

# Internet of Things (IoT): Smart Gym Management

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**Abstract**— In this paper, we propose a framework for a smart gym. SMART GYM based on wearable technology has continued to measure the Movement of body while exercise, track our fitness. It can detect motion and measures it against order to determine what type of activity you're performing. Video Exercise is provided to learn the equipment handling. here we are going to reduce the help of personal trainee in real time as the Virtual Trainee using Video of Exercise. Using algorithms from programmers and precalculated set of information from clients we can schedule their workouts resulting in great time management. Using the sensors, we can easily detect the movement of hand, leg etc to analyze the correct workout of particular equipment through the algorithm of that machine which is stored otherwise wrong movement beep will be given. Here other GYM member can help them or message will be send to trainee. Self-analyzing technology in electronic equipment's can lead to better maintenance and troubleshooting of that equipment. Having a backup offline server situated in gym and synchronizing it with online server can eliminate loss of data. Detailed statistics given to the client after each workout can help to see the progress of that client.

**Key words:** Internet of Things (IoT), SMART GYM, Internet, things, Wearable Technology, Sensors, Gym Equipment, Supervised Learning, Video Exercise, Virtual Trainee, Cloud service

## I. INTRODUCTION

### A. Internet of Things (IoT):

Internet of Things (IoT) is a new revolution of the Internet. Internet of Things (IoT) is can be said the expansion of internet services. It provides a platform for communication between objects where objects can organize and manage themselves. It makes objects themselves recognizable. Internet Of Thing (IOT). The Internet of things (IoT) is the inter-networking of physical devices and other items embedded with electronics, software, sensors and network connectivity that enable these objects to collect and exchange data. The IoT allows objects to be sensed or controlled remotely, direct integration of the physical world into computer-based systems, and resulting in improved efficiency, accuracy and economic benefit in addition to reduced human intervention. The IOT allows everyone to be connected any time and anywhere.

The internet is used to bring a real time interaction among devices that will not be possible with other mediums. Simply, all the information gathered from the sensors must be available in the cloud to be managed and controlled. Thus, a central point of management exists where the information from the sensors remotely distributed is stored

### B. Smart Fitness:

The Internet of Things is a medium where everyday objects can be identifying, networking, sensing, and processing can

be allow them to communicate with one another and with other devices and services over the Internet to accomplish some objective. In Smart Gym Paradigm IOT concept is implemented with use of Different type of Sensors for determination many activities in fitness center. Here, a built in movement sensor that can measure and track your body movement while doing exercise. It can automatically sync data of your workouts onto your phone to keep track of your daily and weekly workout. Its also log the how many calories you burn in a workout. Member use his provided wristband for entering in gym as well as scan the exercise machinery to detect the equipment which has particular code for identification. after scanning the equipment member will start the exercise if member know the way of handling the equipment .if member is fresher then every machinery has provided Video Programming for an learning the way of equipment handling here we are going to reduce the timing of personal trainee. we are handle the trainee work through the Virtual Trainee as Video of Exercise. any difficulties occurs then member can contact the assign person. Trainee can create custom workouts by dropping exercises into a equipment or common screen. a video The suite of tools also lets a trainer monitor your progress with stats from each workout, long term trends like weight loss and body fat also feeding directly. If they don't like what they're doing, they can contact you to give you a remote kick up of view. Sensor tracker will help us to count the number of movement as well as Wrong Movement of body. Such incorrect Movement detected then it will show the appropriate signal on equipment screen and also provide the Video of it. While using the equipment, screen will show the count of total workout of particular machines. After completed each and every work All those data are send in our member account for an later use. User can see his total workout of day as well as previous day of week. Member can register him/herself through the Mobile app or Website of gym. Also Member can see how much calories have burn , according Diet chart and instruction will give appropriately .here we are implementing the virtual trainee as well as use of wristband for calculating the work of day properly. according to the performance of Candidate further work can decided. This refers to the wristband devices such as FitBit that record all your activity throughout the day such as Body Movement, calorie expenditure etc.

In the gym, it will generate a huge amount of data about how members utilize your equipment in real-time. Gym owners, trainers and members will have information, and Motion tracking cameras and digital displays have also been installed to provide a real-time view of its members' workout routines, and provide feedback on their exercise on their membership account. users will use wearable devices to interact with the security system, lockers, along with the gym equipment itself. It will probably mean refitting your gym with new Wi-Fi-connected equipment. It also means learning

how to use the system as whole and determining how to get the most out of the reporting features, and teaching trainers to update their practices.

The Internet of Thing does make possible a different, more holistic approach to fitness. It creates a closer relationship between equipment, gym members, your trainers .you can log in to our connective Machines and you can start to understand how long you ran, the calories you burned, the amount of time you spent on the machine.. We are definitely a support system for an exerciser that knows what they're doing and wants to create their own custom workouts but we also allow personal trainers to use our platform to create custom workouts for their clients and push those workouts onto other people that they train.Wi-Fi can use for remote monitoring.

## II. LITERATURE SURVEY

Internet of Things is widely used in todays life in world. In real time used of internet in gym to only for Online registration for membership and In existing system in gym management Barcodes are used for equipment detection and authentication. In modern world wearable Technology are used for example wristband which has sensors to detect the only machineries for exercise. In gym Trainee is mandatory to give the training to member of gym and suggestion and some instruction has to give personally therefore each and every member required help from trainee in gym anytime and its time consuming to candidate .Also The daily Workout has to measure manually by candidate. Regarding log of every day cannot be determine therefore member cannot get realize about any changes happen or workout should be increase or vice versa.

Another things in gym that sometimes wrong set done by member then its very harmful to member ,even trainee cannot give attention of every activities of member.

Every member have unique time /Schedule of attend the gym .If number of people are maximum then its very complicated to manage the crowd as well as peoples are waiting for equipment That's way modern way of IOT concept can fulfill this bottleneck of gym easily .

## III. METHODOLOGY

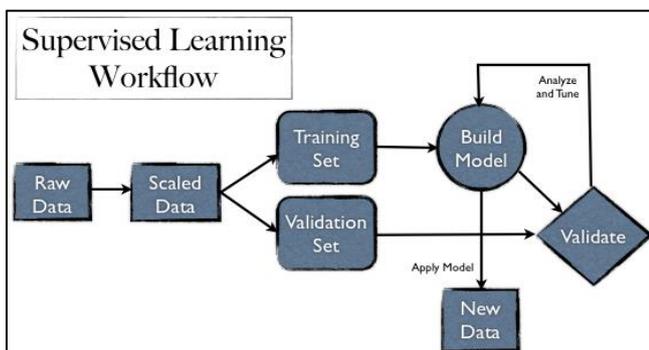


Fig. 1.1: (Smart Gym Workflow)

In Smart Gym management paradigm, Internet of Things a concept is implemented to overcome the limitations of current system of Gym Management. In figure 1.1 shows a working process of System. The methodology is used in this research paper is to solve the issue of current system. Sensor-based motion recognition integrates the sensor networks with

data mining and machine learning techniques to model a wide range of human motions. Human motion recognition systems composed of wirelessly connected sensor remotes (accelerometers and gyroscopes) attached to different body sites to health/fitness monitoring.

Here wristband has sensors to detect the only machineries for exercise but use of Set machine learning algorithms are implemented based on the correct workout of particular equipment's. Today's scenario in gym wristband of sensor is used to detect only equipment's and some other machinery for example Cycling, Calories burned etc. But we are improve the use of wristband using algorithms of every workout machinery which is determine the degree of angle of body part. for example while doing the exercise of dumb bells

The angle should maintain for its correctness of workout similarly other equipment's programming have done to check out the valid set of activities. Here Raw data is improve with scaled data and comparing with its Training set(algorithms) of every equipment's. Validation set will validate the training set with use of Algorithm's.

After analysis it will produce the new data as workout of each and every equipment's easily and effectively

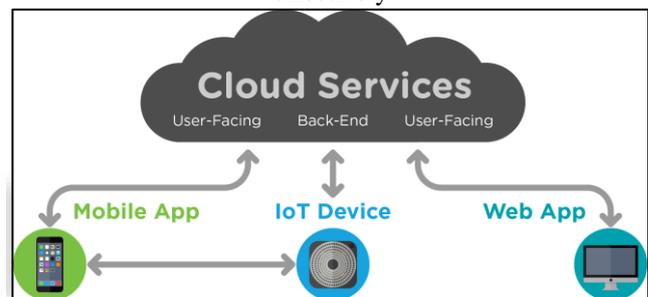


Fig. 1.2: (Member Workout log Management)

Another module is implemented as virtual Trainee ,here video programming is provided to each equipment's for kind of in help. After authentication of equipment member account details and log will be display on screen. Therefore its very useful to track the work done of particular work set easily. Because concept of virtual trainee the work of trainee get reduced if any issue comes out then through automated system notification will send. Self-analyzing technology in electronic equipment's can lead to better maintenance and troubleshooting of that equipment. Also provided a backup offline server for synchronizing it with online server can eliminate loss of data. Detailed statistics given to the client after each workout can help to see the progress of that client. According to schedule of member get notify when machine get released. Fig 1.2 shows the log management i.e history of each and every member can stored on cloud to get it anywhere and anytime easily. According to workout performance trainee can easily suggests to increase the sets of workout or vice versa.

## IV. RESULT

### A. Objectives:

- Virtual Trainee implemented for reduced the work of Trainee
- Wristband use for detect the correct/Incorrect way of equipment's handling
- Cloud service used to maintain the log of member

Above mentioned Objectives are implemented in this research paper to overcome the current system of GYM. Here sensors play vital role to detection of human body movement. different types of sensors are used to detect the motion and movement. wearable technology (wristbands) has used to measure the Movement of body Video programming Exercise is provided to learn the equipment handling. Here work is reduced of personal trainee in real time as the Virtual Trainee using Video of Exercise. Using algorithms of particular equipment's it can easily detect the movement of body part to analyze the correct workout else wrong set beep will be given. Self-analyzing technology in electronic equipment's can lead to better maintenance and troubleshooting of that equipment. Detailed information will give to the client after each workout can help to see the progress of that client.

#### V. CONCLUSION

In this research paper using IOT concept achieved the managing the gym effectively and clients time get reduced Virtual Trainee implemented for reduced the work of Trainee therefore cost of trainee get reduced for gym management. Use of Wristband to detect the movement of member body part therefore its very useful and best way to safe from any kind of injuries and pain of equipment's handling. Here Cloud service used to maintain the log of member therefore member can easily can access the his/her account and check the progress details easily

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