

Color Coded Reminder for Better Memory Performance

Chirag Bhardwaj

Abstract-- Colors have been known to have various effects on how we perceive information associated with them. Various researches conclude that colors can play an important part in retaining information that we gain associated with them. With the use of advanced technology in the field of education, I thought of employing it for a reminder service for the learning disabled and mentally sound people alike. Color Coded Reminder is an Android smartwatch application that displays colors along with relevant information from a credible source such as medical staff or the user itself, at given times. The app and the web portal have been designed to be as minimal as possible to avoid any learning curve that the users may have to go through. The app may help those who need constant help in carrying out daily activities such as learning-disabled children or short-term memory loss patients and also those who just want a simple reminder on their smartwatch.

Index Terms— Mobile Applications, User Interaction, Smart Watches, Internet of Things

1. INTRODUCTION

The use of latest and advanced technologies in the field of learning has been around for almost a decade now[1]. This pattern can also be seen in the field of neuroscience where scientists are trying to employ newer technologies to enhance the human ability of learning new information and retaining it[2]. With the launch of smartwatches, a newer door was opened to the way humans interact with smart devices.

The smartwatch industry has been focused on physical health with almost all of them offering features such as Pedometer and Heart Rate Sensor. To explore the use of smartwatches in helping with mental health I created this software called Color Coded Reminder. The idea for the system was developed after discussion with fellow students from University College of London. The system provides information duly vetted by an authorized user of the app directly on the smartwatch of the user along with a color predefined by the user. The system tries to simplify the use of these technologies by minimalizing and simplifying both the web portal and the watch to maximize its use cases and number of users in different age groups.

My main contribution can be summarized as follows:

- I try to present the arguments and requirement for Color Coded Reminder and discuss how I addressed them.
- I describe the Color Coded Reminders environment and how to use it.
- I report the accomplishments and limitations of the developed system.

2. BACKGROUND

Color is believed to be the paramount visual experience to human beings[3]. Colors play a key role in the human cognitive system and have been found to play a very significant role in enhancing memory performance[4]. Colors can be very effective in learning and educational setting, marketing, communication, or even sport[5]. Various researches have been conducted over the years to understand the role of colors in memory enhancement and memory performance. General consolidation of the results of these studies is that colors can make a significant impact on our information gathering and retaining.

Use of technology in the field of learning has been well studied and documented to be effective. E-learning can be defined as the use of Internet technologies to deliver a broad array of solutions that enhance knowledge and performance[6]. A study found that E-learning can be used by medical educators to improve the efficiency and effectiveness of educational interventions in the face of the social, scientific, and pedagogical challenges [7].

3. SYSTEM OVERVIEW

I built the system keeping in mind that no user from any age group must go through a learning curve in order to use it and that's the reason that it was kept as simple as possible. The system contains of an app to display the information with the color and a very simple web portal to upload the data to the server which then coordinates with the app to push the data to the app.

3.1 USER INTERFACE:

As the basic need of this project was to be able to help

and be user friendly to those with or without mental health issues the user interface for the web portal was designed to be very simple and one which puts recognition rather than recall as its priority as shown in Fig.1.

Following the same pattern, the smartwatch app too was kept fairly simple and basic with the display showing the background of the information as the main color decided and filling up the whole screen of the watch. The watch was also given the function of vibrating in order to garner the attention of the user towards it.

3.2 BACKEND

The backend of the app was written in Nodejs and the database to store all the information was MongoDB. The choice to go with MongoDB was made because of the scalability, speed and efficiency of it. Nodejs was chosen to be the server app because of its ability to provide REST APIs faster and due to its seamless integration ability with MongoDB. Loopback API was used to create the backend in Nodejs to remove any bugs and errors that might occur while writing the REST API calls.

3.3 SMARTWATCH APP

The smartwatch app was written in Java for Android and the main reason for choosing Java was because of future support of Android operating system to apps written in Java. Java apps do not get deprecated and hence are scalable across operating systems. The app employs Alarm Manager API of Android to get the app to display the content at the set time with the set color.

The user can go on the web portal and fill out the details required i.e. Info, Quantity, Color, Time and press the Submit button which then leads the authorized user to the acknowledgement page where they are asked to run the app once in order to sync the app with the backend server. The user is then displayed the information with the given color at the set time.

4. DISCUSSION

The system I designed and implemented was done in a way that the user does not face any problems in using the app to their advantage. Feedback that was received from fellow student at University College of London, education professional in schools and nurses who work with old aged people was also taken into account while designing the user interface of both the web portal and the app.

Although the idea behind the app was to help both people with or without learning disability, there is no study done

with people from both sides. A study that documents the effectiveness and performance of this app in the field of people with learning disability could help fuel the future work that can be done on the app and the web portal alike. The app is not designed to replace the need for human assistance in the lives of these people but as an extra aid to help the medical assistance staff and the users. For those without learning disability or similar mental health issues, I expect that the app should not pose to be a challenge to work with, although a study documenting the general use of the app can also help improve the system. The system at this time is not of significant use to people with color blindness although it can still work as a simple and minimalistic reminder service on their smartwatches.

For those who wish to take my work forward should try to think of ways to secure the website even further so that users must login before being able to fill out the reminders. A database with the ability to maintain the records of all the reminders that were set in the past can also be an addition to the web portal. The app can be made more stable and ported to more devices than it does now. The app can also be used to collect user data such as physical health statistics. This will give the user more insight about their physical health and the medical assistance staff about the users' health. The backend can be modified according to the collection of user's data and reporting to the web portal. Analysis can be done on the data collected from the app regarding its use and the user's data to get more insight into the app's effectiveness and performance.

5. CONCLUSION

In this paper I introduce Color Coded Reminder, an innovative system that is designed to help people with or without learning disabilities receive information associated with colors in order to enhance their memory performance. Besides discussing the decision to go forth with the idea and design, I discuss the implementation and the intended use and the future studies that can help this system become more robust and featureful.

While this is just the initial version of the system, it provides for basic implementation of the idea and calls for studies that can justify it. To improve the system, I would like to collaborate with people without learning disability and people in the field of learning disability and try to gather more information about how the app can affect somebody's daily functioning and information retention.

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