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Sun Salutation Counter For Mobile Application

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ABSTRACT: Sun salutation (SS) is a method of offering prayers to the rising Sun along with a series of physical postures with regulated breathing and physical, mental and spiritual benefits. SuryaNamaskar also has specific spiritual connotations attached to it. A user friendly Android App for the performing and understanding of the Yoga Asanas of SuryaNamaskar (Sun Salutations) which gives a good cardiovascular workout for the body. The app will give quick walk-through into the rounds of Yoga poses of each set in Sun Salutations. The app will also have a user friendly interface. The app will allow user to set timer options to set time laps between poses and each complete round. It will also have counter for counting how many rounds of each set of SuryaNamaskar poses have been completed. There would be option to set Sun Salutation count (10, 12, and 14). The app will provide user with option to decide whether they need background music/count or not. Followed by the above features mentioned the app will also feature detailed monthly analysis providing report card and achievement level with intelligent suggestions from the app itself. The app would study the users performance for 30 days with age as input and will give intelligent suggestions to improve the performance of the user. The app will also tell the user how many calories have been burnt in the month.

KEYWORDS: Suryanamaskar, Android, Steps, Audio Mantra

I. INTRODUCTION

SuryaNamaskar is a sequence of 10/12/14 positions along with regulated breathing and relaxation. SuryaNamaskar does not strain the body or cause injury. It relieves stiffness, revitalizes the body, refreshes the mind and purifies subtle energy channels. Not much research has been done to understand SuryaNa-maskar and its benefits. In an earlier study, it was found that SuryaNamaskar can be an ideal exercise as it involves both static stretching and slow dynamic component of exercise with optimal stress on the cardiorespiratory system. A later study assessed the cardio-respiratory and metabolic responses of four rounds of SuryaNamaskar, a typical amount performed by practitioners, to determine its potential as a training and weight loss tool. With all these benefits body, it is quite essential for people nowadays with their busy schedules to find some time for this type of Yoga. But due to lack of time, it is difficult for people to go to gym or a professional trainer to perform this yoga. Hence this is the motivation behind this project.

II. OBJECTIVE AND SCOPE

The main aim of the application is to help in providing cardiovascular workout for the users of the application. The application of the proposed system would be to provide a counter that will store the time of each workout and provide with a suitable workout report.

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III. PROBLEM STATEMENT

The given problem statement of the project is to develop an application that ease the user into the ways of doing SuryaNamaskar and record the data of user's workout to provide a suitable evaluation of the user's performance. The app will provide basic timers and counters that will keep track of the number of round of SuryaNamaskar performed, time lapse between each round of SuryaNamaskar and each posture of SuryaNamaskar. The app will only be a single user application and would not provide posture detection and correction. It could be extended to provide diet charts and diet plans and recommendation of further workout. Yearly report could also be generated.

IV. LITERATURE SURVEY

Since not much survey has been done of the applications for Surya Namaskar, the survey of existing applications have been done. The following list shows the existing systems surveyed.

1. SuryaNamaskar (Hindi- MyJeo) app Gives information and advantages of SuryaNamaskar on starting page. It gives steps, option to rate the app and information about the developer company as additional options. Name of the steps of each pose is present. Illustrations of pose are also given. Mantra for each step is given in written format. Instructions of the poses is given in Hindi. Memory is 2.70 MB
2. SuryaNamaskar (Marathi- perfect square) app Illustrations of pose are given. Two options available Learning and training modes. There is log count to keep track of progress. Additional options include new daily counts, clear daily counts, rights of the app Option to share the app externally. Explanation of each step and its mantra is given in audio and text format. Timer for each step for effective practice. Memory is 7.01 MB
3. SuryaNamaskar Yoga Poses (Proven Digital Web Solutions) app Gives state the poses are divided into 2 sections. Steps for each pose and breathing are given.
4. SuryaNamaskar (YellowCup) app is easy to navigate menu. Yoga timers are given for all postures. Information about SuryaNamaskar asanas, precautions and benefits are given.
5. Surya Namaskar (Hindi- APPSILO) Yoga postures are described in Hindi. How to Breath for each step is provided. Memory required is 5.92 MB.[5]
6. Sun Salutations- SuryaNamaskar (KarmaRulz) apps is explanation of benefits of each pose. Mantras are incorporated for each pose. The app is useful for all age groups. Memory required is 2.24 MB.[6]
7. SuryaNamaskar There are chair sun salutation steps. Importance of Suryanamaskar is given as an additional option of soothing music plays continuously. Precautions to be taken and right way of performing each step is given. Memory required is 8.54 MB.[7]

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V. EXISTING SYSTEM APPROACH

The limitations of existing systems are that most of the applications do not have audio mantras of the postures, no soothing music in background, no option for user to track how much time they take to perform the postures and no option to repeat the rounds of SuryaNamaskar

VI. PROPOSED SYSTEM APPROACH

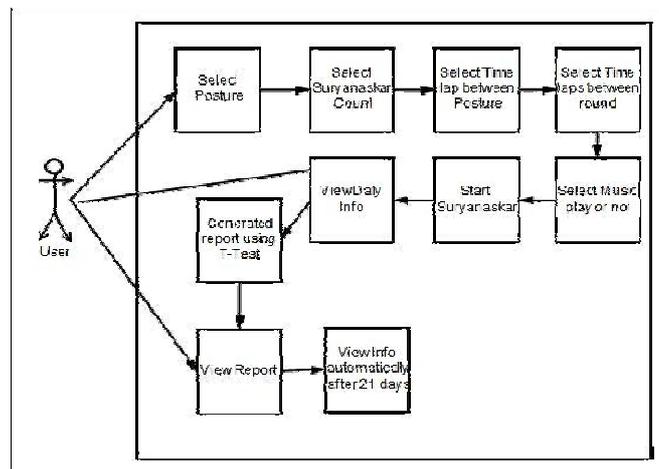


Fig.1 Block Diagram of Proposed System

This project intends to develop a Android operating system mobile designed to help people of all age groups to perform and understand the Yoga asanas of Surya Namaskar. The main modules of the app will include timers to set the time lapse between the poses and each complete round. Users can choose how many number of Sun Salutation count (10/12/14) they would like to perform. The users will be given an option to choose background music/sun salutation specific mantra according to their need. The app will perform a monthly analysis of the user's performance by analyzing the time taken to complete the rounds and considering the height and weight of the user. The system will generate a report showing the user an achievement level and suggestions from the app for improving the performance.

VII. ALGORITHM USED

Student's t-test statistical analysis formula has been used for report generation and widely used to compare the mean of two groups of samples.

Two types of t-test has been used:

- 1.The one-sample t-test, used to compare the mean of a population with a theoretical value, has been used for the first month.
- 2.The unpaired two sample t-test, used to compare the mean of two independent samples, has been used from 2nd month onwards.

T-test formula

- One Sample t-test:

$$t = \frac{m - \mu}{s/\sqrt{n}}$$

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where m is the mean of the sample value and mu is the theoretical value chosen. s is the standard deviation of the sample.

$$df = n - 1$$

df is the degree of freedom

- Independent t-test:

$$t = \frac{m_A - m_B}{\sqrt{\frac{S^2}{n_A} + \frac{S^2}{n_B}}}$$

m_A is the mean of first sample and m_B is the mean of second sample. n_A is the number of elements in first sample and n_B is the number of elements in second sample.

$$S^2 = \frac{\sum (x - m_A)^2 + \sum (x - m_B)^2}{n_A + n_B - 2}$$

S is the common standard deviation of the two samples. The two samples must be normally distributed

$$df = n_A + n_B - 2$$

df is the common degree of freedom of the two samples.

First t-value is to be found out using the df (degree of freedom) and the significance level alpha (0.05 i.e. 5% error) from the t-test table. Then t-value is calculated from the above formulae.

The 2 t-values are compared:

If the difference is close to 0 then there is no significant difference in performance

If difference is positive, performance has increased

If difference is negative, performance has decreased

VIII. SYSTEM ANALYSIS

In our experimental setup, we can find out number of rounds Vs day number .

Sr. No	Day Number	Number of Rounds
1	1	5
2	2	10
3	3	15
4	4	10

Table1: Number of rounds performs by particular user

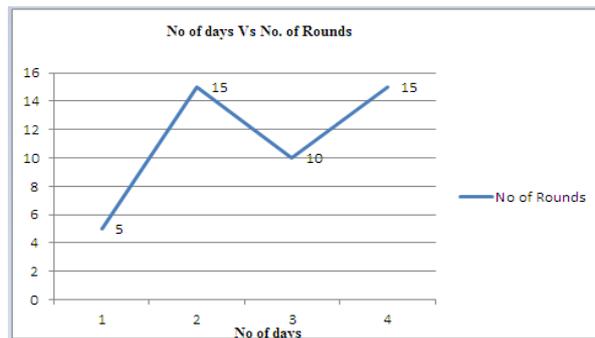
From above data, we can see Number of rounds perform by particular user; we see that 1st day users perform 5 rounds, 2nd day users performed 10 rounds. 3rd day users perform 15 rounds. Day 4 users performed 10 rounds

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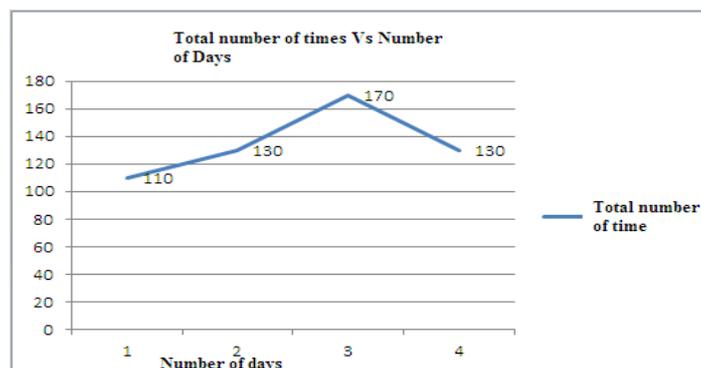
Graph 1: Number of rounds performs by particular user

In our experimental setup, we can find out number of rounds Vs total times.

Sr.No	Day Number	Total times
1	1	110
2	2	130
3	3	170
4	4	130

Table1: Total time taken by particular user

From above data, we can see Number of total times taken by particular user; we see that 1sts day users perform 110 ,day 2 users performed 130s . 3rd day users perform 170s .Day 4 users performed 130s.



Graph 2: Total number of times Vs Number of days

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IX. CONCLUSION

There have been increasing number of health issues growing in today's life of many people. Hence, our app aims to provide a good cardio-vascular workout for the body through the help of Yoga asanas of Surya Namaskar since it has been scientifically proven that its performance have various health benefits.

X. ACKNOWLEDGEMENT

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