

Biometrics – Steps towards Greener Globe

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Abstract—Traditionally, paper-made registers (musters) were used by almost all organizations for employee attendance; eventually some of them started implementing paper-made time cards called punch cards for the purpose. However, more the paper work, more the slaughter of trees. In other terms, more the use of paper, lesser the trees and consequently higher the rate of global warming. In order to save trees and to put an effort towards greener globe, organizations should switch to a technology called biometrics for employee attendance. Biometrics is an advanced technology wherein the employee's face scan or fingerprint is used for his/her attendance. All he/she has to do is stand in front of a camera or place his/her finger on a reader for signing in and out. Thus attendance can go digital resulting in saving of thousands of trees on earth every year. My attempt through the paper is to explain the concept of biometrics, its main types, their working and finally put forth some instances where some concerned organizations are doing their bit towards a greener globe.

Keywords—biometrics, facial scanning, fingerprint, global warming, greener globe, attendance, identification, verification.

I. INTRODUCTION

Biometrics is the study of life. If we consider the Greek meaning of the term biometrics; it means measurement of life; the breakup of the term biometrics is actually bio and metric where bio means life and metric means to measure.

Biometrics is actually a security solution or system, which relies on detailed measurements of selected parts of human body or behavioral characteristics for authentication. Precisely, human traits such as faces and fingerprints are scanned for identity verification or identification. Other biometrical traits that can be used for the same include study of hand shapes, iris or retina scan, analysis of ear shape, wrist veins, body odor, thermal signature dynamics, gait recognition, voice verification, computer keystroke dynamics and many more. DNA identification is also a popular and increasingly use of biometric technology. In short biometrics utilizes the uniqueness of physical or behavioral characteristics of human beings for their identification or verification.

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A. Facial identification

Face is the oldest biometric which is used most frequently for a person identity. At the same time, according to many industry experts, it is also the most controversial of all biometrics as it hinders privacy. The possibility of misuse of facial image by perpetrators or intruders is maximum with facial identification than any other biometrics including

fingerprint scans. However as compared to fingerprint identification (discussed in section B) facial identification has distinct advantage that it involves a non-contact process. Facial images can be captured from a distance without the need of the person who poses for the facial scan, to touch the scanner or reader.

It is easy for people to recognize faces, but not for computers. Most computerized face recognition systems build a template based on 30 or more "markers". Markers are the positions on face like edges of the eyes, the cheekbones, the base of the nose and so on. The parts of face which are unaffected by any expressions or the presence of facial hair are usually chosen as markers. Matching faces is then just a matter of matching templates.

B. Fingerprints

Fingerprint is the most commonly known method of biometric identification, which is used by police forces not only in India but in more than 30 countries including the US. Ink based fingerprints have been in use for over a century, however in recent years have gone digital.

A fingerprint is made up of a unique pattern of ridges, furrows, islands and deltas. A fingerprint match involves a study of these ridges and others, their bifurcations and their endings which are unique for each individual. A standard biometric system is composed of a sensor for scanning the fingerprint, a processor that stores the fingerprint database and software which distills the arches, loops and whorls of scanned fingerprints into a numerical code and compares it with the template stored in the database. The comparison is performed within seconds, with an extraordinary degree of accuracy and whether a match is found or not is conveyed immediately. Accordingly the match allows or the mismatch disallows access of the subject. Organizations like companies and institutes have realized that fingerprint scanning is an effective means of security which deters buddy attendance.



Fig 1: Biometric fingerprint scanner (Ref: www.kushaltech.com)

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II. SIGNIFICANCE OF STUDY

After years of research and development, organizations are still in search for more secure authentication methods for user access and similar security applications. With the increased use of computers as vehicles of information technology, it is necessary to restrict access to sensitive/personal data. Recently biometrics is gaining increasing attention as these can substantially improve any company's information security posture.

The security field uses three different types of authentication:

- something you know—a password, PIN, or piece of personal information (such as your mother's maiden name)
- something you have—a card key, smart card, or token (like a SecurID card)
- something you are—a biometric

Of these, biometric is the most secure and convenient authentication tool.

Biometrics cannot be forgotten or piggy-backed (shoulder-surfed) like a password or personal identity number (PIN) or stolen, lost or forged like a key, an identity card or a badge.

Though the risk of **privacy infringement** is still one of the most compelling arguments against the widespread use of biometric technology in law enforcement, this view holds less weight today, in the light of recent tragedies. On the other hand, there are people, who insist that:

Biometrics is actually privacy's friend because biometrics safeguards information integrity and thwarts 'identity theft'.

It can't be borrowed, stolen, or forgotten, and forging is practically impossible.

III. ORIGIN OF RESEARCH PROBLEM

A large range of biometric products are commercially available as, today, vendors have several products to offer. Yet due to lack of awareness or fear of change there are several organizations including companies, institutes and banks which have not adopted biometrics for employee authentication. There are numerous organization which still use the conventional attendance systems involving plenty of paper work which is not only cumbersome, sluggish but also against nature as it entails finally to cutting of trees.

According to the Resource Conservation Alliance, it requires approximately two to four pounds of wood to create just one pound of paper. In addition to that the huge amounts of chemicals, energy and water involved in the

process of making paper results in wastage of an enormous amount of natural resources. This can be eliminated by the application of this technology called Biometrics at all places wherever paper cards are used.

Biometrics is a technology wherein a simple harmless face scan or fingerprint eliminates the need of paper altogether. Isn't that good news that attendance of employees can be taken by biometric scanning and all an employee has to do is just give a scan of face or finger for registration and that digital scan is the employee's new timecard? Now every time the employee has to sign in or out, he/she has to stand in front of camera or place finger on screen of the punch device instead of swapping timecard. The reader (scanning device) will not, in any case, mistake the employees face scan or fingerprint for anybody else's or vice-versa as each human is blessed with unique face and fingerprint or many other such traits for that matter. Eliminating the paper timecard eliminates paper mess, leading to saving thousands of trees ultimately leading to a greener globe.

Some organizations use plastic cards instead of paper cards. Again plastic is a big "no" when it comes to save earth. In such a scenario what can be the most suitable option than a simple face or finger scan for employee verification. In biometric-based attendance, the records or logs of employees are saved in softcopy. If the organization feels necessary, a printout of the same can be taken at month end, but even that can be avoided. Thus a lot of paper wastage can be controlled.

IV. FINDINGS AND OBSERVATIONS

Thankfully there are few institutes like banks, companies and educational institutes which are implementing these useful gadgets like biometric punch scanners/readers for authentication. According to a survey depicted by the Director of communications at the Center for Energy Efficiency & Sustainability at Ingersoll Rand where environmental efforts using innovative technology are underway there are currently over

- **2,50,000 biometric devices^[7]** deployed worldwide
- saving **650 million^[7]** timecards each year

Some effective steps in this direction taken in India are

- Canara Bank is the first bank in the country to launch mobile Biometric-voice enabled ATM in Bangalore rural in the year 2007. The Union bank of India unveiled the region's first solar powered, voice enabled biometric rural ATM in March, 2011 at Ghawaddi village in Ludhiana district in Punjab works on solar power, has low power consumption and can support biometric and PIN based transactions. Indian Biometric ATMs were implemented by Catholic Syrian Bank in Kerala and by Union Bank of India in Ludhiana and by Canara Bank in Rural Karnataka. The Catholic Syrian Bank installed its first biometric ATM in 2011 at the Malappuram district of Kerala.

- Sinhgad School of computer studies have deployed fingerprint punch machine for employee attendance. In fact in Maharashtra the State government has made it compulsory for all educational institutes to install biometric attendance system. Many agricultural, engineering and management institutes have set up biometric attendance systems throughout cities like Nasik, Mumbai and Aurangabad.
- Apart from educational institutes retail shops, hotels and hospitals have started embracing biometric methods for employee logging.
- Several IT-based companies have also adopted biometric technology of one or the other kind for employee's authorized access.

Biometrics effectively save paper, consequently lessening the wastage of natural resources and on the top of that provides ease to humans in operating. For instance, a farmer will be more than happy to give a harmless scan at an ATM to withdraw money instead of maintaining a debit card. or a busy corporate manager would prefer to give a quick digital fingerprint instead of taking out his key card for the valet which is in his pocket for swapping and then again be sure that the card goes back to its safe place, otherwise an unfortunate misplacement of the card may lead to forging; that means unauthorized access besides blocking his/her authorized access. Thus the facilities which biometrics provide viz. eliminating the need of memorizing a password, changing it frequently or carrying a card, at the same time carrying the risk of losing the card and its misuse by intruders. Therefore biometrics involving a simple scan of employees body part like face or hand for instance, which he/she naturally carries with him/her, in itself debates, for carrying paper-made timecards.

V. CONCLUSIONS

Not only banks, companies and educational institutes have adopted biometrics for employee attendance, but many such efforts are being taken by other institutes or organizations in every possible way to eliminate paper utilization, for instance, already many educational and research institutes accept submission of research papers online. These days proceedings of national and international conferences and publication of research journals have gone online. Thus now-a-days many conference committees take the step of publishing selected research papers online instead of proceedings in a paper book. We have the concept of e-books spurring up. All these are efforts taken by people from every walk of life, from every sphere or field of work to minimize paper wastage and thereby enhance towards a better planet. Trees are our friends, let us save them and biometric employee attendance is the least all organizations can perform for a greener globe!

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