Stretch-a-little

- Take a break from your computer

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ABSTRACT

In this digital world everything is linked with computers and the dependency on computers is increasing every day. Majority of the people are spending a lot of time on computers for various purposes, this could be for work or education or even for relaxation. Long hours spent sitting at a desk, as is prevalent in today's information-based economy, have been linked to a variety of negative health outcomes like poor posture, increased risk of back pain, and decreased circulation. These in turn can increase the risk of conditions like deep vein thrombosis and other circulatory problems [1, 2, 3].

To help alleviate these health issues, the Stretch-a-little desktop application subtly prompts its users to stand up every so often. This application seeks to mitigate these negative impacts by encouraging users to incorporate regular standing breaks into their daily work routines. Integrating these brief rest periods naturally into the working has been shown to have positive effects on workers' health and productivity. The app's notification mechanism is subtle and allows users to choose their own intervals for reminding them to stand up and move about.

Key features of the Stretch-a-little desktop application:
Customizable Reminders: Users can set the frequency and timing of standing reminders, allowing them to tailor the application to their unique schedules.
Stretch related articles: The application provides users with some articles related to basic stretches and exercises to help promote better physical and mental health.
User-Friendly Interface: The user-friendly interface ensures individuals of all technical backgrounds can easily integrate the application into their daily lives.

INTRODUCTION

Modern work and education environments encourage long periods of sitting and have changed the nature of occupations from active to sedentary. The switch from paper-based to computer-based and paperless work is one of the reasons for this change. Office workers in multiple fields spend a majority of their day sitting down [4]. These individuals spend about two-thirds of their working hours sitting down, and sitting sessions usually last for at least 30 minutes [5]. The side effects of sitting down for prolonged periods of time is often underestimated and overlooked by people. Premature death is an effect of a sedentary lifestyle, along with a risk factor for cardio-metabolic disease, type 2 diabetes, obesity, coronary artery disease, musculoskeletal disorders, and some types of cancer. According to the World Health Organization (WHO, 2013), a sedentary lifestyle contributes to premature deaths of 3.2 million people worldwide each year [6].

Contrarily, leading an active lifestyle enhances general health and lowers the risk of developing chronic conditions. Using stairs instead of elevators or escalators could help people get some exercise done during the day. Taking a quick break to enjoy a stroll outside can also help increase the productivity of people. Activity trackers encourage behavior-change strategies like goal-setting and self-monitoring, and their use has been linked to higher levels of physical activity [7].

The way we monitor and manage our health has been revolutionized by health tracking on smartwatches and smartphones. Smartwatches and smartphones can provide timely alerts with the support of sophisticated algorithms and advanced sensors, likely saving lives in emergency situations. They motivate us to keep moving, establish fitness targets, and choose better choices. As technology keeps developing, the abilities of health

tracking are only predicted to expand more, resulting in a new era of healthcare and wellness management.

Stretch a Little desktop application helps address a few problems given by an inactive lifestyle of the modern office settings by encouraging users to take regular standing breaks throughout their workday. Users can take big steps toward a healthier and more active work habit by finding the ideal balance between sitting and standing. The application is user friendly whose primary feature is a subtly effective reminder system that asks users to stand up periodically throughout the course of their working/studying hours. Adaptability is one of the important features that enables users to personalize the timing of these reminders to fit their personal preferences and work/study schedules. Other features include the ability to set up reminders, a user-friendly interface appropriate for different people work styles and goals, and seamless integration with a variety of PC settings and operating systems. The application seeks to target a simple overlooked health concern that results in long-term health issues. It tries to empower people to achieve better work-life balance, increased energy and productivity, and overall improved health by tackling the problem of sitting for an extended period. This application is a useful and efficient tool to improve the health and happiness of the modern workforce.

INTERVIEW END USERS

To understand users' opinion and feedback about the existing applications and trackers, we conducted both in-person interviews and online surveys with potential end users, people who spend most of their time on computers. The users included 24 people of different age groups, genders, and professions - students, desk workers including old adults that work in an office setting. Our questions to the users included wide range of topics that range from how the current interface is helping them or not helping them to what they would like to have to improve their current experience.

In our interviews and surveys, we checked if they were currently using any tracking application and how often they use it, if they found the notifications insightful and if they like the idea of receiving the notifications or not, if they would prefer a customized setting for the notifications, how satisfied they are with the current interfaces, if they would like any enhancements or any additional features to be added in the new applications to be developed. We even checked if they had any additional feedback they would like to give and almost all of them were good with the interview and survey questions.

We noticed that different users have different issues and preferences with the applications they are currently using. Few users mentioned that hourly notifications are fine but they would be more interested in taking a break every 45 minutes and would like to be notified accordingly. Another user mentioned they would like the interfaces to be more interactive. Most of the users mentioned that they would like to get some basic body stretches and eye exercises related articles to gain more insights on how to stay fit and active.

In this section, we have highlighted the survey questions and responses that have influenced our design. A complete list of survey questions and responses is in the Appendix section. We summarized the results of the online survey and in-person interviews. Based on them, we concluded the users preferred more customization in terms of the standing goals and notifications to be a combination of frequent and customized settings. They also expressed a liking toward having an application on their computers rather than using an extra device to remind them. User interviews have impacted us to focus and include more customization features in our design.

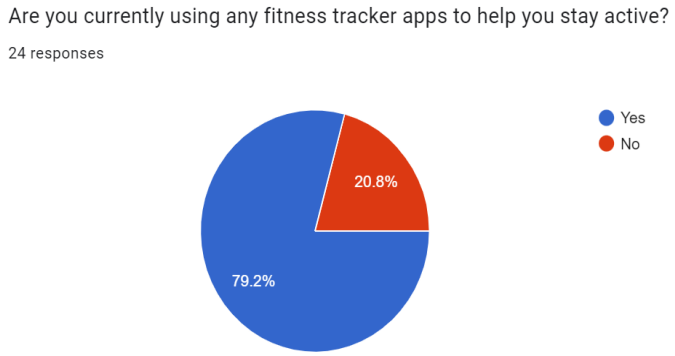

Figure 1: Visual representation of asking users if they are using any fitness tracker apps.

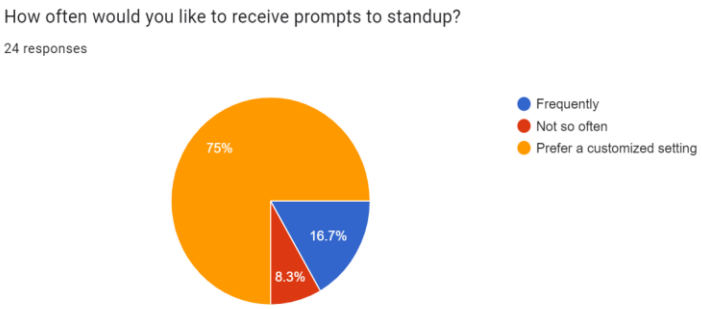

Figure 2: Visual representation to find out users' preference on receiving prompts.

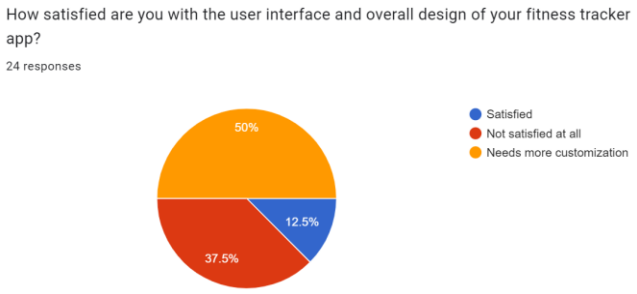

Figure 3 Visual representation on how satisfied they are with the present user interface and design of their fitness tracker.

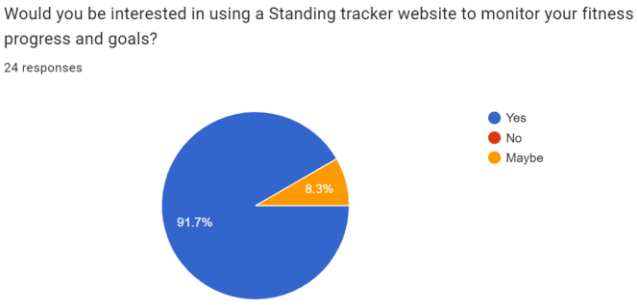

Figure 4: Visual representation of users' interest in using a standing tracker website.

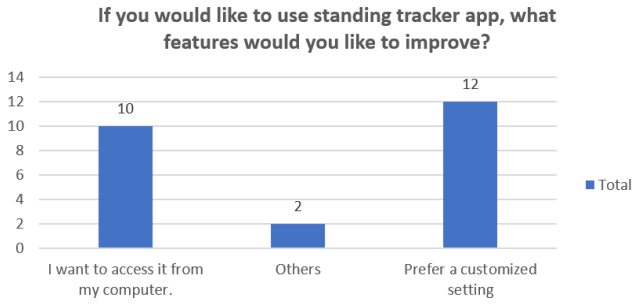

Figure 5: Visual representation of user's interest in improving features in standing tracker app.

CURRENT INTERFACE

There are some reminder interfaces that are used in our lives. However, these interfaces have some problems and advantages that are worth exploring and learning. For example, The Stand Up! Work Break Timer application lets you customize your schedule and choose the color you want. The feature is easy to use, but the interface is not convenient for selecting the time. It uses a sliding method to select the time, so it is difficult for the users to move to the correct position.

Figure 6: Stand Up! Work Break Timer application's interface. It not convenient for selecting the time.

Besides the application, there are some reminder interfaces on the computer. The Big Stretch Reminder is a desktop-based reminder, and the interface can be seen in the figure 10. It can set rest time and display notifications, which is very simple, but the problem is that it only has this function. There is no way to set a specific time period and no way to customize it. A big problem is that the program hides after each notification.

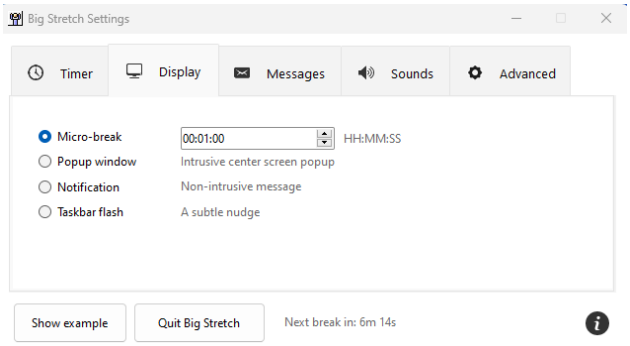

Figure 7: Big Stretch Reminder. It's easy to use but the customization options are very limited

Another desktop application is Workrave and the interface can be seen in the figure 11. The advantage is that it is enforcement, so you can't turn off the reminder and continue using the computer. The second advantage is that it is statistical, it will record the time you rest and use the screen. Although these features are very powerful, they have many fatal flaws. First of all, its interface is

super small and difficult to use, and it starts running immediately after downloading. Also, the settings part is also very complicated and hard to find. Moreover, the design is not easy to understand for a new user and confusing to identify which functions are used at the beginning. Overall, the functions are very powerful, but the design interface is not user-friendly. Therefore, we must learn the good aspects of design interfaces and avoid the bad aspects of design.

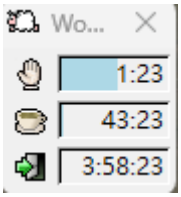

Figure 8: Workrave interface. It has powerful tracking, forcing, and other functions but a poor interface

However, most interfaces only remind people not to sit too long, rather than informing them of the health risks. Bort-Roig el [8] stated that extensive occupational sitting is associated with an increased risk of cardiovascular disease, type 2 diabetes, and musculoskeletal disorders. Therefore, they are improving the health and self-awareness of employees through reminder applications, which is a great idea. When designing a good interface, users should be educated about the importance of health and the dangers of sitting for long periods of time.

CURRENT SOLUTIONS

There are a few apps that are available in the market that tracks user activity and prompts the message for every time interval. Some are wearable devices that track the health activity and prompt the appropriate message. Such as, Apple smart watches and Fitbits allow user customization, tracks user activity and also lets users receive notifications to inform them to stand up but doesn't provide any insights on why that is helpful [9].

There are a few android applications that can identify and notify the users' activity [10]. Some are web-based applications where the user logs in, set the time interval and message to be displayed. The web application then sends the notification through email or text message based on the user preference. They serve a very generic purpose such as to prompt the notification and most of the web-based applications are not free. Some browser extensions, like "Stand Up Reminder", in the market with no customization available and gives notifications every hour [11].

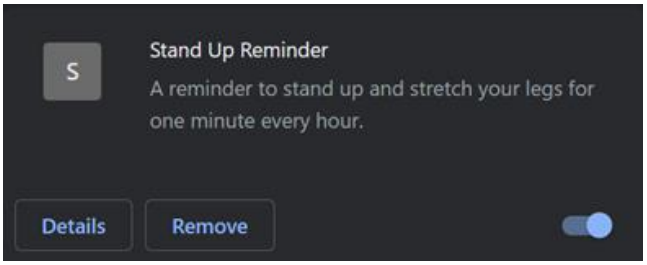

Figure 9: Stand Up Reminder Chrome extension. It reminds the users to stand every one hour. Does not involve any customization

Few desktop applications prompt the users to login and asks to set the maximum time the user wants to see the screen and what the user wants the computer to do such as lock screen for some time or to shut down the system. "Time for break" is such a desktop-based prompting system that allows users to set breaks and also sends a prompt message to stand up or to move [12]. The prompts are very frequent and not that user-friendly and customizable.

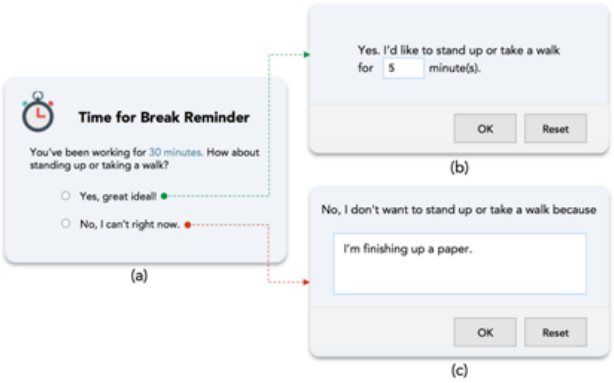

Figure 10: Time for Break interface. It does have some customization features and a bit of an interactive interface but does not provide any articles to improve the users' health

Each application has its own positives and negatives. Wearable devices must be worn on the wrist or on the leg all the time which would not be comfortable at all the times. In web-based applications, the users need to login to the application, give permissions to it to track the user and system activity and the must always be open in a browser to send notifications or to track the activity. Desktop applications are mostly paid versions with less interactive GUI and with little to no customization options. Some users prefer the voice note rather than the notifications as voice notes tend to catch the user's attention more. These problems are not addressed in the current applications that are available in the market and there are no features in existing applications that help older people with vision difficulties to read.

Stretch-a-little - take a break from your computer

The proposed design has been developed while observing the results from the survey. The solution of developing applications according to user's requirements to personalize their standing goals, basic body stretches are included, and it also gives users prompts to stand up.

PROPOSED INTERFACE DESIGN

When we researched the existing solutions, we noticed that they were usually a small part of the health trackers. Though stand-alone applications exist, they usually miss the customization and interactive interfaces, which most of the users mentioned in the survey [13]. The existing applications force the users to break when the application wants them to but not when the users want to and this is one of the major driving factors for the design of our application. From our research and the user interviews, we plan on including the important features of the existing application along with what the users want.

The motivation for our design is mainly the user feedback. Our interface would be a desktop application run on computers that will notify the users to stand up based on their own setting. As the users spend most of the time on their computers/laptops, instead of using an additional device, our application will be running on them. This application allows users to customize their standing goals based on their requirements, as it was one of the main issues the users faced (based on the survey and interview results). It also provides some articles related to the stretches and have a more interactive interface, features other than customization the users wanted. The combination of all these features is not being offered in the applications available today.

Another unique feature we would include in our interface is the "read" notification that actually tells the users to stand up based on the set goal. We decided to include this feature to help support the users with low vision or the users that are old adults and would actually like to listen to the notification asking them to stand rather than try to read the notifications.

The technical specification would mainly include using python and a python framework (mostly Tkinter or PyQt) to build and support the desktop application and the backend maintenance would be done by using any backend software and a database/file storage system and will be able to run on Windows machines.

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APPENDIX

1) Question: Are you currently using any fitness tracker apps to help you stay active?
   - Yes
   - No

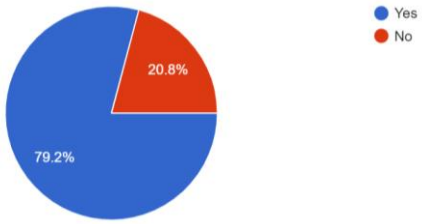

Figure 11: Response of participants to Question 1

2) Question: How often do you use a standing tracker app?
   - Often
   - Not so often
   - Never used it

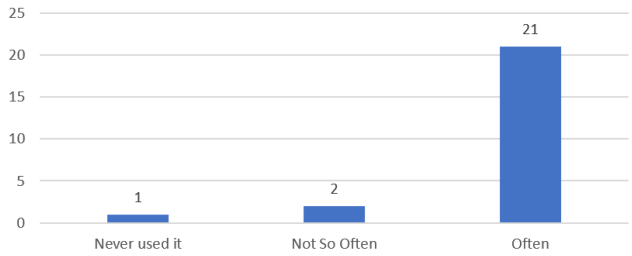

Figure 12: Response of participants to Question 2

3) Question: How would you rate the application's notifications and reminders regarding standing goals?
   - Helpful
   - Insufficient

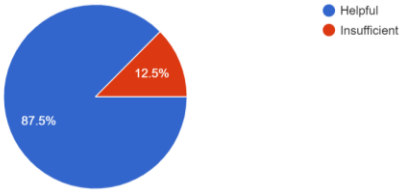

Figure 13: Response of participants to Question 3

4) Question: What are your thoughts on sending prompts for standing up and doing stretches
   - I like it
   - I don't like it

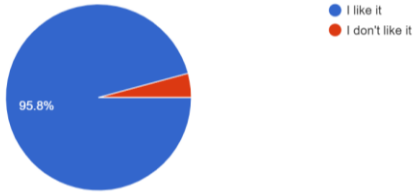

Figure 14: Response of participants to Question 4

5) Question: How often would you like to receive prompts to stand up?
   - Frequently
   - Not so often
   - Prefer a customized setting

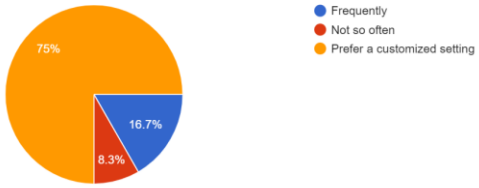

Figure 15: Response of participants to Question 5

6) Question: How often would you like to receive prompts to stand up?
   - Satisfied
   - Not satisfied at all
   - Needs more customization

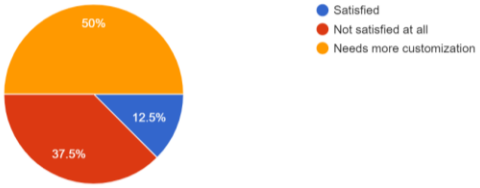

Figure 16: Response of participants to Question 6

7) Question: How often would you like to receive prompts to stand up?
   - Yes
   - No
   - Maybe

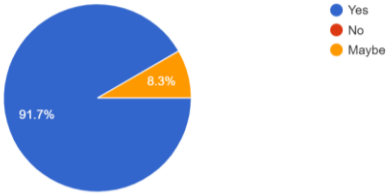

Figure 17: Visual response of participants to Question 6

8) Question: How often would you like to receive prompts to stand up?
   - I want to access it from my computer
   - Prefer a customized setting
   - Others

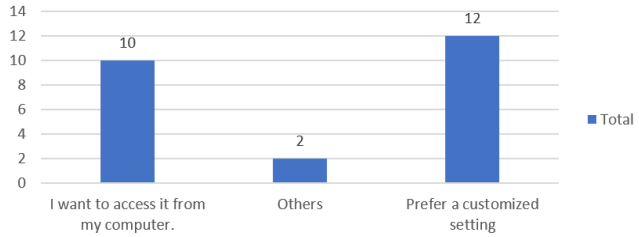

Figure 18: Visual response of participants to Question 8