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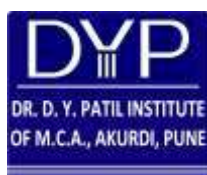
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Automatic Vault Access

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Abstract: The advancement in digital technology has led to automation. It provides convenience to the customers as well as to the management in typical sectors. Similarly bank management has taken a progressive lead in digitization so as to improve the security and ease of access. Bank locker management system has been still processed manually. The access to bank locker is limited to bank timings and it becomes inconvenient for locker holders. Smart vault is fully automated system which will be available 24x7, including weekends and post banking hours. It ensures the secure access of locker holder's valuable with multi-layered security checks. It includes face detection, fingerprint recognition as well as RFID tag with password. The aim of this project is to provide secure access to bank locker.

Keywords: RFID, 24x7

I. Introduction

For safety reasons most of the times valuables are stored in bank lockers, but you can only access your lockers in bank timings. Also it includes a time consuming verification process. It may happen that if any bank customer need their valuables urgently from the locker but his access to it will be limited due to time constraints of the bank.

Therefore we can implement new efficient system called smart vault which will give access to the locker at any time of the day. Similar like ATM machines this system will work. Authorised person will be given a RFID tag and by just using this tag person will be able to access his locker any time.

Customers can access the lockers in total privacy without any intervention of the branch staff. This system is designed to make banking a convenient and more secure for its customers. By using fingerprint recognition and face detection customer can ensure more secure access.

I. LITERATURE SURVEY

ICICI Bank's SMART VAULT

'Smart Vault' is equipped with multi-layered state-of-art security systems including biometric authentication, debit card & PIN authentication, unique dimple Keys that are difficult to replicate, unbreakable lock system and the option of using additional personal lock as well. To add to the security of the customers, there are several alert mechanisms,

such as a biometric alert facility, a direct call line to a central team available round-the-clock, automatic alarms for sessions beyond a specified time, 24x7 armed guard, video patrolling by the Bank post banking hours and SMS alerts to customers on usage of locker, thereby making the 'Smart Vault' safe and secure.

II. PROPOSED SYSTEM

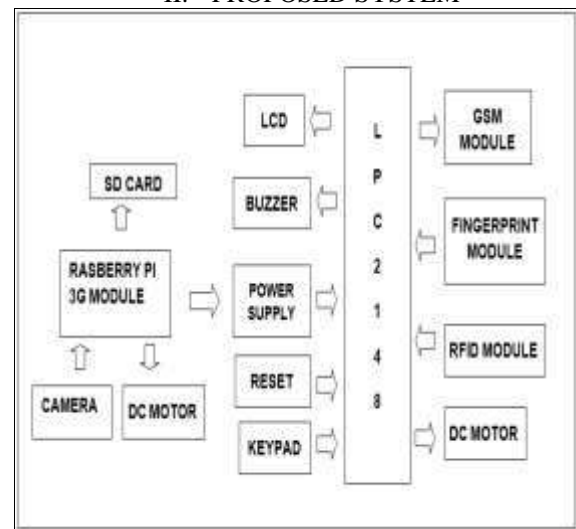


Fig.1. Block diagram of proposed automatic vault access

Microcontroller is the most important part of the whole system. The microcontroller used for this project is ARM LPC2148. It is a 32 bit microcontroller having 64 pins. It provides 2 UARTs. GSM module SIM900 delivers GSM/GPRS 850/900/1800/1900MHz performance for voice, SMS, Data, and Fax in a small form factor and with low power consumption. This GSM module is connected to the microcontroller using the MAX 232 serial communication.

RFID module EM18 is used which produce and accept radio signals. It is connected to one terminal of UART.

R305 fingerprint module is used. Finger print sensor module with TTL UART interface for direct connections to microcontroller UART or to PC through MAX232 / USB-Serial adapter. The user can store the finger print data in the module and can

configure it in 1:1 or 1: N mode for identifying the person.

IV.FLOW OF THE PROPOSED SYSTEM

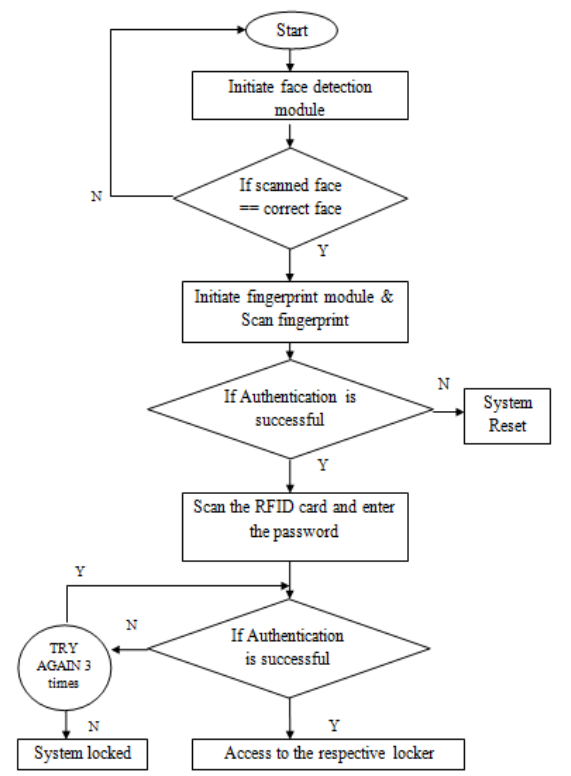


Fig.2. Flow chart of proposed automatic vault access

V. IMPLEMENTATION

This system consists of two stages for ensuring security. In the first stage of security check face detection algorithm is implemented by raspberrypi-3g module. It includes the camera for taking the input. The input image is compared with image in the database. If the result matches then only person can enter locker room For the second level of security check fingerprint is scanned using R305 module. Then system will ask to scan the RFID card with password & at the same time with the help of GSM module message will be sent to the locker holder's mobile. If the password matches then the door will be open for actual locker room with the help of DC motor and corresponding relay of locker will be ON. If password doesn't match then system will ask to re-enter it for 2 more times. Then also if password is not matching then system will be locked and buzzer will be ON, at the same time ALERT message will be sent on locker holder's mobile.

VI. APPLICATIONS

1. It can be used in libraries for attendance.
2. It can be implemented at airports for tracking of luggage.
3. At passport verification system can be used.
4. It can be used for various security purposes.

VII. CONCLUSION

Thus a system for accessing bank locker 24x7 is implemented successfully. By using this this system accessing locker is get more efficient. Authorised person will be given a RFID tag and by using this tag person will enter in the locker room and the LED on the locker will glow so it will be easy to find locker. So the locker holder will be able to access his locker at any time without restricted bank timings. We concluded that rather than manual process of withdrawal from locker, smart vault system consumes less time. The simple process and anytime availability makes system more popular.

VIII.ACKNOWLEDGEMENT

When any work that is new to you ,it needs support and guidance. The consistent guidance and support provided by Prof.Mrs.R.S.Chaudhari is very thankfully acknowledged for the key role played in providing precious ideas, suggestions and help that enabled in shaping the project work

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Drone Based Agriculture

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Abstract: *The use of pesticides and fertilizers in agriculture has vital importance for crop yield. The traditional or conventional methods of irrigation like flood, drip or sprinkler irrigation have their limitations. The solution for these constraints was the basis of the development of smart irrigation system. However, the hardware installations for the smart irrigation system uses excess cultivated land. The remedy to this problem is the use of quadrotors. The use of aircraft is increasing and has now become a common sight. This task is carried out using these drones mainly because of their speed and effective spraying. This paper describes the architecture of Unmanned Aerial Vehicle (UAV), which is deployed to implement a control loop for different techniques in agriculture where UAVs are instrumental in spraying chemicals on crops.*

Keywords: Agriculture, Unmanned Aerial Vehicle(UAVs), Quadrotor, Quadcopter, Microcontroller, RF transmission and reception.

I. INTRODUCTION

Agriculture is the key to the development of countries such as India, Japan, Israel, China and others. Trading of agricultural products is a crucial part of the economy. A developed agriculture employs a large number of people. Agriculture in India generates almost 52% of total number of jobs available. It contributes a share of around 18.1% of the GDP[1]. Time and need has surfaced to increase the productivity of farming to feed the ever-growing population. The advent of technology might prove helpful in increasing productivity within the stipulated time.

Different techniques such as irrigation, use of pesticides and determination of PH value of soil were developed to improve crop yields. Flood irrigation was an ancient method of irrigating crops. However, half of the water provided was wasted in evaporation, infiltration of cultivated lands and transpiration. Too much wastage of water in flood irrigation caused the development of drip and sprinkler irrigation. However, for these techniques, salt deposition at the nozzle resulted in the blockage of the pipes. Moreover, the use of fertilizers and pesticides was increased to improve the fertility of the land so as to improve productivity. The manual spraying of fertilizers and pesticides can affect the nervous system and can result in fatal diseases. The World Health Organisation (WHO) statistics puts that there are more than 1 million pesticide cases every year. Out of these At least 1 lakh deaths occur in the developing countries.[2]

The solution to these limitations has formed the basis for the development of smart irrigation. Using smart irrigation one can irrigate the field, determine the PH value of the soil, convey the status of the crop to the farmer through GPS. Effective agricultural methods were developed using smart irrigation. However, the excessive

area that the smart irrigation consumes is chiefly used for hardware installations utilizing larger areas of cultivated land. This limitation formed the basis for the development of the UAV.

UAV or unmanned aerial vehicle, as the name suggests, is an aircraft that does not require a pilot to operate it. The plane is usually operated using a remote control from the ground. It is also programmed to perform certain tasks using dynamic automation systems which the operator on the ground just needs to monitor to prevent the untoward incident from happening. A quadrotor or quadcopter is unique in the sense that the UAV performs Vertical Take-Off and Landing(VTOL). The use of quadrotors has an advantage over conventional helicopter because of its simple mechanical design. The main feature of an UAV is that individual motor control stabilizes the UAV instead of cyclic control. It can be applied in varied areas such as in military for rescue operations, in discovering mines and agriculture.

II. LITERATURE REVIEW

A. Design and control of quadrotor with application to autonomous flying: [3]



fig 1: Design and control of quadrotor with application to autonomous flying.

The project done by S. Bouabdallah focuses on Vertical Take-Off and Landing (VTOL) system. It includes the specialized design of micro Quadrotor which is based on autonomous control system named as OS4. He applied mathematical modeling techniques such as linear or non-linear quadratic equations and/or inequations to design and simulate various controllers in his project. The author has developed two different platforms in his thesis. The first one is a 'Quadrotor like test-bench' with off-board data processing and power supply. It was used to test control strategies but was only capable of testing up to 3DoF. The second one, OS4, is a highly integrated Quadrotor with on-board data processing and power supply. It has all the necessary sensors for autonomous operation. In design the controller for his Miniature Flying Robots (MFR), five different controllers were developed to achieve the objective. The first one, based on Lyapunov

theory, was applied for attitude control. The second and the third controllers are based on Proportional Integral Derivative (PID) and Linear Quadratic (LQ) techniques. These functions were compared for attitude control. The fourth and the fifth approaches use back-stepping and sliding-mode concepts that applied to control attitude. Finally, back-stepping is enhanced with integral action and proposed as a single tool to design attitude, altitude and position controllers.

B. A wireless multivariable control scheme for a quadrotor hovering robotic platform: [4]



. fig 2: Qx4 3D orientation and telemetry graphing application demonstration

Some of Quadrotor researchers had a problem with a result of the difficulties of controlled flight. Z. Al-khatib, J. Yu, H. G. Al-khakani, and S. Kombarji presented the Micro Air Vehicle (MAV) concept to non-technical users by developing a hovering robotic Quadrotor platform that communicates with the main workstation and a number of controllers and peripherals. The main goal of this project is to develop an abstract flexible autonomous robot according to different levels of control and provide users of different backgrounds access to the functions they want to work with. The system used to connect the platform QX4, workstations and controllers uses a wireless mesh network or commonly known as Radio Frequency (RF) Zig Bee module. The casing of the Quadrotor is using carbon fibers frame and at its center, it houses three microcontroller boards, ten proximity sensors, and three 3-axes inertia sensors. To protect the Quadrotor, a circular shape is created and was placed on propeller made out of foam and mesh wire to protect the vehicle and its surroundings. The workstation is a set of software applications that was executed on a PC and connected to the wireless mesh network. It acted as a controller of the vehicle and provided the operator a simple set of buttons that will make the robot conduct an action such as move forward and move backward. This was done for cases where manual control was desired. It also allowed the operator to take control in cases where the platform behaved in an abnormal way. The use of Wii Nunchuck as secondary manual controller gave the operator more choice in the maneuverability of the Quadrotor. The other part of this Quadrotor controller was the administrator panel that controlled the robot and the main interface on the workstation. It was designed using Java as the cross development platform, where the program was compiled on PC and execution was done on the host machine.

III. COMMERCIALY AVAILABLE UAVs

Many companies were involved either individually or in collaboration for development and enhancement of functions of quadrotors. Following are some commercial UAVs that are instrumental for agriculture.

A. Japan's Yamaha R50: [5]

Ministry of agriculture, forestry, and fishery of Japan had requested Yamaha to devise an unmanned hover for agricultural use. Yamaha then developed the R-50. Later Yamaha sky division Australia developed unmanned remote controlled helicopters for agriculture use. These were named RMAX. Today there are approximately 2400 RMAX flying over Japan and Australia. Primarily they were used for agriculture but later on, the design served for other wide range of applications. For example in the year 2000, the drone was The quadrotor will be fuelled by lithium ion power batteries (LiPo). The purpose behind preferring LiPo battery is used for observation over erupting volcano for Mt Use in Hokkaido Some important features of Yamaha RMAX include its weight approximately 99 kg, 3.63m length, 1.08m height. The load carrying capacity is approximately 28kg. However, because of the use of horizontally opposed two-stroke engines, it is bulkier. To operate the Yamaha R50 the user must need a CASA Operators' certificate.



fig 3: Yamaha R50

B. Agrion: [6]



fig 4: Agrion

American company Agritrix developed a drone named Agrion instrumental for agricultural purposes. Comparative to Yamaha R50 it is less bulky, it is supported with DJI PHANTOM 3 Advanced for easy flying, it is powered with smart batteries of 480mAh. Agrion is a cost effective technology.

IV. GENERAL BLOCK DIAGRAM OF UAV

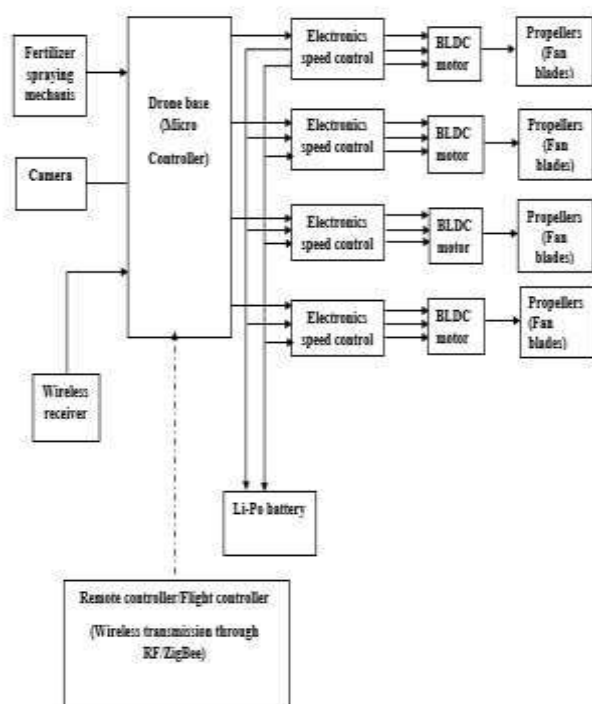


fig 5: Block diagram of quadrotor.

The basic block diagram for a simple quadrotor application is as shown in the figure. It consists of RF/Zig-Bee transceiver for transmission and reception. In main circuit its task is to receive signals from remote control. primarily power outsourcing which is higher than any other batteries like aluminium ion power batteries. Other advantages are high mAh (milli-ampere-hour) rating which is sufficient enough to run a small BLDC motor, and low discharging time. A low weight container attached with container attached with a valve is put on board of quad rotor. Opening of valve is controlled by the use of ON/Off controller & closing switches of Remote control. Brushless DC motors used for rotating propeller blades. 4 BLDC motors are used and evenly spaced around a central fuselage. The speed of these motors will decide the altitude of flight of UAV. Two of them will rotate clockwise and rest will rotate anticlockwise. This combination will be decided by direction control switch of remote control. The geared motors are available in market. DC motors require 12V power supply for their operation. Whereas microcontroller provides only 5V output. Hence there is a need to step up this voltage. The ESC provides various levels of voltages due to which process of shifting gears of DC motor takes place.

V. CONCLUSION

Agriculture is the backbone of Indian economy. At present development of technology in agriculture is important for better crop yield. Especially in country like India this is important since 70 percent of the country's population depends on agriculture. Numerous trends were

developed to enhance technology in agriculture like the flood, drip, sprinkler and smart irrigation and smart agriculture. But these were used for irrigational purposes only moreover they use most of the cultivated land.

A remedy to this solution is to use an aircraft mechanism to conduct agricultural activities. So, this project will demonstrate the same. The project will develop a quadcopter as a fertilizer and pesticide sprinkler, controlled remotely. The expected result is the functioning of the quadrotor according to the commands given by the operator. The drone must be responsive.

VI. ACKNOWLEDGEMENT

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InnOvaTe HOME

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ABSTRACT: *In today's world automatic system are being preferred over manual system. with rapid increase in number of user of internet of over the past decade has made internet a part and parcel of life, and IOT is the latest and emerging internet technology. internet of things is the growing network of every day object from industrial machine to consumer goods that can share information and complete task while you are busy with other activities. the current IOT research community is however highly fragmented, featuring diverging approach and technologies. Innovate home is a small model which gives basic idea about how the home appliances can be automatically controlled and how users can have access on it from wherever they wishes to do so. we have used wi-fi system which is the main part of the system, a web page is also being designed to have a live view of what's going into the home. this system is designed keeping in mind that it can be really used in smart homes.*

I. INTRODUCTION

The home automation is control of home devices from central control point, automation is today's fact, where more things are being completed everyday automatically, usually the basic task of turning on and off certain devices and beyond, either remotely or in close proximity. Many existing and well established home automation system are based on wired communication. In contrast, wireless system can be of great help for automation systems. With the advancement of wireless technologies such as Wi-Fi, cloud network in the recent past, wireless system are used every day and anywhere.

InnOvaTe HOME is basic system which contains various sensors that are going to be used to automate home. Sensors like PIR(to detect motion),IR sensor(for outdoor application i.e. letter box),gas sensor(to detect leakage), humidity and temperature sensor(to detect temperature and humidity) and load cell(for kitchen application).Heart of this system is ATMEGA 2560 which is mounted on ARDUINO mega board, to which all the sensors are interfaced and the brain is webpage from where we can monitor and control the home appliances, for this Wi-Fi is used to connect internet to we can operate webpage from our work place.

II. LITRATURE SURVEY

A real world scenario where the lights are switch On/Off in a home environment when the user is within or away from the proximity of the AltBeacon node, there is system comprised of Arduino microcontroller with

Ethernet shield, Android Smart Phone and an AltBeacon Node. DHCP address is assigned to Android smart phone and Arduino microcontroller with Ethernet shield making them IP enabled. The primary aim of AltBeacon node is to allow an application to determine its proximity with respect to the AltBeacon node. We have setup a simple Arduino circuit to switch On/Off LED light [1].

Since IOT is one of the upcoming technologies that can be used for home automation, there are many challenges that are associated with it. One of the major challenges in the lack of standards for integrating various sensors, applications and other existing intelligent embedded devices. Providing unique IP addresses for connected devices and privacy & security in a smart home environment is another big challenge. Smart home automation concept using low cost Arduino board for controlling various electrical appliances with the help of an Android smart phone. As IOT deals with huge amount of data collected from various sensors deployed in a smart environment, proper care should be taken in handling, storing and securing the data. In future, data analytics and visualization can be used for effective monitoring and management of IoT devices in a smart home environment [2].

IoT based Interactive Industrial Home wireless system, Energy management system and embedded data acquisition system is designed to display on web page using GPRS, SMS & E-mail alert. The Device system can collect Data automatically and send to SMS and Mail and continuous show the result on HyperTerminal window. It was designed based on IEEE1451 protocol by combining with ARM controller and the application of Wireless communication It has the advantage of low price and low power consumption make it easy to implement with high speed. Nevertheless, many interesting application are remaining for future researches. For exam, trough IoT we operate visualizes industries home from anywhere [3].

IoT architecture in providing smarter, connected and personalized healthcare solutions in smart homes. Requires healthcare services to analyze and translate into a functional architecture. Its components are mapped onto physical infrastructure. The components are described and their novel aspects are highlighted. The center of the proposed healthcare system is in M2M data processing using M3 framework. It employs a semantic reasoning engine to generate actionable intelligence from wearable sensor data and combine that with smart home sensors to create cross domain scenarios. Prototypes of the consumer mobile application and M2M gateway are described along with their performance evaluation results [4].

III. EXISTING SYSTEM

A. Home Automation System using Bluetooth

The concept of home automation using IoT is realised using 10w cost micro-controller based Arduino board and an Android mobile phone. Arduino is an open source platform that can be used for prototyping any hardware and software. Arduino can be programmed to receive keyboard input or sensor data and control various electrical appliances connected to output peripherals. Since mobile phone is a wireless communication device, connectivity between Arduino and smart phone is established using Bluetooth, one of the short range wireless communication technologies that can be used for communication in an indoor environment.

Operating at universally available frequency of 2.4 GHz, it can connect digital devices within a range of 10-20 meters (theoretically expandable up to 100m, by increasing transmitter power) at the speed of 256 Kbps to 1 Mbps. Since Arduino micro-controller unit does not have inbuilt bluetooth radio, an external HC-05, bluetooth system is used for establishing wireless connectivity. Once home appliances are connected to Arduino board, they can be easily controlled using any bluetooth enabled smart phone inside a smart home.

B. Home Automation System using Ethernet

The main drawback of bluetooth based home automation can be overcome using Ethernet technology. In this section, Ethernet system is used for connecting Arduino board from any part of the world. Adriano's ethernet system IP address and Port number can be used to locate remote device connected to the Internet in a smart home environment. Android mobile app can be used to control electrical appliances from a remote location. Ethernet shield is placed just above Arduino board which is connected to RJ-45 for Internet connectivity. In this architecture, Arduino board is configured as a server. Whenever user enters IP address and Port number, request will be sent to Arduino board (server), which in turn serves a HTML web page which is stored in Adriano's micro SD card. LED corresponding electrical appliance can be switched ON/OFF using Android mobile app.

IV. PROPOSED SYSTEM

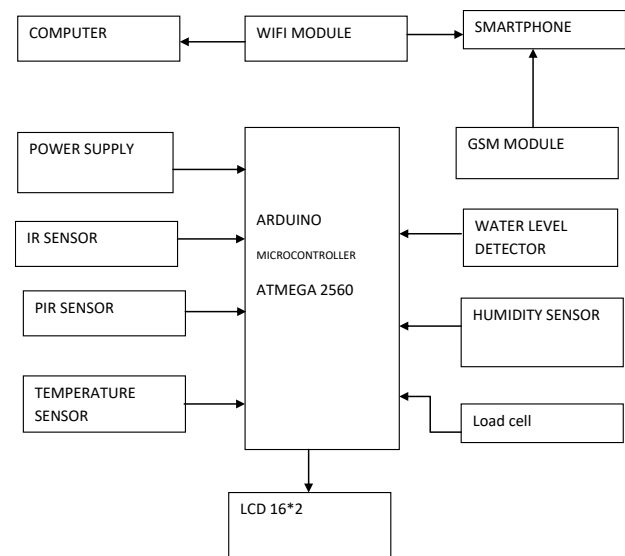
IOT based Home automation

For home automation using IOT our module gives new methodology to control the home appliances using phone or personal computer with help of internet connection. This project is based on IOT (Internet of things) which gives us reliable way to automate home.

In the proposed system one web page is developed from where the user can control fans and lights of home. Basically to make this system cost effective and user friendly Arduino MEGA is used which will act as heart for the system. In this, various home application are

taken into consideration such as automatic control of fans and lights of hall, temperature and humidity monitoring, apart from all these basic applications this system will have gas leakage detection from security point of view, also flow sensor to detect the overflow of water so to avoid the wastage of water. One outdoor application is also taken that is continuous monitoring letter box, IR sensor is placed on the letter box whenever the letter will be inserted in box then user will get text message using GSM system.

Fig. 1 Block diagram of InnOvaTe home



There is need to have internet connection all the time in order to control the appliances apart from IR and gas leakage of which user is going to get text message. Working of this system is very simple and user does not need any special knowledge to use this, because it's basic switching of appliances (i.e. on or off). Temperature and humidity will be directly displayed on the screen whenever the system will be turned on and if kept on all the time system will keep on monitoring it and will accordingly display on screen. PIR sensor will detect if any person is there in home or not and will accordingly give the output on web page. Water level detection is done through the flow sensor so the water will not be wasted. Wi-Fi system will work as interface between the controller and the computer or mobile phone. Internet connection will be provided to user using Wi-Fi.

V. CONCLUSION AND FUTURE SCOPE

The proposed system will reliably help to automate the homes, which we can call as smart homes. In this module much more applications can be added, which will take this system to greater heights. In future many modifications can be done in this project according to user. So that innovate home can use this system easily

and this system will help every city to become smart city as soon as possible.

VI. ACKNOWLEDGEMENT

We are very grateful to all authors in reference section. Their methods, algorithms, conceptual techniques are very helpful for our research. All papers in the reference section are very useful for our proposed system, and also we thank our project guide "Mr Ramgopal Sahu" for his constant supervision, encouragement, motivation and providing all necessary help needed for project.

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Survey: Leaf Spots Detection on Cotton using Neural Network

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Abstract— In this survey, we can proposed computer aided system with open source platform detection system for the leaf spot detection on cotton crop. This system plays very important role to improve outcomes in farming because it is important sector in India. Lot of peoples are depends on the cotton crop. There are many diseases on cotton crop. Due to this disease there is chance of the decrease productivity of the crop. So our aim is to develop leaf spot detection system by using artificial neural network. Early detection of this disease can helpful for the farmer to take preventive action.

Keywords—Artificial Neural Network, leaf spot.

I. INTRODUCTION

Agriculture is the prime livelihood of Indian farmers At present, India holds the second position in the world in agricultural production. Farmers are working like soldiers without thinking of weather it is a day or night as well as weather conditions, even though he is not getting rewards or benefits for the same. Situation of farmers in India is not well; he is struggling lot for the survival of his family. Agriculture of India is advanced to some extent but still there is lot of problems he is facing while farming his grains. Since independence population of India tripled and production is quadrupled. As cotton is one of the cash crop for indian farmers and India is among worlds largest five producers of cash crops. So we have to help farmers for the better gain of this crop by preventing diseases and taking cure timely, he can earn good and will be able to fulfill needs of his family. There are different types of diseases found on cotton. Our aim is to find which type of disease on single click. There is no need to go anywhere for detection. Once, the farmer know about diseases ,he can take preventing action on it[1][2][3][4].

II. TYPES OF LEAF SPOT DISEASES

There are different types of diseases are present on cotton one of them are leaf spot. But leaf spot of cotton is divided into following three types[1][2][3][4].

A. *Alternaria leaf spot: Alternariamacrospora*

Symptoms of .Alternaria leaf spot is given below:

1. Small, pale to brown, round or irregular spots measuring 0.5 - 3 mm in diameter and cracked centers appears on the affected leaves of the plant.
2. Affected leaves become dry and fall off.
3. The disease may cause cankers on the stem.
4. The infection spreads to the bolls and finally falls off.



Figure. 1. Alternaria Leaf Spot

B. *Cercospora leaf spot: Cercosporagossypiana*

Symptom

1. The disease affects older leaves of mature plants.
2. The spots are round or irregular in shape yellowish brown, with purple, dark brown or blackish borders and white centres.
3. Affected leaves become pale in colour and finally fall off.



Figure. 2. Cercospora leaf spot

C. Bacterial leaf blight : Xanthomonascampestrispv. Malvacearum

Symptom

1. Bacterial blight starts out as angular leaf spot with a red to brown border.
2. The angular appearance is due to restriction of the lesion by fine veins of the cotton leaf. Spots on infected leaves may spread along the major leaf veins. As disease progresses, leaf petioles and stems may become infected resulting in premature defoliation.
3. Black cankers may girdle the stem or branches causing the portions to die above the canker.
4. A white waxy crust containing the bacterium may form on old leaf spots or cankers.
5. Bolls may become infected causing boll rot which results in rotted seed and discoloured lint.
6. Infected bolls have round, rather than angular, lesions that initially may appear water-soaked. As infection proceeds, bolls lesions will be sunken and dark brown or black.



Figure.3 :Bacterial leaf blight

III. METHODOLOGY

This methodology uses artificial neural network and image processing techniques to find out spot on cotton leaf. We can use back propagation network to

differentiate different typed of leaf spot on cotton. For back propagation network we can give input from 2D wavelet image and network will classified it as which type of leaf spot is it[6][7].

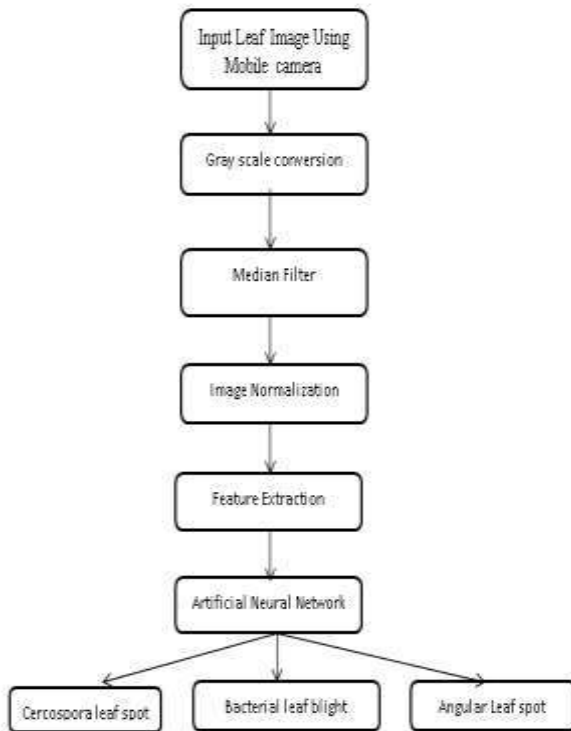


Figure 4. Proposed System

1. Mobile Image:

The color image is captured by digital camera or mobile phone. This image is act as input image for our system(1).

2. Gray scale conversion:

Before pre-processing of images it is important to convert the color image into grayscale image by eliminating hue and saturation after we can perform pre-processing. The algorithm is to convert RGB values to grayscale values by forming a weighted sum of R, G and B Component:
 $I=0.2989 \times R+0.5870 \times G+0.1140 \times B$... (1.1)

3. Median Filter:

Median filtering is used to remove noise for minimizing the influence of small structures like water bubbles. It is used to remove pepper and salt noise. The median filter considers each pixel in the image in turn and looks at its nearby neighbors to decide whether or not it is representative of its surroundings. Instead of simply replacing the pixel value with the mean of neighboring pixel values, it replaces it with the median of those values. The median is calculated by first sorting all the pixel values from the surrounding neighborhood into numerical order and then replacing the pixel being considered with the middle pixel value.

4. Image Normalization:

In this step, we are trying to increase image clarity and obtain better performance. Normalization is a simple image enhancement technique that attempts to improve the contrast in

an image by 'stretching' the range of intensity values it contains to span a desired range of values.

5. Features Extraction:

For Feature Extraction we are using 2D wavelet Transform. The Wavelet analysis aims to tell us which frequency at what time. The DWT is the decomposition of image X which creates four subbands LL, LH, HL and HH at each level s of the decomposition. Wavelet transform decomposes a signal into a set of basis functions. These basis functions are called wavelets.

The upper leftmost square represents the smooth information (Lowest Frequencies) i.e. a blurred version of the image. The other squares represent detailed information (edges) in different directions (horizontal, diagonal and vertical) and at different stages.

There are Mean, Mean absolute Deviation standard Deviation, L1 norm and L2 Norm features are extracted from the wavelet image[5].

The mean of m by n wavelet image is given below:

$$\text{Mean} = \frac{1}{mn} \sum_{i=1}^m \sum_{j=1}^n X_{ij} \quad \dots(1.2)$$

The standard deviation of m by n wavelet image is given below:

$$\text{Standard deviation} = \sqrt{\frac{1}{mn} \sum_{i=1}^m \sum_{j=1}^n (X_{ij} - \text{mean})^2} \quad \dots(1.3)$$

The Mean absolute deviation is a measure of dispersion, i.e. how much the values in the dataset are likely differing from their mean.

$$\text{Mean Absolute Deviation} = \frac{1}{mn} \sum_{i=1}^m \sum_{j=1}^n |(X_{ij} - \text{mean})| \quad \dots(1.4)$$

The L1 norm of matrix m by n of matrix X is defined as

$$L1 = \max_j \sum_{i=1}^m |X_{ij}| \quad \text{where, } j = 0,1,2 \dots n \quad \dots(1.5)$$

The L1 norm of matrix m by n of matrix X is defined as

$$L2 = \sqrt{\max \text{ eigen value } X^H X} \quad \dots(1.6)$$

6. Artificial neural Network:

Classifier is used for classifying different types of leaf spot diseases on cotton . Based on the computational simplicity Artificial Neural Network (ANN) based classifier is used. In this proposed system, Back propagation (BPN) Algorithm can be used for training. The neural network classifier structure consists of Input layer, Hidden layer and Output layer. In this methodology, there is one hidden layer with ten hidden neurons and Output layer with one output neuron. Activation function used is Log sigmoid function. The log sigmoid function is defined as follow:

$$f(x) = \frac{1}{1 + e^{-x}} \quad \dots(1.7)$$

It gives an output of 0 or 1 or in between that .Zero represents Cercospora leaf spot and one represents Bacterial leaf blight and in between that represent angular leaf spot. The hidden and output layer adjusts weights value based on the error output in classification. In BPN algorithm, signal flow will be in forward direction. The output of the network is compared with

desired output. If both do not match, then an error signal is generated. This error is propagated backwards and weights are adjusted so as to reduce the error. In BPN, weights are initialized randomly at the beginning of training. There will be a desired output, for which the training is done. Supervisory learning is used here. During forward pass of the signal, according to the initial weights and activation function used, the network gives an output. That output is compared with desired output. If both are not same, an error occurs.

$$\text{Error} = \text{Desired Output} - \text{Actual Output} \quad \dots(1.8)$$

During reverse pass, the error is back-propagated and weights of hidden and output layer are adjusted. The whole process then continues until error is zero. The network is trained with known values. After training, network can perform decision making (2).

IV. PERFORMANCE EVALUATION

We can evaluate the performance of the system by calculating accuracy of the system,

$$\text{Accuracy} = \frac{\text{Number of correct classification}}{\text{Total Number of Test Images}} \times 100 \quad \dots$$

(1.8)

IV. CONCLUSION

In this paper, we proposed diseases analyzer on the cotton, the analysis of the various diseases present on the cotton leaves can be effectively detected in the early stage before it will damage the whole plant. Here the technique presented can able to detect the disease more accurately. By varying the Image processing techniques and training algorithms of ANN,

the accuracy can be improved for this system and the images are classified into specific types

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PERFORMANCE ANALYSIS OF DATA MINING ASSOCIATION ALGORITHMS

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Abstract: Data mining (DM) means to extract the hidden knowledge from large repositories of data with the use of techniques and tools. It is the process of discovering hidden patterns from large amount of data. Day to day growing data in every sector which requires automatic data analysis techniques for different perspectives and provide accurate results in terms of several parameters i.e. speed, efficiency and cost. Data mining applications are Retail Industry for Marketing Data analysis, Financial Data Analysis, Educational Data analysis, fraud detection, Customer relationship management, for the analysis of Biomedical Data etc. The paper focuses on comparative analysis of Association algorithms. Association rule mining was proposed by R. Agrawal in 1993. This model was initially used for Market Basket Analysis (MBA) to identify customers buying patterns. The paper presents a comparative analysis on Association algorithms i.e. Apriori and FP Tree Algorithms based on some experimental data that give rise to the final conclusion. Weka is a collection of machine learning algorithms for solving real-world data mining problems. It is written in Java and runs on almost any platform. The algorithms can either be applied directly to a dataset or called from any Java code.

Keywords: MBA- Market Basket Analysis , DM - Data mining, FIS - Frequent Item Set

Introduction:

Data mining is the process of discovering actionable information from large sets of data^[17]. It used for retrieving patterns and trends in the data by performing mathematical analysis. These patterns and trends are defined as a *data mining model*. Mining models can be applied to scenarios, such as forecasting, risk analysis, product recommendations, finding sequence and grouping of products. The process of designing mining model is described in the

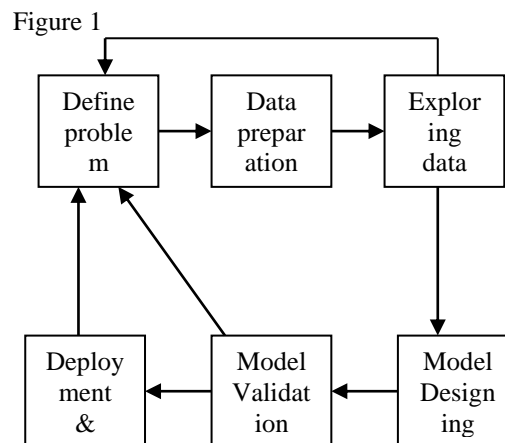


Figure 1: Process of creating Data mining model

The process of data mining model creation is cyclic, dynamic and iterative process. Each step in the process can be repeated many times in order to create a good model. The first step is to clearly define the problem statement by analyzing business requirements, defining the scope, metric, objectives and identify the data needed for analysis. In second step data is consolidated and cleaned. Identify the hidden correlation and sources of the data. The third step is to explore the prepared data by calculating minimum and maximum values, mean and standard deviations etc. Data must be explored in light of understanding business problem. The fourth step is to build the mining model by define the columns of data used for input, defining the parameters and attributes by creating a mining structure. The fifth step explores the built model and tests its effectiveness and performance. Create multiple models with different configurations and test all models for best results for the given problem data. The last step deploys the model to a production environment.

In Data Mining the task of finding frequent pattern in large databases is very important and has been studied in large scale in the past few years. Unfortunately, this task is computationally expensive, especially when a large number of patterns exist. The FP-Growth Algorithm, proposed by Han in ^[1], is an efficient and scalable method for mining the complete set of frequent patterns by pattern fragment growth, using an extended prefix-tree structure for storing compressed and crucial information about frequent

patterns named frequent-pattern tree (FP-tree). In his study, Han proved that his method outperforms other popular methods for mining frequent patterns, e.g. the Apriori Algorithm [2] and the Tree Projection [3]. In some later works [4] [5] [6] it was proved that FP-Growth has better performance than other methods, including Eclat [7] and Relim [8]. The popularity and efficiency of FP-Growth Algorithm contributes with many studies that propose variations to improve his performance [5] [6] [9] [10] [11] [12] [13] [14] [15] [16]

Frequent Item Set (FIS) mining is an essential part of many Machine Learning algorithms. What this technique is intended to do is to extract the most frequent and largest item sets within a big list of transactions containing several items each. For example:

Let T be a list of n transactions $[t_1, t_2, \dots, t_n]$. Each transaction t_i contains a list of k_i items $[a_{i1}, a_{i2}, \dots, a_{ik}]$.

So we have $T = [t_1 = [a_{11}, a_{12}, \dots, a_{1k}], t_2 = [a_{21}, a_{22}, \dots, a_{2k}], \dots, t_k = [a_{k1}, a_{k2}, \dots, a_{kk}]]$.

The Frequent Item Set for T is FIS_T , where $\forall s \in FIS_T$, s is the most frequent and largest set of items, which:

- Is not contained within another set in FIS_T .
- Appears at least m times (we call this m number as the minimum support threshold).

An example of this FIS technique, a customer Mario, with a minimum support threshold m of 50 % and we want to mine the FIS for Mario.

$T_{\text{Mario}} = [[\text{beer, wine, rum}], [\text{beer, rum, vodka}], [\text{beer, vodka}], [\text{beer, wine, rum}]]$.

$|T_{\text{Mario}}| = 4$

$m = 2$ (50 % of 4)

$FIS_{\text{Mario}} = \{ \{\text{beer, wine, rum}\}, \{\text{beer vodka}\} \}$

As you can see, $\{\text{beer, wine rum}\}$ and $\{\text{beer vodka}\}$ appear in 2 of the transactions.

You may be asking why isn't $\{\text{beer, rum}\}$ inside FIS_{Mario} , if it appears on 3 of the transactions. The answer is because $\{\text{beer, rum}\}$ is already contained inside $\{\text{beer, wine, rum}\}$, which is larger. This is not an actual concrete implementation of the algorithm, we will explain you 2 of many implementations: Apriori and FP-Growth.

II. APRIORI ALGORITHM

Apriori is an algorithm for frequent item set mining and association rule learning over transactional databases [18]. It proceeds by identifying the frequent individual items in the database and extending them to larger and larger item sets as long as those item sets appear sufficiently often in the database. The frequent item sets determined by Apriori can be used to determine association rules which highlight general trends in the database: this has applications in domains such as MBA

Apriori algorithm identifies the item sets which are subsets of at least transactions in the database. Apriori uses a "bottom up" approach, where frequent subsets are extended one item at a time (a step known as *candidate generation*), and groups of candidates are tested against the data. The algorithm terminates when no further successful extensions are found. Apriori uses breadth-first search and a Hash tree structure to count candidate item sets efficiently. It generates candidate item sets from item sets. Then it prunes the candidates which have an infrequent sub pattern. According to the downward closure lemma, the candidate set contains all frequent $-length$ item sets. After that, it scans the transaction database to determine frequent item sets among the candidates.

The Apriori algorithm is based on the fact that if a subset S appears k times, any other subset S' that contains S will appear **k times or less**. So, if S doesn't pass the minimum support threshold, **neither does S'** . There is **no need to calculate S'** , it is discarded a **priori**.

Now we're going to show you an example of this algorithm.

Let's suppose we have a client Mario with transactions $[[\text{beer, wine, rum}], [\text{beer, rum, vodka}], [\text{beer, vodka}], [\text{beer, wine, rum}]]$, and a minimum support threshold m of 50 % (2 transactions).

1) First step: Count the singletons & apply threshold

The singletons for Mario are:

beer: 4,
wine: 2,
rum: 3,
vodka: 2

All of the single items appear m or more times, so none of them are discarded.

2) Second step: Generate pairs, count them & apply threshold

The pairs created were: { {beer, wine}, {beer, rum}, {beer, vodka}, {wine, rum}, {wine, vodka}, {rum, vodka} }.

Now we proceed to count them and applying the threshold.

{beer, wine}: 2
{beer, rum}: 3
{beer, vodka}: 2
{wine, rum}: 2
{wine, vodka}: 0
{rum, vodka}: 1

{wine, vodka} and {rum, vodka} have not passed the threshold, so they are discarded and any other subcombination both of them can generate.

The remaining pairs are put into a temporal associations set.
Assocs = { {beer, wine}, {beer, rum}, {beer, vodka}, {wine, rum} }

3) Step N: Generate triplets, quadruplets, etc., count them, apply threshold and remove containing itemsets.

We generate triplets from our pairs.
Triplets = { {beer, wine, rum}, {beer, wine, vodka}, {beer, rum, vodka}, {wine, rum, vodka} }.

Now we count them:
{beer, wine, rum}: 2
{beer, wine, vodka}: 0
{beer, rum, vodka}: 1
{wine, rum, vodka}: 0

Only {beer, wine, rum} has passed the threshold, so now we proceed to add it to Assocs, but first, we have to remove the subsets that {beer, wine, rum} contains.

Before adding our remaining triplet Assocs looked like this: { {beer, wine}, {beer, rum}, {beer, vodka}, {wine, rum} }.

When we add the triplet and remove the subsets that are inside it {beer, wine}, {beer, rum} and {wine, rum} are the ones that should go.

Assocs now look like { {beer, wine, rum}, {beer, vodka} }, and this is our **final result**.

If we had more than 1 triplet after applying the threshold, we should proceed to generating the quadruplets, counting them, applying the threshold, adding them to Assocs and removing the subsets that each quadruplet contains.

4) Example 2

Assume that a large supermarket tracks sales data by stock-keeping unit (SKU) for each item: each item, such as "butter" or "bread", is identified by a numerical SKU. The supermarket has a database of transactions where each transaction is a set of SKUs that were bought together. Let the database of transactions consist of following itemsets:

Itemsets

{1,2,3,4}
{1,2,4}
{1,2}
{2,3,4}
{2,3}
{3,4}
{2,4}

We will use Apriori to determine the frequent item sets of this database. To do so, we will say that an item set is frequent if it appears in at least 3 transactions of the database: the value 3 is the *support threshold*.

The first step of Apriori is to count up the number of occurrences, called the support, of each member item separately. By scanning the database for the first time, we obtain the following result

Item Support

{1} 3
{2} 6
{3} 4
{4} 5

All the item sets of size 1 have a support of at least 3, so they are all frequent.

The next step is to generate a list of all pairs of the frequent items. For example, regarding the pair {1,2}: the first table of Example 2 shows items 1 and 2 appearing together in three of the itemsets; therefore, we say item {1,2} has support of three.

Item Support

- {1,2} 3
- {1,3} 1
- {1,4} 2
- {2,3} 3
- {2,4} 4
- {3,4} 3

The pairs {1,2}, {2,3}, {2,4}, and {3,4} all meet or exceed the minimum support of 3, so they are frequent. The pairs {1,3} and {1,4} are not. Now, because {1,3} and {1,4} are not frequent, any larger set which contains {1,3} or {1,4} cannot be frequent. In this way, we can *prune* sets: we will now look for frequent triples in the database, but we can already exclude all the triples that contain one of these two pairs:

Item Support

- {2,3,4} 2

In the example, there are no frequent triplets -- {2,3,4} is below the minimal threshold, and the other triplets were excluded because they were super sets of pairs that were already below the threshold.

B. Advantages

The Apriori Algorithm calculates more sets of frequent items.

C. Limitations

- The candidate generation could be extremely slow (pairs, triplets, etc.).
- The candidate generation could generate duplicates depending on the implementation.
- The counting method iterates through all of the transactions each time.
- Constant items make the algorithm a lot heavier.
- Huge memory consumption

1) FP-Tree structure

The frequent-pattern tree (FP-tree) is a compact structure that stores quantitative information about frequent patterns in a database [4].

Han defines the FP-tree as the tree structure defined below [1]:

1. One root labeled as “null” with a set of item-prefix subtrees as children, and a frequent-

item-header table (presented in the left side of Figure 1);

2. Each node in the item-prefix subtree consists of three fields:
 1. Item-name: registers which item is represented by the node;
 2. Count: the number of transactions represented by the portion of the path reaching the node;
 3. Node-link: links to the next node in the FP-tree carrying the same item-name, or null if there is none.
3. Each entry in the frequent-item-header table consists of two fields:
 1. Item-name: as the same to the node;
 2. Head of node-link: a pointer to the first node in the FP-tree carrying the item-name.

Additionally the frequent-item-header table can have the count support for an item. The Figure 2 below show an example of a FP-tree.

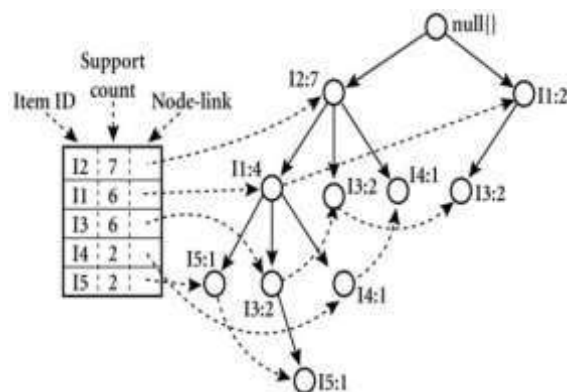


Figure 2: An example of an FP-tree

The original algorithm to construct the FP-Tree defined by Han in [1] is presented below in Algorithm 1.

Algorithm 1: FP-tree construction

Input: A transaction database DB and a minimum support threshold?

Output: FP-tree, the frequent-pattern tree of DB.

Method: The FP-tree is constructed as follows.

1. Scan the transaction database DB once. Collect F, the set of frequent items, and the support of each frequent item. Sort F in

support-descending order as FList, the list of frequent items.

2. Create the root of an FP-tree, T, and label it as "null". For each transaction Trans in DB do the following:
3. Select the frequent items in Trans and sort them according to the order of FList. Let the sorted frequent-item list in Trans be [p | P], where p is the first element and P is the remaining list. Call insert tree([p | P], T).
4. The function insert tree([p | P], T) is performed as follows. If T has a child N such that N.item-name = p.item-name, then increment N 's count by 1; else create a new node N , with its count initialized to 1, its parent link linked to T , and its node-link linked to the nodes with the same item-name via the node-link structure. If P is nonempty, call insert tree(P, N) recursively.

By using this algorithm, the FP-tree is constructed in two scans of the database. The first scan collects and sort the set of frequent items, and the second constructs the FP-Tree.

Advantages:

1. Compress a large database into a compact, FP-tree structure
2. Highly condensed, but complete for frequent pattern mining
3. It avoid costly database scans
4. Develop an efficient, FP-tree-based frequent pattern mining method
5. A divide-and-conquer methodology: decompose mining tasks into smaller ones
6. Avoid candidate generation: sub-database test only!

Comparative Analysis:

Here, each file has multiple customers with multiple transactions. The algorithms are parallelized per client and the results were:

File	Apriori	FP-Growth
Simple Market Basket test file	3.66 s	3.03 s
"Real" test file (1 Mb)	8.87 s	3.25 s

"Real" test file (20 Mb)	34 m	5.07 s
Whole "real" test file (86 Mb)	4+ hours (Never finished, crashed)	8.82 s

The following tables present the test results of Apriori and FP-growth for different number of instances and Confidence..

No. of Instances	Execution Time (in Secs)	
	Apriori	FP-growth
3627	47	3
1689	25	2
941	8	1

Table 1: Execution time for different no. of instances

As a result, when the number of instances decreased, the execution time for both algorithms is decreased. For the 3627 instances of supermarket data set, Apriori requires 47 seconds but FP-growth requires only 3 seconds for generating the association rules.

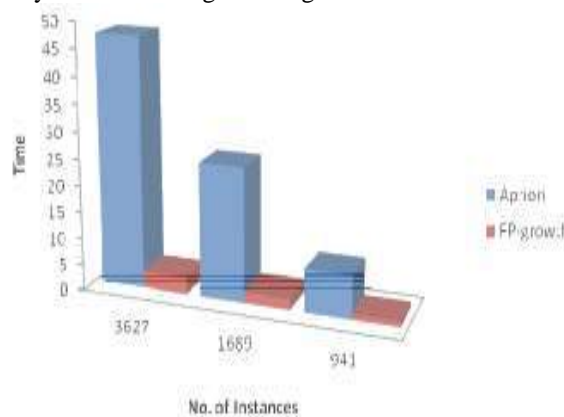


Figure: 5 Scalability of Apriori and FP growth

In the above Figure 5, the performance of Apriori is compared with FP-growth, based on time. For each algorithm, three different size of data set were considered with sizes of 3627, 1689 and 941. Here the x-axis shows size of database in number of instances and y-axis shows the execution time in seconds.

When comparing Apriori with FP-Growth the FP-growth algorithm requires less time for any number of instances. So, the performance of FP-growth outperforms Apriori based on time for various numbers of instances.

Confidence	Execution Time(in Secs)	
	Apriori	FP-growth
0.5	15	1
0.7	18	2
0.9	56	3

Table 2: Execution time for different Confidence levels

Table 2 summarizes that the execution time of Apriori and FP-growth for various confidence level. When Confidence level is high, the time taken for both algorithms is also high. While the Confidence level is 0.5, the time taken to generate the association rule is 15 seconds in Apriori and 1 second in P-growth.

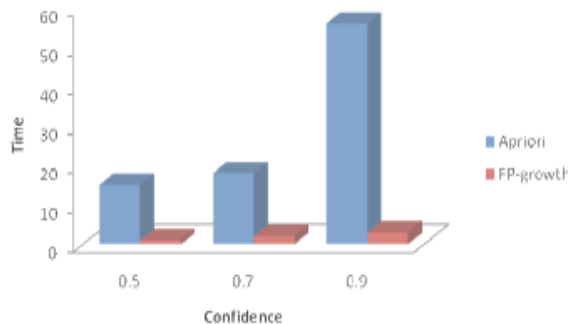


Figure 6: Confidence Vs Time

Figure 2 shows the relationship between the time and confidence. In this graph, x axis represents the time and y axis represents the Confidence. The running time for FP-growth with confidence of 0.9 is much higher than running time of Apriori. From the graph time taken to execute the FP-growth is less compared with Apriori for any Confidence level.

CONCLUSION

The association rules play a major role in many data mining applications, trying to find interesting patterns in databases. In order to obtain these association rules the frequent sets must be previously generated. Frequent pattern mining is the most important step in association rules which finally helps us in many applications like market basket analysis, clustering, series analysis, games, decision making, object mining, website navigation etc. The most common algorithms which are used for this type of actions are the Apriori and FP-Growth. The performance analysis is done by varying number of instances and confidence level. The efficiency of both algorithms is evaluated based on time to generate the association rules. It is found that Apriori uses join and prune

method, and FP Growth constructs the conditional frequent pattern tree which satisfies the minimum support. From the experimental data presented it can be concluded that the

In the future improvements must be taken care to enhance the performance of Apriori using a better layout to store the data. FP-Growth beats Apriori by far. It has less memory usage and less runtime. The differences are huge. FP-Growth is more scalable because of its linear running time.

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Student's Involvement in Different Social Activities through Social Media

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Abstract: Social Networking Services boom is useful for promoting or participating in social activities and events. Organization of social events faces a large issue in publishing their list of events. They cannot provide users with different choices when they conduct multiple events. We seek to plan an event organization scheme in this paper that provides users with different choices. We scheduled to build learners Google Form. This Google Form differentiated users' subjective preferences to events and user's objective preferences to events.

Keyword: Event, Social Media e.g. Google

I-Introduction:

A social event organization that includes a public youth and society performance or entertainment. Many organizations schedule many tasks for learners, such as social functions. Day of Independence, Social Occasion such as Ganesh Festival, Navratri, Beti Bachao and save girls, Social Activity, Blood Camp and Campus Awareness Program, and Save other water. Organization of social events faces a large issue in publishing their list of events. But when they conduct multiple events, they cannot provide users with different choices. This Google Form differentiated users' subjective preferences to events and users' objective preferences to events.

II-Literature Review

This article reviews how data and insight can be derived from open sources of social media. It focuses on the specific research technique that has emerged, the skills they provide, the possible insight they provide, and the ethical and legal issues they raise.

These techniques are considered relevant and valuable to the extent that they can help to maintain public safety by preventing, preparing for terrorism, protecting the public from it and pursuing its perpetrators.

III-Event and benefits:

The recommender for Out life offers users personalized suggestions for events as well as suggestions to invite a group of friends together to attend the recommended event. Conversely, it is possible to automatically compose the group of friends of the user and then

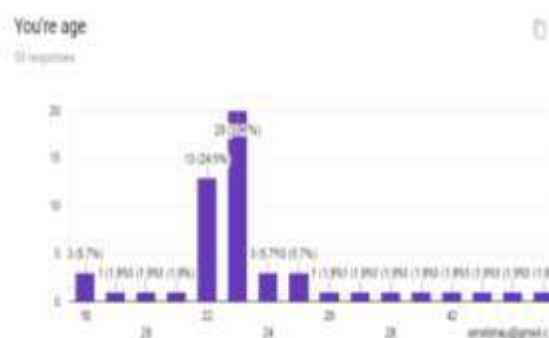
recommend the most suitable events based on the preferences of all group members. Groups of the customer's close friends are made up of users grouped based on their mutual friends and selected the best connections of the user based on interaction behavior. Complementing the top- suggestions with occurrences resulting in a reduced forecast of ratings enhances serendipity and customer satisfaction. Future research may include labeling the detected groups of friends, incorporating user trust in group recommendations, addressing the cold-start issue for new users, and a long-term detailed user study.

IV-Suggestions

The users confirmed that the recommendations match their personal preferences and that they notice an accuracy improvement for the recommendations as well as for the groups after using the Feedback buttons. In addition, the test users experienced the recommendations as surprising and novel, indicating that while still being accurate, the fourth phase of the algorithm adds the necessary serendipity to the recommendations. Test users usually felt great about the recommender system.

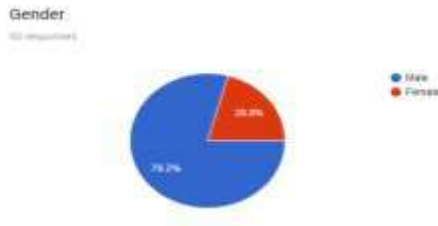
They obviously valued the suggested activities and organizations as well as the feedback on the activities and organizations.

Forms response chart

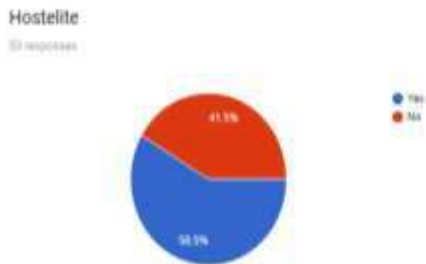


Age group between 18 to 46 and maximum responses from 23 age group people (37.7%), Second Maximum responses from 22 age group people (24.5%).

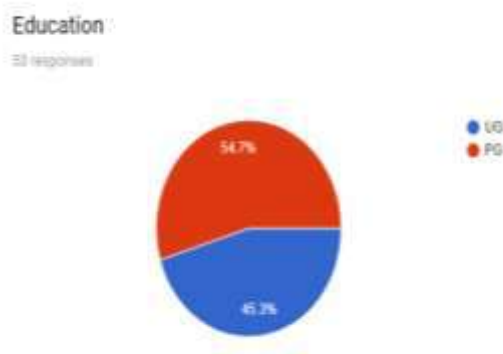
Region behind the participation:-Maximum people participate friend circle event in Pune.



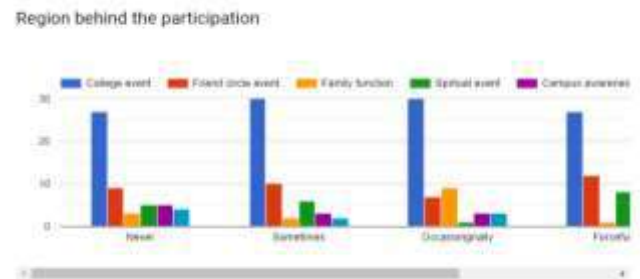
Maximum responses from male group people (79.2%).



Maximum responses host elite group people (58.5%).



Maximum responses from PG student group people (54.7%).



Conversely, it is possible to automatically compose the group of friends of the user and then recommend the most suitable events based on the preferences of all group members. Groups of the user's close friends are made up of users grouped based on their mutual friends and selected the best friends of the user based on interaction behaviour.

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Artificial Intelligence (AI) used as Leading Technology for Future

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Abstrac: “Bill Gates, the founder of Microsoft, recently said that ‘AI can be our friend’ and is good for the society.” “A.I. Artificial Intelligence, also known as A.I., is a 2001 American science fiction drama film directed by Steven Spielberg.”

“Alan Turing introduced Turing Test for evaluation of intelligence and published *Computing Machinery and Intelligence* in 1950.”

It is true fact that Artificial Intelligence has enormous possibilities to reduce the time and increase proficiency in authorized professional. Artificial Intelligence is also becoming a part and package of developing as the next Fourth Industrial Revolution by 2020. Now, small Enterprise developers, corporate’s and engineering stream can solve complex start up business by using intelligent automation.

Keyword: Artificial Intelligence,

Artificial Intelligence is a method of creation intelligent computer, a computer-managed robot, or a software think logically, in the similar manner the machines are able to think as human being. Artificial intelligence is a leading technology based on various streams such as Computer Science, Biology, Psychology, Linguistics, Mathematics, and Engineering. Various types of Intelligence Linguistic intelligence, Musical intelligence, Logical-mathematical intelligence, spatial intelligence, Bodily-Kinesthetic intelligence, Interpersonal intelligence etc.

Linguistic intelligence: Basic problems of machine translation are due to lexical ambiguity and variation, and grammatical differences in morphology and word order. In the rule-based paradigm, the problems are approached by linguistic analysis sorting out the different uses, hence translation options, of the words. The linguistic analysis also is also the back-bone in creating an appropriate word order. AI used the data-driven, or statistical approach, relies on reuse of large amounts of previously translated text, parallel data.

Musical intelligence: Online interactive musical experience between machine and computer give a lot of fun by using AI. Exploration in artificial intelligence (AI) is known to have compressed is the contribution of AI in the field of music. Artificial intelligence used composition technology in music era. Numerous music software’s have been developed that use AI . Musical intelligence used composition technology used AI composition, performance, music theory, and digital sound processing.



AI used as Leading Technology in various sector

Interpersonal intelligence: Virtual representation of human beings whose behavior is determined by artificial intelligence (AI) .It contains the ability to interrelate with other societies. There are many examples of AI exhibiting this intelligence today. Siri, Google Now, and Cortana are all smart agents or intelligent digital personal assistants on various platforms (iOS, Android, and Windows Mobile).

Bodily-Kinesthetic intelligence: Robotics consist of structure of robots whereas AI includes software design intelligence. It involves the control of one’s physical motions and the capacity to handle objects skillfully. AI Robots works in real time environment. It replicate intelligent behavior and perform intelligent behavior with minimal human interference. AI processes are often essential to allow the robot to perform more difficult tasks. Robots and machines have been doing remarkable things. Robots that like an octopus, glide like a snake, fly like an insect, walk like a dog, run like a human, and even do precision surgery.

In a future of universal A.I. where everything that can be robotic will be automated. Moving toward new future, we have to change the focus of high schools from fascinating with the curriculum and teaching to the syllabus. AI is leading technology for developing human brain. AI upgrades awareness, values, and the kind of ambitions that set forward for future. By 2020, the World Economic Forum (WEF) predicts that the Fourth Industrial Revolution will be here, with robotics, artificial intelligence and automation making some roles obsolete.

Artificial Intelligence for Education

While the debate regarding how much screen time is appropriate for children rages on among educators, psychologists, and parents, it’s another emerging technology in the form of artificial intelligence and

machine learning that is beginning to alter education tools and institutions and changing what the future might look like in education. It is expected that artificial intelligence in Indian education will grow by 47.5% from 2017-2021 according to the Artificial Intelligence Market in the Indian Education Sector report. Even though most experts believe the critical presence of teachers is irreplaceable, there will be many changes to a teacher's job and to educational best practices. Government is taken Initiative in the form of E-Learning / Digital Learning like Swayam, NPTEL and various other private players like Byjus, Top scorers etc

The automotive industry is among the industries at the forefront of using AI to mimic, augment, and support the actions of humans, while simultaneously leveraging the advanced reaction times and pinpoint precision of machine-based systems. Indeed, today's semi-autonomous vehicles and the fully autonomous vehicles of the future will rely heavily on AI systems.

Beyond self-driving vehicles, AI can also be used to make life in the car more convenient and safer, for both the driver and the passengers. In-car assistants, driven by natural language processing (NLP) and machine learning techniques, allow the vehicle's systems to respond to voice commands and infer what actions to take, without human intervention. Despite the technological potential of both autonomous vehicles and in-car assistants, an abundance of caution relating to safety concerns, and a desire to ensure users enjoy a smooth, glitch-free experience, these AI systems likely will be deployed gradually. Tractica forecasts that the market for automotive AI hardware, software, and services will reach \$26.5 billion by 2025, up from \$1.2 billion in 2017.

This Tractica report provides detailed market forecasts for AI hardware, software, and services in the automotive market during the period from 2017 through 2025. The technologies covered include machine learning, deep learning, NLP, computer vision, machine reasoning, and strong AI. The forecast covers 15 key use cases for automotive AI, segmented by world region. Profiles are also included for 31 key participants in the emerging automotive AI market ecosystem.

Artificial Intelligence for Healthcare Applications

The role of artificial intelligence in healthcare has been a huge talking point in recent months and there's no sign of the adoption of this technology slowing down, well, ever really.

AI in healthcare has huge and wide reaching potential with everything from mobile coaching solutions to drug discovery falling under the umbrella of what can be achieved with machine learning.

That being said, many healthcare executives are still too shy when it comes to experimenting with AI due to privacy concerns, data integrity concerns or the unfortunate presence of various organizational silos making data sharing next to impossible. We've covered the main barriers to adopting AI in healthcare here.

Medical diagnostics: the use of Artificial Intelligence to diagnose patients with specific diseases. Check out our roundup report from industry experts here. Also, a report AI platform was announced in March 2019 which is expected to help identify and anticipate cancer development.

Drug discovery: There are dozens of health and pharma companies currently leveraging Artificial Intelligence to help with drug discovery and improve the lengthy timelines and processes tied to discovering and taking drugs all the way to market. If this is something you're interested in, check our report titled Pharma Industry in the Age of Artificial Intelligence: The Future is Bright.

Clinical Trials: Clinical Trials are, unfortunately, a real mess. Most clinical trials are managed offline with no integrated solutions that can track progress, data gathering and drug trial outcomes. Read about how Artificial Intelligence is reshaping clinical trials here. Also, you may also be interested in the Healthcare Weekly podcast episode with Robert Chu, CEO @ Embleema where we talk about how Embleema is using AI and blockchain to revolutionize clinical trials. If Blockchain in healthcare is your thing, you may also be interested in our Global "Blockchain in Healthcare" Report: the 2019 ultimate guide for every executive.

Pain management: This is still an emergent focus area in healthcare. As it turns out, by leveraging virtual reality combined with artificial intelligence, we can create simulated realities that can distract patients from the current source of their pain and even help with the opioid crisis. You can read more about how this works here. Another great example of where AI and VR meet is the Johnson and Johnson Reality Program which we've covered at length here. In short, J&J has created a simulated environment which used rules-based algorithms to train physicians in a simulated environment to get better at their job.

Improving patient outcomes: Patients outcomes can be improved through a wide variety of strategies and outcomes driven by artificial intelligence. To begin with, check our report on 10 ways Amazon's Alexa is revolutionizing healthcare and our Healthcare Weekly Podcast with Helpsy's CEO Sangeeta Agarwal. Helpsy has developed the first Artificial Intelligence nurse in the form of a chatbot which assists patients at every stage of the way in their battle with cancer.

Smart watches revolutionizing delivery of care
With the launch of the Apple Watch Series 4 and the new electrodes found within the gadget, it's now possible for users to take an ECG directly from the wrist.

The Apple Watch Series 4 is the very first direct-to-consumer product that enables users to get a electrocardiogram directly from their wrist. The app that permits the readings provides vital data to physicians that may otherwise be missed. Rapid and skipped heartbeats are clocked and users will now receive a notification if an irregular heart rhythm (atrial fibrillation) is detected.



Artificial Intelligence for Business Applications

AI is capable of automating business intelligence and analytics processes, providing a holistic end-to-end solution. In others, computer vision is being deployed to map and navigate terrain, contributing to the development of smart, self-driving cars that are learning to drive as humans do. Below are just a few examples of how AI is being used to improve efficiency:

Banking and Finance – fraud detection

Many banks use the various applications of artificial intelligence to detect fraudulent activity. The AI software is given a very large sample of data that includes fraudulent and non-fraudulent purchases and is trained to determine whether a transaction is valid based on data. Over time, the software becomes incredibly adept at spotting fraudulent transactions based on what it has learned previously.

Retail – online customer support

Many websites now offer some form of 'chat' functionality where you can talk to a customer support representative or sales representative. In most instances, it is some form of automated AI that begins these conversations. As these AI chat bots are capable of

understanding natural language, i.e. human conversation, they can readily assist customers in finding out what they need to know, extracting information from the website, and directing them to the appropriate web page or person for further support.

Security

As cyber-attacks increase in frequency and more sophisticated tools are used to breach cyber defenses, human operators are no longer enough. Top firms across the world are investing heavily in cybersecurity to ensure their data is protected. Real-time threat detection, mitigation, and ideally, prevention, are what's needed for businesses – and AI can deliver. Using machine learning algorithms and feeding those algorithms great quantities of data, IT and security experts can teach the AI solution to monitor behavior, detect anomalies, adapt and respond to threats and issue alerts. AI has quickly become a key component in a business' cybersecurity infrastructure, providing a multi-layered security strategy that is robust and sophisticated.

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A Study on Challenges before Primary Agriculture Credit Societies (PACS) in India

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Abstract: *The Co-operative Movement in India was born out of the distress and turmoil that prevailed in the last quarter of the 19th century. The Industrial Revolution had given a death blow to village industries and driven people to agriculture, the only avenue of employment and livelihood. The consequent sub-division and fragmentation of holdings had made agriculture an uneconomic proposition.*

This study focuses on the Cooperative movement in India and the challenges faced by PACS in India. The study also highlights the importance of PACS in rural credit. It also gives the idea about the working structure of PACS in India. The researcher has collected the data from secondary sources like journals, published reports, websites, etc.

Introduction to Cooperative Movement in India:

The Co-operative Movement in India was born out of the distress and turmoil that prevailed in the last quarter of the 19th century. The Industrial Revolution had given a death blow to village industries and driven people to agriculture, the only avenue of employment and livelihood. The consequent sub-division and fragmentation of holdings had made agriculture an uneconomic proposition.

This, combined with the rigidity of land revenue collection, uncertainty of rainfall and, therefore, of crop production, compelled the agriculturist to knock at the door of the money-lender who advanced money either by purchasing the crop at a throwaway price or by charging a sky-high rate of interest.

The deteriorating condition of farmers under the heavy strain of increasing indebtedness and frequent famines not only proved the inadequacy of legal measures but also emphasized the need for the provision of cheap credit through an alternative agency.

The prevalence of widespread distress in the country, the growing volume of rural debt and the machinations of the money-lender led to certain voluntary efforts in the field of rural credit. In the Madras Presidency were organised 'Nidhis' or Mutual-Loan Associations.

In 1881, some Bombay capitalists drew up a scheme for starting an agricultural bank in Poona. Even a bill to that effect was introduced in the Legislative Council by Mr. Mandlik. Meanwhile, Wedderburn tried but failed to enlist public support for his scheme and it could not take practical shape.

In 1892, the Madras Govt. deputed Fredrick Nicholson to Germany "on special duty for the purpose of enquiring into the possibility of introducing into this Presidency system of Agricultural or other land banks."

In his Report, Nicholson stressed the point that "the substitution of organized credit for that of the money-lender is a necessary development of civilization—the individual system must be eventually passed as general wealth, order, business confidence, and habits of business associations develop."

As to the form it should take, Nicholson favoured the establishment of co-operative societies based on Raiffeisen model. He, therefore, summed up his report in the two words: "Find Raiffeisen." The Govt., however, took no immediate action on the report which was submitted in 1895.

While Nicholson's enquiries were in progress, Mr. Dupernex began experimenting with 'Peoples Banks' in U.P., Maclagan and Crosthwaite started similar societies in Multan district of the Punjab and Mr. Lyon in Bengal.

The interest shown by local agriculturists in these societies and the powerful support lent by the Indian Famine Commission (1901) induced the govt. to set up a committee under the presidentship of Sir Edward Law to report on the introduction of co-operative societies in India. The Committee reported favorably in 1903 and the first co-operative Societies Act was passed in 1904.

Objectives of the Study:

1. To Study the Cooperative Movement In India
2. To study the Cooperative Credit Structure in India
3. To Study the Role of Primary Agriculture Societies in Cooperative Credit System
4. To Study the Challenges faced by PACS in India.

Methodology:

This study focuses on the Cooperative movement in India and the challenges faced by PACS in India. For this study the researcher has collected the data from secondary sources like journals, published reports, websites, etc.

The Second World War:

With the rise in prices and the return of agricultural prosperity during world war II, a new chapter opened in the progress of the movement. Between 1938-39 and 1945-46, the number of societies rose from 1.22 lakhs to 1.72 lakhs; membership from 53.7 lakhs to 91.6 lakhs and working capital from rupees 106.45 crores to 164.0 crores.

This amounted to a 41% rise in the number of societies, 70.6% in membership and 54% in working capital.

The progress may also be judged from the fact that in 1945-46, there was one society for every 3.8 villages and 10.6% of their population as against only one society for 5.4 villages and 6.2% of their population in 1938—39.

The overdoses were repaid and the demand for new loans fell with the result that many societies and central banks came to possess surplus funds for which they were keen to find profitable outlets of investment.

The most notable contribution of the war was the shifting of emphasis from credit to non-credit aspect of the movement, the percentage of non-credit societies having increased from 17 in 1938—39 to 23 in 1945-46.

The shortage of consumer articles like sugar, cloth, Kerosene and matches led to the establishment of a large number of consumer's Co-operative Stores. Similarly, many new types of producers' societies like weavers' co-operative societies marketing societies, Fruit grower and cane-Grower societies, Motor transport societies came to be formed.

The war period also saw a growing trend towards the establishment of multipurpose co-operative societies.

In short, the war broadened the functional range of the movement and brought about a shift from the lopsided emphasis on the credit aspect to the productive and distributive functions or to its multipurpose potentialities and thereby imparted that 'richness and balance' which was so necessary for its proper development.

The Co-Operative Planning Committee:

In 1945, the govt. appointed the cooperative planning committee to draw up a plan of cooperative development in the country. The committee, which was presided over by R.G. Saraiya, fixed an overall target of bringing 50% of the villages and 30% of the rural population within the scope of the movement in a period of ten years.

In order to equip the movement for its new role, it was necessary to formulate a long term policy in regard to its structure and organisation. It was in this context that the rural credit survey Committee was appointed in 1951.

The committee put forward an integrated scheme of rural credit based on:

- (a) 'State partnership at different levels;'
- (b) 'Full coordination between credit and other economic activities, especially marketing and processing;'
- (c) And administration through adequately trained and efficient personnel, responsive to the needs of the rural population. This scheme was approved and accepted as the basis for the future development to be incorporated into the second Five year plan.

A notable shift in policy occurred in 1958 when the National Development Council passed a 'drastic and sweeping' resolution" which in effect, led to the rejection of the old large-sized credit society and the emergence of small sized 'Service Cooperatives'.

Over the period of the three Plans, the co-operative movement made rapid progress.

The number of societies of all types increased from 1.8 lakhs to 3.47 lakhs; membership rose from 137 lakhs to 503 lakhs and their working capital expanded from Rupees 276 crores to rupees 2800 crores. In other words, there was a near-doubling of the number of societies, a more than 3½ times increase in membership and a more than 10 times rise in working capital.

This growth was, however, not equally shared among all the states. The progress was more marked in the States of Maharashtra, Gujarat, Tamil Nadu, Punjab and Madhya Pradesh. The movement was, however, weak in the eastern region comprising the states of Assam, Bengal, Bihar, Orissa, Manipur and Tripura.

The uneven progress was reflected in wide differences in the per capita loan distribution to rural population which ranged all the way from rupees 33 in Maharashtra to just two rupees in Bihar and Assam.

A most welcome development during the plan period was the diversification of the movement. A major breakthrough was witnessed in the field of agricultural marketing and processing. The development of consumer's Stores and industrial co-operatives was also significant.

This can be judged from the fact that in 1965-66 the number of stores stood at 13077, membership at 33.32 lakhs and sales at 162.30 crores of rupees. In the sphere of industrial co-operatives, there were 78 sugar factories, 142 rice mills, 155 cotton ginning and pressing societies, 298 oil crushing and 329 Paddy husking societies in 1965-66.

The co-operative movement, during a span of over six decades, had come a long way. From humble beginnings in 1904, it had expanded into a mammoth organisation covering 85% of villages and 33% of the rural population of the country. In 1961-62 it met 25.8% of the credit needs of the agriculturists as against 3.1% in 1951-52.

The average Loan advanced per member had increased from rupees 44 in 1950-51 to rupees 137 in 1965-66. Apart from providing finance, the movement had diversified into such fields as agricultural production, marketing and processing, small and medium industries, housing, transport, and distribution of essential commodities.

And yet it failed to 'convulse' the country. More than 60% of the rural population was still outside its fold and for nearly 75% of his credit needs, the cultivator was dependent on agencies other than the co-operative society.

The movement had neither materially reduced the burden of the agricultural' debt nor their dependence on the money-lender. It even failed to improve their self-

reliance, resourcefulness, or capacity for concerted action. In the words of Dr. Gadgil, "over large areas, was a sense of disillusion regarding the actual performance of the co-operatives." What was the cause? Where had the movement gone wrong?

Primary Agriculture Credit Societies:

The rural co-operative credit system in India is primarily mandated to ensure flow of credit to the agriculture sector. It comprises short-term and long-term co-operative credit structures. The short-term co-operative credit structure operates with a three-tier system - Primary Agricultural Credit Societies (PACS) at the village level, Central Cooperative Banks (CCBs) at the district level and State Cooperative Banks (StCBs) at the State level. PACS are outside the purview of the Banking Regulation Act, 1949 and hence not regulated by the Reserve Bank of India. StCBs/DCCBs are registered under the provisions of State Cooperative Societies Act of the State concerned and are regulated by the Reserve Bank. Powers have been delegated to National Bank for Agricultural and Rural Development (NABARD) under Sec 35 A of the Banking Regulation Act (As Applicable to Cooperative Societies) to conduct inspection of State and Central Cooperative Banks.

A Primary Agricultural Credit Society (PACS) is a basic unit and smallest co- operative credit institutions in India It works on the grassroots level

Primary Agricultural Cooperative Societies (PACS) are the bottom-tier of three- tier Cooperative credit structure operating in the country. These are Short Term Cooperative Credit Structure functioning at the grassroots (Gram Panchayat) level. These are Primary Societies owned by farmers, rural ... artisans etc. and intended to promote thrift and mutual help among the members; cater to their credit requirements and provide credit-linked services like input supply, storage and marketing of agricultural produce etc. These Cooperative Credit Institutions with their deep reach in the rural areas and accessibility to the small and marginal farmers and the other marginalized populations have been playing a vital role in dispensation of agricultural credit

Objectives of PACS:

1. Assessment of the Credit Needs
2. Disbursement of Credit to Members
3. Recovery of Credit
4. Promote the Economic Interest of the Members
5. To cater to the credit need, mostly, farm credit and income generation activities of farmers, artisans and other members
6. To extend selected banking services to members....

7. To implement Kissan Credit Card Scheme for providing timely and adequate farm credit to members

8. To take up marketing of agricultural produce of member farmers....

To cater to the consumer needs, mostly, essential commodities of members. To create awareness among farmers to adopt improved farming practices

9. To reach upto the unprivileged section of the community through SHGs, JLGs and TFGs. ...
PACS Status:

PACS are important structures that have been providing credit facilities mainly to the farmers in villages of India. It has the deepest penetration amongst all the other credit providing institutions Currently, India has 95,595 PACS — one for every seven villages.

Challenges for PACS

Despite all the above mentioned positive points, PACS are in trouble. The deposits of PACS are continuously falling and has already declined far behind their lending obligations. As per Bakshi committee report, only about 10% of the agricultural loans issued by the PACS were supported through deposits mobilised by PACS and the rest 90% had to be provided by CCBs. As on 31 March 2011, PACS in 25 states had mobilized deposits of Rs 37,238 crore. However, of this, Rs 28,210 crore came from PACS of just three states — Kerala, Karnataka, and Tamil Nadu. Excluding these three states PACS in the rest of the country had mobilised only about Rs 7,000 crore as deposits whereas they had provided loans aggregating Rs 47,000 crore. It is also a low margin yielding business which yields around 0.25% net margin. Besides, the agricultural risk add to the worries. Between the high agricultural risk (compounded by working in a small geography) and the low margin, PACS are not earning enough to hedge against the bad years Other problems like politicisation, across the three tiers are also prevalent. Then, PACS' share in agricultural credit is slipping. It has declined from 50% in the mid-nineties to 17% now – with the rest moving to commercial banks and RRBs

As per Bakshi Committee report, this trend of marginalization is going to continue. It cites the ongoing financial inclusion drive as one of the reasons behind this. With financial inclusion programmes all households will soon have savings bank accounts where deposits are protected by DICGC (Deposit Insurance and Credit Guarantee Corporation). On the contrary, there is no such deposit insurance for PACS

Membership

Theoretically and conceptually, a cooperative comes into being as a result of a common need of members. The need could either be for a service, which serves as

an input into his activity or to service his output. The member owns the cooperative conjointly with other members and is expected to act with due diligence to fulfill his membership duties and responsibilities. If cooperatives are to succeed, it is important that members are well informed of not only their rights but also obligations and the need to participate actively in the affairs of the cooperative.

Ensuring 'Active' member participation and enabling speedy exit of non-user members has remained a daunting task for cooperatives. Unfortunately, over the years, we have come to a state where a large number of cooperatives are either unable to cope with the needs of members or the members have in general become passive and apathetic and do not use the services offered. Quite a number of cooperatives have also become irrelevant to their members' needs. Poor member participation has also been due to lack of effort to enhance member equity in cooperatives and near absence of member communication and awareness building efforts.

This situation has been further aggravated due to the lack of provision in Indian cooperative law to ensure that members are users and for removal of inactive members expeditiously and on a regular basis. The Cooperative Acts allow a person who is not doing business with cooperative to continue being enrolled as a member and eligible to participate in meetings, exercise voting rights and to elect/be elected on the Board. Consequently, it is found that in several cooperatives non-users apart from continuing as members, participate in elections and even get elected to hold positions on the Board of Directors/Chairman

Cooperative Acts in general stipulate removal of membership only by the General Body through a special resolution. Calling a General Body meeting and expelling members is a long drawn process and coupled with this due to political compulsions the problem of removing a large percentage of inactive members has not been addressed with the required seriousness.

Governance

In an organizational context, governance refers to the institutional framework that defines the structure and linkages, behavior, interaction, rules of conduct, conflict resolution, incentives and disincentives for behavior. In cooperatives, governance issues are primarily focused on the structure of the Board and its relationship with members, managers and the State. Sadly, the most important function of governance, which is that of aligning the tasks in tune with the basic objective with which a cooperative is organized, has received very little attention.

Lack of Recognition of Cooperatives as Economic Institutions

A fundamental issue having substantial bearing on the governance of cooperative institutions is the lack of recognition of cooperatives as economic institutions meant to serve the needs of its members. The general perception has been that cooperatives are instruments of government meant for public good and therefore need to be supported by the government.

The ICA Cooperative Identity Statement defines cooperatives as "autonomous associations of persons united voluntarily to meet their common economic, social, cultural needs and aspirations through a jointly owned and democratically-controlled enterprise". Cooperatives must therefore be seen as autonomous, economic institutions of user members engaged in production, distribution or other services. They have to be competitive to survive as viable entities, without which they cannot serve their members.

The general lack of a well-defined and explicitly stated official and legal recognition of cooperatives in most cooperative laws is, and without doubt, the root cause of many of the problems that afflict the sector. Further, both members of cooperatives and the public at large do not consider cooperatives as economic institutions at par with other business organizations in view of the predominant role being played by the government through exercise of vast powers that the law provides

Design Issues

The 'design' of a cooperative is an important factor in determining the manner in which it is governed, its success and viability. While designing a cooperative enterprise, one needs to consider factors such as local socio-political conditions, local economy, leadership, structure, by-laws, norms and rules, critical linkages with federal and other organizations, macro policies etc.

Most Cooperatives in the country have come into being through a Top-Down approach or based on a Blue Print model and are a result of target based programmes/actions taken by the higher tier organizations and State departments. Besides, there are numerous instances of suppression of local initiatives and ignoring the perceived needs of the members while structuring the cooperatives. Higher tier cooperatives in most cases have hardly retained any cooperative character and operate like Parastatals and frequently with little or no member involvement.

Lack of initial knowledge about the multi-faceted choices in designing/re-designing cooperatives seriously affects governance, inhibits growth and can result in wrong choices. This is particularly so where there is no clear focal and dynamic leadership.

Board and Management Interface and Accountability

Cooperatives have a two-tier management structure of the Board and its executives, all in the ultimate analysis responsible to the General Body. The effectiveness of a cooperative depends in large part on the quality of partnership between its Board and Chief Executive. The Board should concern itself with long-term or strategic planning; organizational (as opposed to operational) policies; representation and relationships with members, government, other business and the public at large; resource mobilization; monitoring of the organization's performance; and the selection, supervision/direction of the Chief Executive. The Chief Executive must be responsible for achievement of plan objectives; the efficient, economical and effective use of resources; recommending possible business strategies to its Board; recruitment, supervision and evaluation of employees; coordination of departments and groups; etc.

In general, cooperative Boards suffer from lack of long-term perspective, market and business orientation, understanding of the cooperative way of business and how it differs from other enterprises, awareness about the environment (e.g. globalization) and using the knowledge for furthering member interest. In addition, they are also not able to cope with the changing needs of members and be responsive to member needs.

Ensuring accountability at all levels necessitates vesting the required authority (delegation) and clearly defined roles and responsibilities. Unfortunately, in a large number of cooperatives, Board and executive functions are not clearly demarcated, often leading to identity conflicts. Boards are generally found to be assuming operational responsibilities and disinclined to delegate powers and responsibilities to Managers. Striking a balance between Board and Executive functions is a crucial element which determines the success of a cooperative enterprise. The law too does not clearly define the roles, responsibilities and accountability at different levels.

Operations

Professionalization and Accountability

In a business environment the importance of professionally trained and qualified manpower cannot be overemphasized. However, this is one of the weakest areas of cooperatives where the practice of posting government officials in managerial positions in cooperatives for brief tenures has been growing. Many States have common cadre of employees who are deputed to the cooperatives. Most often, these officials have no understanding of the business, either by training or practice and they are deputed for too short a tenure to acquire adequate understanding. There are also numerous instances where the officers posted by

the government to hold key positions such as Chief Executive are changed too frequently resulting in a lack of accountability and thus affecting the business of the cooperatives. The laws also do not provide the required autonomy to cooperatives in matters related to staff strength, remuneration payable, service conditions etc.

Cooperatives are also unable to attract and retain competent professionals (particularly in areas such as marketing and finance) since apart from their lack of financial ability to pay market based compensation they are also unable to provide a stimulating and conducive work culture and environment including freedom for operations with the required delegation of authority. The need for change and adoption of sound HR policies assumes great importance, particularly with a rapidly growing private sector.

Capital

Lack of capital, both equity and debt, are key constraints to the development and growth of cooperatives. In the case of value-added businesses the problem is further compounded due to their high capital requirements. The need for equity in all forms of organization arises out of the requirement of containing the financial risk of debt within reasonable limits. Equity also ensures member stake and interest in the cooperative. It is the sharing of risk in their venture, through substantial financial stake, that is likely to enhance member interest and participation as well as control in the affairs of cooperatives. In the absence of member funding, the stake of members in the success of the business of their cooperatives is not high, which makes cooperatives vulnerable to poor governance and mismanagement.

Most cooperatives suffer from lack of member capital and consequently low leverage in raising debt required for the growth of the business. In fledgling cooperatives, the problem is particularly acute since they have no reserves to fall back on and nor do the members, most of whom are marginal and small operators, have the wherewithal to contribute substantially to initial capital. Low levels of equity imply a higher debt equity ratio with the accompanying hazards of actual cash flows being possibly inadequate to service the debt.

Unallocated reserves/retained earnings are the highest quality funds available to functioning cooperatives. However, to avoid payment of income tax, cooperatives most often follow the practice of paying price differentials to members for their supply, which has severely undermined capital formation in cooperatives. Further, cooperatives are generally constrained to minimize retained earnings, as the cooperative Act and

Rules virtually treat retained earnings as out of the purview of members' funds.

While corporate entities can raise equity as well as borrow from the market by placing appropriate instruments, cooperatives do not have access to capital markets. Any effort to broaden the equity base through introduction of instruments other than the shares to be subscribed only by members opens up the debate about the ownership, voting rights, cooperative principles etc.

In the globalized economic order, cooperatives as economic entities cannot remain isolated. In order to be competitive they have necessarily to grow and for that, augmentation of capital at the required pace is also necessary, as capital adequacy is one of the important parameters to judge the strength of an economic business entity.

The concept of shareholding in cooperatives suffers in competitive attractiveness when compared to shares in corporate entities.

The principle of one person - one vote precludes any advantage to holders of a larger number of shares in the affairs of a cooperative.

The principle of limited return on capital results in denying cooperatives access to capital,

The value of a share to a member has no correlation with the performance of the cooperative, as he gets back only the face value of his share.

Shares of cooperatives have no liquidity as there is no trading platform for transfer of shares.

As seen above, cooperatives are finding it increasingly difficult to augment their capital to the required levels through the existing available avenues, i.e. seeking more share contribution from their members and retained earnings.

A problem affecting the capital of a cooperative is one relating to recoveries of debt. The high level of under recoveries of Primary Credit Societies has not only adversely affected their own growth, but also the financial results of higher tier financial cooperatives. The problems of non-credit cooperatives are not materially different. A large number of non-credit cooperatives are also either defunct or sick, the major reasons being similar to those of credit cooperatives.

There has been extensive debate on whether government should participate in the share capital of cooperatives. Government financial support is often justified on grounds that cooperatives cannot raise capital from capital markets and a majority of the members are unable to contribute share capital in the quantity required to run the cooperatives efficiently.

However, equity contribution from government has invariably impacted on the autonomy of cooperatives and is a matter which does not merit compromise

Linkages and Competitiveness

Though a tiered structure in cooperatives is intended to bring about effective linkages, both forward and backward and maximize benefits to the primary membership, this has not often been achieved. Since cooperatives at each level are distinctive legal entities, myopic assertions of freedom have prevented greater integration leading to high transaction costs. We also find that more and more cooperatives at primary as well as higher levels are transacting business with non-members; higher tier cooperatives are frequently competing in business with their constituent members and networking amongst cooperatives a rare feature to be seen. Lack of or ineffective linkages have been adversely impacting the business performance of the cooperatives and their competitiveness.

In the current liberalized and globalised economic environment, cooperatives need a level playing field in order to cope with the emerging competition, sustain growth and meet member needs and services effectively. Unfortunately, constrained by restrictive laws, cooperatives lack functional autonomy including the required freedom in matters such as, area of operation, appointment of staff, deciding on remuneration payable, pricing, mobilization of funds, investment of funds and flexibility in business operations.

Accessibility to Finance/Credit Services by Members

Lack of credit facilities to a large segment of rural population, particularly the poor and marginalized, is a concern that needs to be addressed. The formal banking system in the country services 25.9% of total rural households while 14% farmer households depend on money lenders for their credit needs. Further, 51.4% of the total farmer households do not have any access to credit facilities.⁷

Cooperative credit presently accounts for a mere 18% of total agricultural credit. Having declined to this level from 56% in 1985-86, this is indicative of the shrinkage of credit provided to agricultural households by the cooperative sector. Nearly 70 - 80% of the members of cooperatives as also borrowing members are constituted of small and marginal members. Although there is no hindrance in cooperative law for share croppers/tenant farmers/agricultural labourers to be members of cooperatives, they are unable to avail loans in the absence of clear ownership title to land/collateral, and hence remain for all practical purposes outside the cooperative credit system. This marginalized segment

does not have access to the commercial banking system for the same reasons.

The weaknesses of the credit cooperative structure has been discussed in detail in the Vaidyanathan Committee Report. A number of District Cooperative Banks are unable to provide refinance to their member Primary Agricultural Cooperative Societies (PACS) and consequently, even credit worthy members of PACs are unable to access credit to meet their needs.

The weather cycle and the crop cycle do not always match and hence particularly in drought prone areas, farming is, and is likely to be, at best, a marginally viable if not non-viable proposition. From time to time, governments have been resorting to one-time debt settlements and / or re-scheduling of overdue loans, but these are not permanent solutions to the basic problem of a perpetual cycle of indebtedness, which needs to be addressed.

Sickness in the Cooperative Sector

Over 5 lakh cooperatives in the country at different levels, a large number today are not viable, while many are practically dormant. A large number of the non-viable cooperatives are, in fact, on the verge of sickness or incipient sickness. The sickness is particularly visible in the processing sector, of which sugar, textiles and vegetable oil account for a sizeable portion.

Though the government has been providing financial assistance for rehabilitation of sick cooperatives into a healthy enterprise, it has not always met with encouraging results. It must be recognized that most cooperatives function in the agricultural sector where the risk element is relatively high and the returns on investment low and they, therefore, start off with an initial disadvantage. It is also important for us to appreciate that the cooperative form of enterprise may not be the most suitable for all sectors and commodities. While there should no doubt be a clear voluntary exit policy for cooperatives which are not amenable to revival, sick cooperatives with the potential for improvement need to be supported through appropriate agencies and funding possibilities.

Politicization of Cooperatives and Control/Interference by Government

Although cooperative democracy is based on common economic interest and as such is entirely different from political democracy, over time cooperatives have been increasingly politicized. Cooperative institutions in the country with their vast outreach have become powerful instruments of political mobilization. Instances of a political party in power assuming control over large

sized cooperatives through methods such as appointing an active member of the party to the position of Chairman, nominating persons of its choice on the Board, issuing directions to them and the Official nominees to vote for a particular candidate as Chairman have become common. Further, when elections are held, they are fought on party lines with panels of political parties keenly contesting to gain control of the organization. This has led to factions in the board, conflicts in governance and management and lack of consensus in decision making. Also, factors such as personal/political interests of board members and use of the cooperative for political patronage have weakened the cooperative sector and affected their ability to function as competitive and professionally managed business entities.

Mass enrolment of members of cooperatives is also resorted to, prior to elections. Changes in law to suit political ends are also to be found when there is a change of government. In many instances, politicians who are chairmen of cooperative Boards refuse to call for elections, continuing to be entrenched in positions of authority.

Audit of cooperatives is conducted by the Registrar and in several states it is not found to be timely as well as satisfying the current days' requirement/standards and challenges.

This state of affairs is largely on account of the enormous powers that the government and Registrar are vested with by the Act. Apart from paving the way for politicization, with the laws governing cooperatives becoming progressively more restrictive, the functional autonomy and democratic character of the cooperatives have been seriously compromised. Some of the restrictive provisions and powers of the government/Registrar which are contained in the State Cooperative Societies Acts and which often lead to perpetuation of politicization and government interference in cooperatives are:

- Refusal to register cooperatives on various grounds;
- Compulsorily amend by-laws, divide, merge, amalgamate co-operatives;
- Give directions to a co-operative or co-operatives "in public interest"; appoint supervisory staff and set up common cadres, approve wages and staff service conditions;
- Nominate persons on the management committee/Board;
- Conduct/postpone elections;
- Classify co-operatives and deal with them en masse for the purposes of amalgamation, common cadres, service conditions, business, etc.;

- Supersede committees/boards, disqualify members and committee members, compel admission of members and reinstatement of expelled members; direct a committee to suspend an employee etc;
- Rescind resolutions of the committee/board
- Grant exemption to a cooperative or a class of cooperatives from any of the provisions of the Act
- Prescribe Rules to be followed
- Restriction on simultaneously holding office in a number of cooperatives
- Restriction on the terms of office bearers of the cooperative

All these powers militate against the voluntary and autonomous nature of cooperatives. There are numerous instances of misuse of powers such as supercession of boards, postponement of elections, granting exemptions and issuance of directives to meet political ends etc.

Parallel laws have been enacted in nine States, but except to some extent in the State of Andhra Pradesh, they do not appear to have made much impact. Most cooperatives continue to operate under the existing restrictive cooperative Acts. Absence of enabling provisions in the existing Acts allowing existing cooperatives to be registered under the new law, non-availability of refinance to such cooperatives, lack of will by the board and management of existing cooperatives to function as autonomous enterprises, inability to repatriate government equity/government finances and guarantee and political compulsions of the leadership are some examples to name a few.

Conclusion

The Government of India has tried to develop the Indian agriculture sector through the Cooperative movement. The cooperative movement got success in India and made a recognizable change in Indian agriculture and related industry. The development of Cooperative Credit structure is a major task and it has

been developed through SCB' DCCB's and PACS. The PACS are core of Cooperative Credit Structure in India. In South India and few of North-East state the PACS has created a positive impact in the development of agricultural economy through running PACS as an Professional Financial Institutions, computerization, diversification of business, better implementation of HR policies.

The most of the PACS in India are facing severe issues related to financial soundness, lack of professionalism in the working of PACS, Politicization of Cooperatives and Control/Interference by Government, Non Adoption of Computerization, Lack of HR policies, lack of adequate capital, design of PACS, Participation of PACS Members, etc.

As the PACS are the grass root level institutions in rural and agricultural credit the government should restructure these organizations through implementation of better policies related to Recruitment of PACS employees, Raising of Funds, incentives for implementing computerization at PACS which will lead to the availability of better credit to the society at large. Through which it will create a holistic development of rural economy India.

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A Study of Shopping Mall Organizational Environment with select Shopping Malls in Pune.

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Abstract

Compared to malls in USA Philippines, China and Canada, the shopping malls in India reveal glaring differences as respect to size, investment, assortments, services, selling and profit volume, employees' management, decorum or ambience etc, The organizational ambience for these malls is important issue since it concerns to customers' satisfaction and selling volume. The discussion in the chapter covers the number of the organizational issues of the Pune shopping malls. Truly speaking these dimensions discernible in the malls from Pune are just Miniature facsimile of the milieu of those shopping malls abroad. Just as every individual has a typical organization for his /her work that makes him/her to achieve as desired, similarly a Shopping Mall has organizational nucleus that helps it to achieve as desired (Profit, survival etc) and it clearly differentiates from un-organized retailers. Shopping Mall is the manifestation of outlook of its stakeholders/ employees toward the sales of goods on profits to customers. A Shopping Mall exert a pull on customers, so that its profit based survivals is perpetual.

Introduction

The largest mall ever is South China Mall in Dongguan, China with a gross floor area of 892,000 m² (9,600,000 sq ft). The world's second-largest shopping mall is the Golden Resources Mall in Beijing, China with a gross floor area of 680,000 m² (7,300,000 sq ft). The SM City North EDSA in the Philippines, which opened in November 1985, is the world's third-largest at 460,000 m² (5,000,000 sq ft) of gross floor area, and SM Mall of Asia in the Philippines, opened in May 2006, is the world's fourth largest at 386,000 m² (4,150,000 sq ft) of gross floor area. Previously, the title of the largest enclosed shopping mall was with the West Edmonton Mall in Edmonton, Alberta, Canada from 1986–2004. It is now the fifth largest mall. One of the world's largest shopping complexes in one location is the two-mall agglomeration of the Plaza at King of Prussia and the Court at King of Prussia in the Philadelphia suburb of King of Prussia, Pennsylvania, United States. The King of Prussia mall has the most shopping per square foot in the U.S. The most visited shopping mall in the world and largest mall in the United States is the Mall of America, located near the Twin Cities in Bloomington, Minnesota. However, several Asian malls are advertised as having more visitors, including Mal

Taman Anggrek, Kelapa Gading Mall and Pluit Village, all in Jakarta, Indonesia, Berjaya Times Square in Malaysia, SM North EDSA in Quezon City, Philippines, SM Mall of Asia in Pasay, Philippines, and SM Megamall in Metro Manila, Philippines. The largest mall in Southeast Asia is the SM City North EDSA, located in Quezon City, Philippines. The largest mall in South Asia is Mantri Square in Bangalore, India.

Environmental Features The following are the environmental features of shopping Malls:

- (i) The Shopping Mall environment is a tangible concept. But it exercises a significant impact on the behavioral performance of employees and customers
- (ii) It is the perceived aspect of internal environment
- (iii) Its setup has enduring characteristics which remain perpetual by succession.
- (iv) It has a distinct identity from unorganized retailers.
- (v) Its environment is a total appearance of what the Shopping Malls is; it is a summary perception which people envisage.
- (vi) It has all the control tools like hierarchy, channel of command, authority, leadership, communication, Control etc.

i) Components of Shopping Mall- Milieu

- 1) **Individual Autonomy.** It implies the degree to which employees or stake holders are free to manage themselves; they have considerable decision-making power and accountability to higher management. Thus, it means, unlike unorganized retailers the restricted individual's freedom to exercise responsibility for positive results.
- 2) **Position.** It refers to the degree to which objectives of the job and methods for accomplishing it are framed formally or informally and communicated to the employees. In other words, it means the extent of direct supervision, formalization and centralization.
- 3) **Reward Orientation.** It means the degree to which a Shopping Mall rewards stake holders/employees for hard work or

achievement. Reward orientation is high when a Shopping Mall orients people to perform better and rewards them for doing so.

- 4) **Task Orientation.** If the management is task oriented, the leadership style will be autocratic. The employees will have to speed up the pace of work to please their bosses.
 - 5) **Relations Orientation or Consideration.** The Shopping Mall climate will be considerate and supportive if the managers are relations-oriented while dealing with the workers. The needs and aspirations of the workers will be given due importance. This will produce team spirit in the Shopping Mall.
 - 6) **Job Satisfaction.** The satisfaction of the workers that they get on their jobs is also an important component of Shopping Mall climate. The workers feel happy if their jobs are designed to allow the workers to use their innovative skills.
 - 7) **Morale.** Morale represents a composite of feedings, attitudes and sentiments of Shopping Mall employees towards the Shopping Mall, superiors and fellow members. If it is high, there will be an atmosphere of cooperation in the Shopping Mall. But if the morale is low, there will be conflicts and poor cooperation among the workers. They will also feel disinterested in their work.
 - 8) **Control.** The control systems may be either rigid or flexible. If the control is rigidly followed, there will be impersonal or bureaucratic atmosphere in the Shopping Mall. The scope for self-regulation will be the minimum.
- ii) **Effectiveness of Shopping Mall**

Every Shopping Mall requires a sound climate to realize its objectives. The study of the climate of a Shopping Mall is necessary for an insight into important dimensions such as communication, cooperation, creativity, employee satisfaction, morale, etc. All these determine the effectiveness of the Shopping Mall. A Shopping Mall is likely to be more effective if there is two-way communication and employees are cooperative and have better perception of their retailing business. Such employees have higher job satisfaction and feel committed to the Shopping Mall. Their productivity will also be higher. Thus, good Shopping Mall climate is instrumental to higher employee satisfaction, better human relations and higher productivity.

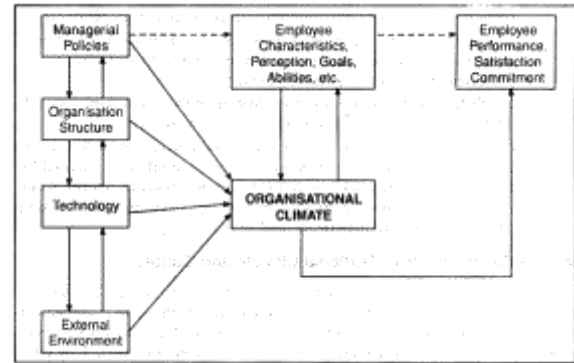


Fig. 6.1: Shopping Mall Climate

The role of Shopping Mall Organizational climate is shown with a hypothetical model (Fig. 1) that specifies the relationship between the major sets of variables. Alongwith climate, technology, external environment and managerial policies and practices exert important influences on climate. These relationships are shown in Fig. 1 the emerging climate represents the arena which is influenced by managerial policies, its style, technology and its external environment. When management is conducive to the needs of individuals, it would expect goal directed behaviour to be high. The ultimate behaviour or outcomes are determined by the interaction of individual needs and Shopping Mall management culture. The feedback regarding resulting level of performance contributes not only to the culture of the particular work environment, but also to possible changes in managerial policies and practices. Thus, management culture has an important influence on performance and satisfaction of the employees and customers. If the managerial ambience is favorable, there would be greater Shopping Mall effectiveness. Research evidence demonstrates that there is a positive correlation between Shopping Mall management ambience and employee performance. Varying Shopping Mall climates have resulted in significant differences in employee performance and satisfaction. For example, three types of Shopping Mall organizational climates—authoritarian climate, democratic friendly and achieving business—revealed different results. The *achieving business* climate produced the most in terms of money volume, number of new products, and cost-saving innovations. Employees in *democratic friendly* climate expressed maximum job satisfaction. However, employees in *authoritarian* climate produced high quality services due to rigid supervision and control. The Shopping Mall management influences satisfaction and performance through change in behaviour in four different ways:

- i) It defines the stimuli for an individual through its various elements.
- ii) It places constraints upon individual freedom of choice and decision-making. The behaviour is influenced by attaching different rewards and punishments to varying patterns of

- behaviour.
- iii) It influences behaviour through evaluation of the self and others; such evaluation is based on different physiological variables.
 - iv) It influences behaviour through employee perception of the whole Shopping Mall and of his own ability. Perceived ability is influenced by the nature and clarity of job, degree of freedom, extent of authority, scope of responsibility, supervisory support, training, safety, physical working conditions, previous experience, and so on.

iii) Factors Influencing Operational Performance of Shopping Malls

An Operational Performance of Shopping Mall is a manifestation of the manipulation of factors of production of Shopping Mall by stake holders and employees. This manipulation or arrangement is based upon management policies, supervisory techniques, "fairness" of management, labor's reactions to management, and literally anything that affects the work environment. Lawrence James and Allan Jones have classified the factors that influence basic factors of production into five major components:

- (1) Organizational *context*: mission, goals and objectives, functions, etc.
- (2) Organizational *climate*: size, degree of centralization and operating procedures.
- (3) *Leadership process*: leadership styles, communication, decision-making and related processes.
- (4) *Physical environment*: employee safety, environmental stresses and physical space

characteristics.

- (5) Organizational *values and norms*: conformity, loyalty, impersonality and reciprocity.

The manner of utilization of imputed factors (Land, Labour, capital, managerial skill and Govt) may change as per need. All such factors of production take a different silhouette while performing.

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Partitioning Based On Various Color Spaces and Similarity Measures Of Thepade's Sorted Ternary Block Truncation Coding(TSTBTC) In Content Based Video Retrieval

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Abstract—"Content-Based" means search the content of images instead of metadata such as keywords, tags or descriptions related to image. In This Modern ERA, Content Based Video Retrieval (CBVR) utilizes the rich and varied video contents for video Representation and Retrieval. The feature extraction methods used demonstrate varying degrees of computation, complexity and Performance. The paper attempts TSN-ary BTC(Thepade's Sorted N-ary Block Truncation Coding) Color Feature Extraction Technique and Partitioning RGB Planes into No. Of Different Partitions, Such as Partitioning Equal in Horizontal and Vertical Fashion and then TSN-ary BTC applied. In This Paper, Thepade's Sorted N-ary Block Truncation Coding (TSN-aryBTC) has been Attempted For Color Content Based Video Retrieval. This Paper Attempts 16 Different Similarity Measures and 9 Various Color Spaces, In Which YCbCr Color Space and Sorensen Distance gives Higher Accuracy. The Process of Feature Vector generation by using 20th Frequency Frame of videos. TSTBTC (Thepade's Sorted Ternary Block Truncation Coding) Onto RGB Squared Partitioning gives Excellent Result as compared to remaining Combinations of Partitioning. TSTBTC based Video Retrieval experimentation is done on test bed of 500 videos of Different 10 Categories of Video Sets. Each Category Consist of 50 Videos. 500 Queries Fired onto 500 Videos , and the Average Accuracy is computed For each Partitioning, Horizontally as well as Vertically For each Different Combination.

Keywords—Color Content Based Video Retrieval; Thepade's Sorted Ternary Block Truncation Coding; Thepade's Sorted N-ary Block Truncation Coding ,Partitioning, Similarity Measures

I. INTRODUCTION

Today's advances in Digital video, Broadband Networking and data Storage have inspired people to express by sharing videos and other forms of media .Content Based Video Retrieval is Logical extension of Content Based Image Retrieval and Content Based Audio Retrieval Systems. "Content" may refer to colors, shapes, textures, and other information that can Derived from Frame.

"Content-Based" means search the content of images instead of metadata such as keywords, tags or descriptions related to image. Video Retrieval returns the Retrieval of a behavior of an object from Frames of videos. It may contain the same objects but little difference in between them. Therefore, it is essential to encode within the indexing of video. The Target Of Content Based Video Retrieval Is Video Indexing and throw the Most relevant and Accurate Video In Fast manner[2]. Video is dividing it into no. of Frames, Frames again divided it into no of Shots, Shots again divided into no. of Scenes, collection of scenes becomes a video[5].

Many Applications of CBVRs are - News Broadcasting, Advertising, Music Video Clips, Distance Learning, Medical Applications and etc[3]. Textual Metadata is manual process so human need to maintain higher Accuracy of retrieval. it is time and cost consuming technique. So retrieval based on metadata does not give the accurate result. Video Indexing can be used for tagging of videos and arrange them for retrieval[7]. In CBVR, Different Color, Texture, Shape, Motion, etc are used for indexing and retrieval [1]. Feature Vectors calculated using VSR (Video Segment Representation) and Key Frames[2].

Color Content Based Video Retrieval means to Extracts the Color Features and retrieving the videos based on color features. For this Purpose of Video Retrieval, Block truncation Coding Technique is used[7]. Video Retrieval retrieves the videos for query video from the huge collection of videos database.

In Video Retrieval, Relevant Videos are retrieved for the query Video from huge collection of video database. Video Retrieval consists into 2 phases Feature Extraction and Query execution Phase[2]. Feature Extraction phase generated by using Partitioning Based TSTBTC for color Feature Extraction Technique[3]. Database Videos Feature Vector from Feature Extraction Phase is matched with Query Execution in Second Phase[1].

II. LITERATURE SURVEY

Color Contents shows more Information in Frames of Videos. This paper includes Color Content of video as a feature for easily Content Based Video Retrieval.

Image Color Histograms is Collection Of colors in an Frame. It Can be represented by no. of Pixels belongs to Particular color shade. Layout and Histogram Describes the Image.

A. Thepade's Sorted Ternary Block Truncation Coding (TSTBTC)

Before TSTBTC, BTC has been Introduced. BTC(Block Truncation Coding), is good method for color feature extraction for color content of frame[5]. In Beginning, BTC is used for gray-scale images after that it modifies for color images which improves retrieval performance of Video[5]. In BTC, Frame is divided into no. of blocks. BTC is divided into Binary and Ternary BTC.

In Binary BTC, Frame is divided into two non-overlapping regions based on threshold value[2]. Calculation of bitmap from two means which returns feature vector for the image[8].

In The Ternary BTC, Frames of videos will contain 3 non overlapping regions .3 different pixels regions are formed of pixel intensity values[4].Color BTC works on Color Planes[3]. Generation of image features done from the Red, Green and Blue planes of Image. There are different forms of BTC depending on Color Spaces[2]. Thepade's Sorted Ternary Block Truncation Coding Performs Well[3].

B.TSTBTC On RGB Planes Partitioning

B.1 Introduction

TSTBTC on RGB Planes Partition it into different parts In Horizontal and Vertical Fashion. Before Applying TSTBTC ,RGB Planes Partition it into Horizontal 2 equal parts, Vertical 2 equal parts, Horizontal 4 equal Parts, Vertical 4 equal parts, Squared parts, Horizontal and Vertical in 3*3 Parts, Horizontal and Vertical in 4*4 Parts, Horizontally and Vertically In 8 equal parts[2]. From above combinations Squared Partition gives good result as compared to remaining combinations.

B.2 Graphical Representation of RGB Planes Partitioning



Fig 1.Vertically In 2 Parts

Fig 2.Horizontally In 2 Parts

Above Fig.1 and Fig.2 Shows that Graphical Representation of Vertical And Horizontal Partition In Equal 2 Parts. It Consist Into 2 Parts such as Part 1 & Part 2. Each Part Consist Of 9 Values such as 3 Red, 3

Green and 3 Blue Values Of Each Part. So Totally It Returns 18 Values Per Frame.



Fig 3.Horizontally In Equal 4 Planes

Above Fig.3 Shows that Graphical Representation Of Horizontal Partition In Equal 4 Parts. It Consist Into 4 Equal Parts such as Part 1,Part 2,Part 3 & Part 4.Each Part consist of 9 Values such as 3 Red,3 Green and 3 Blue Values of each part.So It Returns totally 36 values Per Frame.

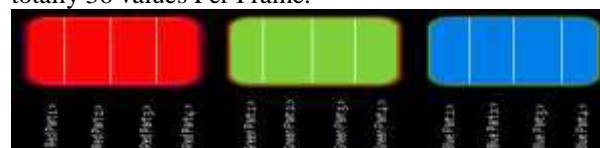


Fig 4.Vertically In Equal 4 Planes

Above Fig.4 Shows that Vertical 4 Equal Part Partitioning Into Equal 4 Parts, Which also returns 36 Values Per Frame.



Fig.5 Squared 4 Equal Plane Partitioning

Above Fig.5 Shows that Squared 4 Equal Plane Partitioning into 4 Different Grids. Again,It Consist into 4 Different Parts such as Part 1,Part 2,Part 3 & Part 4.Each Part has 9 Different Red, Green and Blue Values. So It Returns Totally 36 Values.

1. From Fig.1, In Horizontal 2 Equal Parts On RGB Planes divide into 2 parts such as Part 1 and Part 2 .Basically TSTBTC gives 9 values per Frame Of Video. In Partitioning, Each Part has 9 Values.

$$\begin{aligned} \text{Part 1} &= 3R\text{Values} + 3G\text{Values} + 3B\text{Values} \\ \text{Part 2} &= 3R\text{Values} + 3G\text{Values} + 3B\text{Values} \\ \text{Total Parts} &= \text{Part 1} + \text{Part 2} \\ &= 9 + 9 \\ &= 18 \text{ values/Frame.} \end{aligned}$$

2. It returns same parts for Vertical Fashion also.

3. In TSTBTC Horizontal 4 equal RGB Planes Partitioning Divide it into 4 parts Such as Part 1, 2, 3, and Part 4.

$$\begin{aligned} \text{Part 1} &= 3R\text{Values} + 3G\text{Values} + 3B\text{Values} \\ \text{Part 2} &= 3R\text{Values} + 3G\text{Values} + 3B\text{Values} \\ \text{Part 3} &= 3R\text{Values} + 3G\text{Values} + 3B\text{Values} \\ \text{Part 4} &= 3R\text{Values} + 3G\text{Values} + 3B\text{Values} \\ \text{Total Part} &= \text{Part 1} + \text{Part 2} + \text{Part 3} + \text{Part 4} \\ &= 9 + 9 + 9 + 9 \\ &= 36 \text{ values/Frame.} \end{aligned}$$

4. In Vertical 4 Equal RGB Planes Returns same 36 values.

5. In Squared 4 RGB Planes divide into 4 Different Grids as shown in TSTBTC on RGB Squared Partitioning which also returns 36 values. Each Grid Consist Of 9 Values.

III. Partitioning Based TSTBTC Video Retrieval Technique

Algorithm for Registration Phase Of Content Based Video Retrieval.

In this paper, TSTBTC is applied onto RGB Planes Partitioning in Horizontal and Vertical Fashion.

There are two Part procedure for Content Based Video Retrieval.

Part 1: Algorithm for Phase of Videos Registration.

Part 2: Algorithm for Phase of Query Video Execution.

In Part 1: Algorithm for Phase of Videos Registration

1. Select a Video from Database.
2. Extract 20th Key Frame Of respected video.
3. Find Red, Green and Blue Components of each frame in sorted column Vector.
4. Partition Red, Green and Blue Components in Horizontal and Vertical Fashion.
5. Apply Thepade's Sorted Ternary Block Truncation Coding (TSTBTC).
6. Get Feature Vector of each key frame for Individual Red, Green and Blue Components.
7. Repeat Step 1 to 6 for Video of Database to get Feature Vector Table.

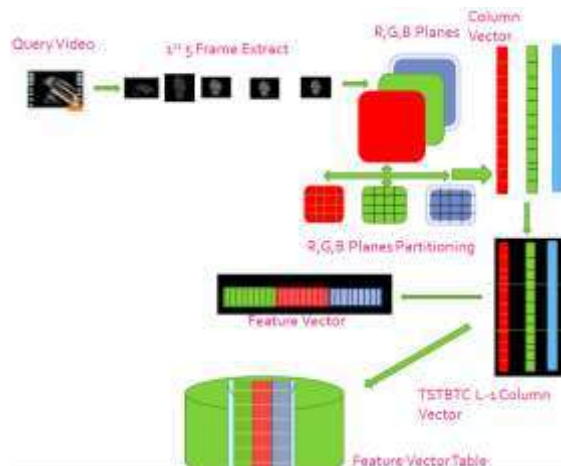


Fig 6. Video Registration Phase Of TSTBTC On RGB Planes Partitioning Based CBVR

Partitioning Based TSTBTC Formulated given in equation 1,2,3 and 4. FVT Is Feature Vector Table. $FV(kSorCVR_v, kSorCVG_v, kSorCVB_v)$ be the Feature Vector of all frames k of size $(m*n)/5$ for Video v .

FVT=

$$\left\{ \begin{array}{l} FV(kSorCVR_v, kSorCVG_v, kSorCVB_v) \\ v = video \in videodata \neq \tan d \\ k = keyframe of \end{array} \right\}$$

(1)

Where,

$SorCVR(k)$ is Sorted Column Vector of Red Component of Frame k of selected video.

$SorCVG(k)$ is Sorted Column Vector of Green Component of Frame k of selected video.

$SorCVB(k)$ is Sorted Column Vector of Blue Component of Frame k of selected video.

For any video v the Individual $kSorCVR_v, kSorCVG_v, kSorCVB_v$ be the arrays having 9 or 18 or 36 Values each; Evaluated in equations where i will vary from 1 to 9 or 1 to 18 or 1 to 36.

$$kSorCVR_v(i) = \frac{1}{(m*n)/5} \sum_{k=((m*n)/5 - i/9 \text{ or } 18 \text{ or } 36)+1}^{(m*n)/5} SorCVR(k) \quad (2)$$

$$kSorCVG_v(i) = \frac{1}{(m*n)/5} \sum_{k=((m*n)/5 - i/9 \text{ or } 18 \text{ or } 36)+1}^{(m*n)/5} SorCVG(k) \quad (3)$$

$$kSorCVB_v(i) = \frac{1}{(m*n)/5} \sum_{k=((m*n)/5 - i/9 \text{ or } 18 \text{ or } 36)+1}^{(m*n)/5} SorCVB(k) \quad (4)$$

for $i=1,2,\dots,9$ or $i=1,2,\dots,18$ or $i=1,2,\dots,36$

Part 2: Algorithm for Phase of Query Video Execution

1. Extract 20th Key Frame Of respected video.
2. Find Red, Green and Blue Components of each frame in sorted column vector.
3. Partition Red, Green and Blue Components in Horizontal and Vertical Fashion.
4. Apply Thepade's Sorted Ternary Block Truncation Coding (TSTBTC).
5. Get Feature Vector of each key frame for Individual Red, Green and Blue Components.
6. Query Video Feature Match with Feature Database which returns most relevant match for query video.

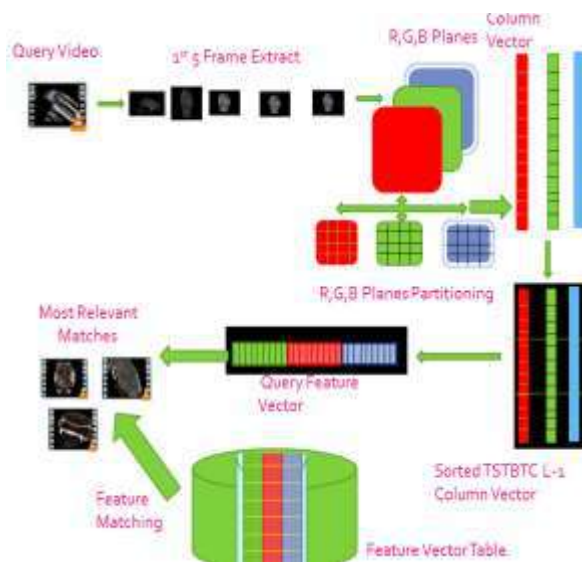


Fig.7 Query Execution Phase Of TSTBTC Partitioning On RGB Planes Based CBVR

$$\text{Accuracy} = \frac{\{\text{Number Of Relevant Videos Retrieved}\}}{\{\text{Total No.Of Videos Retrieved}\}} \quad (5)$$

IV. Experimentation Environment

Here Experimentation Platform is Matlab R2012b With Processor Core i5 with 4GB RAM.

Test Bed has 500 videos .videos database has 10 Categories, each category consist of 50 videos.therefore total 500 queries fired on database.Below Diagram Shows Collection Of Videos Considered in Database.



Fig 8. Test Bed Database

V. Results and Discussion

Result is On impact of RGB Planes Partition On TSTBTC and Accuracy is Computed For Different Combinations.

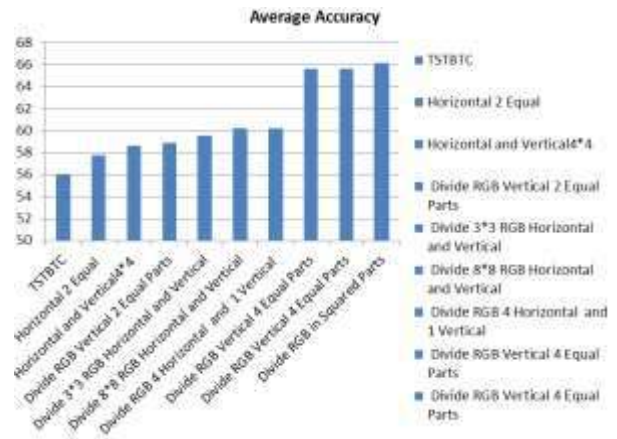


Fig.9 Performance of TSTBTC Partitioning On RGB Planes

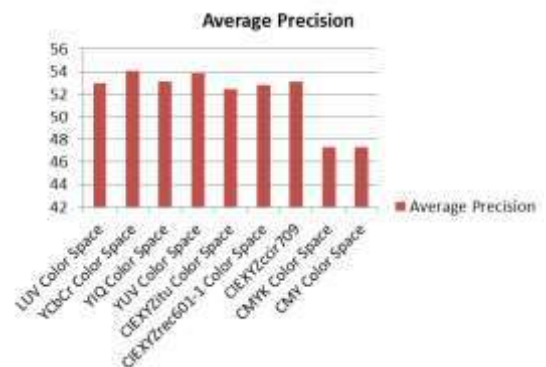


Fig.10 Performance of TSTBTC-Level 1 On Different Color Spaces

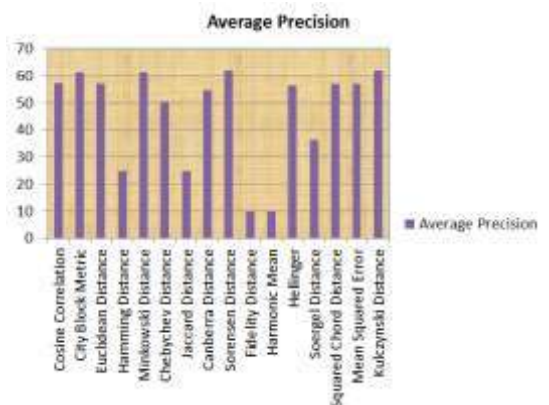


Fig.11 Performance of TSTBTC-Level 1 On Different Similarity Measures

After Applying TSTBTC On RGB Planes Partitioning Accuracy is improved for Different Combinations. TSTBTC RGB Planes Partitioning On Squared returns Highest Accuracy as compared to other Combinations.

The Experimentation Conducted on 500 Videos Database in 10 different Categories and 500 Queries fired. TSTBTC Applied on Different Combinations Of RGB Planes Partitioning and Average Accuracy is computed, in which TSTBTC Squared RGB Partitioning Gives Highest Result as compared to other Combinations.

TABLE I. Results Of TSTBTC Based RGB Planes Partitioning for CBVR

Technique	Average Precision (In %)
TSTBTC	56.02
TSTBTC On RGB Planes Partitioning In Vertical 2 Equal Parts	58.87
TSTBTC In Horizontal 2 Equal Parts	57.74
TSTBTC In Horizontal 4 Equal Parts	65.59
TSTBTC In Vertical 4 Equal Parts	65.59
TSTBTC On Squared Parts	66.11
TSTBTC On 3*3 Parts	59.54
TSTBTC On 4*4 Parts	58.60
TSTBTC On Vertical 8 Parts	60.18
TSTBTC On Horizontal 8 Parts	60.18
TSTBTC On 1 Vertical and 4 Horizontal	60.18

VI. CONCLUSION

Thepade's Sorted Ternary Block Truncation Coding (TSTBTC) on RGB Planes Partitioning is used for Color Content Based Video Retrieval with Different Combinations of RGB Planes Partitioning In Horizontal and Vertical Manner.

After Experimentation Environment of 500 Videos Database it identifies that TSTBTC Squared RGB Planes Partitioning returns Highest Percentage Accuracy and comfortable for Content Based Video Retrieval. Sorensen Distance and YCbCr Color Space retrieves Higher Accuracy.

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