



Biometric Attendance System: An Innovative Monitoring Mechanism of Public Sector and Government Organizations in Kerala

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ABSTRACT

Punctuality and attendance of all employees are extremely crucial in any organisation. Late arrivals, early departures, and proxy attendance manipulation have long been issues in India's central government, state governments, and public sector enterprises. This has a significant impact on the efficacy and efficiency of the work done in those companies. This has a significant impact on promptly serving stakeholders, decision-making on major state and national issues, and establishing and implementing strategic policies in the political, economic, social, and technological settings. According to the Ministry of Corporate Affairs (MCA) record, only 20% of officers reported to duty on time at 9.00 a.m. The average reporting time in the office was discovered to be 9.24 a.m., which is 24 minutes late on a daily basis. This is true not only in India's central government agencies, but also in the different central, state, and public sector entities at all levels, from Secretariat level offices to village level Panchayat offices. Though the causes and reasons may vary from person to person, this is a severe problem that requires attention. Though the federal and state governments have raised concerns and guidelines on this subject throughout the years, nothing has shown to be effective in resolving the issues. The deployment of the Biometric Authentication System (BAS) in the aforementioned firms would be one of the first and most important solutions to this problem. When the federal government and state governments devised a strategy to implement BAS in their government and public sector organisations, there were differences of opinion among personnel at all levels of these institutions, as well as within the political arena.

Keywords: Punctuality, Biometric Authentication System, Public Sector Organization,

Government Organization

INTRODUCTION

Punctuality and attendance of all employees are extremely crucial in any organization. Late arrivals, early departures, and proxy attendance manipulation have long been issues in India's central government, state governments, and public sector enterprises. This has a significant impact on the efficacy and efficiency of the work done in those companies. This has a significant impact on promptly serving stakeholders, decision-making on major state and national issues, and establishing and implementing strategic policies in the political, economic, social, and technological settings. According to the Ministry of Corporate Affairs (MCA) record, only 20% of officers reported to duty on time at 9.00 a.m. The average reporting time in the office was discovered to be 9.24 a.m., which is 24 minutes late on a daily basis. This is true not only in India's central government agencies, but also in the different central, state, and public sector entities at all levels, from Secretariat level offices to village level Panchayat offices. Though the causes and reasons may vary from person to person, this is a severe problem that requires attention. Though the federal and state governments have raised concerns and guidelines on this subject throughout the years, nothing has shown to be effective in resolving the issues. The deployment of the Biometric Authentication System (BAS) in the aforementioned firms would be one of the first and most important solutions to this problem.

Biometric Authentication System refers to the collecting of human body metrics for the establishment of a data base, verification or identification, and access control purposes. Fingerprints, facial metrics, eye metrics, voice metrics, and other body metrics are among the most important. By implementing a biometric attendance system, the same system may be utilized to monitor and control employee attendance.

Biometric technology, which includes studying human physical traits to identify and verify persons, has been widely employed in various aspects of life for various purposes, most notably in the area of employee attendance (Adewole, K.S., 2011). Biometric punching was first used to identify offenders using their fingerprints, which were examined and stored for use in the event of a subsequent crime.

A biometric attendance system is a biometric machine that is integrated with a time clock and linked to computer software that tracks employee arrival and departure times as well as overall attendance. It features a built-in finger print and face recognition scanner that scans the employees'

fingerprints and face metrics. This makes it easier for the employee to keep accurate time records. This also removes proxy attendance as a form of fraud.

Biometric punching is used to unlock computer systems and equipment, server rooms, Android mobile phones, vaults, and a variety of other sensitive locations and situations. The scope of employing biometric punching in any type of industry around the world has been proven to be immense in terms of security and surveillance, and it was originally primarily manual, with several flaws in such manual surveillance and security. In the workplace, an attendance book was set up, and everyone who was present signed it. This may result in favors for some, especially if they arrive late or by proxy. This system has definitely overcome all of these problems and has become a marvel in terms of its ability to perform in high-risk and high-security environments. These systems also aid in a country's critical defense domain, where a single failure might wipe out a nation's whole defense force.

Employees prefer to steal the firm's output or job efficiency without the management realizing through absenteeism and proxy attendance or punching, according to several research. The traditional employee attendance system, in which employees are obliged to sign the attendance book while reporting to work, allows for late signing, proxy signature, or signing in for absent days, among other things, which has a negative impact on the firm's production and efficiency. According to a research conducted in the United Kingdom, employee misbehavior in the attendance system cost the UK economy almost 17 billion pounds, or 27 million working days. The diagram depicts the detrimental effects of attendance misbehavior on a company's production or efficiency, which could be mitigated by installing a biometric attendance system.

By considering these aspects the investigators tried an attempt to study the biometric attendance system followed by Public Sector undertakings and Government Organizations in Kerala and entitled the study as **Biometric Attendance System: An Innovative Monitoring Mechanism of Public Sector and Government Organizations in Kerala.**

Objectives

1. To analyze the various aspects related to the biometric attendance system of public sector organization and government organization in Kerala
2. To find out the advantages and disadvantages of the biometric system of public sector organization and government organization in Kerala

Research Question

Are the existing the biometric attendance system of public sector organization and government organization in Kerala is effective in ensuring attendance?

Methodology

Employees of a public sector organization and a government organization were polled on several aspects of the biometric attendance system as part of the methodology. Employees of these organisations were polled on their thoughts on the benefits and drawbacks of the biometric system through an unstructured interview schedule after guaranteeing that the participants' opinions would be kept confidential and with their permission, without naming anyone in any of the information provided. While some of them were politically inclined, the majority of them spoke confidently and without prejudice. As previously indicated, the technique was based on opinion polls, one-on-one conversations, group meetings, and a secret opinion basis.

The required data was collected from 90 employees in public sector organization and 100 employees in government organizations of Kerala. The analysis of data collected through the interview schedule through light in to the existing biometric attendance system of public sector organization and government organization in Kerala and its advantages and disadvantages. The opinion of the employees were sorted and analyzed with percentage computation.

Analysis and Interpretation

i. Analysis based on Objective 1 - Case of Public sector organization

The percentage analysis on the opinion poll of employees in Public Sector Undertaking on Biometric system as shown in Table 1 below:

Table1. Opinion of Public sector organization

Opinion	Percentage
Favoured to BAS	94.4
Denial	5.6
Neutral	0
Political leanings	0
Favoured to old system	0

For the study, public limited companies with 90 employees were randomly chosen. These approaches were necessary since the employees were either employee of a public limited corporation or from the government's administrative office, where it is forbidden to comment on the functions of any form of employment. When it came to the Public Limited Company, 90 employees were polled. The majority of employees at the Public Limited Company believed that having a Biometric Punching system was beneficial. Only a small number of people disagreed. Because the employees dreaded the fury of the management, the opinion was based on a secret poll. Out of the total sample, a lion share of 94.4% was in favour of using the biometric punching system with full satisfaction. Only nominal 5.6% employees in public sector undertaking had denial opinion and mental acceptance towards Biometric Attendance System.

1.2 Analysis based on Objective 2 - Case of Government organization

Table 2. Opinion of Government organization

Opinion	Percentage
Favoured to BAS	46.55
Denial	0
Neutral	33.25
Political leanings	13.79
Favored to old system	6.4

A government organization with 100 personnel includes sensitive departments, crisis management departments, the home department, administration, and workers were interviewed by collecting the relevant data. The Government office has a diverse range of viewpoints. Some of them favored the old way of keeping track of attendance. Out of the total sample 46.55% employees that expressed with favored viewpoint on BAS, 33.25% had neutral opinion; 13.79% expressed political leanings, and the remaining 6.4% expressed the belief that there was a lack of freedom and that the system was skewed in favor of the system.

The analysis of findings were depicted in the following Figure 1

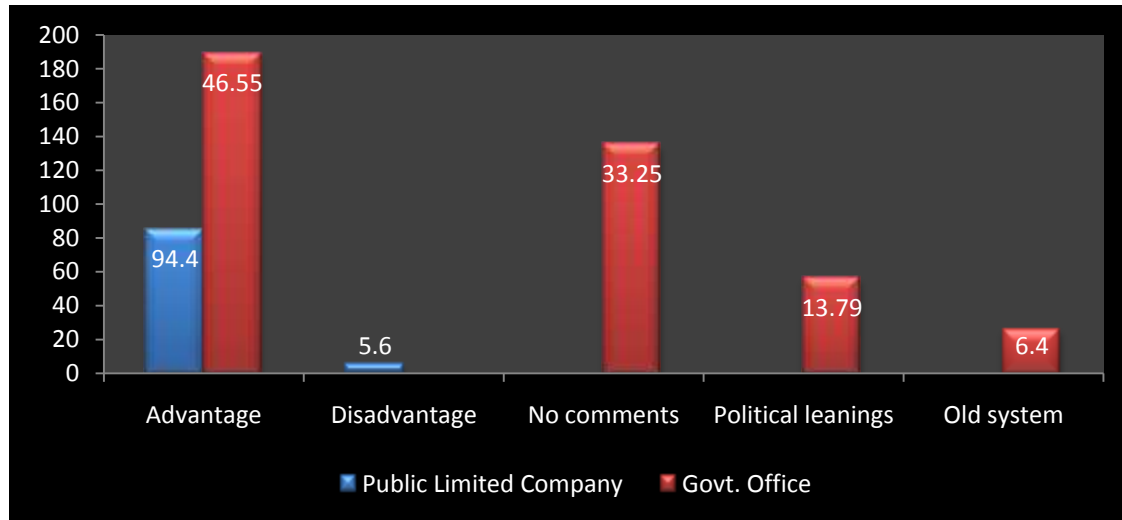


Fig. 1 Opinions of employees on BAS

ii. Analysis based on objective 2 from interview schedule

The unstructured interview schedule enable the investigators to find out a no. of advantages on BAS for effective and systematic monitoring of quality work time in their professional place as specified below:

- It is simple and convenient to use. There is no need for a PIN or swiping.
- No proxies are permitted. The user is the only one who can sign in. Individuals possessing identity cards were previously granted entry, and there was no means of knowing if these cards had been stolen or counterfeited.
- There are no passwords; therefore there is nothing to remember.
- There will be no latecomers. Employees at the Public Limited Company believe that if they arrive late on the third day, they will lose a half-pay.
- There are no long lines. Employees may have to queue if an attendance register is required.
- There is no need for an external identification card. Previously, the employee had to show his or her identity card to gain access to the building.
- Return on investment (ROI). Keeping track will be better than the previous system of keeping an attendance register in a huge organisation with a high number of employees.

The interview schedule helped the investigators to pick out some notable demerits on BAS as below:

- It will be difficult for the biometric system to identify the user if the data is not fully collected.
- The biometric system is vulnerable to hacking.
- Users will be unable to log in if the system is not properly maintained.
- The system is expensive to keep up with.
- If a user's finger is injured, he or she will be unable to log in.
- Handicapped people who have lost fingers may be unable to operate.
- In the Government office, the amount of space within the building was enormous, and the personnel density in relation to the amount of space occupied was excessive. The officials in charge had been extremely stringent in enforcing the rule that all employees must punch while coming in and out. However, there was no mechanism in place to track employee movements while they were at the office. Many of the employees were discovered using the back entrance to leave on various pretexts, only to return when they were told to leave during their lunch recess or while heading out in the evening. As usual, the work is unproductive.
- If the system is hacked, the user's identity cannot be changed.
- A technical administrator will be required to maintain and manage the system when a new user is added.
- The environment can also affect the system's ability to function. The system can display error reports in extremely cold environments.
- In situations where attendance is a problem, additional hardware may be required. This will necessitate the procurement of monitors, cameras, and personnel to operate the monitors.
- The most significant downside is that it is unsanitary. The current "Corona Virus" has had a significant impact on the biometric punching mechanism. Because of the risk of infection, most offices have discontinued utilising this technique. Though disadvantages outweigh the advantages as stated, Biometric punching system is considered a boon in many industrial and administrative units. This is because of the error factor which is considered to be nil.

Considerations of BAS

The biometric attendance system has three steps: capture, processing, and comparison. Capture entails scanning biometric data, processing entails processing the acquired data to extract the unique properties associated with a certain person, and comparison entails comparing the processed data to previously record or saved data in the database. The best biometric technology to use is determined by the organization's unique needs. Level of security required, whether system to be attended or unattended, whether system to be resistant to spoofing, reliability level, number of working hours of the machine, system backup requirements, time taken for enrollment, how many types of report available, and so on are some of the requirements to consider.

Installation of BAS

Before implementing BAS in a company, there are a few things to think about before purchasing biometric punching machines. The following factors are taken into account:

- 1) Number of employees in the company: An organisation with a large number of people, such as a manufacturing company, may need to purchase a sufficient number of machines. There should be enough machines so that staff does not have to wait in lines. Otherwise, the employee can claim that they were stuck in line for an extended period of time as an excuse. Because the majority of staff will come 5 minutes before the start of work. As a result, there should be enough machines to prevent a line from forming.
- 2) Department size: The number of biometric machines to be purchased may be determined by the size of the organization's departments. If a department has a certain number of employees, for example, a separate biometric equipment can be deployed just for that department.
- 3) Employee-to-Biometric-Machine Ratio: Another factor to consider is establishing a standard for employee-to-biometric-machine ratio. A man-to-machine ratio of 1:25 or 1:30, for example, would be standardised.
- 4) Number of devices: The number of biometric machines to be purchased can be determined using the aforementioned criteria. It's always a good idea to keep a few extra machines on hand in case of an emergency.

- 5) Biometric machine installation location: The location of a biometric machine installation might be a critical decision for a company. It must be chosen if it should be kept at the main entrance gate, near the administrative office, or near the involved departments. It can be kept near the office entrance door for small businesses. The machine, on the other hand, can be kept at the front gate for industrial companies with a smaller campus. However, for manufacturing companies with a larger campus and multiple buildings spread out over a large area, it is preferable to maintain machines in specific buildings. If the machine is located at the main door, employees will have to go 5 to 10 minutes to their respective departments after punching, which is a waste of time.
- 6) Device costs: There are a variety of biometric machine manufacturers and models accessible on the market. The typical price of a biometric machine gadget is between Rs. 5000 and Rs. 25000. The price may vary depending on the features offered, such as fingerprint punching just or with facial recognition, voice recognition, and eye scanning, among others. The equipment may cost Rs. 5000 with simply finger print scanning and Rs. 25000 with additional functions.

Suggestions to overcome disadvantages

The following approaches for overcoming the BAS's drawbacks could be used in government and public sector organizations:

1. Organizations should guarantee that all data is gathered such that the user may be identified without difficulty. They can do this by using a variety of data collection methods such as fingerprint, face, eye-ball recognition, voice, and so on.
2. To prevent hackers from hacking BAS, proper and powerful firewall protection should be deployed.
3. The BAS should be properly maintained by a skilled IT professional so that the issue of login can be resolved.
4. Hiring qualified IT personnel would help reduce the cost of upkeep.
5. Even if the user injures his or her finger, numerous finger prints can be kept in the BAS so that the user can register their attendance using any of those fingers, as well as other metrics such as face and voice recognition.

6. Other metrics, such as face and voice recognition, can be employed to compensate for handicaps.
7. Vigilance CCTV cameras can be installed inside the office to monitor the movement of personnel to address the issue of officials leaving the workplace during working hours. Furthermore, if practicable, automatic doors linked to punching machines can be built so that whenever an employee enters the building, the punching machines are activated.
8. When he or she goes outside, he or she must punch the BAS machine. In addition, only one way should be maintained for both access and exit.
9. The BAS should be installed in a weatherproof location to ensure that the system is not affected by the elements and that an error report is not generated.
10. The user's identification can be verified using several metrics such as face and voice recognition, eye-ball recognition, and so on, so that the identity can be verified as needed.
11. Because most government and public sector workplaces are computerised and digitalized, the BAS can be operated and maintained by the same IT people.
12. The face scanning and eye-ball scanning metrics can be used to solve the sanitary problem. Employees can use sanitizers before and after punching if a sanitizer vending machine is kept near the BAS.

Conclusion

Many businesses have benefited from implementing BAS in their workplaces, not just in terms of resolving attendance difficulties, but also in terms of increasing productivity, efficiency, and lowering expenses. The GHMC commissioner noted at a Smart Cities Council India Conclave on Smart Technologies that the BAS not only helped the Corporation achieve a positive outcome in terms of productivity, but also helped it reduce its total monthly compensation of Rs 30 lakh by around Rs 8 lakh due to employee absenteeism. The company will undoubtedly gain from proper execution, which is backed up by supportive norms and regulations. These advantages are also available to public sector and government organizations who implement the BAS. Employees of these public sector and government organizations could attend a motivational training and counseling session to help them establish a positive attitude toward the BAS implementation. Employees that are punctual and timely may be rewarded through a reward system related to this

BAS. This reward system could be in the form of a credit point system, which may be utilized to provide annual wage increases or yearly best employee of the year awards. These credit points might also be taken into account when offering promotions to these firms' employees.

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