Examining the Identification Systems (Biometric) Applicable In Banks Using Infrastructures of Electronic Banking
(The Case of Mahabad Melat Bank Branches)

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Abstract: The goal of the present study is to examine the identification systems (biometric) applicable in banks using infrastructures of electronic banking. So, the study is applied. The data is gathered by means of researcher-developed questionnaire. Therefore, the study is that of descriptive and survey-based. The statistical population comprises of public and private banks' clients chosen using simple random sampling method. 262 questionnaires were analyzed. To study the hypotheses, descriptive statistics, Friedman and binomial test were used. The results showed that none of the physiologic biometrics, behavioral and chemical sets was appropriate for electronic banking. The first five prior methods were reported by participants as pal scanning, fingerprint, DNA, iris print, and retinal imaging. In addition, twenty-sixth to thirtieth prior methods were found to be face mobility, physical form of fist and 3D fingerprint, odor sensing, face mobility, and face form.
Keywords: infrastructures of electronic banking, physiologic biometrics, behavioral biometric, chemical biometrics

Introduction

Non-development is an issue in dynamic world where rivals tend to make ultimate efforts. Nowadays, technology has captured the attention when it comes to establish discussion on progression and development. Benefits of natural, economic and strategic factors are substituted or using the science and techniques in today's rapid-changing world. Currently, competitive advantage of countries depend on technologic-based competitive advantage rather than relying on inherent natural resources or existing industrial potentials. Since the new technologies have adopted multi-dimensional nature due to the integration of diverse sciences and techniques, policy-making requires total putting into perspective and long-term retentions.

Recent developments in informing and technologies of imaging have enabled people to make use of biometric systems. Biometric systems are the ones having the capability to extract the identification sample and compare the referred data. Also, this systems is able to recognize whether the claimed person is the same individual or not (Thompson, 2006). To answer the aforementioned question, the person's identification should be determined. On the other hand, it is evident that the communication among people is turn out to be electronic-based. So, it is essential that people's identification is determined in an accurate way 9 different indexes are considered such as finger, palms, legs, faces, eyes, chicks, teeth, vein, voices, signatures, typing and walking) so that a number of identification problems are resolved. As an example in case, DNA was used in forensics, but nowadays identification systems are equipped with high-accurate and reliable systems. Recant development in the field of information technology and machines visionary systems along with the importance of security has led to the fact that rapid developments are done in the field of intelligent identifications.

Biometric is a type of science which is concerned with measuring the biologic or behavioral characteristics of people or confirmation of their identification (Mehrabian et al. 2006).

The concept of biometric

The communication era undergoes four factors; globalization, change, rapidness and information. The important of the last factor which is the most important factor in this category has resulted in the fact that the information security and access to information security are considered. On the other hand, interaction of people with different systems in new communities has brought about the formation of new concept named electronic identification or cyber-based identification. The realization of this concept in using biometric characteristics to identify people by biometric systems has been the scope of studies conducted on national and international level. The biometric technology is considered as new developed technologies in the field of information technology. In other words, it is regarded as the eye to information world and communication control. Incorporating this technology in different areas has resulted in the notion that true understanding of it is made by opting total and multi-dimensional approach. The biometric technology is the automatic confirmation of people's identities through examining the physiological or behavioral characteristics (such as fingerprint, iris scanning, face detection, shape of hand, and etc.) (Sajedi & Jamebozorg, 2006).
Identification systems
Identification confirmation methods are categorized by three factors:
Things that users are aware of (such as PIN)
Things that user have (ATM cards, intelligent cards)
Things related to users themselves (biometrics such as fingerprint, iris sample, and retinal)
The third category developed safer and more secure factor of identity confirmation in information and communication world. Biometric is concerned with automatic face detection methods of individuals' identity confirmation through measuring physiologic or behavioral characteristics so that biometric is taken into account as a new technology (Mohamadpor, 2012, p. 17).

Thanks to the development of internet and electronic banks, identification process has attracted the attention of pioneers. The password is most common method in using identification knowledge for its realization. As an example in case, person who refers to internet-based systems is forced to provide information so that the identity is realized. Although there are many advantages of using identification process, a number of challenges exist such as forgetting the password which is regarded as fundamental issue (Moeinzade, 2011, p. 30).

Behavioral biometrics

As the name suggests, these metrics measure some of the human behaviors. The first and most common characteristic is the signature. Today, new methods such as typing and other people's voice are used (Hasanabadi, 2007). It is feasible to consider that signature is one of the first approaches of identification. People should draw a picture or compose some lines of writing so that they are compared with the original forums. It is clear that this approach cannot be used in an expanded way. Unavailability of signature sample and human error are among the problems which restricts the usage of this approach. One digital signature is an asymmetric decoding.

Chemical biometrics
DNA

In this method, constant DNA data strips are examined to make the identification which is a rapid and accurate method. Sine this method requires that a long time is spent for each sampling and identification, the use of this method is limited and complex (Hatef, 2007, p.71). The temperature reflection of people is an attribute through the examining of which one can access to regular spectrum. This technology can be used for latent identifications. Ultraviolet sensors are expensive to purchase which causes that little use is made (Jalali & Rajabi, 2008, p. 18).

Electronic banking and different approaches related to this term

Electronic banking faces a number of serious challenges and prevention of criminals done in the field of cyber network when attempting to developing strategic goals of electronic business. The way these systems process the transactions define the level of detrimental aspect and this level of risk is higher in the case of

internet since the identity is not known (Phua, 2003). People tend to increase online purchasing. Based on the study conducted by Islinilsen (2005), one tenth of people across the world tend to purchase the goods in online way (Kelly, 2003).

Baks have recently endeavored to achieve electronic banking services and traditional methods have been substituted for the new methods which focus on using the information technology tools for enjoying the banking services. The quality of service providing, service quality, and the attributes related to the electronic baking services are directly relevant to the amount of clients' tendency to use these services. Also, these services have positive effect on satisfaction and loyalty of clients with regard to the electronic baking. In addition, competitive atmosphere governs the management of banks regarding developing electronic banking services. In such cases, the clients would have higher levels of expectations to receive better quality (Rasoli & Manian, 2011, p. 42).

Conducted studies

Salehi Naseh (2011) indicted in his paper entitled the electronic signature and its role in proving the struggling that the commonality of electronic business requires the ensuring of credit and security by legal systems. One of the most important instrument to develop credit is the acceptance of electronic signature and providing its technical requirements. Currently, electronic signature is considered as the legal function equal to the manual signature which is also accredited by legal system. The electronic signature does not differ from other similar legal systems. This means that when the electronic signature meets the required standards and observes the legal issues as well as the fact that the safety is proved by computer, then the same credit (considered for manual signature) is true so that it can be used as a reason when there is legal-based issue. Dogman (2003) employed integral-differential method to identify the iris divisions which separates the upper and lower eyelashes. This method can be considered as Haf conversion changes since it uses the first derivation to explore. This method would yield incorrect responses when the initial image has noises. In addition, it needs spending lots of time to do so.

Kong and Jang (2001) developed a method for identifying and detecting the eyelashes. In this method, separable eyelashes and stuck eyelashes are identified using Gabor filters and variance of photon intensity. Later, circular iris area is reflected on strip through converting the circular coordinate.

Study design

The design of the study is that of survey-based. The statistical population comprises of Mahabad banks. 300 questionnaires were distributed randomly among the clients of banks and 262 questionnaires were collected to make analysis. To collect the data, the scale of questionnaire was developed based on types of biometric method known so far. The questionnaire involved 30 items developed on Likert-five item scale.

Studying the normality of data

Using Kolmogorov-Smirnov test, the data can be examined. This test was done on all data and variables individually. This test is done at 95% level of confidence. In other words, the level of significance is $\alpha = 0.05$. Two hypotheses are at work in the study:

H0: data follow normal distribution

H1: data do not follow normal distribution

In case the p value is greater than 0.05, then data are normally distributed; otherwise, the data are said to follow non-normal distribution.

Table 1. The results of normality test related to variables

result	probability	k-s-z	variable
Not normal	0.001	0.077	Using biometric in e-banking
Not normal	0.000	0.103	Using physiologic in e-banking
Not normal	0.000	0.096	Using behavioral in e-banking
Not normal	0.000	0.114	Using chemical in e-banking
Not normal	0.000	0.185	Using other biometrics in e-banking

The results of K-S test shows that variables are not distributed normally, so non-parametric test of hypotheses is used.

Testing the hypotheses
Main hypothesis

Using biometrics in banks is appropriate through employing electronic infrastructures

The results of binomial test shows that none of the clients is satisfied with types of biometrics (physiologic, behavioral and chemical) regarding the e-banking infrastructure since the probability is obtained as less than 0.05. Also, the optimal responses are less than negative responses; however, the cents prefer the physiologic biometrics over other types of it. Since the men rank of this type of biometric is greater than that of other identification methods and that the probability is less than 0.05, the main hypothesis is not confirmed.

To rank the methods of identification. Friedman test was used. The results of the table indicate that palm scanning, fingerprint, DNA, iris printing and retinal imaging re the first five methods. Also, the smile detection, physical form of fist as well as 3d image of finger, odor, quality of smiling and form of lip are ranked as the twenty-sixth to thirtieth priority.

Table 2. The results of binomial testing related to biometrics usable in e-banking

result	Percent of negative	Percent of positive responses	The number of negative responses	The number of positive responses	sig	Expected value	components
inappropriate	0.95	0.05	248	14	0.000		Physiologic biometrics
inappropriate	0.88	0.12	230	32	0.000	50%	Chemical biometrics
inappropriate	0.88	0.12	230	32	0.000		Behavioral biometrics
inappropriate	0.99	0.01	260	2	0.000		Other biometrics

Table 3. Friedman test related to types of biometrics usable in e-banking

Level of significance	df	Chi-square	number	rank	Mean rank	index components
				1	25.77	(6) palm scanning
				2	25.25	(3) fingerprint
				3	24.56	(23) DNA
				4	24.04	(1) iris scanning
				5	23.70	(2) retinal imaging
				6	22.43	(24) DNA
				7	22.38	(7) body veins (fingers, palm, wrist)
				8	21.24	(5) thermal imaging
				9	21.06	(4) video imaging
				10	20.85	(22) signature scanning
				11	18.12	(20) people's voice properties
				12	16.63	(17) echo of output voice reflected from ear canal
				13	16.37	(25) displaying the body temperature
0.000	29	3946.048	262	14	14.72	(14) skin electromagnetic spectrum (absorption and reflection of photon by skin)
				15	14.51	(12) skin thermal characteristic
				16	13.24	(26) reflected thermal sample
				17	12.95	(15) sub-nail fiber
				18	12.63	(19) handwriting
				19	11.43	(11) skin lines
				20	11.17	(16) auricle form
				21	10.93	(21) manner of walking
				22	10.66	(18) manner of typing
				23	9.80	(27) thermal imaging of body
				24	9.29	(8) lip sign
				25	9.10	(29) the quality of handling things
				26	8.99	(13) smiling style
				27	8.63	(30) physical from of fist or 3d form of fingers
				28	8.52	(28) odor of people
				29	8.20	(9) the quality of lip movement
				30	7.85	(10) form of lip

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