App Planner: Co-creating mobile applications with Generative AI

Anonymous submission
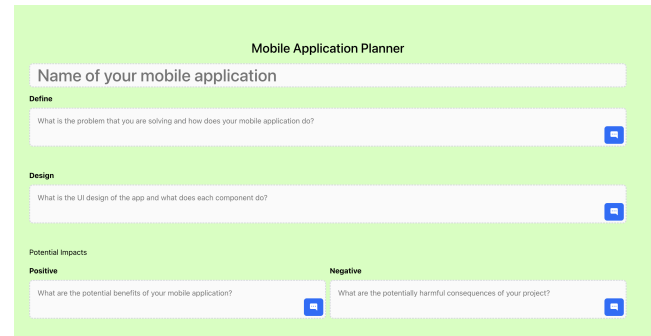
Abstract

App Planner is an interactive tool crafted to assist students in crystallizing their ideas into actionable mobile application designs that address real-world problems. Harnessing the capabilities of generative artificial intelligence (AI), App Planner scaffolds students' efforts towards creating mobile apps through guided conversations via a chat-based interface. Built on the principles of 'collaborative learning' and 'learning by doing,' this interface collaborates with students as a partner rather than a mentor. It assists them in brainstorming and formulating new ideas for applications, provides feedback on those ideas, and stimulates creative thinking. We mediate these conversations to follow a design thinking framework that enhances and encourages students to adopt human-centered problem-solving and critical thinking perspectives. We envision App Planner to be a catalyst for student empowerment, unlocking their potential to innovate and create with technology, guided by a human-centered AI mindset.

Introduction

In today's world, where smartphones are ubiquitous, there's a growing need for building innovative apps that solve everyday problems. Yet, many people, especially young students, struggle with taking the first step in app design due to the technicalities involved. A significant number of our existing Computer Science programs do not prioritize the importance of formulating and designing solutions with a human-centered perspective that encompasses users and considers the ethical and societal implications of the application. App Planner seeks to address this gap by making app development both accessible and educational.

App Planner employs generative artificial intelligence (AI) to create a conversational interface that guides students in outlining and designing their app ideas. Through engaging dialogues with the tool, students can articulate the objectives of the application they want to build and receive personalized recommendations for features and designs that align with their vision. App Planner serves as an interactive worksheet and collaborative learning partner, engaging in both brainstorming sessions with students to explore ideas and teaching students important concepts such as problem-solving and design thinking (Neto and Fernandes 2019). Students learn by doing: defining problems, formulating solutions, and understanding how apps can impact

Figure 1: The tool is structured around five key text boxes, each guiding the user through a distinct stage of app development.

society (Gibbs 1988). This prepares students to seamlessly translate their designs into tangible applications, streamlining the journey from conceptualization to creation.

App Planner

App Planner (Figure 1) facilitates each phase of app development for students. The process starts with a text box prompting students to enter the title of their project or the desired name for their mobile application. The next steps are based on the key features of 'Design Thinking,' a user-centered problem-solving method defined by T. Brown (Brown and Wyatt 2010).

Define: The next text box invites students to articulate the problem they aim to address by describing the type of app they envision creating to tackle this issue. Students are encouraged to analyze the problem they want to solve, identify target users, and consider specific contexts in which the problem occurs. This systematic approach promotes a human-centric perspective, prompting students to think critically before delving into feature development. If they find themselves at a deadlock or struggling to progress, they have the option to engage with an intelligent chatbot (Figure 2). The chatbot's role is to offer a blend of rule-based instructions for systematic guidance and AI-powered suggestions for creative enhancement. Students are provided with interactive options such as buttons labeled 'How can I define a problem?', 'Who are the target users?', and
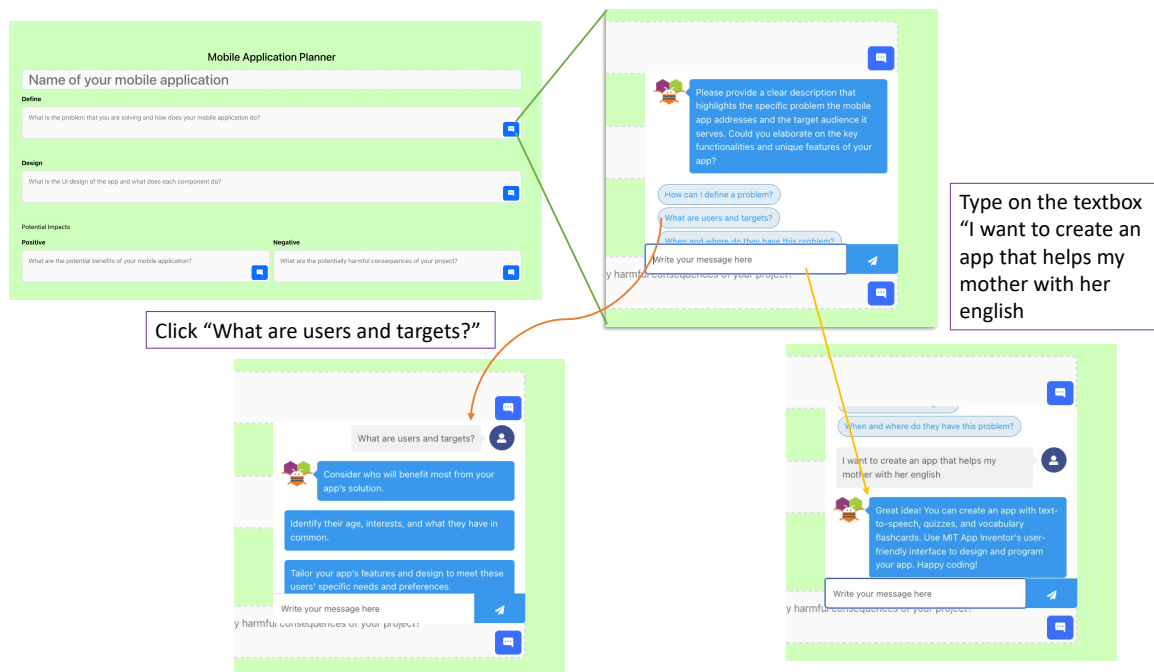
Figure 2: If students encounter difficulties while filling out any of the text boxes, they have the option to consult with a chatbot, as illustrated in the top right image. For immediate guidance, they can select one of the pre-set question bubbles to receive a rule-based response like the bottom left. Alternatively, like the bottom right students can directly input their queries, which will be processed through an API call to ChatGPT, providing them with tailored assistance and clarifications, enhancing their understanding and progress.

'When and where do users encounter this problem?'. Clicking these prompts them with examples and insights to foster a deeper understanding of these aspects. Additionally, students can directly input queries like *"I want to help my mother with her English; what kind of app should I make?"* Such inquiries are processed through our backend, where we utilize OpenAI's API to send these requests to the GPT model (OpenAI 2023). GPT's advanced capabilities then generate tailored responses, offering students creative and practical suggestions for their app development queries. This conversation is the cornerstone of our tool, assisting students in refining their ideas into solid goals and objectives.

Design: Following this, App Planner offers a dedicated section for discussing the application design. Here, students can deliberate on the user interface and app functionality, considering how to best structure their app to achieve the defined goals. For instance, a student might want to add a translator component to help their mother learn English. This will require the student to add a text box and a button, where the mother can type in their own language and press the button to see the English-translated version. To further the design process, the Planner provides guided prompts and examples, ensuring that students' exploration remains in line with their vision. Students can ask what features should be added and how to integrate such features into their app design to make it user-friendly. This phase also encompasses the 'Ideate' and 'Prototype' stages in the Design Thinking framework.

Positive and Negative Impact: In the final stage, students are encouraged to thoroughly consider both the positive and potential negative impacts of their applications. For this critical thinking exercise the interactive chatbot serves as a brainstorming partner to explore various perspectives and consequences (Dwyer, Hogan, and Stewart 2014). This step ensures that the students' creations are not only goal-oriented but also ethically sound and socially responsible. The inclusion of the chatbot enriches the learning experience, making it both engaging and educational. It underscores the cultivation of a well-rounded skill set that includes app design, ethical reasoning, and critical thinking – essential attributes for the responsible creators of tomorrow.

Future Work

In our future endeavors, we aim to integrate our platform into MIT App Inventor (Wolber, Abelson, and Friedman 2015). This planned integration is crucial for enhancing the app creation experience. Subsequently, we will conduct comprehensive testing with student groups to evaluate the impact of our platform on their app development journey.

Acknowledgments

References

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