ColorVision

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1 Summary of Project

Color blindness, affecting around 300 million people globally (1 in 12 men and 1 in 200 women), presents significant challenges in daily life, from reading traffic signals to interpreting workplace data. Many individuals remain unaware of their condition due to limited access to affordable and accurate testing.

ColorVision offers a user-friendly mobile app that addresses this gap by providing accessible, clinically recognized color blindness tests, such as the Ishihara and Farnsworth D-15 tests. Users can easily diagnose their color vision deficiency from the comfort of their home. The app not only identifies the condition but also educates users about different types of color blindness (e.g., red-green and blue-yellow deficiencies) and their daily implications.

In addition to benefiting individual users, ColorVision supports educators and parents by helping to identify and accommodate individuals with color vision challenges. The app's design prioritizes accessibility, making it suitable for users of all ages and technical skill levels.

Compared to competitors, ColorVision stands out by offering a comprehensive set of tools, including multiple testing options and educational resources, all in one affordable, easy-to-use app. It empowers users with knowledge while promoting broader awareness of color vision deficiencies to reduce stigma and create a more inclusive environment.

By enhancing accessibility and raising awareness, **ColorVision** aims to improve the quality of life for millions of individuals globally and foster a more inclusive society.

2 Project Analysis

2.1 Value Proposition

ColorVision addresses the significant challenge of diagnosing color blindness, a condition that affects approximately 300 million people worldwide, including 1 in 12 men and 1 in 200 women. Many individuals with color vision deficiencies remain undiagnosed due to limited access to affordable and accurate testing tools, which can lead to difficulties in various aspects of life such as interpreting

color-coded information, reading traffic signals, and performing tasks in color-dependent professions.

The lack of accessible testing creates pain points for both individuals and the professionals who support them—educators, parents, and employers often struggle to identify and accommodate those with color vision challenges, which can hinder performance in academic and professional settings.

ColorVision directly addresses these pain points by offering an affordable, easy-to-use app that provides clinically validated color blindness tests. Users can conveniently test themselves at home, gaining a better understanding of their condition. By making accurate diagnosis accessible to a wider population, ColorVision empowers individuals to take control of their condition, improving daily functionality and promoting inclusivity.

The app also supports a broader audience, including educators and employers, by helping them identify color vision deficiencies in students and employees, leading to better accommodations and reduced barriers in learning and professional environments. This, in turn, enhances awareness and promotes inclusivity for individuals with color vision challenges in everyday life.

2.2 Primary Purpose

The primary purpose of ColorVision is to deliver an efficient and accessible platform that allows individuals to easily test for color blindness and gain insights into their color vision. The app is designed to empower users by providing them with accurate results and educational resources, enhancing their understanding of their condition. By focusing on ease of use and affordability, ColorVision aims to make color blindness testing available to a broader audience, filling a gap left by expensive professional assessments.

For educators, parents, and employers, ColorVision provides a practical tool to better understand and support individuals with color vision deficiencies. The app helps create more inclusive environments, ensuring that people affected by color blindness receive the necessary accommodations and support. Ultimately, the app's purpose extends beyond testing, fostering awareness and inclusivity in both personal and professional settings.

2.3 Target Audience

ColorVision is primarily targeted at individuals who suspect they have color vision deficiencies or those who have already been diagnosed but want a deeper understanding of their condition. This includes people of all ages, but specifically targets individuals between the ages of 18 to 40, who are more likely to rely on mobile technology for self-diagnosis and health-related information. Additionally, we target students, professionals in color-critical fields (such as design, engineering, and healthcare), and individuals who face challenges in day-to-day activities that involve color differentiation.

Beyond individual users, ColorVision also targets secondary audiences, including parents, educators, and employers. Parents can use the app to assess

whether their children are color blind, helping them make early interventions in education. Educators benefit by identifying students who may need special accommodations in the classroom, while employers in industries that rely on accurate color perception can ensure inclusivity and safety by assessing employees for color vision deficiencies.

To reach this target demographic, ColorVision plans to leverage digital marketing strategies, including targeted ads on social media platforms like Instagram, Facebook, and LinkedIn. These platforms will allow us to connect with younger adults and professionals in relevant industries. We will also collaborate with educational institutions and professional organizations to promote the app to teachers, HR professionals, and industry experts, positioning ColorVision as a trusted tool for color blindness testing and awareness.

2.4 Success Criteria

We will measure the success of *ColorVision* based on the following key factors:

1. **User Adoption:** We will track the number of app downloads and regular active users to gauge the app's reach and popularity.

2. **User Feedback:** We will rely on positive ratings, reviews, and direct user feedback to assess overall satisfaction with the app's functionality and ease of use.

3. **Test Completion Rate:** The percentage of users completing the color blindness test will be a primary indicator of user engagement and the app's effectiveness.

4. **Financial Performance:** We will measure our financial success through revenue generated from in-app purchases and premium feature subscriptions.

5. **User Retention:** High retention rates, with users returning to the app, will indicate that we are providing sustained value.

These criteria will help us evaluate the app's success in meeting its goals and delivering value to users.

2.5 Competitor Analysis

ColorVision competes in a market with several notable players, including EnChroma, various color blind test apps, and traditional in-office testing by optometrists. EnChroma offers specialized glasses that enhance color perception, providing a unique corrective solution but at a high cost, making it inaccessible for many. Color blind test apps, while typically low-cost or free, often lack clinical validation and comprehensive educational content, leading to potential inaccuracies in diagnosis and limited user engagement. Traditional in-office testing provides medically validated assessments but is costly and time-consuming, making it

impractical for many users. In contrast, ColorVision combines affordability with an easy-to-use, clinically validated testing solution that also offers educational resources to help users understand their condition. By emphasizing accessibility and inclusivity, ColorVision not only addresses the gaps left by its competitors but also empowers individuals and supports educational and professional environments in promoting awareness and accommodations for color vision deficiencies.

2.6 Monetization Model

Our monetization model for *ColorVision* will include the following strategies:

1. **Limited Free Tests:** Each user will be allowed to take a specific number of tests for free. After the free limit is reached, users will need to pay a fee for each additional test or opt for a membership subscription that provides unlimited access to all tests.

2. **Advertisements in the Free Version:** The free version of the app will include advertisements. After each test, users will be required to watch an advertisement before they can view their test results. This will allow us to generate revenue from non-paying users while maintaining free access to the app.

3. **Future Premium Features:** While most current features will remain free, we plan to introduce paid premium features in future updates. These features will offer enhanced functionality and insights, and users will need to pay an additional fee to access them.

This combination of freemium access, ad-based revenue, and premium features will ensure a sustainable monetization model that caters to both free and paying users.

3 Initial Design

3.1 Minimum Viable Product (MVP)

The Minimum Viable Product (MVP) for ColorVision is designed to provide essential features that enable users to effectively test for color blindness and gain a foundational understanding of their condition. The MVP will include the following key components:

- **User-Friendly Interface:** A simple and intuitive design that allows users of all ages and technical skill levels to navigate the app with ease.

- **Color Blindness Tests:** The MVP will feature multiple clinically recognized tests, including the Ishihara Test for red-green color blindness and the Farnsworth D-15 Test for assessing color discrimination. Users will be able to select a test and receive immediate feedback on their results.

- **Results Summary:** After completing a test, users will receive a clear summary of their results, including explanations of their condition and potential next steps, such as consulting with a healthcare professional or accessing educational materials.
- **Educational Resources:** A dedicated section within the app will provide users with informative articles and videos about color blindness, its types, and practical tips for managing challenges associated with the condition.
- **Accessibility Features:** The app will include customizable settings, such as adjustable text size, to ensure that it meets the needs of users with varying abilities.

3.2 Scope and Limitations

While the MVP will focus on these core features, there are known limitations. The initial version will not include advanced features such as personalized progress tracking or integration with healthcare providers, which may be considered for future updates based on user feedback. Additionally, the MVP will primarily cater to English-speaking users, with plans for multilingual support in subsequent versions. Overall, the goal of the MVP is to validate the core concept of ColorVision by providing essential testing and educational functionalities while gathering user insights for future enhancements.

4 UI/UX Design

The UI/UX design for *ColorVision* will focus on simplicity and ease of use, ensuring that users can quickly navigate the app and complete tests without confusion. The key components for the Minimum Viable Product (MVP) include:

1. **Home Screen:** A straightforward layout with clear buttons for starting a test, viewing test history, and accessing information. The design will prioritize large, readable fonts and simple navigation.
2. **Test Process:** The testing flow will be easy to follow, with simple instructions provided before each test. Progress indicators will help users understand how far they are in the test.
3. **Results Screen:** Test results will be displayed in a clear, easy-to-understand format, with simple text and visual elements to highlight the user's results.
4. **Basic Navigation:** Users will be able to navigate between different sections (e.g., test, history, settings) through an intuitive and familiar mobile navigation system (e.g., bottom menu bar or hamburger menu).

5. **Accessibility Considerations:** The design will include basic accessibility features, such as adjustable font sizes and high-contrast options to cater to users with visual impairments.

These basic components will ensure the MVP is functional and user-friendly, meeting the core needs of our audience.

5 Technical Architecture

The technical architecture for *ColorVision* will focus on creating a functional and reliable foundation for the MVP. The key components include:

1. **Mobile Application Framework:** We will use a cross-platform framework like React Native or Flutter to ensure that the app works seamlessly on both iOS and Android devices. This will allow for efficient development and deployment across platforms.

2. **Data Storage:** Local storage will be used to save user preferences and test history, ensuring users can access their previous results even when offline. For more advanced features such as syncing test data across devices, we may use cloud storage like Firebase. This is something we may give more thought to moving forward, especially as the app grows.

3. **APIs and Third-Party Services:** We will integrate third-party APIs, such as Google AdMob, to include advertisements in the free version of the app. This will help generate revenue from users who choose not to pay for premium features. For cloud storage and user authentication, we will likely use a simple solution like Firebase. As the app scales, we may explore additional third-party services for enhanced functionality, which is something we may give more thought to in future updates.

4. **Backend Server:** Initially, we will rely on a lightweight backend, such as Node.js, to handle basic user authentication and manage cloud storage requests. This setup will support our initial user base and can be scaled as the app evolves. More complex server architectures may be considered later as the app's needs grow.

5. **Security and Privacy:** Basic encryption will be implemented to ensure user data, such as test results, is protected. As the app develops, we will continue to enhance our security measures to maintain user trust and comply with data privacy standards. This is an area we may give more thought to over time.

6. **Measuring Success:** We will measure technical success by monitoring system stability (low crash rates), user retention, and smooth integration with third-party services such as advertisements and cloud storage.

This basic technical architecture will ensure that *ColorVision* delivers a stable and user-friendly experience while allowing room for growth and future enhancements.

6 Challenges and Open Questions

6.1 Technical Challenges

- **Form Factor (Different Sizes, DPI, and Orientation):** Ensuring the color blindness tests are displayed accurately across various devices with different screen sizes, resolutions (DPI), and orientations. Variations in display settings may affect the test results.
  - *Solution:* Use responsive design that adapts to different screen sizes and resolutions, ensuring consistent and clear presentation of tests on all devices.
- **Restoration of Data on Reinstall:** Users may lose previous test results and settings if they uninstall and reinstall the app, disrupting their experience and progress tracking.
  - *Solution:* Implement simple cloud-based storage or local data backups to automatically restore test results and preferences when the app is reinstalled.
- **Resource Constraints (Internet and Storage):** Users with limited internet access or device storage may face difficulties in downloading or using the app, especially in offline scenarios.
  - *Solution:* Optimize the app for offline functionality, allowing users to take tests and view results without an internet connection. Keep the app lightweight to minimize storage usage and ensure accessibility across a range of devices.

6.2 Open Questions

- What additional features do potential users feel would enhance their experience with the app? Gathering feedback through surveys or focus groups could provide valuable insights.
- How can we effectively market ColorVision to reach the target audience, especially those unaware of their color vision deficiencies? Researching effective marketing strategies and partnerships with educational institutions may help.

By identifying these challenges and open questions, ColorVision aims to proactively address potential issues and gather insights that will inform the app's development and improve user experience.