Literature review

1. *Approach to fitness:*

Data inputs:

One of the main objectives of this project is to provide users with a customised exercise routines based on certain criteria and preferences. Many articles have stated factors like current fitness level, fitness goal, and accessibility should be factored in. [1] Looking further into website and applications [2] which have similar goals, further factors such as nutritional intake, personal demographics identifications and commitment levels are often surveyed as they are integral to the customisation process, the planed application should therefore ask for these details as well. All of these data points will be used as inputs in the developed algorithm.

Routine planning:

In conjunction with the understanding of data inputs further research on creating an effective routine suggests eight important factors to take note of e.g., having a variety of activities, high-interval/low-interval training, recovery. [3] To discuss a factor further - users who are newer to the exercising will require 3-4 days of rest whereas those who have more acclimatized to exercising will be able to perform optimally with 2 rest days with low-intensity, the algorithm will therefore suggest 4 resting days for those who have selected a combination of new to exercise, of the older demographic and more beginner fitness goals.

Furthermore, another important aspect to consider is ‘progress overload’ multiple articles have cited that gradually increasing the intensity of the workout to be the most optimum method of improvement. [4] In general, beginners should see a general improvement of 5-7% fortnightly and more experienced members should see an improvement of 2-3% fortnightly. The algorithm will also take note of this and increase the number of sets and reps recommended per exercise to users by roughly by the figures mentioned above.

Psychology of gamification:

One of the most effective ways to ensure users commit to their goals is gamification [4]. The application will also try to implement established gamification philosophies. One of the core aspects of this would to be to regularly reward users for meeting goals through – this would potentially be in the form of medals and badges. The Skinner Box experiment goes into extensive detail on this can done through the use of conditioning – where treats for actions are given frequently at the start and more sporadically. Other competing apps use a technique similar to this; in the Garmin app users are given badges for very simple tasks initially like creating an account and logging in and eventually leading to more difficult task such as running 10km in one session. [5] The Skinner Box experiment continues to say that negative reinforcement can also be to condition test subjects – although there are heavy limitations to how this can be used in a mobile application, the best representation of this would be the implementation of streaks where visual prompts are shown in celebration of users meeting daily goals and lost if the users fail to meet them. A streak like system can also be put into place in this project.

1. *Infrastructure and frameworks:*

Web-dev and mobile application:

The JavaScript React framework has been chosen as the primary way to coding and deploying this project. Other languages and frameworks were considered such as Java, Python, Kotlin, Swift and Flutter however in the end React was concluded to be the best. The most significant advantage being its compatibility on multiple platforms and operating systems. Where as Java and Python would require addition code to make it compatible and Kotlin and Swift being very orientated towards android and IOS respectively – React code can be run on most devices without the requirement of additional code or being limited. As one of the main objectives is make the software as inclusive as this heavily determined the conclusion.

Furthermore, due to React JS and React Native being very similar the program can be coded for one of the platforms and be transformed very easily to support the other. The only major change that will be required is changing some of the syntax. For example, in the React JS framework which is designed for web development on computers clicking the screen events are handled using ‘onclick’ functions whereas on React Native which is built for mobile application ‘touchable’ and ‘pressable’ is used to handle clicking events. [6]

Databases:

The databases will need to store information about the user and the exercises. Due to limitation of time and skill – the program itself will not have advanced data protection meaning the storage of private information will be dependent on another service. From research the best options were non-confidential information managed using MySQL on Hostinger and the more sensitive information being managed using inbuilt NoSQL features on Google Firebase. This will make the application much more secure as Google are more advanced than the ones the project itself is able to provide. However, Firebase is not compatible with MySQL and relational databases so the information of the exercises themselves will be stored on a hosting service. The service itself based on reviews is secure and is able to support high bandwidth and scaling. [7]

1. *User Interface and User experience:*

To ensure optimum UI/UX, research on popular philosophies were conducted. According to the article written by N Babich, there are 4 golden rules. These include: placing the users in control of the interface, make it comfortable for the user to interact with the product, reduce cognitive load and make the UI consistent. [8] Furthermore, the article concludes by stating the UI should be as forgiving as possible and as easy to understand as possible. It was clear that colour played a large part in a good UI. As the program will cater to a wide audience, colour blindness and other forms of visual impairment needs to be catered to. On further research, combinations of blue are deemed to be the most colour blind friendly and use of stacked spacing where text is separated by paragraphs and alignment makes text the most legible. [8]

Another article also talks about how colours can be used to enforce subliminal messages. From research conducted on colour theory every colour is able to invoke certain meaning and feelings e.g., blue – trust and confidence, red – passion and anger, purple – opulence and royalty. Therefore, which colours are used in the application will be greatly considered.

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