appointment scheduling,
integrating it with a centralized patient management system.
This would allow for efficient allocation of resources, optimized
patient flow, and reduced waiting times by ensuring seamless
coordination between departments and healthcare
professionals.

Expand

4 ideas are presented to the user, generated by AI

3. User can either:
   a. Choose one of the ideas to generate the entire idea's contents
   b. Choose the one they like the best, and generate more similar ideas and return
   back to step 3
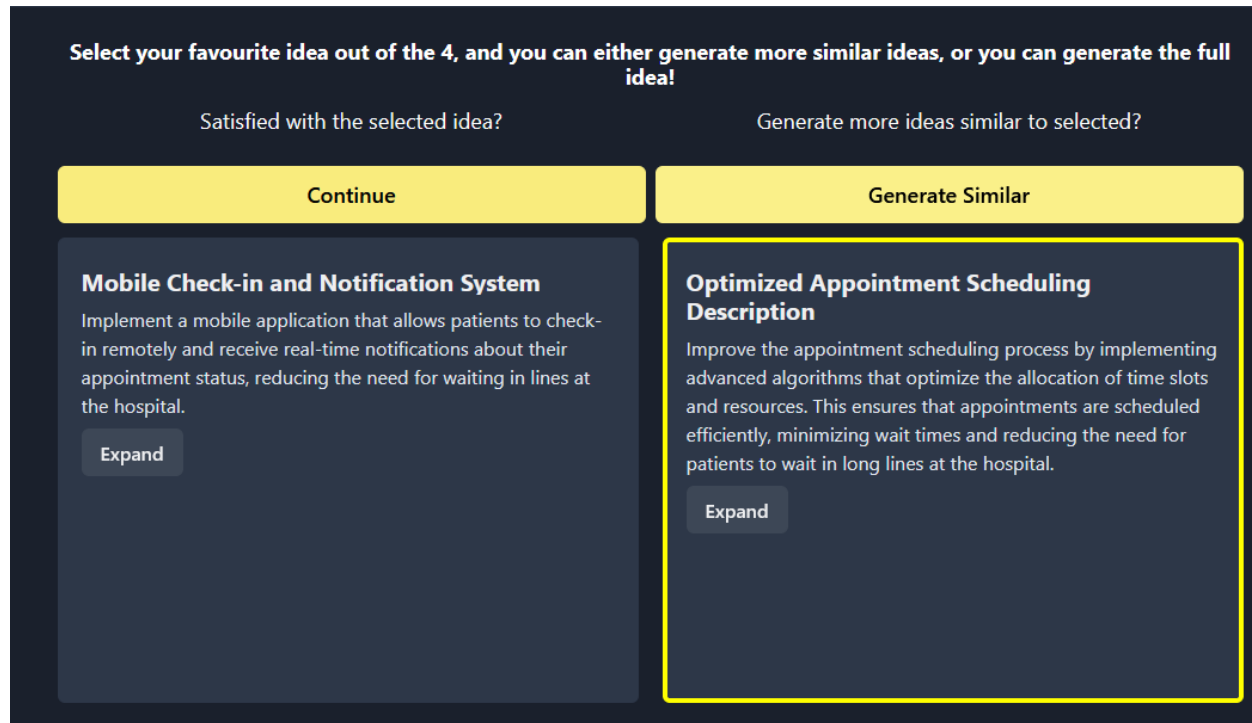
User can either continue or generate similar ideas

An alternative workflow that we considered was:
1. User enters the problem they want to solve
2. App generates many ideas at once (e.g. 10), and user selects one
3. App continues generating idea content for the selected idea

We chose the current workflow for a few reasons:
1. Presenting the user with multiple ideas at once can be overwhelming, as such we kept it simple (4 ideas) and the user can choose to either iteratively make it better over time, or if they are satisfied, they can proceed with the content generation.
2. It presents a more addictive user experience, as the user has a hand in steering the AI in the right direction, as compared to just presenting an initial problem and then not having a hand in the decisions made.
3. It allows for a simpler, more intuitive UI. Presenting 10 ideas to the user at once might cause the UI to be cluttered and it would be harder for the user to grasp the usage of our application.

Viewing a full idea
There are 2 scenarios which could lead to the user viewing a full idea:
1. The user chose an idea that they were satisfied with and proceeded to generate the full content. The user will then be able to see the idea's contents update in realtime as they get generated by the AI.

2. The user was browsing ideas and decided to view the full idea content for an idea they liked.

When viewing the full idea, the user is able to view the entire content in a UI similar to a Nextra site (e.g. https://cs3216.com/), where they can navigate to the different sections easily.
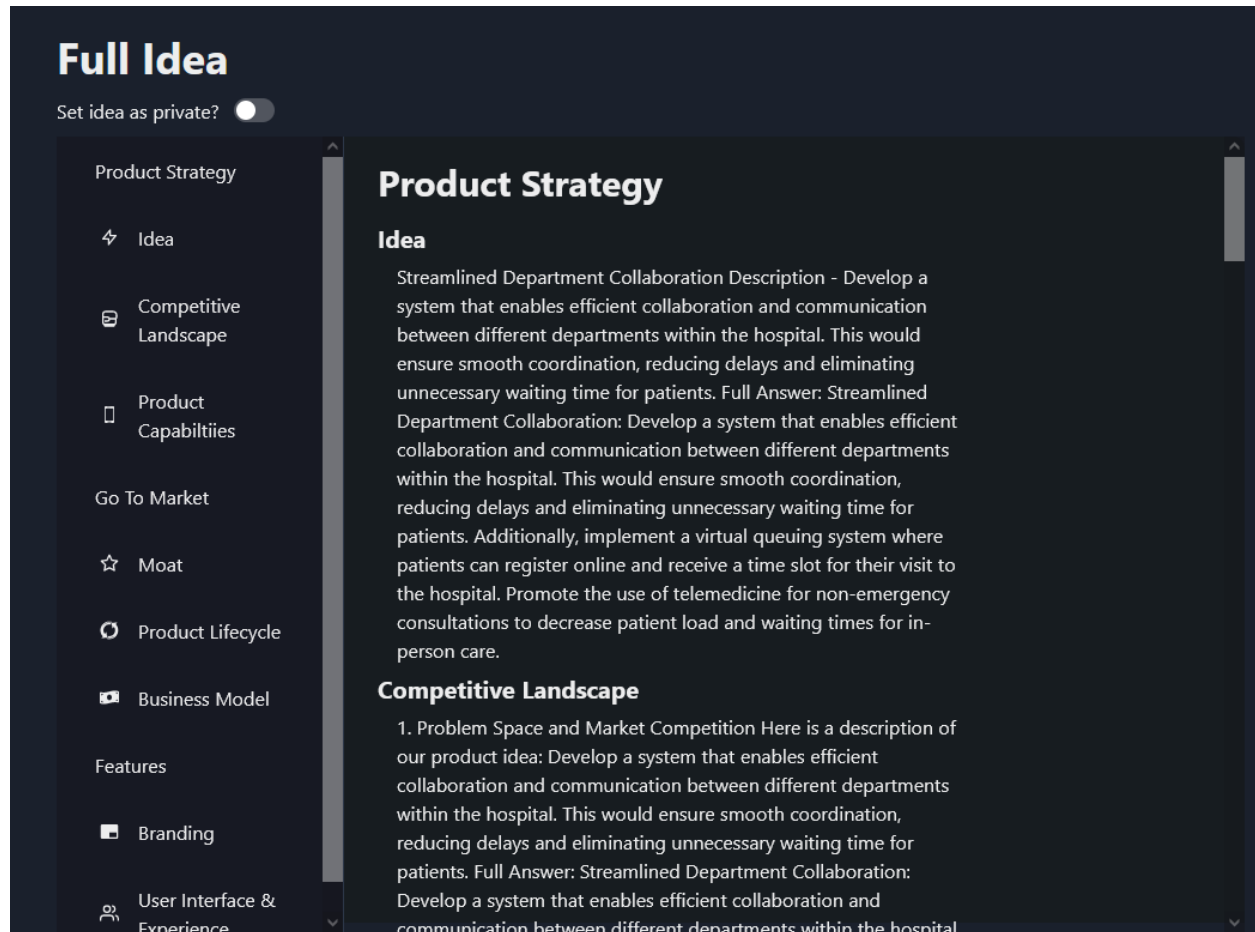
Sidebar on left can be used for fast navigation between sections

An alternative would be to perhaps use some collapsible sections, where the user can expand the various sections to read the content. However, we opted for our current UI for various reasons:

1. Easier Navigation: User can use the navigation at the side to easily view all the sections and subsections, and navigate.
2. More cohesive: Should the user want to read the entire content, it is easier to read from section to section, as the content is all displayed linearly, as compared to being in collapsible sections. This allows for a smoother reading experience, compared to being interrupted by breaks in the texts

<u>Idea Inspirations</u>
To obtain inspiration, the user would scroll the existing ideas or search for an idea, via the Inspiration and Search page respectively.
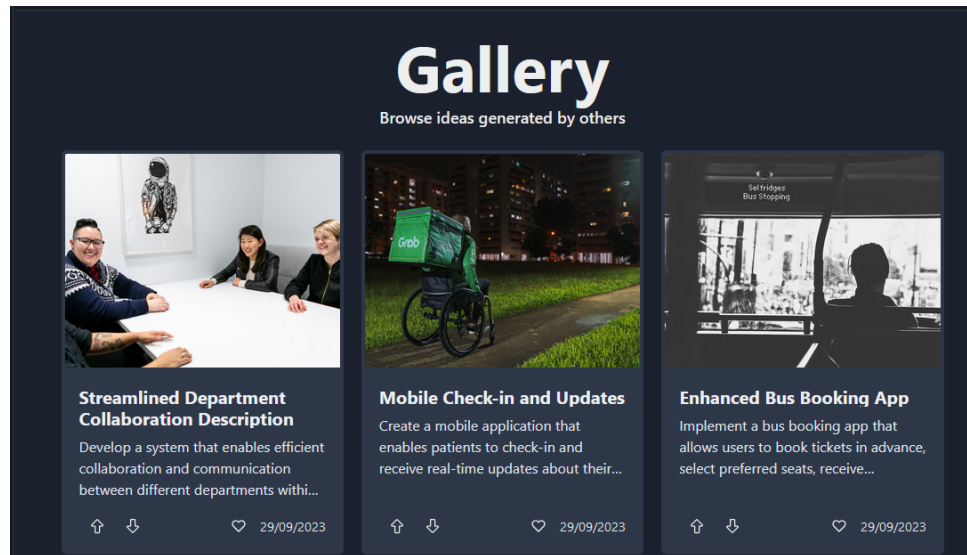
Inspiration Page
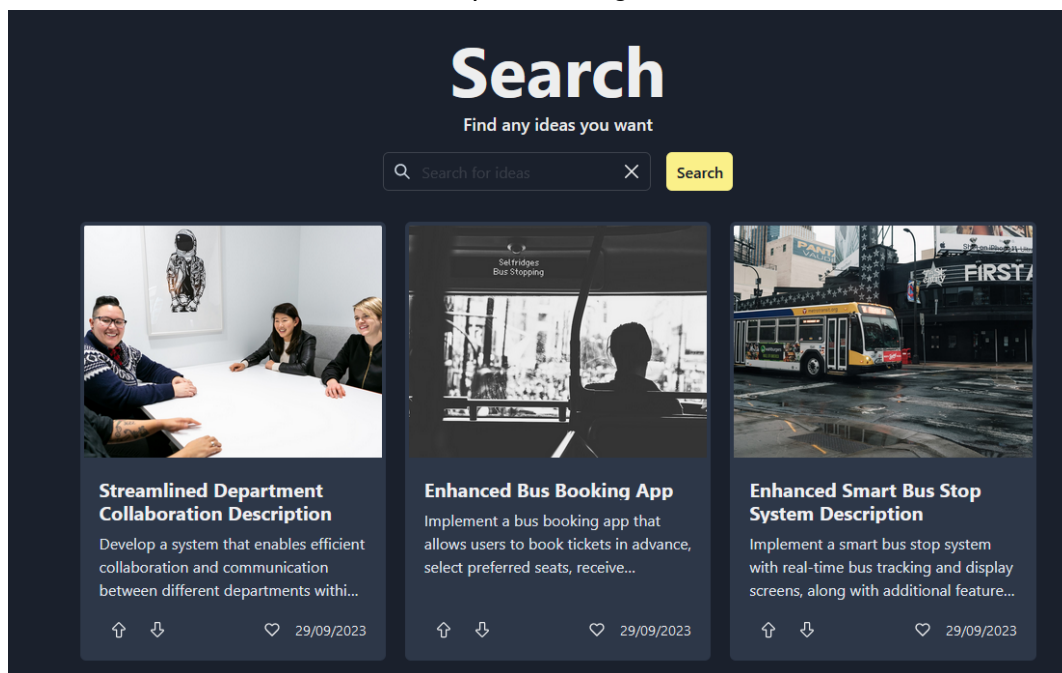
Search Page

An alternative workflow we considered was when the user entered their problem, it would display suggestions (other users' generated ideas) which solved a problem similar to the one they entered. This is something similar to the UI of Stack Overflow:

Ask a question

Title

Alignmen issue in the act

Similar questions

1 answer — Alignment issue in top posts section in the profile page

There is an alignment issue in the Top Posts section of the Profile tab Previously All was showing first and there was an separator in between the Votes and Answers. Looks like some CSS code was break. This issue occurred in all over the Stack Exchange communities. Screenshot ...

asked May 31 '17 at 11:24 by Arulkumar

2 answers — flag: declined, but acted upon

This answer https://stackoverflow.com/a/19018558/731947 had a rather unhealthy discussion happening in the comments section and was still ongoing. I flagged with other, message:

One

Body

Stack Overflow Suggestions for when user asks question

However, we opted for our current workflow for 2 reasons:
1. With our current UI, it allows users to casually scroll without having a problem. This increases the usability of our app, as users might just want to view ideas or get inspiration without having to use their own credits
2. The search functionality covers the functionality of suggestion, as the user can enter keywords and find results which might solve the problem they want to solve without having to generate an entire idea.
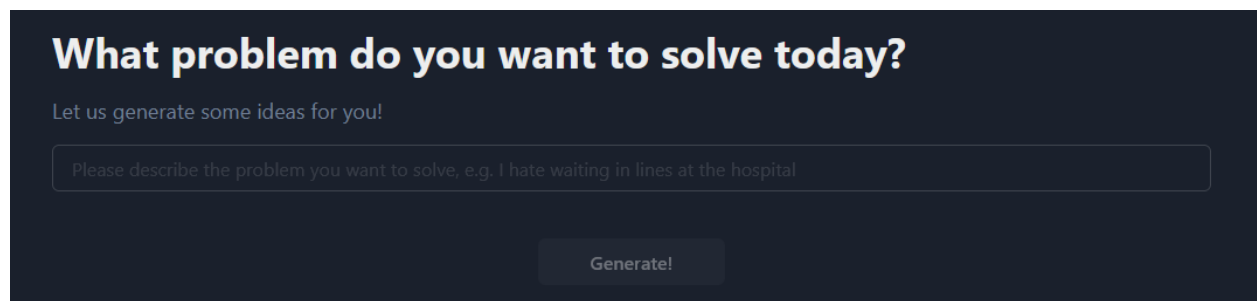
Milestone 13: Show and explain considerations/decisions in your UI that were specially made for an app that leverages AI. Provide examples, citations, or justifications where necessary. You may also show different prototypes and outline their trade-offs.

While designing the UI for our application, we took into consideration some AI application design principles, as well as consulted Donn (lecturer for Lecture 3) for some feedback on our UI.

Giving a problem
When the user is giving a problem, they are greeted by the following UI:

This keeps the UI simple for the user, who won't be overwhelmed with the many different features that are possible with AI. All the user needs to do is insert a problem. This conforms to the design principle, "Users should expect most benefit from minimal input" (van Esch, 2018).

Generating ideas
Instead of showing the user the entire text output of the AI, we just show the user the end result, that is the 4 ideas that were generated.

Queue Management System Improved Idea

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Enhanced Appointment-based System

Implement a digital platform for appointment scheduling, integrating it with a centralized patient management system. This would allow for efficient allocation of resources, optimized patient flow, and reduced waiting times by ensuring seamless coordination between departments and healthcare professionals.

Expand

The user can steer the AI in a direction by selecting one of the ideas and choosing the "Generate Similar" option, which conforms to the design principle: "Design ability for users to intervene and take over control" (van Esch, 2018). This idea was also verified by Donn, as he mentioned that this gives the user the ability to steer the AI, since it is generally quite hard for normal users to prompt engineer to get the AI to accomplish what they want.

Full Idea
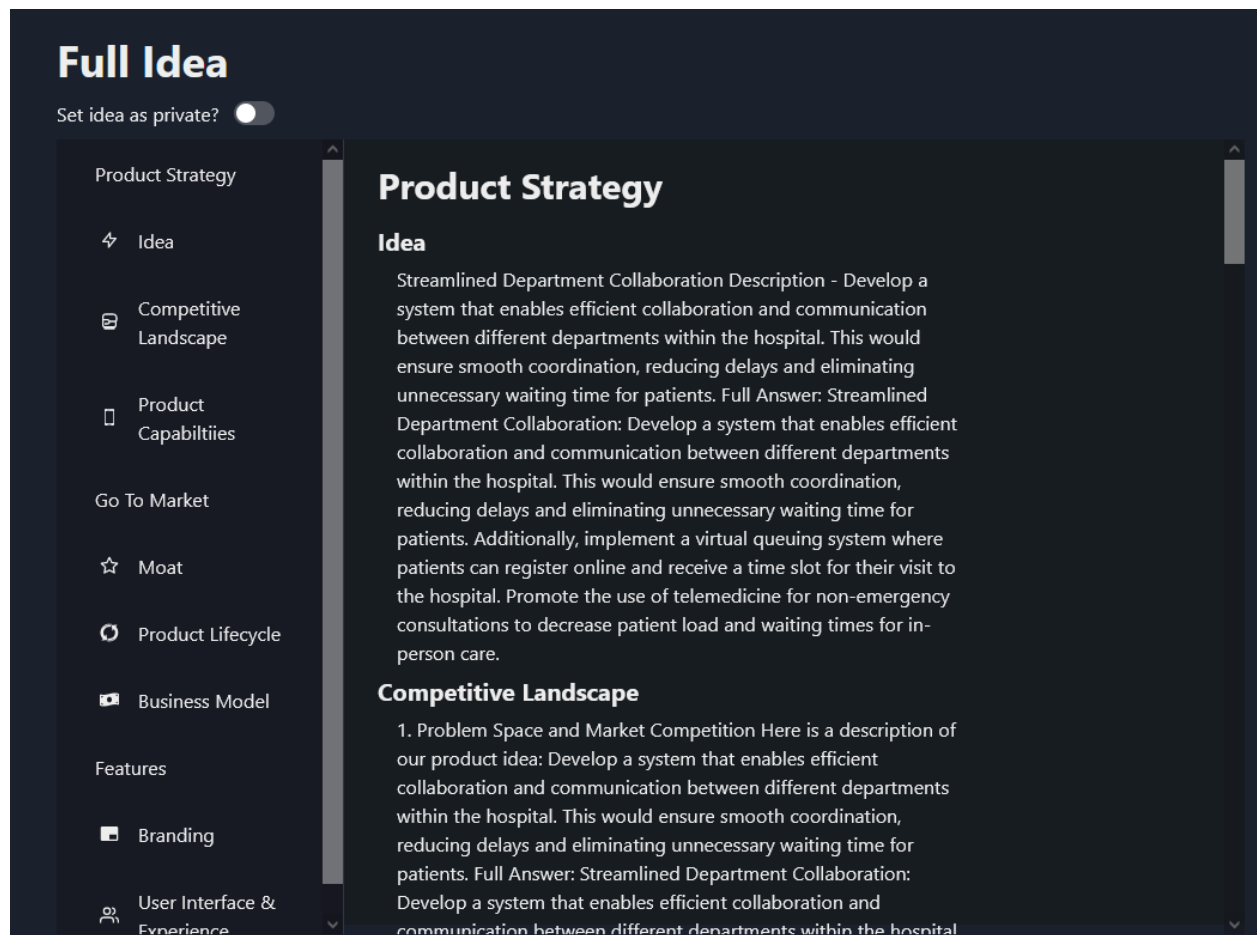
For the full idea, we decided to display only the generated content. An initial idea we had was to show the entire thought process of the AI. However, we opted not to do this, for multiple reasons:

1. Just showing the final output makes it simpler for the user, as the main point of using the application is to get the generated idea, rather than inspecting the thought process of the AI.
2. Should the AI make some mistakes in the middle, it is unknown to the user, as to them this is some sort of black-box abstraction, where they input a problem, choose an idea, then generate the entire idea content.

Milestone 14: Create a landing page for marketing purposes with the following sections: hero, features, pricing section. Feel free to add more relevant sections if you wish.
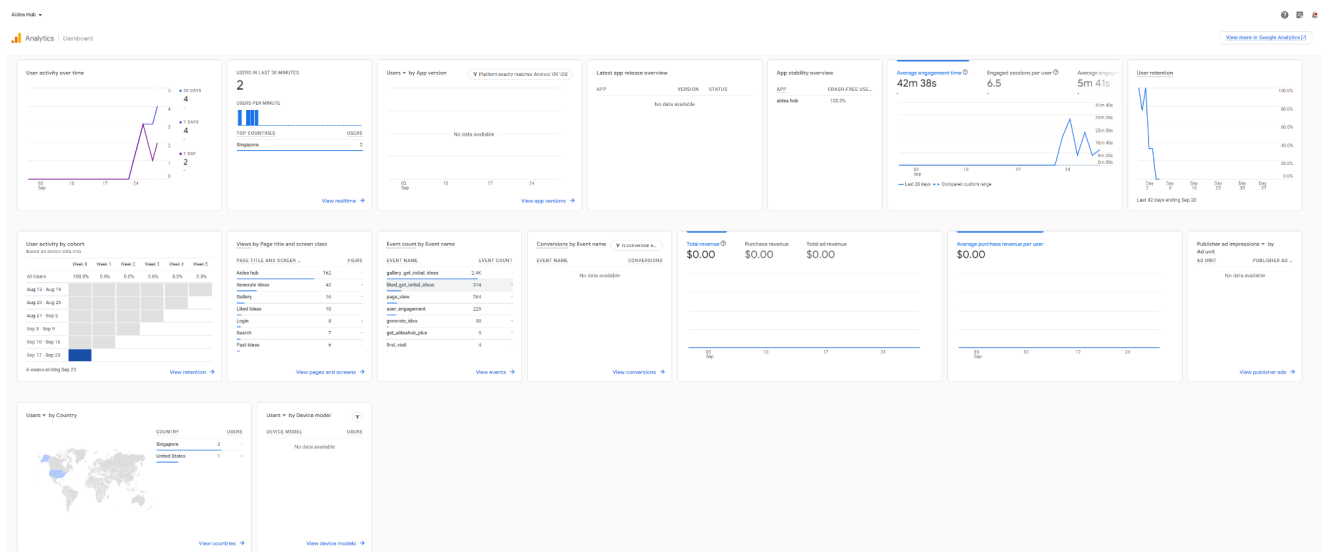
Link: https://aidea-hub.netlify.app/
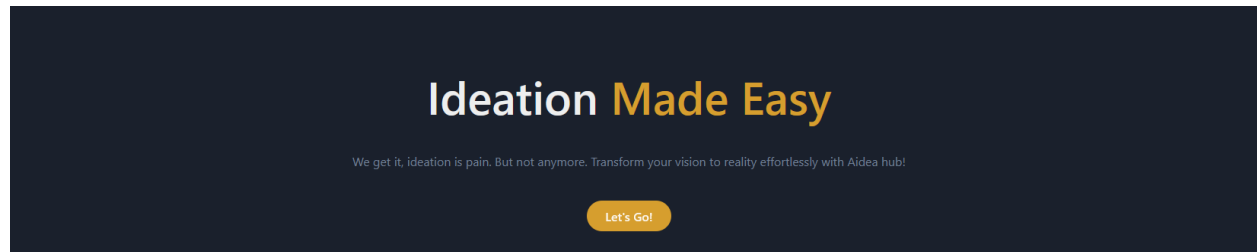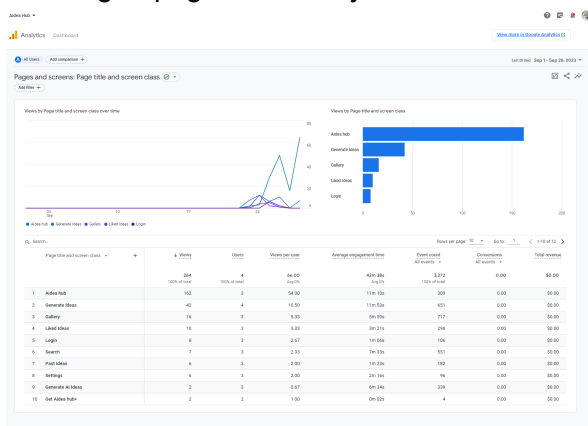

Hero
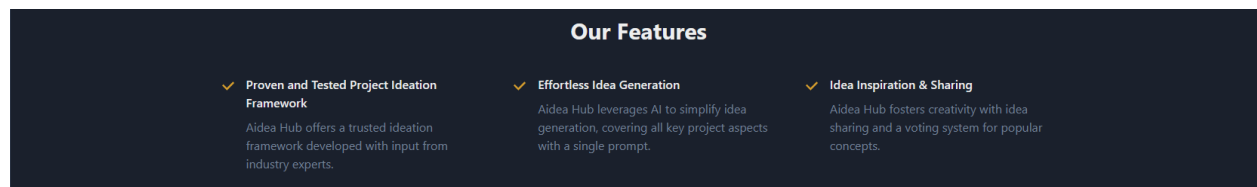
Features
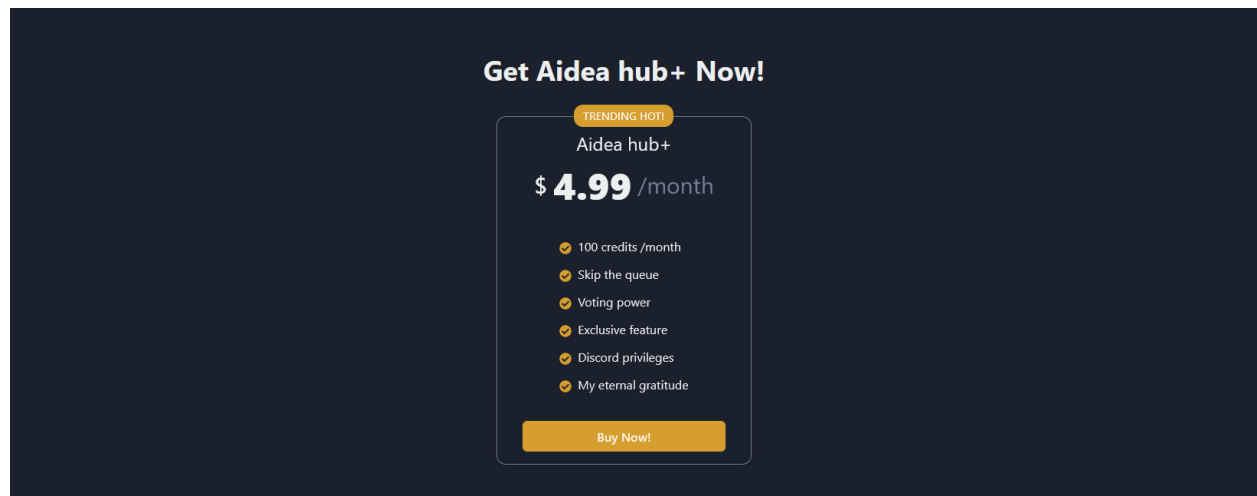
Pricing

Milestone 15: Embed Google Analytics or equivalent alternatives in your application and give us a screenshot of the report. Make sure you embed the tracker at least 48 hours before the submission deadline as updates for Google Analytics are reported once per day.
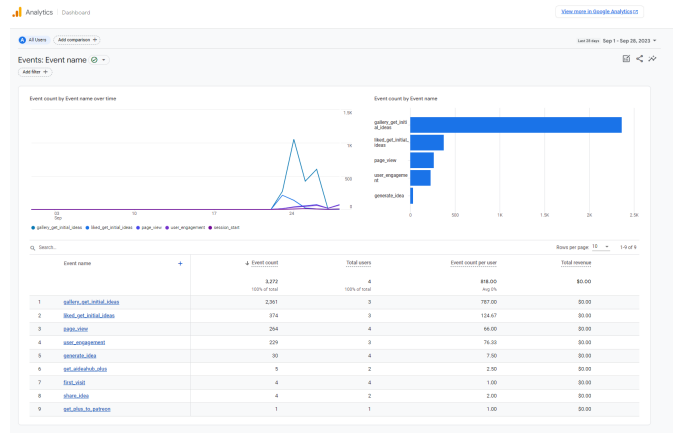
Overall Google Analytics Dashboard

Tracking of pages visited by users

Tracking of events, such as when generate_idea is clicked

👤 All Users   Add comparison ⊕

Last 28 days   Sep 1 – Sep 28, 2023 ▾

Events: Event name ⊘ ▾

Add filter ⊕

Event count by Event name over time

● gallery_get_initial_ideas ● liked_get_initial_ideas ● page_view ● user_engagement ● session_start

Event count by Event name

🔍 Search...   Rows per page 10 ▾   1-9 of 9

	Event name ⊕	↓ Event count	Total users	Event count per user	Total revenue
		3,272	4	818.00	$0.00
		100% of total	100% of total	Avg 0%	$0.00
1	gallery_get_initial_ideas	2,361	3	787.00	$0.00
2	liked_get_initial_ideas	974	3	124.67	$0.00
3	page_view	264	4	66.00	$0.00
4	user_engagement	229	3	76.33	$0.00
5	generate_idea	30	4	7.50	$0.00
6	get_aideahub_idea	5	2	2.50	$0.00
7	first_visit	4	4	1.00	$0.00
8	share_idea	4	2	2.00	$0.00
9	get_idea_to_patreon	1	1	1.00	$0.00

Milestone 16: Assume you were launching on Product Hunt. Come up with content and marketing materials that you will use for your Product Hunt submission. You may even want to launch on Product Hunt for real if you think your product is ready.

🚀 **Introducing AideaHub - Unleash Your Creative Ideas!** 🚀

👋 Hey, Product Hunt community! We are thrilled to introduce AideaHub, your go-to platform for sparking innovation and generating brilliant ideas. Say goodbye to brainstorming blocks and hello to unlimited creativity.

🌟 **Key Features:**

🔥 **Idea Generation**: Need fresh ideas? Tell us your problem or challenge, and our AI-powered Idea Generator will provide you with creative solutions tailored just for you.

🕐 **Real-time Updates**: Experience seamless, real-time updates as your ideas evolve. No more waiting for refreshes or manual updates.

🎨 **Beautiful UI/UX**: We've designed AideaHub to be not only functional but visually stunning. Enjoy an intuitive and delightful user experience.

🔐 **Security First**: Your data is precious. We ensure top-notch security to protect your ideas and information.

💬 **Join the Conversation**: Engage with a vibrant community of innovators, share your insights, and help others tackle their challenges.

🌎 **Global Reach**: With servers in Asia, Europe and US, we offer lightning-fast performance no matter where you are.

👉 **Get Started Today**: [Link to our website] - Sign up now and experience the future of idea generation!

📣 **Join Our Early Adopters Program**: Be part of our journey! As a thank-you for your early support, early adopters will receive exclusive perks [1000 free credits, 6 months free Plus membership]

🤝 **We Value Your Feedback**: AideaHub is a product of continuous improvement. Your feedback is invaluable in shaping the future of our platform. Share your thoughts and suggestions with us on our Product Hunt thread!

📈 **Our Vision**: At AideaHub, we believe that innovation should be accessible to everyone. Our mission is to empower individuals and teams with the tools they need to turn ideas into reality.

📱 **Available on All Devices**: AideaHub is accessible on web and mobile, ensuring you can access it whenever and wherever inspiration strikes.

🌐 **Try our app!**: https://aidea-hub.netlify.app/

📣 **Connect with Us**: Follow us on Reddit for the latest updates, tips, and inspiration. Join our Discord community here!

💡 Join us on this exciting journey of innovation and creativity. Let's unlock limitless possibilities together!

🚀 AideaHub- Where Ideas Take Flight 🚀

Milestone 17 (Optional): Use embeddings in your app. Explain why it was useful for your product to use embeddings.

Our team did not use embeddings

Milestone 18 (Optional): Identify and integrate with social network(s) containing users in your target audience. State the social plugins you have used. Explain your choice of social network(s) and plugins.
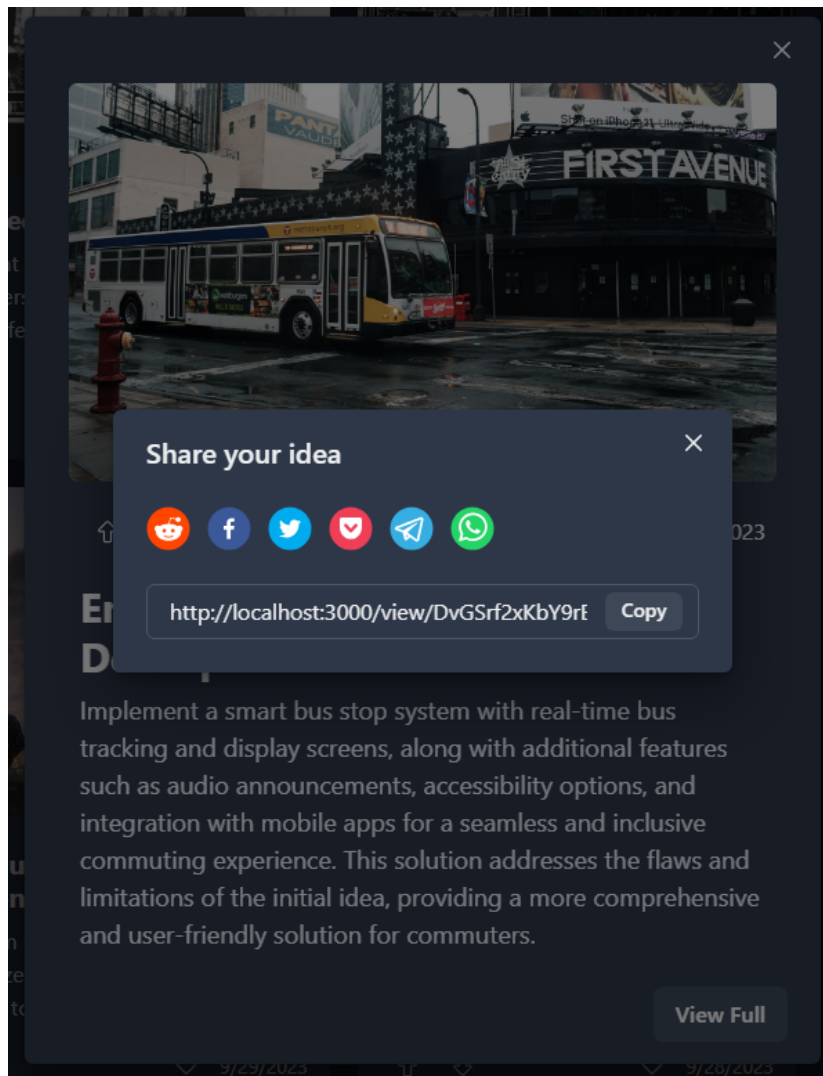
Social Network Choices:
- Reddit: A vast platform with numerous communities (subreddits) dedicated to various topics. Given its nature of fostering deep discussions and sharing ideas, it aligns well with an idea generation and sharing platform. It can help tap into niche communities passionate about specific subjects.
- Twitter: An influential platform where trends emerge and thoughts spread like wildfire. By integrating with Twitter, users can quickly share ideas and reach a wider, global audience. Given its short-form content, it's great for sharing bite-sized insights.

- Facebook: With billions of users, Facebook offers a vast demographic range. By integrating with Facebook, users can share ideas among their network, groups, or even wider audiences, ensuring broad visibility.
- Telegram & WhatsApp: Both are messaging platforms with vast user bases, especially in Singapore. They can be crucial for direct and group sharing, especially for users wanting to discuss ideas in a more private setting.
- Pocket: As a bookmarking service, integrating with Pocket allows users to save interesting ideas for later perusal, aiding in content retention and revisitation.

Social Plugins Used:
- Reddit Share Button: Allows users to directly share to specific subreddits or their profile.
- Tweet Button: Enables direct sharing of ideas to one's Twitter feed.
- Facebook Share Button: Facilitates content sharing either on user profiles or specific groups/pages.
- Telegram Share Link: Provides direct sharing capabilities to Telegram chats.
- WhatsApp Share Link: Allows for sharing ideas directly to contacts or groups.
- Pocket Save Button: Lets users save ideas to their Pocket account for later reading.

Our decision to integrate with these globally recognized social platforms was to ensure users have the convenience to share ideas seamlessly across networks where discussions thrive. By selecting platforms that are both broad in reach (like Facebook) and niche in content discussions (like Reddit), we aim to cover a wide spectrum of user preferences. Furthermore, plugins like the Tweet Button or Reddit Share Button simplify the sharing process, ensuring a smooth user experience. In essence, our choices were driven by the goal to enhance user engagement, expand content reach, and foster collaborative idea exchanges across diverse digital communities.

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    openai-api

van Esch, N. (2018, June 12). *How to design for AI-enabled UI. What to keep in mind when*

    designing for… | by Naïma van Esch. Prototypr. Retrieved September 29, 2023, from

    https://blog.prototypr.io/how-to-design-for-ai-enabled-ui-77e144e99126