iJRASET
International Journal For Research in Applied Science and Engineering Technology



INTERNATIONAL JOURNAL FOR RESEARCH

IN APPLIED SCIENCE & ENGINEERING TECHNOLOGY

Volume: 3 **Issue:** II **Month of publication:** February 2015

DOI:

www.ijraset.com

Call: 08813907089 | E-mail ID: ijraset@gmail.com

ISSN: 2321-9653
International Journal for Research in Applied Science & Engineering Technology (IJRASET)

Biometric-A Fraud Reduction Technology in E-payment and its impact on Inclusive Growth of India

Swatantra kumar[1], Sanjay Baijal [2], Arjumand Bano [3]
[1]*Research Scholar, Dept. of Business Administration DDU Gorakhpur University*
[2]*Professor Dept. of Commerce DDU Gorakhpur University*
[3]*Research Scholar Dept. of Business Administration DDU Gorakhpur University*

Abstract: Inclusive growth is very important for the progress of developing nations and it is not possible without financial inclusion. Government has already given directives on financial inclusion and most Indian banks and other institutions are taking requisite technological initiatives and solutions to support the policy. Automated Teller Machine has become popular in rural as well as urban areas of the country and it is a very strong chain in the direction of financial inclusion. This century will be known for technology innovations thus people are becoming more and more depended on e-banking, ATM and online money transactions to meet their needs. On one hand with extensive usage of technology people are feeling convenient but on the other hand the increase in financial fraud can't be denied.
The paper focuses on the ways of reducing financial frauds through biometric technology and the process of biometric identification. It also describes its role in strengthening financial inclusion and economic position of India.
Keywords: Biometrics, Biometric Identification, e-payments, financial inclusion, Techno driven Inclusive growth

I. INTRODUCTION

Bank is considered as the securest place to keep our amount and asset for future. To maintain this relationship of faith and reliance, banks must constantly develop their security measures to safeguard customer interest and protect them from any frauds.

In today's techno-enabled era e-commerce is at boom and most transactions like train/bus ticket booking, flight booking, shopping, and payment of various bills are performing online during which customer has to face e-security fear about being stolen of their card details. RBI India has registered **111655 cases** of frauds (as at end of March 2013) pertaining to ATMs, debit and credit cards as well as net-banking since 2009.

European ATM security team has also reported **7345 cases** of ATM related fraud Attack in 1st half year of 2014.

II. OBJECTIVE OF STUDY

A. To give an overview of biometric technology and its working.
B. To know the role and importance of biometric technology in financial inclusion and economic growth of India.

III. RESEARCH METHODOLOGY

The methodology used for the study is descriptive one. Data are collected from the secondary sources most particularly from concerned research articles, Books, Journals, magazines, web sites, various reports and publications of various associations connected with business and industry, reports prepared by research scholars, economists, various committee reports submitted to the govt. etc.

IV. TYPES OF ATM FRAUDS

ATM fraud means taking out of funds illegally from an ATM by a crook by using stolen ATM cards and PIN details. In the last few years (as mentioned above), there have been many reports of hacking into the electronic ATM system as well as in online bank transaction which has caused billion dollars of losses in the banking company itself. Some of the threats are:

A. Eavesdropping
B. Spoofing

©IJRASET 2015: All Rights are Reserved

C. Skimming Attack
D. Phishing Attack
E. ATM Malware
F. PIN Cracking
G. Card Trapping
H. ATM hacking

V. EXISTING FRAUD PREVENTION TECHNOLOGIES

Financial institutions use a variety of technologies and methodologies to authenticate their customers. It may include customer passwords, PIN (personal identification numbers), OTPs (one time passwords), digital certificates, tokens, USB plug-ins etc. One method is completely different from all above is Biometric Identification.

VI. INTRODUCTION TO BIOMETRICS

"Biometrics" word came from the Greek words "bios" and "metric", which denotes life and measurement respectively. "Biometrics" means "life measurement". A biometric system is basically a pattern-recognition system that identifies any person based on their unique physiological or behavioural characteristic that every person possesses differently.

Table 1 : Example of physiological and behavioural characteristics

Physical	Behavioural
Fingerprint	Handwriting
Hand geometry	Signature
Face recognition	Keystroke/patterning
Iris	Voice recognition
Retina	Handgrip dynamics
Voice	Lips dynamics
Ear Shape	Gait recognition
DNA	

Traditional procedures of authentication via usernames and passwords are not enough (Vandommele 2010). Biometric technology slowly replacing the traditional method of token based, PIN based and signature based service. Biometric machinery is realised as an accelerative approach due to involvement of individual's unique features that can be used for identification. Vandommele (2010) labels the different characteristics of biometrics like **Distinctiveness, Universality, Permanence, Collectability, Performance, Acceptability and Circumvention**. Sarma and Singh (2010) also focus on the same characteristics asserting that they should be given full consideration when evaluating biometric technology.

A. Applicability Of Biometrics In E-Banking

1) Biometrics for Online Banking: Many computer, laptops, smartphones etc have inbuilt microphone webcams and fingerprint scanner functionality. These entire modern features enable the banks to install the biometric solution using voice, face, finger vein recognition etc. Banking institutions are now offering fingerprint verification through mouse so that the customer can safely process the banking activity over the internet.

2) *Biometrics in Branch Banking:* A Fingerprint reader system developed for portable PC in banking institution through which banking official place their finger on optical sensor, get permission after matching with previously recorded fingerprints to access the information on certain computer. Most of the banks are securing their transaction after verifying digital signature at the reading location itself instead of at an outdoor location. Moreover **S**ince biometrics delivers fast result so most of the bank branches are using biometric solution in order to reduce the human rush in branch.

3) *Biometrics in ATMs*: There are two approaches of using biometrics authentication in ATMs. One is using only biometric and second is using bank card or pin along with biometric authentication. This brings outstanding benefits to both banks as well as to customer.

©IJRASET 2015: All Rights are Reserved

4) *Biometrics for Mobile Banking*: In many smartphones bank offers financial transactions and customer service through voice or speech recognition.

5) *Single Sign on Solution for Additional Secure & Effective Password Management*: Biometric single sign on (SSO) eliminate the vulnerable password and loopholes of bank data security system thus providing high level of security to customer as well as bank.

VII. WORKING OF BIOMETRIC SYSTEM

A biometric authentication system is a pattern recognition system that works by obtaining biometric data from an individual (enrolment process), extracting a feature set of data acquired, and comparing this acquired sample with earlier recorded template. If the old pattern matched with new scanned pattern then it permits user to process the action. The template may be stored in the system's database or on a token (like smart card etc), depending on the type of application.

The biometric system operates through the following four steps:

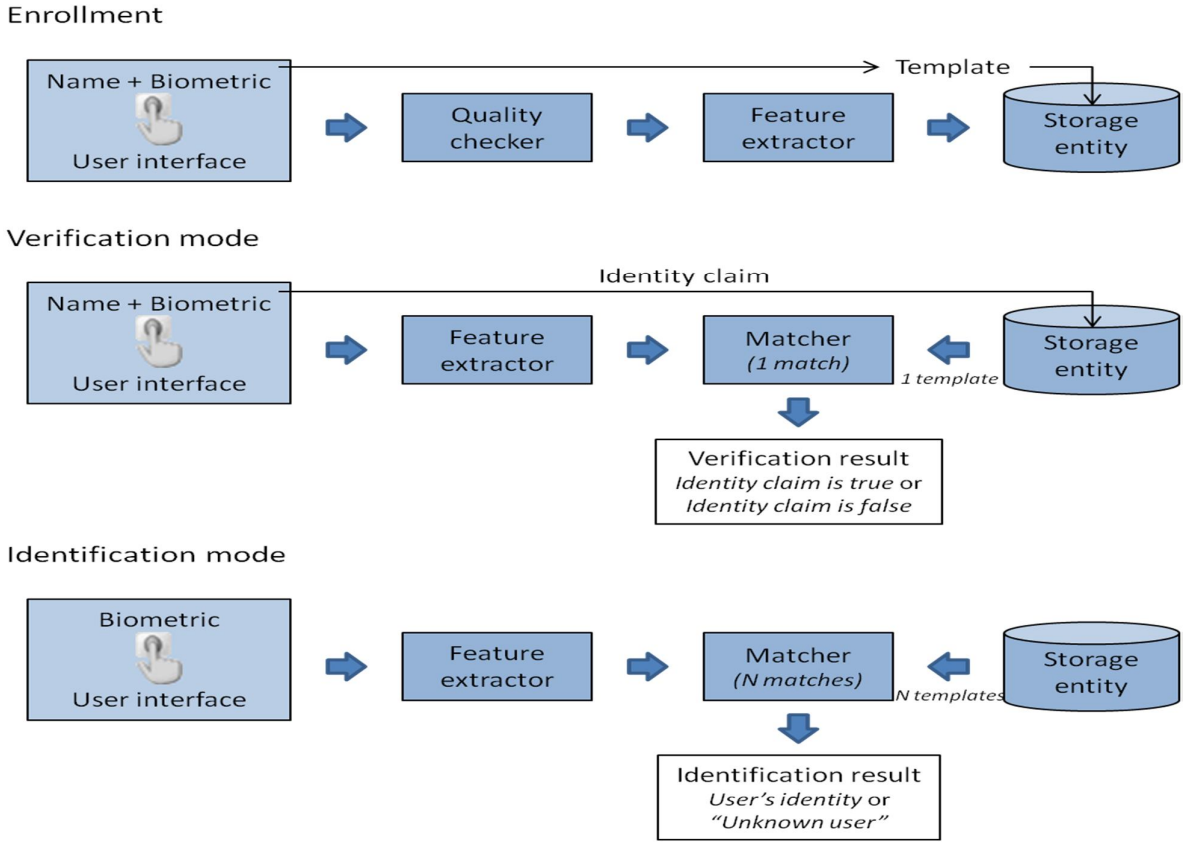
Acquisition of sample -Physical or behavioural biometric sample is taken by the system during enrolment.

Feature Extraction-Template is created by extraction of unique data from the sample.

Comparison- The template is then compared with a new sample.

Matching and decision- Deciding if the features extracted from the new sample are matching or not.

Fig 1: Functioning of Biometric technology



Source: International Telecommunication Union-Technology Watch Report 2009

A. Features used for biometric Authentication

Table 2: List of Biometric Features

Biometric	Trait
Fingerprint	Finger lines, pore structure
Facial geometry	Distance of specific facial features(eyes, nose, mouth)
Retina	Eye background (pattern of the vein structure)
Iris	Iris pattern
Voice	Tone or timbre
Finger geometry	Finger measurement
Hand geometry	Measurements of fingers and palm
Signature (dynamic)	Writing with pressure and speed differentials
Ear form	Dimensions of the visible ear
DNA	DNA code as the carrier of human hereditary features
Vein structure of back of hand	Vein structure of the back of the hand

VIII. ROLE OF BIOMETRIC TECHNOLOGY IN INCLUSIVE GROWTH OF INDIA

A. Need for Inclusive Growth

India needs inclusive growth in order to achieve speedy and well-organized growth. It is essential for sustainable development and justifiable circulation of wealth and prosperity. The core thrust areas are:
Reduction in income inequalities
Elimination of poverty and unemployment
Reduction in regional discrepancy
Societal development
Agronomic Development
Environment protection

B. Financial Inclusion and Inclusive Growth

According to **World Bank** report "Financial inclusion, or broad access to financial services, is defined as an absence of price or non-price barriers in the use of financial services."
Rangarajan Committee (2008) viewed financial inclusion as "The process of ensuring access to financial services and timely and adequate credit where needed by vulnerable groups such as weaker sections and low income groups at an affordable cost."
For poverty reduction and objective growth, financial inclusion is very essential especially for the developing nations. It has been seen that the total development in most of the rising countries are due to economic activities of top few per cent of the whole society. Now through the financial inclusion process the economically deprived groups are contributing to economic progress of the country.

Indian Govt. has given highest priority to the goal of achieving inclusive society as could be seen from P.M's Independence Day speech on 15th Aug 2014, and so also emphasis in Union budget to deepen and broaden the agenda for inclusive development.

The GOI, RBI and NABARD have initiated many welfare programs such as Poverty Alleviation programs, Self Help Groups, General Credit Card (GCC), Kisan Credit Card (KCC), Jan Dhan Yojna, No Frill Account, opening up of more Rural Banks, rural and urban Co-operatives, Farmers clubs, Agri Business Centres, Agri Clinics, Rural Development and Self Employment Training Institutes (RUDSET), etc. Further, some techno-enabled tools have been also initiated by financial institutions to deliver a variety of financial services to the vulnerable and poor to help the drive for financial inclusion such as micro, mobile ATM, Internet enabled kiosks & POs terminals, smart cards etc.

C. Biometric Utility for the Developing World

Without proper identity documents, People can't use their fundamental rights and access various services needed for economic and physical security, democratic participation, and employment. Further with the traditional method of identification & authentication government will be unable to utilize the funds for actual needy beneficiaries. Biometric system being more accurate and safe offers possibility of including people without documentation, such as millions of rural and urban people who

©IJRASET 2015: All Rights are Reserved

even don't have birth certificate.

D. Aadhaar: biometrics ID sparks economic and social revolution

Over three years into the Aadhaar project in India, the Indian government's initial objectives were exceeded in April 2014 with over 620 million UID numbers allotted by the Unique Identification Authority of India (UIDAI).

"*This is the biggest, most innovative development project the world's ever seen. It's going to revolutionize India!*

E. Biometric enabled Distribution ***of MGNREGS Wages and*** *Microcredit*

Many Bio-Metric ATMs with secure finger print authentication system has been installed in order to attain the poor and vulnerable people and to boost micro financing initiatives. Recently in Periakankanakuppam, Pathirikuppam, Pachiankuppam and Thiruvanthipuram villages of Cuddalore District in Tamilnadu. Now illiterate or semi-literate people just have to use their thumb impression on a touch screen which allows them to withdraw their week's wages of MGNREGS. In this system government electronically transfers wages into the bank accounts of workers. Payments are to be done through ATMs in the village's premises itself using biometrics. This shows that Bio metric ATM is very easy to use.



Fig 2: An NREGS worker Laxmi withdrawing her salary using bio-metric sensor ATM at Periyakankanankuppam village in Cuddalore district

Therefore in this way biometric system on one hand ensure leakage proof delivery of payments & wages to the real intended beneficiary and on other hand it promote financial literacy about the banking services. Thus decreasing the growth of informal sources of credit like money lenders (Sharma, 2012) and transfer the economic power from the wealthy few to many which ultimately grow the rural economy.

F. How biometric IDs helps to fight against corruption and bust fake workers.

Biometrics solutions have the great capability to reduce waste and increase the efficiency in people welfare schemes .such as in public distribution system (PDS) scheme which runs by central govt with the help of state govt. A recent report given by Bloomberg says that in just single state of U.P, more than US$ 14.5 billion value of subsidized materials has been siphoned off by bureaucrats and govt officials instead of fulfilling the target for which the fund was released in last decade. The main cause for this widespread malpractice is the traditional identification and manual transactions for recipients, and thus it can be easily manipulated by the fraud people involved in the PDS process. Due to this a large number of intended beneficiaries don't receive the subsidized food supplies. Two fundamentals are essential for transparency of such type of welfare schemes. One the beneficiary must physically present and the other is that transaction should be done in electronic form. Then only there will be no diversion. A great number intended beneficiaries are poor and illiterate so exposed to exploitation. A cost-benefit analysis report conducted by National Institute of Public Finance and Policy (NIPFP) says that considerable benefits may be accrue to the government if various welfare schemes are integrated with biometric system. All these schemes increase up to approx. Rs. 2, 10,000 crore of transfers per annum. In last years, digitalisation of public has completed in many state which gave result into reduction in the cases of leakage due identification and verification issues .i.e. the existence of Ghost recipients, who are actually not untitled beneficiary and real person but absolutely spurious person, who exists merely in files of the officials who implementing the scheme. The money collected through the reduction in leakage is considered as benefit and can be used for its genuine purposes and in other progressive programs.

G. Attendance through biometric

Recently, Indian govt has initiated a Biometric Attendance System (BAS) using the Aadhaar number. So far some 50,000 central govt employees have been registered across 148 organisations in UT Delhi. Now employees have to log in and out daily using their UID Aadhaar card. Their attendance rates can be easily accessed by any one through BAS public domain: www.Attendence.gov.in. This Program is launched to identify the ghost employee, their fraud and further to increase employee productivity. These types of programs have also been implemented in other developing countries such as in Kenya to get rid of ghost workers from payroll.

H. Other Scopes Are:

Airport security, commercial driver licences, passport, and boarding passes in transportation, Prison IDs, surveillance for unacceptable activities, health insurance, student and teacher verification and control. Access control for home, building, offices etc. are other traditional application of biometrics. Biometrics traits are using at majority level in dead body recognition, criminal detection, terrorist identification, misplaced children and parenthood determination.

IX. ISSUES AND CHALLENGES

In spite of the encouraging results, there are still concerns and challenges when collecting and using such information in real life and when trying to set up an identification system at a national level.

A. 100% Participation can't be achieved in biometric based identification system. Say for example due to cuts or burns as in case of farmers and old age people. In some cases people may lost their fingers, eyes as in accident or due to past or present rivalry.

B. Untested accuracy of biometric technology up to a great extent Biometric reports by companies are given in controlled condition thus the report is made after using artificial generated data so there are chances of getting false reading/recognition.

C. People hesitate in providing their biometrics. People fear to provide their biometrics traits as they think it is linked with criminal justice process.

D. At present the cost of biometric technology is very high which may come down when the technology will become popular.

X. RECOMMENDATIONS

A. Awareness programs should be provided by the bank about their e-banking product, services and their use. Different audio and visual media such as radio and TV programs, especially in local languages may give better response.

B. Banks should make special provisions to provide full security of customer funds such as ATMs should have inbuilt CCTV camera.

C. Separate efficient, technical and talented staff should be available in bank for supporting that system and for achieving better service user satisfaction.

D. A well-furnished DEMO room and video conferencing system should be maintained with the banks to demonstrate new technologies and for live communication with the customers.

E. Healthy usage of e-banking is to be promoted through various rural workshops and seminars.

F. There should be a toll-free number to make people financial literate as well as instructing them on steps to use mobile banking.

G. Banks should always offer support to their service users regarding any problems while using e-banking services.

XI. CONCLUSION

To reduce the poverty level and to increase social cohesion, access to finance by deprived and poor groups is a prerequisite. In fact it is a form of empowerment of these vulnerable groups for accessing various goods and services comprising banking services. We have all recognized, technology have ability to perform as a great ladder to attain the final goal of "inclusive growth". Biometric Technology has great potential to offer significant benefits to society. Since it essentially uses human body part like fingerprints, retina, voice etc. for identification and authentication, so it is one of the securest technologies for society. It is because retina, fingerprints etc. all are unique to every person, and every individual profiles thus can be kept without duplication risk. Banks are now deploying these biometric solutions in ATMs to enhance micro financing activities along with security. Moreover, establishing biometric identity for rural illiterate or simply literate people makes them include in banking

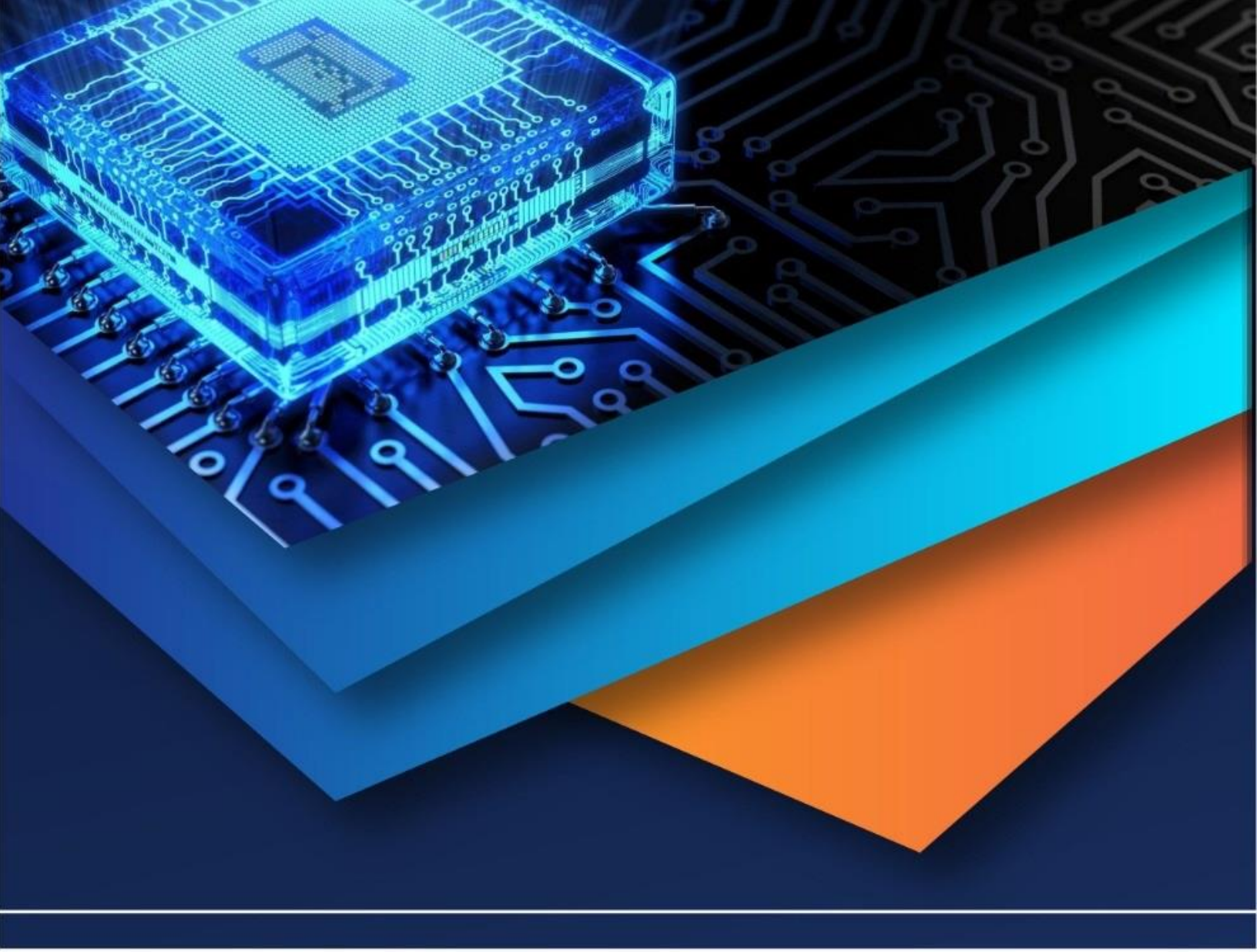
©IJRASET 2015: All Rights are Reserved

user community. Various government initiatives related to identity of people like national ID projects, e-passport, e-licence and various other benefit schemes are further increasing the size of biometric envelop. Thus, Innovative products, effective regulatory norms and leveraging technology together could change the landscape of the current progress of the much needed and wanted, Financial Inclusion Program.

REFERENCES

[1] Anil K. Jain, Ajay Kumar, Biometrics of Next Generation: An Overview. SPRINGER, 2010.
[2] Department of Financial Services (2014): "Sampoorn Vittiyea samaveshan, An Approach Paper for Comprehensive Financial Inclusion", 16 June
[3] Devinaga, R. (2010). ATM risk management and controls. European journal of economic, finance and administrative sciences. ISSN 1450-2275 issue21.
[4] Gelb. A and Clark .J brief: "The Evolution of India's UID Program: Lessons Learned and Implications for Other Developing Countries," CGD Policy Paper 008 (Washington: Centre for Global Development, 2012), http://www.cgdev.org/content/publications/detail/1426371/.
[5] Jain A.K, Ross A. and Prabhakar S. *IEEE Transactions on Circuits and Systems for Video Technology*, 14, 4-20, 2009.
[6] Meenakshi. S and Murugan A., "Enhancing Rural Development in Tamilnadu through ICT: An Evaluation of Latest Technologies in the scheme MGNREGS," *International Journal of Computer Trends and Technology (IJCTT) – volume 7 number 2– Jan 2014*
[7] Mohammed. A. "Use of biometrics to tackle ATM fraud" 2010 International Conference on Business and Economics Research *vol.1 (2011) © (2011) IACSIT Press, Kuala Lumpur, Malaysia*
[8] Rangarajan C (2008), "Report of the Committee on Financial Inclusion"
[9] Sahoo,P ,(2013) 'Direct benefit transfer: Panacea to remove poverty and inequality in India? 'Yojana, planning commission, pp 45-48
[10] Sarma, M. (2012). Index of Financial Inclusion- A measure of financial sector inclusiveness. Berlin Working Papers on Money, Finance, Trade and Development. July,2012, pp. 1-34.
[11] Sarma, G., & Singh, P. K. (2010). Internet banking: Risk analysis and applicability ofBiometric technology for authentication. International Journal of Pure and Applied Sciences and Technology, 1(2), 67-78.
[12] Srinivasan.S (2013) "Bio metric atm- recent trends", kurukshetra, ministry of Rural development Govt of India vol 62 no 9.. pp 39-41.
[13] Syed, Amir Hamza (2014**): "**New Beginning for Financial Inclusion", 14 August, http//www.livemint.com
[14] Vandommele, T (2010). Biometric Authentication Today. [Online] Available at: < http://www.cse.hut.fi/en/publications/B/11/papers/vandommele.pdf> fetched on oct 15,2014
[15] Viswanathan, R (2014): "RBI Report on Financial Inclusion: A Review", Economic & Political Weekly, Issue No 9, 1 March.
[16] Websites Referred:
http://www.bankinfosecurity.com/atm-east-a-7437/op-1 fetched on Oct 15, 2014.
http://www.biometricupdate.com/201410/indian-govt-launches-biometric-employee-attendance-system fetched on October 9, 2014
http://www.ibef.org/.../ Technology-Application-For-Financial-Inclusion-060212_2 fetched on oct 9,2014.
http:// macrofinance.nipfp.org.in/FILES/uid_cba_paper.pdf fetched on 12 Oct 2014
http://www.nrega.net/ict/information/ongoing-ict-projects/ fetched on 28 Nov, 2014
http://www.rbi.org.in/scripts/bs_viewcontent.aspx?Id=2598 fetched on 25 Nov, 2014
http://sanjeevshriya.wordpress.com/ fetched on 19 Oct, 2014
http://uidai.gov.in/UID_PDF/Front_Page_Articles/Strategy/Exclusion_to_Inclusion_with_Micropay ments.pdf fetched on 25 Nov, 2014

©IJRASET 2015: All Rights are Reserved



10.22214/IJRASET

45.98

IMPACT FACTOR: 7.129

IMPACT FACTOR: 7.429

INTERNATIONAL JOURNAL FOR RESEARCH

IN APPLIED SCIENCE & ENGINEERING TECHNOLOGY

Call : 08813907089 (24*7 Support on Whatsapp)