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Surveying Techniques and Development of Authentication Key in Smart-Devices

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Abstract*: *In today's digital era of technology secure authentication is the basic need of every smart system. As the information security is the prime need of today's systems so the authentication is the basic step of the process of authentication for the confidentiality of information. In this paper different authentication techniques and their development are given. Also we have described the comparison of them. The form of password from it's simple to complex form is described.
Keywords: Alphanumeric authentication, graphical authentication, biometric authentication, securing password, information security.

I. INTRODUCTION

In older days before the age of smart systems the information was printed on the papers and kept in cupboards. After the completion of the work cupboard was locked and the key was given to the trustworthy human being. File work we can consider in office, school, colleges, hospitals, medicals, banks, etc. Also the considering the same case in government offices too. But the question raises that, were documents completely safe? Also the salary was needed to the human being who is taking responsibility. Fig.1 shows the medical records stored in cupboard [18].

Fig. 1. Medical Record Storage

After the advancement in technologies instead of hardcopy files softcopy files are generated and stored in hard disks which can be internal or external. In this case instead of human being software is needed to guard the documents. So the information security is the sensitive aspect generated. Here a creative shot is generated showing the hard disk with lock and tag respectively to encryption and secured data, Fig. 2 shows the creative shot of hard disk as described [19].

Fig. 2 Hard disk

II. LITERATURE SURVEY

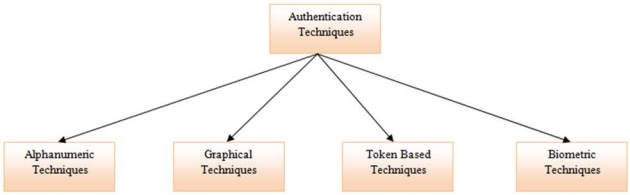

Fig. 3 Authentication Techniques

A. *Alpha-Numeric Authentication Techniques*

The system takes the ASCII characters which are printable as an input to it. It may consist of combination of alphabetical characters (A-Z or a-z), numerical characters (0-9) and special characters (@,-,+,_,%,^,#,$,etc.) that is taken as password or key for the system [16].

1) *Alphabetical Key:* In the system the alphabetical key as password which ranges from the upper case and lower case letter of A-Z and a-z respectively or the combination of both. Here the Fig. 3 shows the login window of user which taking the alphabetical password to system [3] [6].
2) *Alphanumeric with special characters Key or Hybrid:* Here the combination of the alphabetical or the numerical or special characters is taken. Fig. 4 shows the login window of user which taking alphanumeric with special characters as password [6] [20].

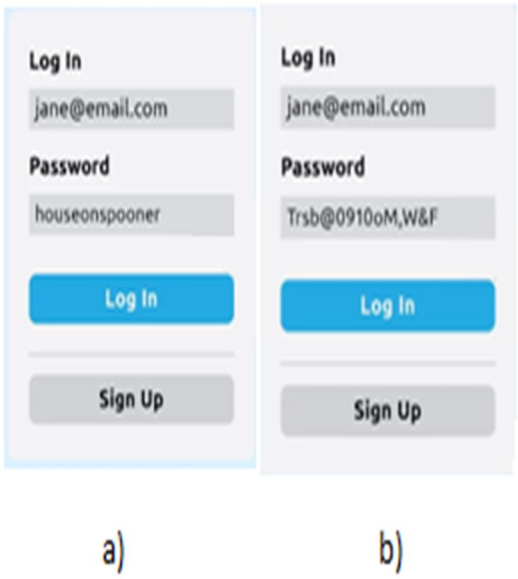

Fig. 4 Password Methods: a) Alphabetical , b) Alphanumerical with special character

B. *Graphical Authentication Techniques*

Graphical password authentication is a memory based task [10] [11] [13] [17]. Depending on that it has been classified into following categories:

1) *Recall Based Graphical Authentication:* In the recall based graphical authentication a secret password is drawn and recalled using the system. It is further classified into pure and cued recall graphical authentication, here in these methods of authentication password is called by without hint and with hint respectively [7] [8].
2) *Pure-Recall Based Graphical Authentication:* In this method of system algorithm techniques used are draw a secret, background draw a secret, doodle pass, yet another graphical password, pass shapes, pass go, GrIDsure, etc.[2] [4] [5].

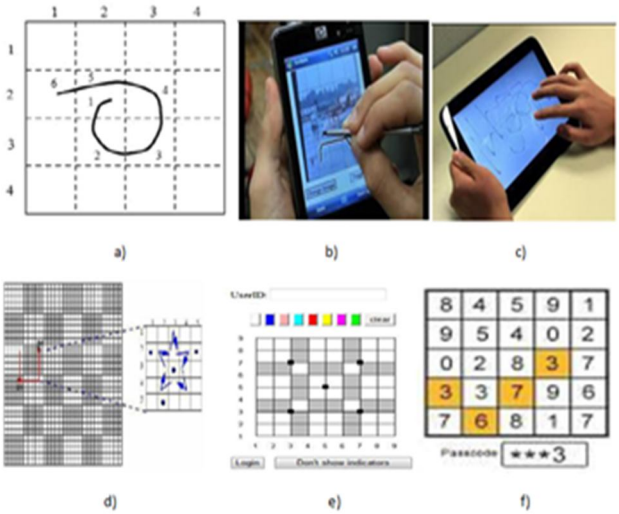

Fig. 5 Pure-Recall based techniques: a)DAS, b)BDAS, c)Doodle Pass, d)Pass shapes, e)Pass Go, f)GrIDsure

3) *Cued-Recall Based Graphical Authentication:* In this method of system algorithm techniques used are pass-points, cued-click-points, persuasive-cued-click-point ,etc.[2] [4] [5].

Fig.6 Cued-Recall based techniques: a)Pass-points, b)Cued-click-points, c) Persuasive-cued-click-point

4) *Recognition based Graphical Authentication:* In this method of system algorithm techniques used are pass faces, Déjà vu, story system pass, etc. [2] [4] [5] [8].

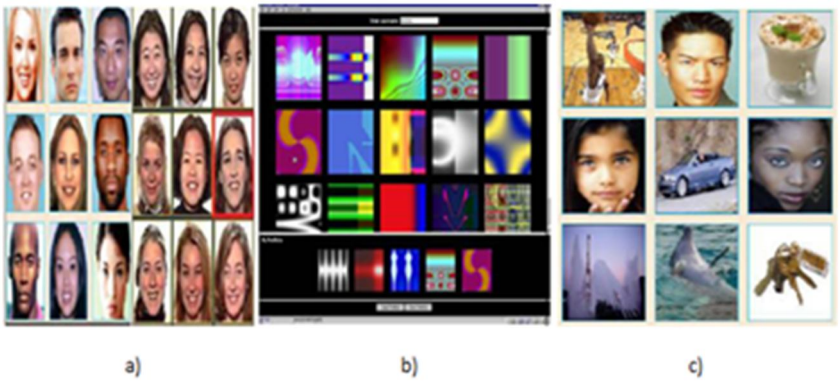

Fig.7 Recognition based techniques: a) Pass Faces, b) Déjà vu, c) story system pass

C. Token Based Authentication Techniques

In token based authentication system techniques used are in the form of tokens such as smart card, ATM card, railways valid ticket user entry token, one time password, self secure digital lock, etc.[2] [4] [5] [14] [21] [22] [23] [24].

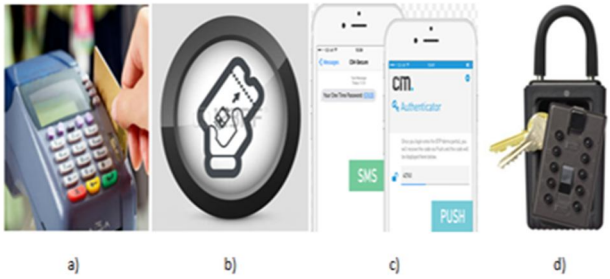

Fig 8 Token based techniques: a) ATM card, b)Railways valid ticket user entry token, c) OTP, d)Digital Lock

D. Biometric Authentication Techniques

Biometric techniques:1) Finger print technique- A fingerprint is nothing but impression of the friction ridges (raised portion on palmer, digits or plantar) of all the fraction part of the finger. See Fig.1. Biometric techniques -a. 2) Face recognition technique- It is application of smart system for identifying and verifying a person from digital image or video stream in real-time or offline mode of camera. See Fig.1 Biometric techniques -b. 3) IRIS technique- It uses the iris of eye which is nothing but area surrounds the pupil. IRIS patterns are unique. See Fig.1 Biometric techniques -c. 4) Hand geometry technique- It includes the measurement of width, length, thickness and surface area of hand. See Fig.1 Biometric techniques -d. 5) Retina Geometry technique- It is based on the unique blood vessel pattern of the retina of the eye. See Fig.1 Biometric techniques -e. 6) Speaker recognition technique- It is based on the vocal characteristics. See Fig.1 Biometric techniques -f. 7) Signature technique- It is based on the dynamics of making the signature. See Fig.1-g. 8) Other techniques- Consists of palm print, Hand vein, DNA, Thermal imaging, Ear shape, Body odor, keystroke dynamics, fingernail bed etc. See Fig.1 Biometric techniques -h, i, j, k, l. [1] [9] [12] [15].

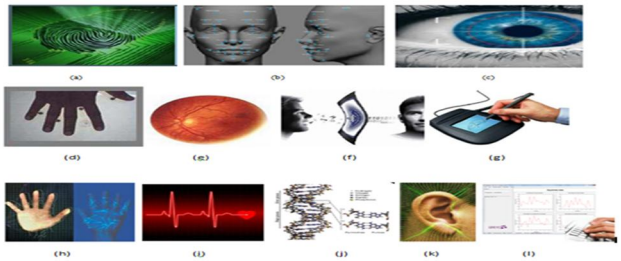

Fig.9. Biometric techniques

III. SECURITY AND PARAMETRIC GOALS

Here depending on the different parameters comparison of the authentication techniques is given [3].

TABLE IPARAMETRIC COMPARISON OF TECHNIQUES

Parameters	***Authentication Techniques***			
	Alphanumeric	***Graphical***	***Token***	***Biometric***
Security	*Low*	*Medium*	*Higher*	*Highest*
Complexity	*Low*	*Medium*	*Higher*	*Highest*
Attacks Immunity	*Low*	*Medium*	*Higher*	*Highest*
Time Consumption to process	*Low*	*Medium*	*Higher*	*Highest*
Password Space Requirement	*Less*	*Depend on Selection*	*Medium*	*More*
Remembering	*Depends*	*Medium*	*Medium*	*Easy*
System Cost	*Less*	*High*	*Medium*	*Highest*

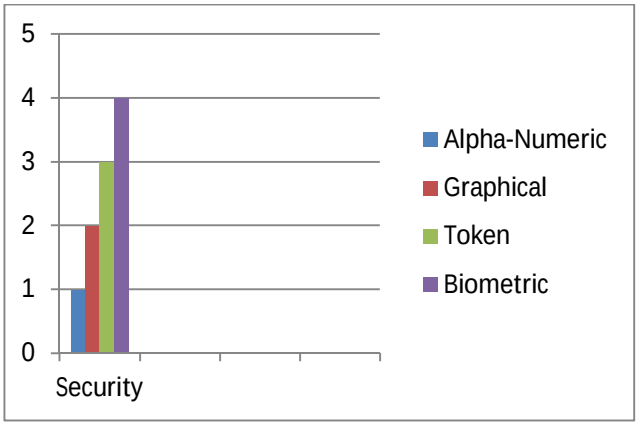

Fig. 10 Graph of Security Level Comparison in Authentication Techniques

IV. CONCLUSION

The paper describes the different existing authentication techniques with sub-techniques and also respective algorithms. Comparison of techniques with respect to different parameters is given. With technology advancement, no technique remains ideal, so evolution happens.

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