





As shown in the fig the system consist of three main apps : Employee App, Central Server and Manager App. The Employee App should be run continuously in the android mobile phones of the employees in the company. The Manager app provides the details of Employees to the Manager through the mail. The database is stored in the central server which is accessible only to the Manager.

The details about employee like history of incoming calls, outgoing calls, SMS history, web browser history, data usage, unauthorized call list and location of employees are provided to the manager and it helps the manager to determine the behavior of employees working in the company[6]. The system uses JSP for server side implementation. The database used is mysql as it is open source and user friendly. Apache tom-cat and Xampp along with Android Studio are used designing the system [5]. The database connectivity is done and thus information is displayed to the manager in the form of JSP and HTML web pages and thus it helps the manager to improve the output of company.

#### Software Requirement:

Core java 1.5 or higher, eclipse android SDK, bluestack, ms access, my-sql database, jdbc driver, micromedia dreamweaver, apache tomcat server, Google chrome 2 or higher for html file templates.

#### Hardware Requirements:

ATX cabinet ,core 2 Dual processor or higher, 128 GB HDD minimum ,modem for website upload with internal for uploading ,android mobile minimum 4.2 ,USB cable.

#### K-means Algorithm:

Clustering is the process of partitioning a group of data points into a small number of clusters. For instance, the items in a supermarket are clustered in categories (butter, cheese and milk are grouped in dairy products). Of course this is a qualitative kind of partitioning. A quantitative approach would be to measure certain features of the products, say percentage of milk and others, and products with high percentage of milk would be grouped together. In general, we have  $n$  data points  $x_i, i=1 \dots n$  that have to be partitioned in  $k$  clusters. The goal is to assign a cluster to each data point. K-means is a clustering method that aims to find the positions  $\mu_i, i=1 \dots k$  of the clusters that minimize the square of the distance from the data points to the cluster. K-means clustering solves

$$\operatorname{argmin}_c \sum_i \|x_i - \mu_{c_i}\|^2 = \operatorname{argmin}_c \sum_i \|x_i - \mu_i\|^2$$

where  $c_i$  is the set of points that belong to cluster  $i$ . The K-means clustering uses the Euclidean distance  $d(x, \mu_i) = \|x - \mu_i\|^2$ . This problem is not trivial (in fact it is NP-hard), so the K-means algorithm only hopes to find the global minimum, possibly getting stuck in a different solution [9].

#### Algorithmic steps for k-means clustering

Let  $X = \{x_1, x_2, x_3, \dots, x_n\}$  be the set of data points and  $V = \{v_1, v_2, \dots, v_c\}$  be the set of centers.

- 1) Randomly select ' $c$ ' cluster centers.
- 2) Calculate the distance between each data point and cluster centers.
- 3) Assign the data point to the cluster center whose distance from the cluster center is minimum of all the cluster centers..
- 4) Recalculate the new cluster center using:

$$v_i = (1/c_i) \sum_{j=1}^{c_i} x_j$$

where, ' $c_i$ ' represents the number of data points in  $i^{\text{th}}$  cluster.

- 5) Recalculate the distance between each data point and new obtained cluster centers.
- 6) If no data point was reassigned then stop, otherwise repeat from step 3).

The algorithm eventually converges to a point, although it is not necessarily the minimum of the sum of squares. That is because the problem is non-convex and the algorithm is just a heuristic, converging to a local minimum. The algorithm stops when the assignments do not change from one iteration to the next.[8]

**AES ALGORITHM:**

AES is an iterative rather than Feistel cipher. It is based on ‘substitution–permutation network’. It comprises of a series of linked operations, some of which involve replacing inputs by specific outputs (substitutions) and others involve shuffling bits around (permutations).

Interestingly, AES performs all its computations on bytes rather than bits. Hence, AES treats the 128 bits of a plaintext block as 16 bytes. These 16 bytes are arranged in four columns and four rows for processing as a matrix. [7]

Security Encryption algorithm for providing the security to the system:

- 1) Start
- 2) Log in to the system and authenticate the user
  - a) If user is employee change the mode to corporate mode
  - b) Else if user is manager change the mode and Fetch the call log, sms history, web history.
  - c) Else if user is admin Fetch the call log, sms history, web history, data usage of the employee and manager. Else reject the user
- 6) Save the activity to the database
- 7) if any unauthorised data is found then goto step8
- 8) give notification to the admin
- 9) send warning to the user
- 10) stop.

Following figure [fig 2] shows the overview of the system and the flow in the employee tracking and monitoring system :

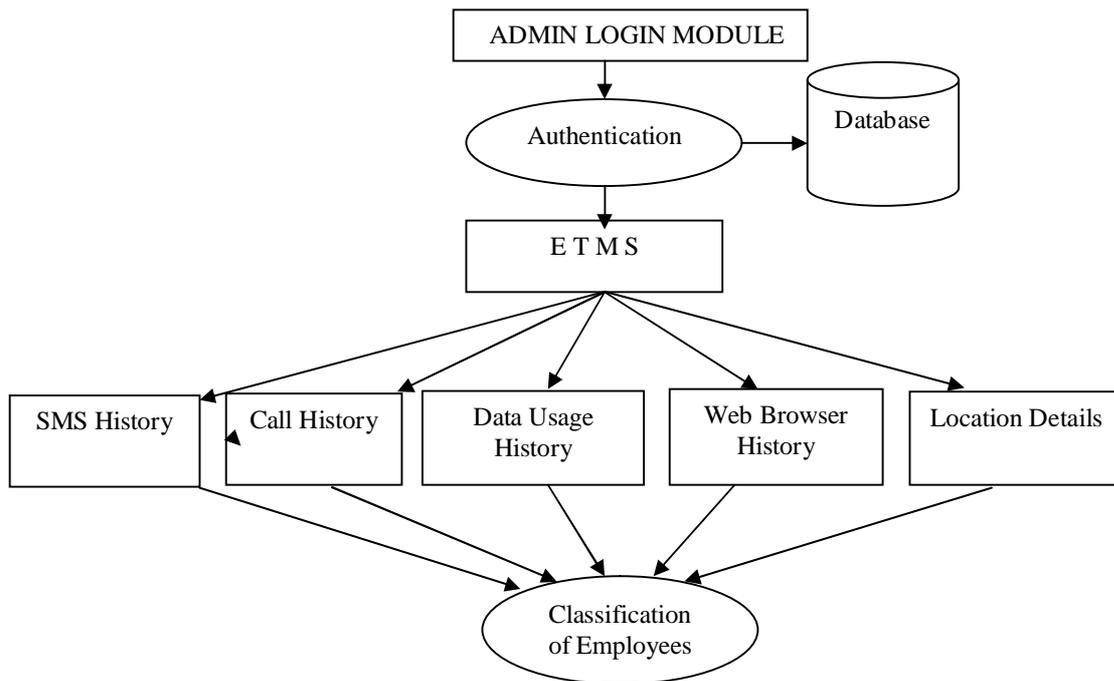


Fig 2: Flow of the system

The above figure explains the flow of the employee tracking and monitoring system using android. In the diagram the admin module defines the manager login in which access is granted only if authenticated. The different modules are used to classify the employee as best, worst, average using call history, sms history, data usage history, web browser history and location details.



### III. CONCLUSION

Using this system we are able to monitor and track the Employees in the company and thus it helps the manager to examine each and every employee from and outside of the company also. The details like SMS history, incoming call list, outgoing call list, web browser history, data usage, unauthorized call list accessible to the manager using this system. It helps to increase the output of the company thus getting good position in the world. The company's annual growth is increased and the wastage of time is minimized. It helps to track easily employee's log in and out. It helps to see employee details and their activities and also reduces the complexity of employee detail maintenance.

### FUTURE SCOPE

In future scope the same system could be tried to implement in different mobile phones like Windows and Apple phones. Also separation of data i.e. personal and corporate data can be applied.

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