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Color based android shuffling pattern lock

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Abstract - *To increase convenience and portability, the devices used for IT services have changed from big immovable machines to mobile devices such as smartphones and tablets. Due to increased use of smartphones for every purpose including storing important personal data, they require a better security. Belonging to the twenty first century, the era of data security where new security schemes are being developed by scientists and engineers every day. Currently we are using pin lock, alphanumeric lock, pattern lock and some other locking applications.*
These days when talking about data security the applications currently being used somewhere lag to fulfill the requirement to some extents.
This idea introduces a new innovation in the field of data security that is an application with improved features such as locking with the help of some colors arranged in the circular pattern and shuffling every time when applied. The applications which use number based authentication scheme or a fixed point based android like pattern scheme are prone to the shoulder surfing attacks, which is a type of password guessing using social engineering as a hacking tool." [2]

Key Words: **Android, Security, Shuffling, Smartphone, Authentication, Pattern Lock.**

1.INTRODUCTION

These days we can find many cases of data stealing by the attackers for making their own profit by using the hacked (stolen) data. When talking about different types of attacks on personal data of users and precautions against them, there are many possible ways for both. Manually input passwords are the most commonly used security schemes in daily use applications. It has been scientifically proven that human brain chooses a psychologically weak password, as they face problem remembering strong ones, which can easily be guessed by shoulder surfers. Then came the pattern scheme in existence which is the most used security scheme till the date for security in mobile devices. Also the bio-metrics are being used on a large scale level such as banks, defense etc. but when it comes to personal use, it cannot be preferred due to its very high cost. Apps related to networking services (i.e. chatting, social-networking, e-mailing, net-banking etc.) are more prone to attacks as they contain more important information. In this we propose an upgraded (innovative) idea related to android app locking with the help of 6 color block pattern arranged in circular user interface. The color sequence of the pattern gets shuffled every time when the locked application is given an attempt to open.

2. RELATED WORKS

2.1 PIN Lock

It is most basic idea of security application. A PIN generally consist of a combination of 4-digit (from 0-9999) strong enough not to be guessed by anyone. It is very commonly used in smartphones to lock applications and even the screen of the phone. In order to unlock a locked application, the user applies the same no. sequence (4-digit PIN) which can easily be remembered by someone if once noticed. [4]

2.2 Alphanumeric lock

Alphanumeric password is somehow similar to PIN but provides a higher level of security with a combination of numbers and alphabets and hence the name given to it. But when technically speaking it becomes more risky as the users apply the passwords related to their real lives such as their date of birth, pet name, name and many more which becomes very easy for the shoulder surfers or someone known to the user to guess the password. [1]

2.3 Pattern lock

After finding the vulnerabilities and weaknesses of Pin and Alphanumeric locking scheme, an advanced an advanced scheme was introduced for security in smart- phones. Pattern security scheme gives a facility of complex formation or pattern to the user. It consist a User Interface having 9 dots arranged in 3*3 matrix. Instead of remembering passwords the user just have to remember the formation applied to lock the application.
Even by using a 3*3 matrix of 9 blocks (dots) which gives a complex formation for higher security, I becomes very easy for the attackers (or the people around the user) to guess the pattern formation by continuously noticing the hand gestures when the user is applying the pattern to the locked application.

2.4 Bio-metric lock

Biometrics need the biological information of the user such as thumb-finger impression, face structure, voice pitch and toning and retina size and color. All these need an external hardware and a big database to manage a successful secure application. The hardware needed is very costly and needs a very high maintenance. [3]

3. PROPOSED PLAN

The work flow diagram shows the two processes:

3.1 Save the pattern and lock applications

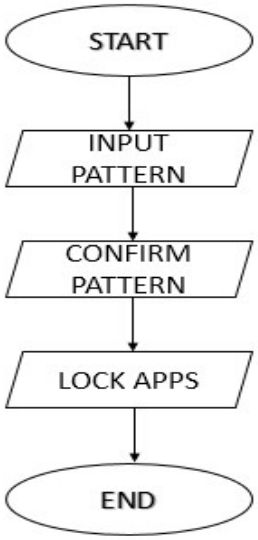

Fig -1: Save the pattern and lock applications

First ow describes the initialization of the locking applications for the first time the user have to create the pattern and go through conformation of that pattern and then select the applications which needs security. The sequence will be saved.

3.2 Opening of the lock applications

In the second ow, when the locked application will be opened the same UI of six color blocks will appear to apply the formation but this time the colors will be shuffled which will create a new pattern having the same sequence of colors. This sequence will be then compared with the

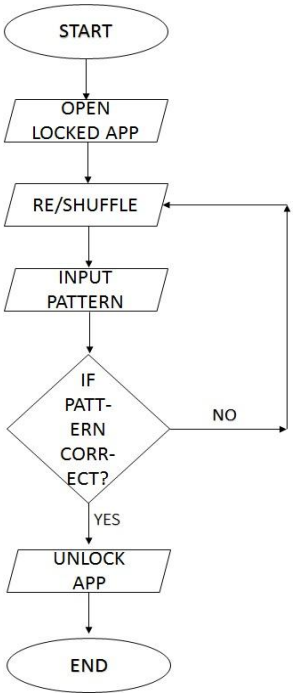

Fig -1: Opening of the lock applications

sequence saved, if the pattern does not match the position n of the colors will reshuffled again and user will have to input the pattern again. If the pattern matches, the application will be unlocked.

3. SUMMERY

Typically the inbuilt features and various locking systems are providing security to the applications in the smartphones, but they are not up to the mark. They are vulnerable to smudge attacks and shoulder surfing, where the passwords can be easily determined. In this paper, we analyzed the problem in the current locking schemes used in the smartphones. By providing shuffling of the colored blocks in a circular form, it improves security and users convenience.

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