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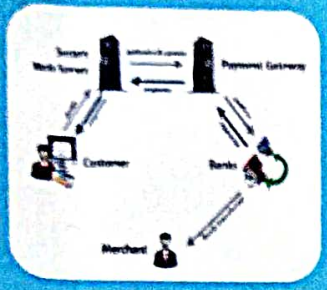

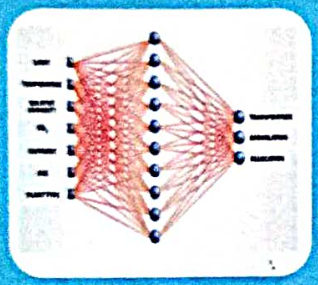

Special Issue

Proceeding of the 3rd National Conference on "Emerging Trends in Computer and Information Technology" held on 7th October 2017.

Editor in Chief

Dr. B. H. Barhate

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Tapti Education Society's

Dept. of Computer Science and Information Technology

Bhusawal Arts,Science & P.O.Nahata Commerce College, Bhusawal - 425 201 Maharashtra

NAAC Reaccredited : Third Cycle Grade 'A' (CGPA : 3.30)

UGC recognised ' College with Potential for Excellence for II nd Phase Effective from 2014 to 2019

Affiliated to North Maharashtra University, Jalgaon

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Special issue on

3rd National Conference on

"Emerging Trends in Computer and Information Technology"

Held on 7th October, 2017

About Publisher of IJCRT

Bhusawal, as recalled and noted down in records has a prominent place on the map of the nation; proudly housing two ordnance factories, a thermal power station in the region, and itself being one of the major railway junctions of Central Railway from where, residents proudly say, you may visit any corner of India. A mixture of farmers, tribal people from adjoining areas with the servants from all over India, Bhusawal serves as a slice of the nation; and honorably has unity in diversity. It is 25 kms away from the district, Jalgaon, famous as a city of gold; and few kms away from Yawal and Raver tehsils, famous all over nation for bananas. It is the only 'A' graded Municipal Corporation in the district. Another identification as well as benefit of the city is that it is situated at the banks of the Tapi river, the only river that flows from east to west. The city of Bhusawal has been a home place for the British authorities, and it is famous for railways since British rule. It is historically remarkable for the grave of Major Robert Gill, who invented world famous Ajanta caves; and for the tomb of Sant Gadgebaba, a famous and truly a leading social reformer in Maharashtra. It is believed that the parental home of Rani Laxmibai (famous as Queen of Jhansi) is situated at Parola, 50 kms away from the city. Bhusawal is also famous for many mythological stories like that of Shravana, coming from Ramayana who is said to be killed at Hartala, which is near to the city. Besides, the city was once famous in Bollywood for film distribution companies. The world famous Ajanta caves are just 60 kms away from the city.

Summing up the physiognomies of the city, Bhusawal stands as a glorious city in the eyes of everyone. However, it was the time- besides all assets of the city- when Bhusawal was a degenerated city in terms of higher education even after a long time from independence. There were few schools imparting high school level education but none of the colleges. It was only in 1958, under the motivation of Late Hon'ble Madhukarrao Chaudhari, ex-speaker of Maharashtra Legislative Assembly, a group of social well-wishers came together and established the Tapti Education Society in 1958. Simply having the wish in mind to provide potential students higher education facilities near their home, they started the Bhusawal College of Arts and Commerce in 1963. Their philanthropic view may be seen in the motto: *Vidya danam mahat punyam.* Yet difficulties were innumerable. The college with two faculties was started in the place of rent of a high school in the city.

It is wisely said that *vidya danam* is *mahat punyam*. The dedicated faculty, the sublime view of the management soon started to produce good academicians. Inspired by the results the trust purchased a barren land of 7 acres out of the city which is soon to be developed as a centre of imparting quality higher education in the area. The barren land with sustaining hard work, and devotion was then transferred into a naturally beautiful campus. The college is then shifted to a new place in 1972 with the introduction of Science stream. The philanthropist Late Mr. Poonamchand Nahata donated to the college, hence the college is renamed- and which today itself is a brand- as Bhusawal Arts, Science and Poonamchand Omkardas Nahata Commerce College, Bhusawal.

The college is then marching forward with a goal to **creatively contribute the society through the pursuit of learning at higher level of excellence**. The institute has contributed in many ways for economic, social and cultural uplift of the society by offering quality education. Since the inception it has been known for academic excellence, inventive pursuits and athletic dynamism. The college is a multi-stream institute catering to the needs of the young minds primarily from the rural areas. Our society runs not only the college but also the Institute of Management and Career Development and much-sought Tapti Public School (affiliated to CBSE Board, New Delhi) within a minimum space of 7.3 acres. The institute is developing vertically in all of the fields.

The Tapti Education Society's Bhusawal Arts, Science and P. O. Nahata Commerce College was accredited as **four stars** in 2001, reaccredited as **'A' Grade** with CGPA3.28 in 2008 **and recently reaccredited 3rd cycle as 'A' Grade with CGPA 3.30 in 2015** as the **first College** in North Maharashtra University jurisdiction. It is also the first college to volunteer for the third cycle of accreditation in the jurisdiction of the university. It is also recognised by UGC as **College with Potential for Excellence**. Recently, the society is certified as ISO 9001:2008 institute. Our institute is one of the renowned institutes in the adjoining area. We welcomed the upcoming students from rural areas who made remarkable progress and set theirs and college's image in society. Many of the students of this institute secure top position in various fields. This make us feel great. The college achieves 'A' grade in three subsequent cycles of Re-accreditations and it brings the college towards autonomous status.

Initially the college was affiliated to the Pune University, and got permanent affiliation in 1990. Since the inception of North Maharashtra University in 1991, the college is permanently affiliated to the same. The university spreads all over three districts: Jalgaon; Dhule; and Nandurbar, being on the boundaries of Gujrat and Maharashtra, and one being the district of tribal people. The university is trying hard to uplift the downtrodden, while keeping in touch with the rapidly changing world.

Last but not least, the college has the advantages of developing youth coming from rural area, and forming them into sensible youth as they are mixed in the cosmopolitan society. The college is aware that every coin has two sides: hence students coming from rural areas have inferiority complex, their vernacular background being most disadvantage for them. The college has faced challenges to improve their communication skills, to boost their confidence to bring them into modern current while making them aware of great Indian culture. As recently, the college has celebrated its golden jubilee, it will be a golden, in fact a platinum moment for us when the students coming from different backgrounds will be essentially Indian serving for the welfare of humanity. With this view the college is making progress towards quality excellence so that it will be a lead college that will stand as a lighthouse for the confused.

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President's Message

Our belief is that education cannot be confined within the boundaries of only academic studies. It grows with every additional activity of student, teacher and industrialist. It fill me proud to know that Department of Computer Science and Information Technology of Tapti Education Society's, Bhusawal Arts, Science and P. O. Nahata Commerce College is organizing one day 3rd national conference on "Emerging Trends in Computer And Information Technology" (ETCIT-2017).

Organizing the gamut of such national level event now becomes the passion of the Department of Computer Science and Information Technology of our college. I assure that this conference will provide a platform to bring together researchers from various research and industrial organizations and educational institutions under a common environment and discuss the emerging trends in Computer and Information Technology.

Moreover, such a conference will help the staff and students of the department to interact with prominent personalities from the renowned institutions across the country.

My warm wishes are always for the fruitful conference.

From principal's Desk……..

I am happy to publicize that after majestic success of second National Conference ETCIT-2016, the Department of Computer Science and Information Technology is organizing one day 3rd National Conference on "Emerging Trends in Computer and Information Technology"-(ETCIT-2017) on 7th October 2017.

By considering the broad view of research topics the conference trickily arrange in one day with wide coverage to present and discuss the research ideas among the practicing academicians, research scholars, scientists and industrialist.

Enthusiasm of organizing committee of the national conference ETCIT-2017 is very appreciative. Department of Computer Science and Information Technology as it always make such innovative and challengeable events successful beyond our expectation and make me proudly.

My heart offers enormous success for this one day 3rd national conference ETCIT-2017.

Convener's Message

Steps towards world of digitization, needs the knowledge of advance and improved technology. Today researches with emerging trend in Computer and Information Technology together becomes vibrant and makes available the source. This source is useful for gathering and moving towards the auspicious aim.

Our department is organizing the 3rd one day national conference entitled "Emerging Trends in Computer Science and Information Technology - (ETCIT-2017)". The conference will be helpful and fruitful for new researchers.

We are proud of all the participants who submit their research work for this conference and will be publish selected papers in the International Journal of Computer Research and Technology (IJCRT), a peer reviewed, half yearly research journal, Vol.-3, Issue-2, July-Dec. 2017, ISSN: 2454-7719.

We are very thankful to our patrons, principal, resource persons, vice principal for their blessing and moral support. There is no doubt that the National Conference will achieve the great success.

Dr. B. H. Barhate
Vice-Principal,
HOD of Comp. Sci. and Info. Tech.,
BASPONC College, Bhusawal
Mobile: +91-9890966830

I N D E X

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WEB MINING RESEARCH CHALLENGES

Mrs. Rane Seema Vijay

Department of Computer Science & I.T.
Smt.G.G.Khadse College, Muktainagar,
Dist.: Jalgaon, Maharashtra, India
Email- seemavijay99@gmail.com

ABSTRACT:

With the exponential developments in digital media technologies, transmitting and storing large amounts of collections example text, images, music, video and their combination is more executable and inexpensive than ever before on WWW. Web mining is the mining of data using mining tools and technologies. The main objective of this paper is to present an overview of both applications and technologies used in mining, also to provide brief description about web data mining and to give a view of some important research contributions in web mining, with a goal of providing a broad overview rather than rigorous analysis.

Web mining focuses on the discovery/retrieval of the relevant information from the Web.

KEYWORDS: ***Web Mining, Text Mining; Image Mining; Video Mining; Audio Mining.***

I. INTRODUCTION

Web usage mining is the diligent effort of data mining techniques to extract useful information from server logs, e.g.: Web usage mining is the process of finding out what users are looking for on the Internet. Most of the users wish to look at only textual data, whereas some others may be interested in multimedia data. Web Usage Mining is the important function of data mining to unwrap interesting usage patterns from Web data to understand and better serve the needs of Web-based applications. At the website, the Usage data captures the identity or origin of Web users along with their browsing behavior. Web usage mining can be arranged further that depends on the kind of usage data considered:

 Web Server Data: The Web server collects the user logs. Web data includes IP address, page reference and access time.

 Application Server Data: Commercial application servers have considerable features to enable e-commerce applications to be built on top of them with slight effort. The important aspect is the ability to track various kinds of events and log them in application server logs.

 Application Level Data: New sort of events can be defined in an application, and logging can be moved on for them thus bring forth histories of these specially defined events. However many end applications require a combination of one or more of the techniques applied in the categories above.

II. WEB MINING TAXONOMY

Web mining can be generally divided into three distinct categories, according to the kinds of data to be mined. Figure1 shows the taxonomy.

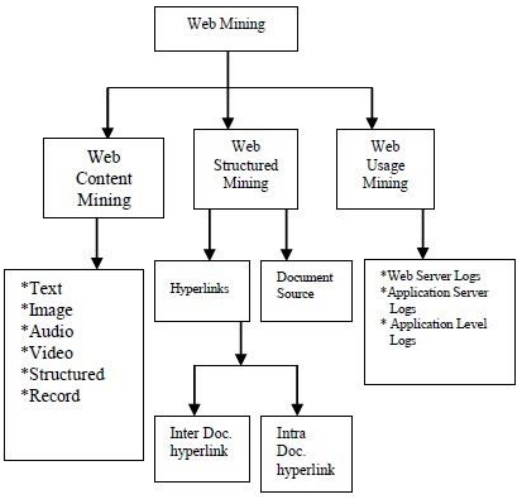

Figure 1.1 Taxonomy of Web Mining

III. WEB CONTENT MINING

Web content mining is the process of drawing out useful information from the contents of web documents. Content data is the collection of facts that a web page is designed to contain. It may compose of text, images, audio, video, or organized records such as lists and tables. The use of text mining to web content has been the most widely researched. Issues come up in text mining include topic discovery and tracking, extracting association patterns,

clustering of web documents and classification of web pages. Research activities on this topic have drawn heavily on techniques developed in other disciplines such as Information Retrieval (IR) and Natural Language Processing (NLP). While there exists a significant body of work in extracting knowledge from images in the fields of image processing and computer vision, the application of these techniques to web content mining has been limited.

IV. WEB STRUCTURE MINING

The structure of a typical web graph consists of nodes which contain web pages, and hyper-links which connecting related pages. Web structure mining is the process of discovering structure information from the web. This can be further divided into two kinds based on the kind of structure information used.

Studies related to work [Weichbroth et al.] are concerned with two areas: constraint-based data mining algorithms applied in Web Usage Mining and developed software tools (systems). [Costa and Seco] demonstrated that web log mining can be used to extract semantic information (hyponymy relationships in particular) about the user and a given community.

Due to the properties of huge, diverse and dynamic and unstructured nature of web data, web data research has encountered a lot of challenges for data mining principles, or web mining. The web mining filed encompasses a wide array of issues, aimed at extracting actionable knowledge form the web, and includes researchers from information retrieval, database technologies, and artificial intelligence [1]. In the present time, it is not easy tasks to retrieve the desired information because of more than 1,000,000,000 pages are indexed by search engines. So, this redundancy of resources has enhanced the need for developing automatic mining techniques on the World Wide Web, thereby giving rise to the term "Web Data mining" [2].

The Web is changing fast over time and so is the user's interaction in the Web suggesting the need to study and develop models for the evolving Web Content, Web Structure, and Web Usage. Therefore, the most important criterion to Researchers has identified the broad categories of web mining [3].

1) Web Content Mining is the application of data mining describes the discovery of useful information from the web contents, data and documents to content publish on Internet, usually as HTML (semi structured), plain-text (unstructured), or XML (Structured). Web content mining is especially representative of the attributes of text when it occurs in Web resources. Therefore,the aim of it on the discovery of patterns in a large document collection, and in frequently the collections of document changing [4]. Further, the methods of content mining will be used for ontology learning, mapping and merging ontologies, and instance learning [5].

2) Web Structure Mining operates on the web's hyperlink structure. The graph structure can provide information about a page's ranking [6] or authoritativeness [7] and enhance search results through filtering. Web structure mining and Web content mining are often worked together to exploit the content and the structure of hypertext [5]. Similarly, the search engine Google owes its success to the PageRank algorithm, which focuses that the relevance of a page increases with the number of hyperlinks to it from other pages, and in particular from other relevant pages [8]. Indeed, some researchers included both under the notion of Web content mining [9].

3) Web Usage Mining is the automatic discovery of user interactions with a web server, including web log, click streams and database transactions at a website or a group of related sites [10] .Web usage mining focuses on privacy concerns and is currently the topic of extensive debate. The knowledge gathered from Web usage mining can be very useful in many Web applications such as Web caching, Web perfecting, intelligent online advertisements, and in addition to constructing Web personalization. Most of the research efforts for modeling personalization systems are clustering pages or user session, association rule generation, sequential pattern generation and Markov models [11].

4) Text mining, also known as text data mining or knowledge discovery from textual databases, refers to process of mining interesting and non-trivial patterns or knowledge from the large volume of text documents. In the text mining systems, are based on natural language processing where the integration function integrated with the products for knowledge distillation [12].

V. RESEARCH CHALLENGES

A. Web Mining

From the experimental viewpoint of human behaviorist's, the web is the perfect experimental aid. There are number of web measurement or web analytics techniques have the ability to measure for human experimental behaviorists. The measurement ways are hits, page views, visits or user sessions and find the unique visitor regularly used to measure the user impact of various proposed changes. An example of operational metrics such as site visits and visit/buy ratios, as well as on financial metrics such as revenue and profit. Research should be done in developing the right set of web metrics, and their measurement procedures, so that various web phenomena can be studied.

B. Process Mining

When Process mining aims at extracting information form event log to capture the business process as it is being executed. For example, in market-based data collected at the point of sale in any

store provides only the process end result. The overall goal of any online store to maximize the probability of reaching the final state (Complete purchase) or maximize expected sales from each visit. Whenever the click stream data provides the opportunity for making the decision process itself and extracted the knowledge from where it can be used for optimizing and influencing the process. Research needs to be carried out in:

i) Process mining starts by accumulating information about the process as they take place. So,extracting process models from usage data.

ii) It's important to understand how different parts of the process model impact various web metrics of interest.

iii) Process models can be changed in response to various changes that are changed, so how to change the models which can also change stimuli to the user [13].

C. Web Evaluation

Web mining has been explored to a vast degree and different methodologies have been proposed for a variety of applications including web search, classification, personalization, etc. The temporal behavior of web mining has been classified into three kinds of web data: web content mining, web structure mining, and web usage mining. The researchers have to be finding out in extracting temporal models of how web content, web structures and web communities, authorities, etc are evolving. Large institutions and organizations archive usage data from the web sites.

From a statistical approach of web log data to determine the browser type of our visitors. With the availability of these data, there is a large scope to develop techniques for analyzing of how the web evolves over time. The popular two browsers of Chrome and Mozilla Firefox as can be observed from the right-hand side and pie chart on the left depicts percentages of the total hits per browser, representing the volumes of accesses for a web browser [14].

D. Optimization of Web Services

Data mining is basically classified into web mining; web content, web structure, and web usage mining; the last two are used to solve the website structure the optimization problem.

To make the robust, scalable and efficient services should be provided for the growing demand for web. So, web mining can be applied to better understand and behavior of these services. To improve various aspects of web services, developing of web mining methods logics are needed.

E. Fraud and Threat Analysis

Data mining technologies have advanced a great deal. The main problem issue is that, are they ready for detecting and/or preventing fraud activities and can we completely remove the false positive and false negatives? The challenge is to find how we can gather knowledge directed data mining to eliminate false positives and false negatives.

Another challenge of data mining is in real-time. The available tools of data mining have the ability to detect credit card violations and calling card violations. The research community should have the challenge to build a real-time model. The challenge is necessary for many companies where they have interactions with up to millions of external parties details the subgroups of internal, insurance, credit card, and telecommunications fraud detection which is very concerned for both the researchers and particular organization [15].

F. Counter-Terrorism

Privacy is a major challenge with respect to data mining for counter-terrorism. In this scenario, the challenge is to extract the structure and usage patterns or mine useful information form data mining but at the same time maintaining privacy. Different efforts are under way for privacy preserving data. Bar chart of fraud types from 51 unique and published fraud detection papers [15]. There are various using techniques such as randomization, cover stories as well as multi party policy enforcement for privacy preserving data mining. That is while data mining could become a useful tool for counter-terrorism, there are many challenges need to be addressed [16].

G. Semantic Web Mining

The research area of semantic web mining is targeted to combine two fast-developing research areas semantic web and web mining. The researchers are very much interested to improve from both areas of the results of web mining by exploring semantic structures in the web. The interesting thing of semantic web mining to create itself as the dependence between the semantic web and web mining increases. These research activities benefit many areas of industry such as „e-activities", health care, privacy and security and knowledge management and information retrieval. So, the researchers need to be carried out in to explore the semantic structures in the web [17], [18], [19].

VI. CONCLUSION

As seen in web metrics and measurements that various web phenomena can be studied in developing the right set of web metrics and their measurement procedures. The goal of process mining of any online enterprise used to maximize expected sets from each visit which is depicted in Fig. 2. As because large institutions and organizations achieve usage data from the website so a model is to be researcher out in extracting temporal models of Web content, Web structure, Web communities, authorities, etc. are involving. Optimization of Web services is needed to make the robust scalable and efficient services should

be provided for the growing demand of the Web. For fraud and threat analysis, knowledge directed data mining to eliminate false positive and false negative is to be developed efficiently. For Counter terrorism, many challenges are needed yet to be addressed to make data mining to become a useful tool. Research is to be carried out is to explore the semantic Web structure in the Web for getting benefits in many areas of the industries

As nowadays web and its usage are continuously growing, so opportunities also grow to analyze web data and extract in all manner of useful knowledge from it. The past ten years have seen the emergence of web mining as a rapidly growing area, due to the efforts of the research community as well as various organizations that are practicing it. In this paper, I had briefly described the key computer science contributions made by the field, a number of prominent applications, and outlined some areas of future research. Our hope is that this overview provides a starting point for fruitful discussion.

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AN ARCHITECTURE OUTLINE FOR TARGET MARKETING USING SPATIAL DM TECHNIQUES.

Dr. Archana Deshmukh[1]
1. *Asst. Professor, Nagnath Arts, Commerce & Sciecne College Aundha ,socs,SRTMUN*

Kailash Hambarde[2]
2. *Asst. Professor, Nagnath Arts, Commerce & Sciecne College Aundha ,socs,SRTMUN*

Dr.Nilesh Deshmukh[3]
3. *Asst. Professor, Nagnath Arts, Commerce & Sciecne College Aundha ,socs,SRTMUN*

Preetam Tamsekar[4]
4. *Asst. Professor, Nagnath Arts, Commerce & Sciecne College Aundha ,socs,SRTMUN*

Shaikh Husen[5]
5. *Asst. Professor, Nagnath Arts, Commerce & Sciecne College Aundha ,socs,SRTMUN*

Govind Kulkarni[6]
6. *Asst. Professor, Nagnath Arts, Commerce & Sciecne College Aundha ,socs,SRTMUN*

ABSTRACT

In Today's competitive world good marketing strategy with technical support is needed to attract the customers. This proposed model gives an enhancement to customer relationship using data mining with DRFM model, in which additional parameter duration is added to RFM model.

KEYWORDS: ***DRFM (Duration Recency Frequency Monetary), RFM (Recency Frequency Monetary), DM (Data Mining).***

I. INTRODUCTION

In any business organization, changing consumer behaviour is a big challenge in sustainable growth of the business. In developing country like India, there is need to formulate and successfully implement strategies related to consumer behaviour because there are fewer resources to meet the basic requirements of the business. Changing consumer behaviour is an obstacle in the growth of business because it leads to heavy losses due to obsolete stock of the organization. Consumer behaviour is complex and very often not considered rational. A further challenge is that consumer personalities differ across borders and also between and within regions. Taste, behaviour and preference of consumers cannot be ignored because consumers are the Kings of market. Consumer behaviour is a complex, dynamic, multidimensional process, and all marketing decisions are based on assumptions about consumer behaviour. Therefore, marketing strategies related to consumer behaviour are made to beat cut throat competition in global context. In modern times, prediction of consumer behaviour is much essential for prosperity of the business. Its prediction and strategy formulation is a challenge for the management of any business organization. Only those organizations which formulate and implement consumer oriented marketing strategies, can survive in global competitive era [3]. Various studies on consumer purchasing behaviours have been presented and used in real problems. Data mining techniques are expected to be a more effective tool for analysing consumer behaviours. However, the data mining method has disadvantages as well as advantages. Therefore, it is important to select appropriate techniques to mine databases. The competitive world of today demands for having good marketing policies to attract the customers as well as retain the old customer's .Organizations hence use strategies that would give the best customer satisfaction and which will return all their investments in their products with profit.

A. What is CRM

Customer relationship management (CRM) is an approach to managing a company's interactions with current and future customers. It often involves using technology to organize, automate, and synchronize sales, marketing, customer service, and technical support. Since the early 1980's, the concept of customer relationship management in marketing consists under the four different dimensions. They are; customer identification, customer attraction, customer retention and customer development have gained its importance. According to the literature,

very few studies can be seen relates to the CRM. It can be describe as a comprehensive strategy and process of acquiring, retaining and partnering with selective customers to create superior value for the company and the customer. The CRM systems can also give customer-facing staff detailed information on customers personal information, purchase history, buying preferences and concerns. It is one of the most important divisions in any company. So, CRM directly communicate with customers for managing interaction between company and the customer. The CRM databases include current information and transactions of the customers. It has direct link with Data ware house. Generally, mining part is handling through Data-ware house. So, Integration between CRM and Data-ware house is most important.

B. RFM Variables (Recency, Frequency, Monetary)

The RFM stands for recency, Frequency and Monetary value. RFM analysis is a marketing technique used for analysing customer behavior such as how recently a customer has purchased (recency), how often the customer purchases (frequency), and how much the customer spends (monetary). It is a useful method to improve customer segmentation by 2 dividing customers into various groups for future personalization services and to identify customers who are more likely to respond to promotions. • **Recency** refers to the interval between the time, that the latest consuming behaviour happens, and present. Many direct marketers believe that most-recent purchasers are more likely to purchase again than less-recent purchasers. • **Frequency** is the number of transactions that a customer has made within a certain period. This measure is used based on the assumption that customers with more purchases are more likely to buy products than customers with fewer purchases. • **Monetary** refers to the cumulative total of money spent by a particular customer

.

C. What is Data Mining?

Generally, data mining (sometimes called data or knowledge discovery) is the process of analysing data from different perspectives and summarizing it into useful information that can be used to increase revenue, cuts costs, or both. Data mining software is one of a number of analytical tools for analysing data. It allows users to analyse data from many different dimensions or angles, categorize it, and summarize the relationships identified. Technically, data mining is the process of finding correlations or patterns among dozens of fields in large relational databases.

Although data mining is a relatively new term, the technology is not. Companies have used powerful computers to sift through volumes of supermarket scanner data and analyse market research reports for years. However, continuous innovations in computer processing power, disk storage, and statistical software are dramatically increasing the accuracy of analysis while driving down the cost. For example, one Midwest grocery chain used the data mining capacity of Oracle software to analyse local buying patterns. They discovered that when men bought 3 diapers on Thursdays and Saturdays, they also tended to buy beer. Further analysis showed that these shoppers typically did their weekly grocery shopping on Saturdays. On Thursdays, however, they only bought a few items. The retailer concluded that they purchased the beer to have it available for the upcoming weekend. The grocery chain could use this newly discovered information in various ways to increase revenue. For example, they could move the beer display closer to the diaper display. And, they could make sure beer and diapers were sold at full price on Thursdays.

D. ***K-means Algorithm***

K-means algorithm [6] is the simplest clustering algorithm and widely used. K-means requires an input which is a predefined number of clusters. This input is named k. The K-Means Clustering is a method used to classify semi structured or unstructured data sets. This is one of the most common and effective method to classify data because of its simplicity and ability to handle voluminous data sets. Generally, it accepts the number of clusters and the initial set of cancroids as parameters. The distance of each item in the data set is calculated with each of the cancroids of the respective cluster. The item is then assigned to the cluster with which the distance of the item is the least. The centroid of the cluster to which the item was assigned is recalculated. One of the most important and commonly used methods for grouping the items of a data set using K-Means Clustering is calculating 9 the distance of the point from the chosen mean. This distance is usually the Euclidean Distance the steps of the K-means algorithm are given below.

1. Select randomly k points to be seeds for the centroids of k clusters.
2. Assign each point to the centroids closest to the point.
3. After all points have been assigned, recalculate new centroids of each cluster.
4. Repeat step 2 and step 3 until the centroids no longer move

II. METHODOLOGY

In order to make a decision support system for supply chain management the following method has been used.

1. Data collection
2. Import data in GIS
3. Integrate R with GIS
4. Install R binding
5. Get customer data

6. Data prepossessing
7. Analysis of Time, Recency, Frequency, Monetary.
• Customer Ranking
• DRFM Score
• Distinguish Customer on Score Basis
8. Result of DRFM graph and tabular form by completing these steps we can successfully design a model for analysis purchasing behaviour of customer.

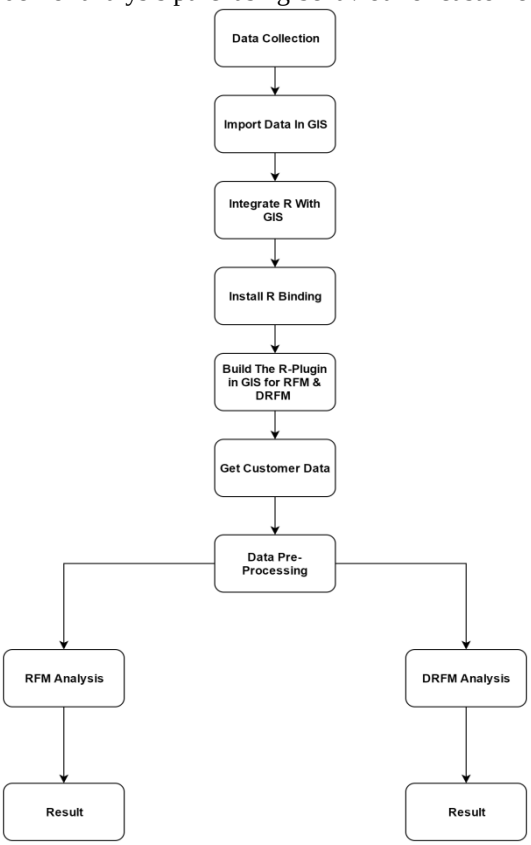

Figure 1: Flow diagram

A. Data Collection

The first and foremost thing is to identification of the necessary fields for the data collection, the next step was to acquire the data. In order to perform the DRFM analysis the important thing is to collect the past historical data of customer from which we can build the model of customer behaviour or customer purchasing pattern. Here we have taken into consideration values of four attributes to calculate the DRFM score,

1. Duration taken to purchase.
2. Last purchase date.
3. Number of transaction performed within a period.
4. Information of amount spends on purchase.

B. Import data in GIS

The data collected for performing the DRFM analysis needs to be invoked in GIS. In this phase the dataset build with the values of four attribute are inserted in table.

C. Integrate R with GIS

Tough GIS gives a sound hand on DBMS but to enhance it further with the Data mining techniques in this phase we integrated the R programming with GIS, which helps in performing the RFM, DRFM analysis and more data analysis on DRFM analysis results.

D. Install R binding

After integrating R with GIS it is necessary to install the R bindings in order to create the plug-in required to perform the RFM, DRFM analysis and other data mining techniques?

E. Get customer data

After successfully invoking the data and R in GIS and before processing to DRFM analysis its necessary to get the customers required data field from collected database to be identified and invoked.

F. Data prepossessing

In data prepossessing the checking of missing value is done so there is no missing value in the dataset to deal with and removing of unnecessary variables that doesn't help for the data mining is done.

G. Analysis of Recency, Frequency, Monetary model.

In this phase the RFM model is implemented with the required parameters from the customers data derived from the database and the RFM score is generated.

H. Analysis of Duration, Recency, Frequency, Monetary model.

In DRFM model analysis Duration, Recency, Frequency, Monetary parameters are used from the customers extracted data from the database and Customers with priority are distinguished on the basis of DRFM score is generated.

I. Result of TRF, DRFM model in graph and tabular form.

The RFM score and DRFM scores generated are depicted in graphical and tabular form and comparative analysis can be done.

III. DRFM

The DRFM model is a step forward with RFM model. The concept of RFM model was first touched by Bult Wansbeek in 1995 and since then it started evolving and been widely used in marketing.[blatberg et al 2008]. RFM which stands for Recency, Frequency and Monetary value, is a analysis technique used to draw the customer behaviour patter like last purchase period (recency), purchase interval of customer (frequency), and the amount spent by the customer (monetary). It is a method which helps in marketing as it gives target customers who are likely to respond. In DRFM model the D is added which stand for duration spent by customer to purchase, which enhances the RFM model a way ahead.

IV. DATA ANALYSIS AND RESULT

Duration, Recency, Frequency, Monetary Model

In order to implement the model we have the following steps have been adopted and finally both RFM and DRFM analysis has been compared.

A. ***Data Collection***

The important part is to get the customers past historical data on which this model could be implemented. Here we have taken into consideration values of four attributes to calculate the DRFM score as follow.

1. Duration taken to purchase.
2. Last purchase date.
3. Number of transaction performed within a period.
4. Information of amount spends on purchase.

We have generated this value in R programming for our experimental purpose and have implemented these models on that data.

B. ***Import data in GIS***

The dataset generated in R programming for experimental purpose is invoked in GIS.

C. ***Integrate R with GIS***

Tough GIS gives a sound hand on DBMS but to enhance it further with the Data mining techniques in this phase we integrated the R programming with GIS, which helps in performing the RFM, DRFM analysis and more data analysis on DRFM analysis results.

D. ***Install R binding***

After integrating R with GIS it is necessary to install the R bindings in order to create the plug-in required to perform the RFM, DRFM analysis and other data mining techniques?

E. ***Get customer data***

After the dataset has been imported in GIS the customer data field required for experiment is acquired.

F. **Data prepossessing**

It is always necessary to have the cleaning of unnecessary data, reduction in number of attributes, normalization, etc. In this step the unnecessary attributes are removed, missing values are filled by using a appropriate method, the inaccurate values are removed or corrected, data is transformed in a correct format.

G. **Result and comparative analysis**

The result and comparative analysis of both RFM and DRFM model can be understood by seeing the below RFM cluster and DRFM cluster. The figure 2 shows the result analysis of different number of customers in different RFM cluster. The figure 3 shows the result analysis of different number of customers in different DRFM cluster. The figure 4 shows the result analysis of different number of customers in different customer type in RFM analysis and DRFM analysis. Table 1 shows the detail about different customer type in RFM and DRFM analysis.

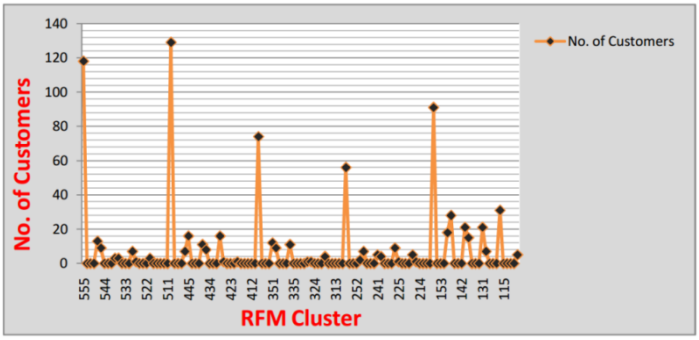

Fig.2 RFM

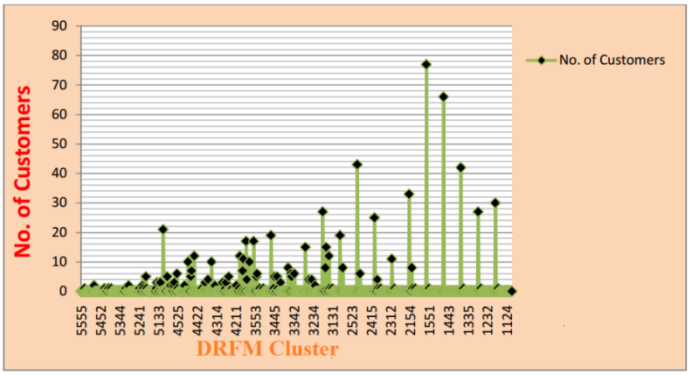

Fig.3DRFM

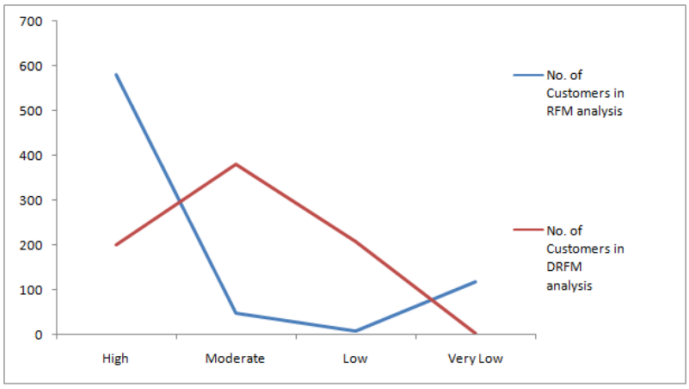

Fig.4 Comparative analysis graph of DRFM RFM.

Table.1

Customer Type	Customers in RFM analysis	Customers in DRFM analysis
High	580	200
Moderate	47	380
Low	7	208
Very Low	117	3

V. CONCLUSIONS

This research study indicates the use of DRFM analysis as compared to RFM analysis gives more enhanced result for target marketing. RFM analysis segregates vital customers from a large number of customers in database by considering three parameters recency, frequency and monetary. But the duration or time taken by the customer to purchase is not taken into consideration in RFM analysis. So, DRFM analysis will take into consideration the duration taken by the customer to purchase. Customers with the high DRFM scores represent the best target customers for promotions or marketing. With the use

of DRFM, the customers who take less duration in purchasing are more desirable target audience for marketing than those who take more duration on purchasing. Solely duration will not able to derive to the result but along with RFM it enhances the RFM results and gives more precise and better target audience for marketing. DRFM analysis helps to better attain the goal of profit by targeting the correct audience. In this way DRFM score will give a more enhanced desirable target audience than the RFM analysis.

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DEFINING FUZZY LOGIC CONTROL SYSTEM AND ITS APPLICATIONS

Hemlata G. Kolhe
Bhusawal Arts, Science and P.O. Nahata *Commerce* College

ABSTRACT:

The concept of fuzzy logic is based near the human thinking and natural activities. It presents predicates which are present in nature and similar to those either big or small. This theory mimics human psychology as to how a person makes the decision faster. Fuzzy logic is a superset of conventional (Boolean) logic that has been extended to handle the concept of partial truth values between "completely true" and "completely false". It can be implemented in hardware, software, or a combination of both. It can be built into anything from small, hand-held products to large computerized process control systems. In the present competitive scenario the fuzzy logic system are being adopted by the automotive manufacturers for the improvement of quality and reduction of development time and the cost as well. Fuzzy logic was conceived as a better method for sorting and handling data but has proven to be an excellent choice for many control system applications.

KEYWORDS: fuzzy logic, control system, subset, application, technology.

I. FUZZY EXPERT SYSTEMS

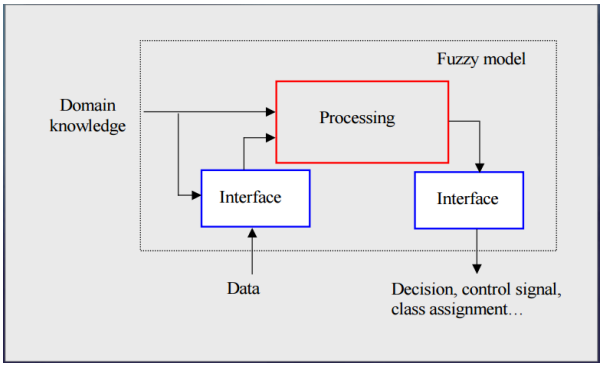
A fuzzy expert system is an expert system that uses fuzzy logic instead of Boolean logic. Fuzzy expert systems are the most common use of fuzzy logic. They are used in several wide-ranging fields, including:

- Linear and nonlinear control.
- Pattern recognition.
- Financial systems.

II. HOW DOES FUZZY LOGIC WORKS

Fuzzy Logic requires some numerical parameters in order to operate such as what is considered significant error and significant rate-of-change-of-error, but exact values of these numbers are usually not critical unless very responsive performance is required in which case empirical tuning would determine them. For example, a simple temperature control system could use a single temperature feedback sensor whose data is subtracted from the command signal to compute "error" and then time-differentiated to yield the error slope or rate of change of error, hereafter called "error-dot". Error might have units of degs F and a small error considered to be 2F while a large error is 5F. The "error-dot" might then have units of degs/min with a small error-dot being 5F/min and a large one being 15F/min. These values don't have to be symmetrical and can be "tweaked" once the system is operating in order to optimize performance. Generally, FL is so forgiving that the system will probably work the first time without any tweaking.

III. GENERAL ARCHITECTURE OF FUZZY LOGIC



- Input interface: accepting heterogeneous data (information and numeric data) and converting them to internal format where processing at the level of fuzzy sets is carried out.

Input X: express it in terms of fuzzy sets Ai present in the conditions of rules

- Processing module: processing pertinent to information granules.

collection of rules, i=1, 2, …, N

If condition1 is Ai and condition2 is Bi then action (decision, conclusion) is Di

- Output interface: converting results of processing information granules into the format acceptable by the

modeling environment. decode the result of processing, say fuzzy set D, in the format required bythe modeling environment, say a single numeric entity.

IV. BASIC PRINCIPLES OF FUZZY CONTROL SYSTEM

The principal aim of fuzzy logic based systems is to emulate human behavior in managing and solving problems that cannot entirely be formalized by use of mathematical models and treated by use of system theory approaches.

In fuzzy process control, expertise is encapsulated into a system in terms of linguistic descriptions of knowledge about human operating criteria, and knowledge about the process states and input/output relationships. The control actions are encoded by means of fuzzy inference rules.

V. TWO APPROCHES OF CONTROL SYSTEM

There are two approaches in international research and control can be divided into two main branches: 5.1. Algorithmic Optimization Approaches: Which stem from mathematics, classical computer science and operations research can find and the global optimum with respect to the goal function chosen. 5.2. Heuristic Approaches: Which try to find good (not necessarily optimal) solutions fast by employing AI methods and expert knowledge? These approaches are not necessarily mutually exclusive but can be combined in a useful manner.

VI. FUZZY REASONING ORLOGIC OPERATIONS

Fuzzy Set Theory defines Fuzzy Operators on Fuzzy Sets. The problem in applying this is that the appropriate Fuzzy Operator may not be known. For this reason, Fuzzy logic usually uses IF-THEN rules, or constructs that are equivalent, such as fuzzy associative matrices. Rules are usually expressed in the form: IF variable IS property THEN action For example, an extremely simple temperature regulator that uses a fan might look like this:

IF temperature IS very cold THEN stop fan

IF temperature IS cold THEN turn down fan

IF temperature IS normal THEN maintain level

IF temperature IS hot THEN speed up fan

Notice there is no "ELSE". All of the rules are evaluated, because the temperature might be "cold" and "normal" at the same time to different degrees.

The AND, OR, and NOT operators of Boolean logic exist in fuzzy logic, usually defined as the minimum, maximum, and complement; when they are defined this way, they are called the Zadeh operators, because they were first defined as such in Zadeh's original papers. So for the fuzzy variables x and y:

NOT x = (1 - truth(x))

x AND y = minimum(truth(x), truth(y))

x OR y = maximum(truth(x), truth(y))

There are also other operators, more linguistic in nature, called hedges that can be applied. These are generally adverbs such as "very", or "somewhat", which modify the meaning of a set using a mathematical formula.

VII. WHY WE USE FUZZY LOGIC SYSTEM?

Fuzzy logic is conceptually easy to understand.

- Fuzzy logic is flexible.
- Fuzzy logic is tolerant of imprecise data.
- Fuzzy logic can model nonlinear functions of arbitrary complexity. ¬ Fuzzy logic can be built on top of the experience of experts.
- Fuzzy logic can be blended with conventional control techniques.
- Fuzzy logic is based on natural language.

VIII. APPLICATION OF FUZZY LOGIC

There are several fields where fuzzy logic system uses as given below:

- Automobile and other vehicle subsystems, such as automatic transmissions, ABS and cruise control.
- Air conditioners.
- Cameras.
- Digital image processing, such as edge detection.
- Rice cookers.
- Dishwashers.
- Washing machines and other home appliances.
- Video game artificial intelligence.
- Pattern recognition in Remote Sensing.
- Hydrometeor classification algorithms for polarimetric weather radar.
- Fuzzy logic has also been incorporated into some microcontrollers and microprocessors.
- Mineral Deposit estimation.

IX. Limitation

1) Fuzzy System lack the capability of machine learning as well as neural network type pattern recognition.
2) Verification and validation of a fuzzy knowledge based system require extensive testing with hardware.
3) Determining exact fuzzy rules and membership functions is hard task.
4) Stability is an important concern for fuzzy control.

X. CONCLUSIONS

Fuzzy Logic provides a completely different, unorthodox way to approach a control problem. This method focuses on what the system should do rather than trying to understand how it works. It uses an imprecise but very descriptive language to deal with input data more like a human operator. It is very robust and forgiving of operator and data input and often works when first implemented with little or no tuning. One can concentrate on solving the problem rather than trying to model the system mathematically, if that is even possible.

In recent years, the number and variety of applications of fuzzy logic have increased significantly. The applications range from consumer products such as cameras, camcorders, washing machines, and microwave ovens to industrial process control, medical instrumentation, decision-support systems, and portfolio selection.

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PATIENT DATABASE MANAGEMENT SYSTEM (COMPARATIVE STUDY OF MANUAL V/S DBMS)

Narendra Bhardwaj[1]

Dept. of Computer Science, Seva sadan college Burhanpur
Devi Ahilya Vishwavidyalaya Indore(M.P.)
narendrambhardwaj@gmail.com

Leena Jadhav[2]

Dept. of Computer Science, Seva sadan college Burhanpur
Devi Ahilya Vishwavidyalaya Indore(M.P.)
Leenavishal83@gmail.com

ABSTRACT:

Medication in many countries is confronted with growing demand for medical treatment and services. The medical records must appropriately have all of the patients' medical history. Physicians must maintain flawless records, because this document serves a number of purposes. This study on hospital patient datable management system was design to transform the manual way of searching, sorting, keeping and accessing patient medical information (files) into electronic medical record (EMR) in order to solve the problem associate with manual method. The existing system (manual) has been studied and hence a computer based application was provided to replace this manual method. These computer based systems generate the patient report as the patient register in and out of the hospital. This paper generally looks for a more accurate, reliable and efficient method of computer to facilitate patient record's keeping in General Hospitals to ensure efficient outcome. The study proposed that the design of hospital patient database record will be a solution to the problem being experienced by the current manual method of keeping patient medical record.

KEYWORDS: ***Data; Database; Patient; Hospital; Medical Record; Electronic Medical Record.***

I. INTRODUCTION

In the present era of globalization and advanced technology efficient record keeping cannot be overemphasized. Imagine the scenario when the manual processes and manual modes of instruction get replaced with electronic systems. One of such replacement can be done in the area of patient's database management system within a hospital. Developing patient database management system software would benefit the hospital management who can have effortless access to the data securely and more easily. Hospitals are not excluded in record keeping. The records kept include patient data, which help to maintain patient's medical records. The medical records must have correctly all of the patient medical history. Physicians must maintain flawless records, because this document serves a number of purposes. It serves as a communication tool. As an important source of patient information, the medical record facilitates the transfer of data to other physician involved in an ongoing treatment of patient or the transfer of patient to another physician outside the office of the attending physician.

It also facilitates the transfer of data to health care establishment or to any other organization or individual such as insurance company or employer. Well-kept records usually reflect the level of care given to a patient by the physician Therefore medical records can be used as an evaluation tool. The more complete the record, the better they will serve the physician and the patient in the event of any action. Every patient's medical record must include the following specific information. Patient's identity which includes the patient's first name, last name,sex, age, address, etc.

II. STATEMENT OF PROBLEM

In spite of the important function of medical record, it has come under severe threat that by the manual system of medical record keeping. This system involves taking down patient data on pieces of papers, which are then put in to the files and filed in cabinets.Another problem is the missing of pieces of information. One standard hospital study reveals that on the average, patient records visited, there are pieces of information the doctor could not find in the paper file. Physicians and their office staffs have said that, they spent more time looking for patient information, than the time they have for the patient, as issues related to risk management is security. The first consideration is the physical safety of the data being stored. Threats exist externally in the form of natural disasters. The most important issue is the security involved in patient's privacy.

Definition of Basic Terms

Data: A collection of fact on which conclusions maybe drawn.

Hospital: An institution that provides medical,

surgical or psychiatric care and treatment for the sick or the injured.

Patient: One who receives medical treatment attention care.

Medical records: It's any data, which is collected and use to diagnose or treat a patient's health problem.

Database: A collection of data arranged for ease and speedy search and retrieve.

III. OVERVIEW OF PAPER-BASED PATIENT MEDICAL RECORD

Most of the patient and administrative information that flow throughout the health care system is still recorded on paper. In general, medical records may be on physical media such as film (X-rays), paper (note) photographs, often of different sizes and shapes, physical storage of documents in problematic as not all document types fit in the same size folder or storage spaces. In the current global medical environments, patient are shopping for their procedures many international patients travel from one country to the other for special treatment or to participate in clinical trial co-ordination these appointment via paper-based record is a time consuming procedure. Physical records usually requires significant amount of space to store to them, when physical records are no longer maintained, the large amount of storage space are no longer required paper film and other expensive physical media usage can be reduce by electronic record storage. Paper records are stored in different location, furthermore, collecting and transporting them to a single location for review by a health care provider is time consuming. Also when paper records are required in multiple location, copying, faxing and transporting cost are significant. Hand written paper medical records can be associated with poor legibility, which can contribute to medical errors. The data are only as secure as the paper itself and the entire records are individual page within a record can easily be misplace, damage lost or stolen. This research work focus on how this method can be improved through the automation of patient database system which convert the paper based patient medical record to computer-based paper-based.

IV. REVIEW OF COMPUTER-BASED PATIENT RECORD

The health care delivery could fully documented information using a variety of convectional and handheld computers equipment with keyboard, pen-based. Structured data entry or handwriting recognition illegible or consistent entries could be caught and corrected as they are entered in medical order, their results and all others internal transactions could be tracked automatically. A page from a paper-base patient record could be stored electronically in many different ways. The information could be scanned and store as an image (much like a fax) that is the picture of a paper form but is not searchable or editable document imaging system are widely available that use computer and optical disk to store such image and make them available to clinicians on workstation with graphic terminals. These system reduces the amount of physical storage space require for patient record and they allow the record to be shared by clinicians and administrative officers without physically transporting the records. Handwritten medical record can be associated with poor legibility which can contribute to medical error, pre-printed firms, the standardization of abbreviation and standard for penmanship were encouraged to improve reliability of paper medical records. Electronic record help with the standardization of forms terminology and abbreviation and data input. Digitization of form facilitates the collection of data for epidemiology and clinical studies. Duplication of lab tests, diagnostic imaging, and other services can be prevented by good record-keeping of any type. However, because database records can be available at many locations at once, integration of services and awareness of duplication can be reduced. Database management system enable health organization to access old records instantly, thereby allowing the health work to send to another health organization in the event of an emergency.

V. THE NEED FOR COMPUTERIZED PATIENT MEDICALRECORD

Electronic Health Record (EHR) refers to an individual patient's medical record in digital format. Electronic health record system co-ordinate the storage and retrieval of individual record with aid of computer.

VI. RECORD AND METHOD/PROCEDURE

Patient's record and procedure vary greatly according to patient data received and the extension of automation in processing data. These are some fundamental step which is common to patient record in all clinics and hospitals. some of these steps taken at each treatment of patient and assessment in clinical procedure include:

- Assessment: To get the information and the assessment of patient's symptom and signs.
- Data entry: recording of data into a patient's record (which may be a complex electronic data written records results etc)
- Data retrieval: extracting data for interpretation.
- Information interpretation: governance of interpretation of individual patient data

VII. THE OLD SYSTEM

The procedure involved in the current system is that, when a patient visit the hospital for medication, the patient will first of all buy the identification card which contains name, and other relevant information needed, and card identification number. The patient will then waits for the card to be processed together with a file jacket that holds the card that has column for diagnosis made by physician, drugs prescribed, and date at the waiting room for the arrival of the card.When the file arrived, the patient joints the queue to see a doctor. In this current system, file cabinets are used for keeping individual patient card enclosed in a file. This system is so tedious in tracing a record files slow in processing of records, space occupied by the file time waiting while waiting for the patient file to be retrieve by the receptionist.

VIII. THE NEW SYSTEM

This new system is design for medical practitioner/physician to keep track of all patient's medical record/information such as diagnosis, drug prescribed, admission and discharged, etc the new system will take care of the long processes and tedium work involved in tracing and retrieving a patient's record in the old system in a nut shell this will improve the efficiency of the management in a daily work as it can provide required records on time.

System Specification

For maximum and effective execution of the task by the system, there are the hardware and software requirement.

Hardware requirement

- System unit
- Monitor (VDU)
  - Uninterrupted power supply (UPS) RAM (64)
- CD-ROM
  - Hard disk capacity of 40GB Printer

Software Requirement

- Window XP operating system Microsoft access
- Microsoft visual basic

Programming Language

The programming language to be use in designing the program is Microsoft visual basic MS, access 6.0 Visual basic programming: is a programming language environment that are specially designed for creation of other programs, which is an object oriented programming (OOP) and event driven,(user don't control and determine the sequence of execution, but user will just press keys and click on various button and boxes in the window). In visual basic, we work with object (things), properties (which tell something about the object), and method (action associated with object). Therefore a visual basic program is made up of many subprograms, each has own program codes, and can be executed independently and at the same time each can linked together in one way or the other. The programming language are window basic program contain tools to make programming for windows easy, code is compiled, therefore the compiled code runs quick, keeping simple organized and protected, arranging component or control on a form using drag and drop techniques. Visual basic is user friendly.

Database Implementation

The database of this application was implemented in Microsoft office Access. MS-Access is database application with which one can create database files using the relational model. With this model you can create tables, store and manipulate data within the tables as required. Relationship can also be established to create communication among them

Database Normalization

Normalization is the organization of data to conform to a standard called Normal form and for efficient manipulation, storage and update of data.

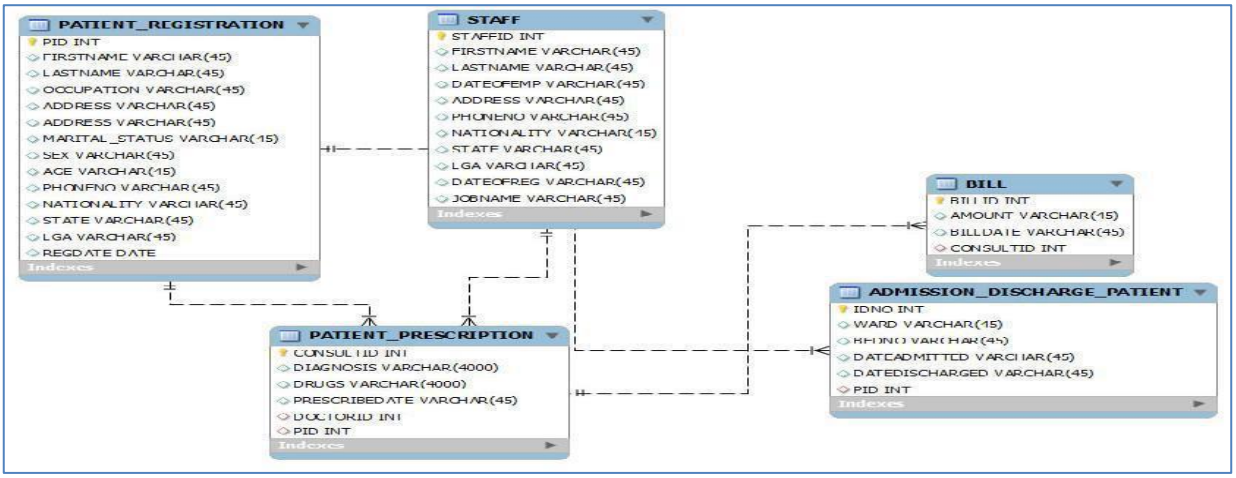

Figure 4.1 NORMASLISATION FORM ONE (1NF)

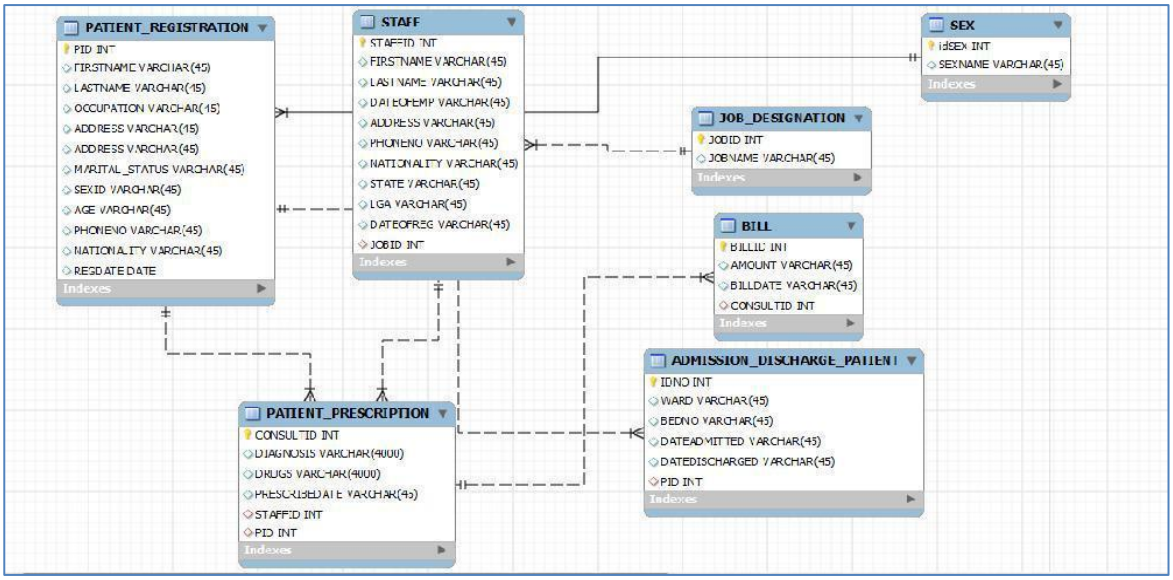

Figure 4.2 SECOND NORMALISATION FORM TWO (2NF)

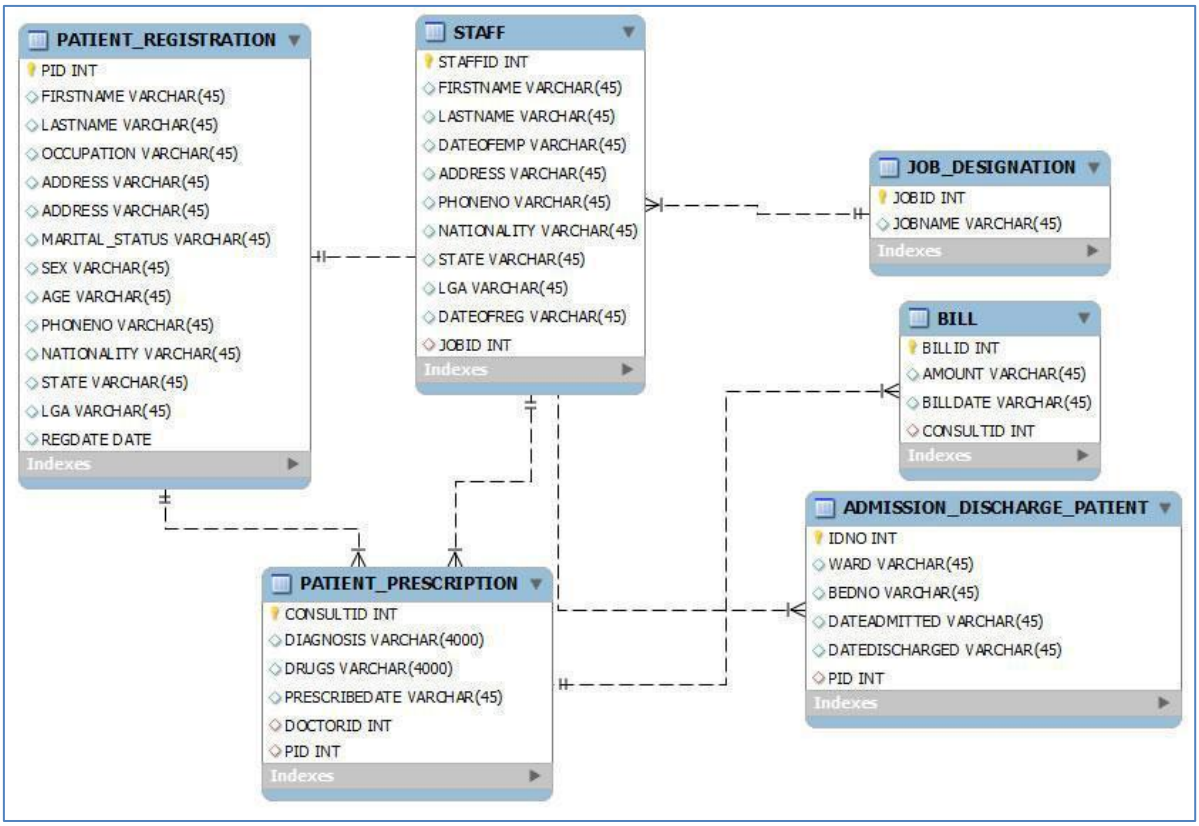

Figure 4.3 THIRD NORMALISATION FORM THREE (3NF)

IX. CONCLUSION

This study embarked on the patient medical information which substitutes the current (manual system) of sorting, handling, searching, amending and keeping of patient medical records. This portrays the importance and indispensable nature of the computer and its application in the hospital. The database aimed at reducing paper work in the reception area to reduce the time wasted by patients in the course of waiting for their files to be retrieved. This also reduced the spaced occupied by the files and provide adequate security for patient s medical record. Based on the finding of this study, the design of hospital patient database record will be a solution to the problem being experienced by the current manual method of keeping patient medical records. The study has

critically indentified the importance associate with using electronic in keeping patient medical record to eliminate missing files and enhance speedy retrieval of patient's record. The management of General Hospital the manual method of keeping patient records should be change to computerized patient medical records which will help them to eliminate inefficiency, and unreliability associated with the manual method. Through the exhausted study and analysis made in this research, it was recommend that General hospital and other medical centre that had been providing health care service should have an automated system for effective operations.

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USING BINARY-DECIMAL KEY WITH DIVIDE BY APPROACH TO ENCRYPTION SCHEME

Sharad Patil[1]
HOD ACS College, Navapur ,
sd_patil057@rediffmail.com

Yogesh Patil[2]
M.Tech.(C.S.)
AMDOX Pune

ABSTRACT:

In this articles we here show how implemented security approach is more lucid , effective , However today's technology trends proving that, the increasing importance of I/O bound devices are driving the development of commodity network attached storage devices which deliver both increased functionality and increased performance to end-users. In today's corporate world, what we are protecting and from whom we are protecting it is important. Here we focus basically on security which is more complex in nature of attacker view. We consider into mind the basic one-time pad encryption scheme which is itself mathematically unbreakable. (see Claude Shannon's "Communication Theory of Secrecy Systems"). Designing secure network is always a challenging task in balancing the various business requirement of network access with the security requirement and policies of an organization. In addition to today attack's the network security technological personnel is concerned about the various vulnerabilities of the latest network technologies. In this articlewe implement by proposing a cryptographic capability system which extends the length of protects to various application.

KEYWORDS: ***Cryptography, encryption, decryption, network security, computer security.***

I. INTRODUCTION

Most of the people trying some form of improved security concept every day, such as locking their houses and placing their keys on their pockets or their own bags or purses. Similarly, organization also needs to use security techniques to protect their digital information and their resources. Information is one of the most important and stronger assets of company or organization, which need tobe protect. Due to the widespread use of computer and their interconnecting large network i.e internet, of course the internet has undoubtedly changed the corporate world forever, and are used in an increasing number of sensitive applications, such as online banking and shopping , control of hardware installations and public infrastructure . As we know that the security became the focal point for government, enterprise and consumers, the new question arose, such as what does it mean to be secure? The question itself suggests that the answer is binary sense either secure or not[1,2]. Hence the interest of understanding what everyday practical computer security consist.

The security simply be the process of allowing or disallowing others access to information and resources[2]. NowNetwork security consumes a significance share of a typical corporate information technology budget. [Good security means that the system and users are protected from attacks originating from inside the network just as well as they from outside attacks.]The development of network security parallel the development of network technologies, thereby enforcing this old adage: if someone builds it, someone else will find a way to break it. The first networks consisted of serial point-to-point lines connecting dumb terminals to a central computer. To break into these simple systems, one hadto get physical access to either the terminal or the serial port. Security system consisted principally of physical security mechanism. Security systems focused on authenticating legitimate users by various techniques such as dial back. Password technology also improved. But what is a system, when it comes to network security? simply be defined as a collection of network connected devices, technologies and best practices that work in complementary ways to provide security to information assets.[3] Security-guarding against interference by entities external to a system. The main aim is to protect the information, which are sent from one computer to another computer through network. The information security is defined as follows.

Information security = Confidentiality + integrity + availability + authentication.

The increasing availability of the internet has allowed tremendous amounts of data to be stored and accessed by the user and hence need arise to protectit by using various security (cryptography)

mechanism. The internet user are becoming more concerned about security due to numerous coverage

given to Internet threats aimed at causing financial losses and identity theft.[4]

So we here are trying to implement one of the effective techniques that is to be used to protect the digital data effectively and efficiently.

There can be no information security without confidentiality. Confidentiality ensures the unauthorized users do not intercept copy or replicate the information. The integrity is necessary so that the accurate information can flow over the network The information security is also required during the retrial of the data. The users should be authenticated to retrieve data and the information is not secure without authentication[5].

There is no such thing as a completely secure computer network. The nature of a network is to allow communication. Any communication can fall into the wrong hands. The purpose of this guide is to help you secure your networkwithout putting a halt to its use and put in place the safeguards to detect when your security is breached [5].

II. OBJECTIVES OF NETWORK SECURITY

Network security is the effort to create a secure computing platform, designed so that agents (users or programs) cannot perform actions that they are not allowed to perform, but can perform the actions that they are allowed to. The actions in question can be reduced to operations of access, modification and deletion. Network security can be seen as a subfield of security engineering, which looks at broader security issues in addition to network security.

Ensure that any message sent, arrives at the proper destination. Ensure that any message received was in fact the one that was sent. (nothing added or deleted) they refer to as Minimal Security Functional Requirements for Multi-User Operational Systems. The major functions are listed below.

Protect information in-transit, from being seen, altered, or removed by an unauthorized person or device.

Any breaches of security that occur on the network should be revealed, reported and receive the appropriate response.

Have a recovery plan, should both your primary and backup communications avenues fail.

III. .METHODOLOGY

Here in this approach we consider key by dividing from one of the random number with 3 always, such as 11 by 3 we will get 3.66

(i.e. 3.66 + 3.66+ 3.66 = 11)

I II III

Here Part first consider as key such 4 , k=4 (Here fraction part is more that 0.5 so consider as next digit instead of 3 it could be 4 after that the part II and III get combined forms the gap that 3.66+3.66=7.33 so gap is 7 only. (Total 4+7=11 random number)

Then after divide the massage according to gap for example here we consider the massage **"** Jay Ganesh Bhagwan**"** so there are 15 characters in the message. So in first phase k=4 and gap is 7, then in second phase k=7 and gap=4 (alternate key and gap still end of the character), Once message divide the apply sequence either forward or backward, when second or next phase is start then continue the sequence from previous character and so on. By getting cipher text consider key and gap at each phase alternately. Details of methods given in the experimental analysis for better understanding. The term encryption and decryption explained with diagrammatically for better understanding fig.1 shows Encryption and Decryption respectively.

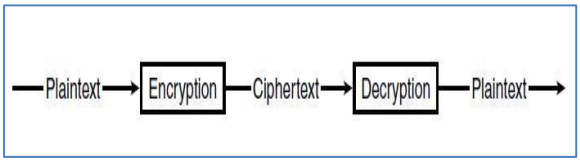


Figure. 1 Encryption and Decryption.

IV. EXPERIMENTAL ANALYSIS

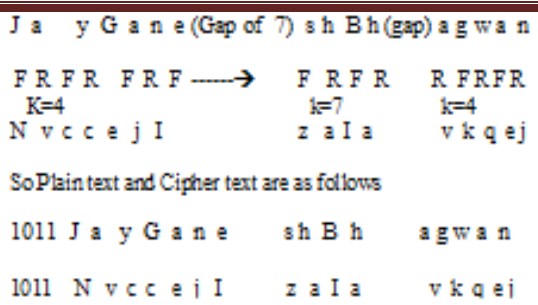
Consider the Message " Jay Ganesh Bhagwan " Random Number is 11 consider divide it by 3 always Get 3.66 so key is 4 and gap is 7 for first phase and second phase it is vice-versa and so on. Consider the sequence forward-reserve for each consecutive character. The Random number is (to get key) converted into 4 bit binary while sending the message and attached to the begin of message. The receiver receive the message converted the binary into equivalent decimal and then divide by three only to recover the original message.

1011 J a y G a n e (Gap of 7) s h B h a g w a n

F R F R F R F -----→ F R F R R F R F R

Here replace first character with k=4 forward and second k=4 with reverse

A	B	C	D	E	F	G	H	I	J
K	L	M	N	O	P	Q	R	S	T
W	U	V	X	Y	Z				



The beauty of the scheme is that, here we change the key and gap alternately that generate similar character in cipher text makes no sense and even the attacker may find key that help upto only Ist phase and it not support to cover whole message because we change the key after each gap and also change gap after each key that makes more confusing to the attacker.

V. CONCLUSION:

The various numbers of fields e.g. On-line shopping, banking, military etc. are facing the security problems regarding their sensitive data and their transaction. In this paper we have described the security concept that likely make strong security a more realistic expectation in the future. The proposed security model provides better interface to the authenticate users and reduce the threats regarding their sensitivity. This approach used for short massage particularly in which attacker could not find clue even same alphabet in the message generate diff. cipher.

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BRAIN COMPUTER INTERFACE THROUGH EEG SIGNALS

Rahul D Chaudhari[1]
1. Dept. of Computer Science
S.S.V.P.S's Science College,
Dhule (M.S), India

Rakesh S Deore[2]
2. Dept. of Computer Science
S.S.V.P.S's Science College,
Dhule (M.S), India

Ashok A Pawar[3]
3. Dept. of Computer Science
S.S.V.P.S's Science College,
Dhule (M.S), India

ABSTRACT:

Brain Computer Interfacing (BCI) is one of the important areas under Human Computer Interaction. It is challenging area of research in which communication to computer system can be performed through brain signals. A Brain Computer Interface (BCI) is a communication system that translates brain signals into commands input for a computer. BCI is a communication system that recognizes user's command only from his or her brainwaves and reacts according to them. The main goal for writing this paper is to show interaction between humans and computers, more specifically using brain-computer interfaces. Brain-computer interfaces (BCIs) provide interestingly new form of human-computer interaction.

KEYWORDS: ***Human Computer Interaction, Brain Computer Interaction, EEG, Brain.***

I. INTRODUCTION

In the nearly 80 years since Hans Berger first recorded electroencephalographic activity from the scalp, the electroencephalograph (EEG) has been used primarily for clinical diagnosis, for exploring brain function, and to a very limited extent for therapy. At the same time, many people have speculated that the EEG or other reflections of brain activity might be useful for another purpose as well: to serve as an alternative method for the brain to send messages and commands to the outside world. While the brain's normal communication and control capabilities depend on nerves and muscles, the existence of easily recordable brain signals, such as the EEG implied the possibility of establishing no muscular communication and control based on brain–computer interfaces (BCIs) [1].

In spite of recurring scientific and popular interest in the idea of BCIs, and despite a few encouraging initial efforts, it is only in the past 20 years that sustained research has begun, and only in the past 12 years that are cognizable field of BCI research and development has emerged. The field is now populated by a large and rapidly growing number of research groups throughout the world. This new surge of interest and activity is due largely to the combination off our important elements [1].

It is greater appreciation of the needs and the abilities of people paralyzed by disorders such as cerebral palsy, spinal cord injury, brain stem stroke, amyotrophic lateral sclerosis (ALS), and muscular dystrophies. Life-support technology (e.g., home ventilators) now enables even the most severely disabled people to survive for many years. Furthermore, it is now clear that even people who have little or no voluntary muscle control, who may be nearly 'locked-in' their bodies, unable to communicate in any way, can have lives that they consider enjoyable and productive if they can be given even the most basic means of communication and control [1].

II. LITERATURE SURVEY

Carlo Matteucci (1811-1868) and Emil Du Bois-Reymond (1818 – 1896) were the first people to register the electrical signals emitted from muscle nerves using a galvanometer and established the concept of neurophysiology. However, the concept of action current introduced by Hermann Von Helmholz clarified and confirmed the negative variations that occur during muscle contraction.

Richard Caton (1842-1926), a scientist from Liverpool, England, used a galvanometer and placed two electrodes over the scalp of a human subject and thereby first recorded brain activity in the form of electrical signals in 1875. Since then, the concepts of electro-(referring to registration of brain electrical activity) encephalo- (referring to emitting the signals from the head), and gram (or graphy), which means drawing or writing, were combined so that the term EEG was henceforth used to denote electrical neural activity of the brain.

Fritsch (1838-1927) and Hitzig (1838 - 1907) discovered that the human cerebral can be electrically stimulated.

The discoverer of the existence of human EEG signals was Hans Berger (1873-1941).

He began his study of human EEGs in 1920.Berger is well known by almost all electroencephalographers. He started working with a string galvanometer in 1910, then migrated to a smaller Edelmann model, and after 1924, to a larger Edelmann model. In 1926, Berger started to use the more powerful Siemens double coil galvanometer. His first report of human EEG recording of one to three minutes duration on photographic paper was in 1929. In this recording he only used a one- channel bipolar method with fronto – occipital leads. Recording of the EEG became popular in 1924. The first report of 1929 by Berger included the alpha rhythm as the major component of the EEG signals.

During the 1930s the first EEG recording of sleep spindles was undertaken by Berger. He then reported the effect of hypoxia on the human brain, the nature of several diffuse and localized brain disorders, and gave an inkling of epileptic discharges. During this time another group established in Berlin- Buch and led by Kornmuller, provided more precise recording of the EEG. Berger was also interested in cerebral localization and particularly in the localization of brain tumors. He also found some correlation between mental activities and the changes in the EEG signals.

In England, W.Gray Walter became the pioneer of clinical electroencephalography. He discovered the foci of slow brain activity (delta waves), which initiated enormous clinical interest in the diagnosis of brain abnormalities. In Brussels, Fredric Bremer(1892-1982) discovered the influence of afferent signals on the state of vigilance [26].

III. DEFINITION OF BCI

In the first international meeting devoted to BCI research held in June 1999 at the Rensselaerville Institute near Albany, New York, it was defined as follows: "A brain-computer interface is a communication system that does not depend on the brains normal output pathways of peripheral nerves and muscles" [2].

A Brain Computer Interface should be able to detect the user's wishes and commands while the user remains silent and immobilized. In order to do this, the brain activity must be monitored. Today there exists various techniques to do this. These include, for example, functional Magnetic Resonance Imaging (fMRI), magnetoencephalograph (MEG), Positron Emission Tomography (PET), Single Photon Emission Computer Tomography (SPECT) , optical brain imaging, single neuron recording (with microelectrodes) and electroencephalography (EEG).

A BCI creates a nonmuscular output channel for the brain. Instead of being executed through peripheral nerves and muscles, the user's wishes are conveyed by brain signals, and these brain signals do not depend for their generation on neuromuscular activity. Like other communication and control systems, a BCI establishes a real-time interaction between the user and the outside world. The user gets feedback on the results of the BCI's operation, and that feedback influences the user's intent and the brain signals that encode that intent.[1]

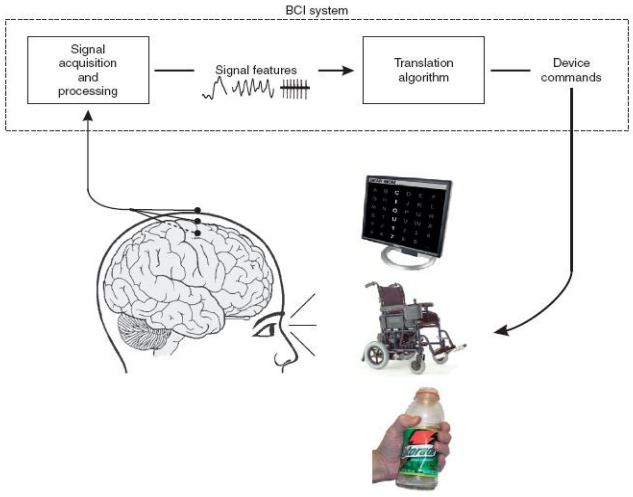

Figure 1. The Basic Design Of Brain Computer Interaction (BCI)

A Brain Computer Interface (BCI) provides alternative communication and control channels to convey message and commands from the brain to the external world. Brain Computer Interface system help those patients suffering from several neurological or muscular diseases.[3] BCIs can significantly improve the quality of life of neurologically impaired patients with pathologies such as : amyotrophic lateral sclerosis, brain strike, brain / spinal cord injury, cerebral palsy, muscular dystrophy, etc [4]. At present electroencephalogram (EEG) is the major brainwave signal used by non – invasive BCIs. One strategy of EEG – based BCI involves the use of event related potential (ERP) that exploits the electrophysiological response to a certain event. A recent study showed that only 12% of published BCI studies use implanted electrodes, 5% use microelectrode arrays and more than 80% use EEG signals. The main reason is that the EEG recording equipment is commercially produced and their cost is lower than other brain signal recording technologies [5][6].

IV. THE HUMAN BRAIN

The human brain is the most complex structure known to man. It is the organ where most of the exterior stimuli are processed and translated into functions.

The average human brain weights around 1400 grams. The brain can be divided into four structures: cerebral cortex, cerebellum, brain stem, hypothalamus and thamalus. The most relevant of them concerning BCIs is the cerebral cortex. The cerebral cortex can be divided into two hemispheres. The hemispheres are connected with each other via corpus callosum. Each hemisphere can be divided into four lobes. They are called frontal, parietal, occipital and temporal lobes.

Cerebral cortex is responsible for many "higher order" functions like problem solving, language comprehension and processing of complex visual information [7].

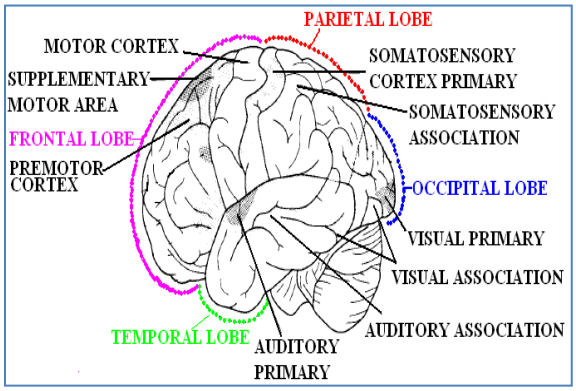

Figure 2. Functional areas of the brain

The cerebral cortex can be divided into several areas, which are responsible of different functions. These areas can be seen in Figure 2. The functions are described in Table 1.

Cortical Area	Function
Auditory Association Area	Complex processing of auditory information
Auditory Cortex	Detection of sound quality (loudness, tone)
Speech Center (Broca's area)	Speech production and articulation
Prefrontal Cortex	Problem solving, emotion, complex thought
Motor Association Cortex	Coordination of complex movement
Primary Motor Cortex	Initiation of voluntary movement
Primary Somatosensory Cortex	Receives tactile information from the body
Sensory Association Area	Processing of multisensory information
Visual Association Area	Complex processing of visual information
Wernicke's Area	Language comprehension

Table 1. Cortical areas of the brain and their functional

A. Neurons

Neurons consist of a cell body (soma), an axon and a dendritic tree. The axon serves as an "output channel" and connects via synapses to the dendrites (the "input channel") of other neurons. This connection is called an action potential, which travels along the axon of these cells, leading to a release of neurotransmitters when arriving at a synapse. These neurotransmitters trigger an ion flow across the cell membrane of the neuron receiving the action potential, which leads to a change in membrane potential. When reaching a critical value of around -50uV, a new action potential is triggered, and information is transmitted via the axon to the other neurons [8].

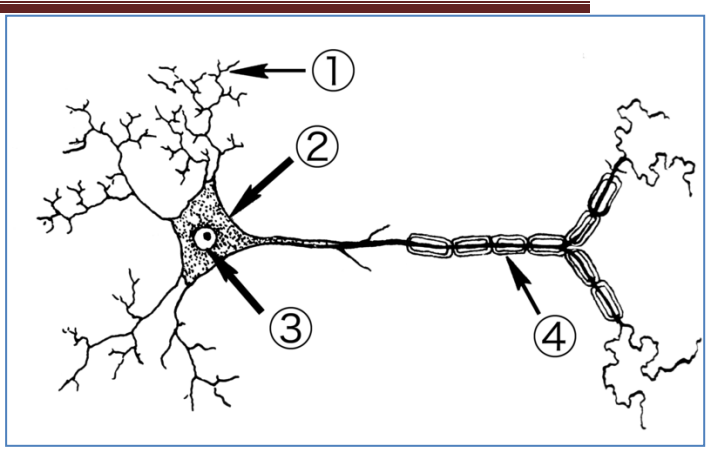

Figure 3. Representation of a neuron. 1: Dendrites; 2: Cell body (soma); 3: Nucleus; 4: Axon

V. TYPES OF BCI

There are two methods for getting brain signals i.e invasive and non – invasive brain computer interface.

A. Invasive

In invasive brain computer interface electrode called the neurotrophic electrode is implanted in the brain through a brain surgery. In this method neurons which are in contact with the cone send the brain signals to a tiny receiver near the skull. The signals are amplified and send to the computer [6]. Due to the aggressiveness of such implementation of brain computer interfacing, this method is only considered if it provides significant benefits over noninvasive technology. The main advantages are higher information bitrates and signal resolution, making it a better choice for delicate rehabilitation projects.

In order to select an appropriate implantation region, techniques such as functional resonance imaging, magnetoencephalography and other imaging tools are used, although the most common choice is the motor cortex. It is generally the information from this region that allows paralyzed people to find alternative pathways to communicate and interact with their surroundings [8].

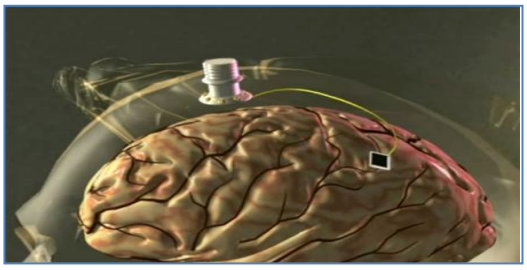

Figure 4. Invasive BCI

B. Non – Invasive

In non – invasive brain computer interface method doesn`t require a brain implant, only user wear a cap studded with electrodes. There are so many researchers support the non – invasive method because there is no risk required a surgery to implanted electrode in brain.[6]

Whereas the non – invasive ones mostly employ electroencephalograms (EEGs) recorded from the people scalp. The non – invasive method can be further subdivided into three groups. The first group explores visually evoked potentials (VEPs) and they can be traced back to the 70`s, when Jacques Vidal constructed the first BCI. The Second group of non – invasive BCIs rely on the detection of imaginary movements of the right or left hand. The third non-invasive group are the BCIs that rely on the 'oddball' evoked potential in the parietal cortex.[9]

An event related potential (ERP) is a stereotyped electrophysiological response to an internal or external stimulus. One of the most known and explored ERPs is the P300 [9].

The non – invasive methods like the P300 speller are enough to give back a communication potential emulating a keyboard or a mouse. [10]

Figure 5. Non-Invasive BCI

VI. OVERVIEW OF BRAIN IMAGING TECHNOLOGIES

There are two general classes of brain imaging technologies: invasive technologies, in which sensors are implanted directly on or in the brain, and non-invasive technologies, which measure brain activity using external sensors.

The invasive technologies provide high temporal and spatial resolution, they usually cover only very small regions of the brain. Additionally, these techniques require surgical procedures that often lead to medical complications as the body adapts, or does not adapt, to the implants. That why many researchers uses non-invasive technique for acquiring brain signals.

C. Electroencephalography (EEG)

Electroencephalography is the recording of electrical activity, as obtained from surface electrodes on the scalp. The first EEG experiments were performed in the late nineteenth century and early twentieth century; by the 1950s, the technology was commonplace [11]. It was used primarily in hospitals and in medical research. The primary medical uses were to detect signs of mental activity in catatonic patients, distinguish epileptic seizures, locate regions of the brain affected by seizures, as well as many related applications. EEG is used to monitor other procedures, such as examining the depths of anesthesia or mental activity during surgery. EEG is also used to monitor for non-convulsive seizures and the mental activities of comatose patients. EEG is commonly used in cognitive psychology, neuroscience, and cognitive science research [11].

Electroencephalographs, thus, measure membrane potential variations occurring in neurons. The polarity of the signal changes according to the location of the synapses, being excitatory and inhibitory synapses inversely correlated. For excitatory, the polarity is negative when located in superficial cortical layers and positive when close to the soma of a cell, while the opposite happens for inhibitory synapses [12].

Although the cerebral activity is better detected over the region of interest, the volume conduction in the cerebrospinal fluid, skull and scalp allows the signal to spread to distant electrodes. Additionally, this barrier created between the neurons and the sensors makes frequencies over 40 Hz almost invisible. Both these conditions generally restrict EEG to global measurements of the brain activity [12].

A.A Signal Acquisition

1) Electrode

The EEG is recorded with electrodes, which are placed on the scalp. Electrodes are small plates, which conduct electricity. They provide the electrical contact between the skin and the EEG recording apparatus by transforming the ionic current on the skin to the electrical current in the wires. To improve the stability of the signal, the outer layer of the skin called stratum corneum should be at least partly removed under the electrode. Electrolyte gel is applied between the electrode and the skin in order to provide good electrical contact. Usually small metal-plate electrodes are used in the EEG recording [13].

The most common type of electrodes used in consumer-grade EEG devices are metal disk and cup electrodes, generally built with tin, silver, gold or surgical steel, or even some of these combined. Their size is important to ensure sufficient contact is made with the scalp, and is generally within the 4-10 mm range. For a better conductivity, a special gel or saline solution is usually required, although most recent devices are being developed with dry sensor

technology [15]. This alternative has proven to be relatively decent in terms of daily usage, but recent research showed significant decreases when comparing dry to water-based electrodes. Also, brain activity is always recorded with respect to reference electrodes, which means EEG signals are small potential differences between electrodes placed at different positions on the scalp [12].

Additionally, while low-cost EEG devices feature a low number of electrodes, research has shown that, ideally, at least 12 electrodes were required to maintain a 90% accuracy in terms of motor imagery detection [14].

2) Electrode Placement

While originally the electrical activity produced in the brain was detected using electrodes in the front and back regions of the skull, it was later discovered that these signals varied across different locations of the head. As the complexity of the measurements evolved and the number of used electrodes increased, finding optimal positioning schemes became an important objective. Also, in order to better compare results among similar studies or to detect changes over time on a same patient, the introduction of a standard positioning system became necessary. In 1958, the now called International 10-20 system (Figure 2.6) was recommended by the International Federation of Societies for Electroencephalography and Clinical Neurophysiology. This system measured specific anatomic landmarks on the skull, the nasion (depression between the eyes) and the inion (lowest point on the back of the skull), and then used 10% or 20% of that distance to calculate the electrodes interval. Each electrode is designated by the first letter of the lobe it is placed on top of, and a number, odd on the left and even on the right hemisphere [16].

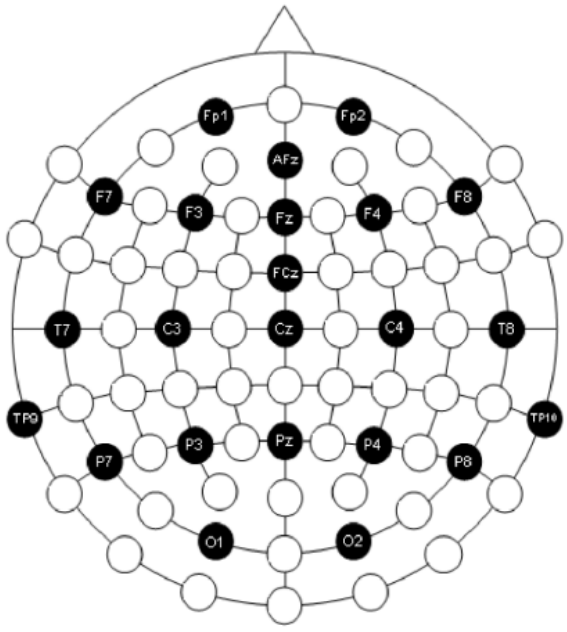

Figure 6. The International 10-20 System

3) Rhythmic brain activity

Depending on the level of consciousness, normal people's brain waves show different rhythmic activity. For instance, the different sleep stages can be seen in EEG. Different rhythmic waves also occur during the waking state.

Band	Frequency [Hz]
Delta (δ)	< 3.5
Theta (θ)	4-7.5
Alpha (α)	8-13
Beta (β)	>13

Table 2 Common EEG frequency ranges

frequency ranges as displayed in Table 2. They are named after Greek letters (δ, θ, α, β, γ). These ranges set the limits in which the different brain rhythms (named according to same letter as the frequency range) can be observed. The order of the letters is not logical and can be understood only in the historical view [17].

3.1) Delta rhythm

EEG waves below 3.5 Hz (usually 0.1-3.5 Hz) belong to the delta waves. Infants (around the age of 2 months) show irregular delta activity of 2-3.5 Hz (amplitudes 50-100 _V) in the waking state. In adults delta waves (frequencies below 3.5 Hz) are only seen in deep sleep and are therefore not useful in BCIs.

3.2) Theta rhythm

Theta waves are between 4 and 7.5 Hz. Theta rhythm plays an important role in infancy and childhood. In normal adults theta waves are seen mostly in states of drowsiness and sleep. During waking hours the EEG contains only a small amount of theta activity and no organized theta rhythm. Niedermayer lists some studies in which the theta activity of 6-7 Hz over frontal midline region had been correlated with mental activity such as problem solving. However, he did not find it in his own studies.

3.3) Alpha rhythm

The International Federation of Societies for Electroencephalography and Clinical Neurophysiology proposed the following definition of alpha rhythm: Rhythm at 8-13 Hz occurring during wakefulness over the posterior regions of the head, generally with higher voltage over the occipital areas. Amplitude is variable but is mostly below 50 _V in adults. Best seen with eyes closed and under

conditions of physical relaxation and relative mental inactivity. Blocked or attenuated by attention, especially visual, and mental effort.

The posterior basic rhythm increases in frequency during the childhood and reaches the frequency 8 Hz (the limit of the alpha rhythm) at the age of 3 years. At the age of 10 years the frequency reaches a mean of about 10 Hz, which is typical mean adult alpha frequency. The frequency tends to decline in elderly individuals and in dementia.

The alpha rhythm is temporarily blocked, i.e, its amplitude decreased, by eye opening, other afferent stimuli or mental activities. The degree of reactivity varies. Usually, eye opening is the most effective manipulation.

3.4) Beta rhythms

Any rhythmical activity in the frequency band of 13-30 Hz may be regarded as a beta rhythm. Beta rhythm amplitudes are seldom larger than 30 _V. Beta rhythms can mainly be found over the frontal and central region. A central beta rhythm is related to the mu rhythm. It can be blocked by motor activity and tactile stimulation.

4) Event-related potentials (ERPs)

Event-related potentials is a common title for the potential changes in the EEG that occur in response to a particular "event" or a stimulus. These changes are so small that in order to reveal them, EEG samples have to be averaged over many repetitions. This removes the "random" fluctuations of the EEG, which are not stimulus-locked.

Event-related potentials can be divided into exogenous and endogenous. Exogenous ERPs occur up to about 100 ms after the stimulus onset. They depend on the properties of physical stimulus (intensity, loudness etc.). The potentials from 100 ms onward are called endogenous [18].

The most commonly studied ERP is P300. This positive deflection in the EEG occurs about 300 ms after the stimulus onset. P300 is commonly recorded during an "odd-ball paradigm". In it the subject has been told to respond to a rare stimulus, which occurs randomly and infrequently among the other, frequent stimuli [18].This is discuss in chapter no. 3 in deeply.

Evoked potentials (EPs) is a subset of the ERPs, that rise in response to a certain physical (visual, auditory, somatosensory etc.) stimulus. A typical evoked potential is the Visual evoked potential (VEP) that reflects the output features of the entire visual pathway. The EEG over the visual cortex varies at the same frequency as the stimulating light [19].

Magnetoencephelograph (MEG)

Magnetoencephalography (MEG) is a method to noninvasively measure the magnetic field strength generated by the flow of electrical currents through the pyramidal neurons in the cortex. The signals are measured with superconducting quantum interference devices (SQUID) which are extremely sensitive to the changes in the magnetic field [20]. The use of MEG in BCI is limited in a few studies [21], [22]. It is reported that this method can also be used in BCI applications when considered in communication speed [23]. However, as the instrumentation in MEG systems are relatively larger in size, unportable and more expensive as compared to EEG, it is usually not preferred for real world applications of BCI.

D. Positron Emission Tomography (PET)

Positron emission tomography (PET) is a technique that uses radioactive marked substances, called tracers, to indirectly image metabolic processes within the human brain. The tracer is a substance that is metabolized by the brain during activity. Usually fludeoxyglucose (FDG), an analogue of glucose, is used as a tracer. Activity in brain tissues results in increased glucose uptake which can be measured by detecting pairs of gamma rays emitted by the tracer. This type of scan is usually combined with computer tomographic x-ray scans to visualize the anatomic structures of the tissue resulting in a 3-dimensional image of the brain augmented with metabolic activity. The scan itself is rather slow due to the neurovascular coupling, i.e. the slow metabolic responses to neuronal activity. Further, the injection of radioactive molecules, though with a short half-life time, bears a certain risk for the subject [24].

E. Single Photon Emission Computed Tomography(SPECT))

Single-photon emission computed tomography (SPECT, or less commonly, SPET) is a nuclear medicine tomographic imaging technique using gamma rays. It is very similar to conventional nuclear medicine planar imaging using a gamma camera. However, it is able to provide true 3D information. This information is typically presented as cross-sectional slices through the patient, but can be freely reformatted or manipulated as required.

The basic technique requires delivery of a gamma-emitting radioisotope (called radionuclide) into the patient, normally through injection into the bloodstream. On occasion, the radioisotope is a simple soluble dissolved ion, such as a radioisotope of gallium(III), which happens to also have chemical properties that allow it to be concentrated in ways of medical interest for disease detection. However, most of the time in SPECT, a marker radioisotope, which is of interest only for its radioactive properties, has been attached to a specific ligand to create a radioligand, which is of interest for its chemical binding properties to certain types of tissues. This marriage allows the

combination of ligand and radioisotope (the radiopharmaceutical) to be carried and bound to a place of interest in the body, which then (due to the gamma-emission of the isotope) allows the ligand concentration to be seen by a gamma camera [25].

F. Functional Magnetic Resonance Imaging (fMRI)

Function Magnetic Resonance Imaging (fMRI) is able to measure metabolic changes in living brain tissues, just as the former mentioned technique. In contrast to PET it does not require any sort of radioactive tracer and thus eliminates the risk involved with radiation. Neural activity is thought to be correlated to increased blood deoxygenation since active neurons require a greater amount of energy which is delivered in the form of oxygen. Hemoglobin, the molecule binding and releasing oxygen, has different magnetic properties depending on its state of oxygenation. To measure neural activity, fMRI detects relative changes of oxyhemoglobin and deoxyhemoglobin. This contrast is called Blood-oxygen-level dependent signal (BOLD). As with PET, this technique also requires relatively long scan times and picks up signal frequencies in the range of 4-5Hz [24].

G. Functional Near Infrared (fNIR)

Near infrared spectroscopy is a rather new non-invasive technique that can measure metabolic processes of the brain. Similar to fMRI, NIRS employs special properties of oxygenated blood to receive a BOLD signal. In contrast to the former technique, NIRS emits near infrared light of a specific wavelength. This light penetrates the skull and cortex to a depth of 1-2cm . The reflected light is detected at multiple positions. Depending on the position and absorption of the light, blood oxygenation can be deduced from that data. As with with all former methods, the temporal resolution of NIRS is also bound by the neurovascular coupling that leads to signals of 4-5Hz [24].

VII. CONCLUSION

Our objective for writing this paper is to explore some of the basic concept regarding Brain Computer Interface through EEG signals. This is helping BCI researchers to work in future. The main objective of Human Computer Interaction is to invent new interfaces of computer and make it more usable in daily life. For the last few years, it inspired new solutions primarily for the benefits of user as a human being. One motivation for doing research on Brian Computer Interface is to influence the design of future systems. This study can have its most significant effect on future work.

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Modern Teaching Learning Methodology: Review

Dr. Rakesh Deore
Department of Computer Science & I.T.
ScienceP.R.Ghogrey Science College.
Dhule,Maharashtra,India
Email: rakeshsdeore@gmail.com

ABSTRACT:

The ways knowledge, skills and values are delivered to the learner have a meaning both for the teacher and the taught. Methodology of teaching has evolved over the years. In the contemporary period teaching methods have changed radically. A would be teacher is expected to be equipped with the appropriate methodology of teaching. In present scenario the education become the student-centered. So the different types of learning methodologies are also very much useful to build up student own knowledge, skills and values. In this poster variety of teaching and learning methodologies are mentioned.

EFFECTIVE TEACHING STRATEGIES:-

Open-ended Quizzes

Open-ended quizzes really challenge students to think and come up with their own solutions and methods. The objective of this quiz is in direct opposition to normal quizzes that require students to memorize and reproduce. An interesting method employed is to provide the students with take-home exam sheets which they can give in after a period of a few weeks. Now this is the interesting part: students who produce straightforward answers will receive a minimum passing grade. Higher grades would be awarded to those who display a deeper understanding of the material, the ability to apply techniques from other disciplines, and the ability to evaluate.

Show and Tell

The concept of "Show and Tell" is one that most teachers are familiar with. While it may come across as an interesting activity, its utility goes much deeper. One of the best aspects of show and tell is that it can be used for students belonging to any age group. One of the primary objectives this method achieves is, of reversing the role of the student to a teacher. In order to explain a concept to someone else, students must first truly understand the concept. This requires them to understand and analyze the selected subject deeply, and establish a clear line of thinking, to be able to explain the phenomena to their peers.

Interactive Lectures

Lectures are one of the old methods used for teaching large groups of students. A plain and simple session usually allows the students to listen passively, without encouraging active participation. To grab the interest of students, one can try to make lectures more interactive by using techniques to encourage students to participate willingly. For example, students can be given a particular question which they could discuss with their neighbor and collectively derive a final answer. Demonstration is another interesting way of making lectures more interactive.

Practical Examples

An effective teaching strategy that must be used frequently is the use of practical examples. These can help students link theory to practical application, which results in more productive learning. While a sound theoretical base is important, it would not be effective without the understanding of its practical application. Examples not only help enhance the theories taught in the classroom, but are also a useful tool in illustrating and explaining new material. By using these examples, educators are able to show students practical applications of what they are learning, and also teach them how to apply basic principles to real life problems. It is a good idea to use contemporary themes that students are interested in. For example, the cost of concert tickets to the 'Jonas Brothers', to explain a numerical problem.

Case Studies

Case studies are a compilation of "real-life" activity, in which theories have been put into practical use. As finding a case that fits the class material may be challenging, a teacher may provide students with case material or leave it up to them to find and develop. If the case material is provided, students are expected to go through it and be prepared to answer questions about various aspects of the case. If students are expected to develop a case, their workload will increase significantly, and must be balanced out with

other assignments. Students are usually required to work in groups while preparing, presenting the case, and fielding questions. As a teacher, one is required to guide the discussion, keeping in mind the goal of the case.

Brainstorming

Another fun and effective teaching technique, brainstorming engages students and forces participation. There are many ways to brainstorm with a class. One can provide the entire class with a topic to discuss and each student is required to contribute at least one idea. Alternatively, students may contribute ideas as and when they think of them, though this can lead to unequal participation. One may also split the class into small groups, which can discuss and present their idea after a given amount of time.

Roleplaying

A role-play is an effective method of getting students involved so as to come up with solutions on their own. One can give them a topic to study and ask them to prepare a role-play with every student of the group performing a particular part, and present it to the class so as to make other students understand the topic. This strategy not only helps the students in understanding the course content, but also makes them aware of real world aspects associated with it.

Jigsaw Technique

This technique is very useful in grabbing the attention of each and every student towards a particular topic through individual involvement. Teams can be formed within the class and each group can be given different, but related topics to prepare. When students are done with their topics, groups are reshuffled in such a way that each new group has one member of all the previous groups. Now the students are required to teach everyone in the new group what they have learned in the previous team. This way every student pays proper attention when learning a particular topic because they know that they will have to teach the same to other members of their new team.

Just-in-Time Teaching

This method helps in preparing students before the class is actually conducted. Instructors post questions related to the topic of discussion on student portal, which students are required to answer before the class. Posting open-ended questions will require the students to read about the topic and then answer the questions as per their understanding of the subject. Before the session, instructors review the answers and figure out the aspects which students have not understood properly and prepare class activities in such a way that those aspects are addressed.

Flowchart

This tool can be used to make students understand where the lecture is headed to, and the goals that are to be achieved at the end of the session. The board is divided into two sections, with one section dedicated to a flowchart which is developed as the session progresses to establish the flow of thought, and the second section dedicated for presentation purposes. At the end of the session, the flowchart serves as a summary of what has been taught in the session. These flowcharts are very useful, specially for a quick review before tests. Some of the best methods emerge from one's own experiences. So spend some time reminiscing about the aspects of school or a certain class that you disliked. Also try to recollect what you liked and what you wished to be incorporated in your educational system. These experiences serve as the best base material to come up with your own teaching strategies.

Effective Learning Strategies

Inquiry-Based Learning

This is a learning process that is based on inquiry or asking questions. Through asking challenging questions learners get intrinsically motivated to start delving deeper to find answers for these questions and in doing so they are exploring new avenues of knowledge and insight. As you can see in the graphic below inquiry-based learning is a cyclical learning process composed of many different stages starting with asking questions and results in asking more questions. Inquiry based learning is not just asking questions, but it is a way of converting data and information into useful knowledge. A useful application of inquiry based learning involves many different factors, which are, a different level of questions, a focus for questions, a framework for questions, and a context for questions.

Problem-based learning

In a problem-based learning (PBL) model, students engage complex, challenging problems and collaboratively work toward their resolution. PBL is about students connecting disciplinary knowledge to real-world problems—the motivation to solve a problem becomes the motivation to learn.

Discovery Learning

Discovery learning is a kind of teaching that is based on the student finding things out for themselves, looking into problems, and asking questions. Essentially, it's all about students coming to their own conclusions and asking about things in their course that might not make particular sense. Obviously, as soon as enquiries are made, they can learn new things and hence will have become part of an innovative, thought-provoking and interesting educational journey. Top psychologists in the country have promoted this kind of learning

.

Project-based Learning

"An instructional approach built upon authentic learning activities that engage student interest and motivation. These activities are designed to answer a question or solve a problem and generally

reflect the types of learning and work people do in the everyday world outside the classroom."

Situated Learning

Situated learning is a type of learning that involves learning materials within the context of how the information or skills are actually used and applied. It is typically associated with social learning and though it was initially recognized in regard to adult education, some of its practices have been extended to youth education as well. With this type of learning, communities of practice are established in which individuals learn and build mutual meaning through active processes that imbue context and purpose into what is learned. Situated learning does not typically involve a particular pedagogical approach, but instead seeks to understand how learning relates to daily practices and social interactions.

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APPLICATION OF ELECTROENCEPHALOGRAM (EEG) PROPERTIES FOR DETECTION OF DIGIT

Rakesh Deore
Dept. of Computer Science,
S.S.V.P.S's L.K.Dr.P.R.Ghogrey Science College
Dhule, Maharashtra, INDIA
Email:rakeshsdeore@gmail.com,

Dipashri Sisodiya

North Maharashtra University,Jalgaon
Jalgaon, Maharshtra, INDIA
Email: dipashri.sisodiya@gmail.com

ABSTRACT:

Based on Linear Discriminate analysis (LDA) we explore the characteristics of multichannel Electroencephalogram (EEG), which is recorded from no of subjects recognizing different numbers displayed on the screen by a GUI software designed in VB6. The scaling exponent of each digit is different especially at positions C3 and C4, and at positions O1 and O2. LDA exhibits its robustness against noises in our works. We could benefit more from the results of this paper in designing mental tasks and selecting brain areas in brain-computer interface (BCI) systems.

Keywords- EEG,LDA,BCI,BETA signal, random number generation using GUI, HCI.

1.Introduction

The Electroencephalogram (EEG) is a unique and valuable measure of brain's electrical function. Electrical Signals are produced by brain activity were first recorded from the cortical surface in animals by Ricard Carton in 1875 (Car-ton 1875) and from human scalp by Hans Beger in 1929 (Berger,1929)[6]. EEG activities mainly used for clinical diagnosis and explores brain function. Now a day different researchers shows that brain activity might serve an entirely different purpose that they might provide the brain with another means of conveying messages and commands to external world . EEG is one such technique which measures the electric fields that are produced by the activity in the brain [4, 10]. EEG signals arise due to electrical potential produced by the brain. EEG spectrum contain characteristic waveforms which fall in 4 frequency bands viz alpha(8-13Hz), beta(13-30 Hz), theta (4-8 Hz), delta(< than 4 Hz). Alpha waves are found in normal awake people, not engaged in intense mental activity, which disappear when a person is asleep. Beta waves with higher frequency are seen during intense mental activity and stress. Delta waves occur during deep sleep, during infancy and in serious organic brain diseases. Theta waves appear during emotional stress in adults in sleep, particularly during disappointment and frustration . Literature review of similar work which focuses more on identification from EEG of healthy subjects rather than classification of pathological cases for diagnosis were made [1,2, 3, 7, 8, 9, 10] EEG is collected at the millisecond level, in contrast to the longer time intervals required for traditional measures such as mouse clicks or user responses. This permits effective monitoring of workload fluctuations in very rapid decision-making processes that are unobservable using traditional methods [11]. As security issue is always challenging to the real world applications many biometric approaches, such as fingerprint, iris and retina, have been proposed to improve recognizing accuracy or practical facility in individual identification in security. However, there is little research on individual identification using EEG methodology mainly because of the complexity of EEG signal collection and analysis in practice [5]. In future we can work to extract individual specific information from a person's EEG and use this information to develop identification methods like EEG biometry. The remaining sections are organized as follows. Section 2 provides experimental data acquisition setup used in this research work. Section 3 details the experimental analysis of EEG data, followed by results and conclusion in section 4.

2. EXPERIMENTAL DATA ACQUISITION

EEG recordings of 10 male right-handed subjects in the age group of (20-25) were taken. The subjects were normal without any mental disorder. They did not have any problem in communicating and had normal vision. Subjects were made to sit comfortably on an arm chair facing the screen in electromagnetically shielded room. The subjects had given their written consent for recording EEG signals before participating. For the EEG data, experiments were conducted in which subjects were shown visual stimuli consisting of the Random Number Generator. Graphics User Interface was developed in VB6 .The GUI was shown for one minute and then there was a gap for certain time interval, where in subjects were asked to take rest with eyes closed. A single experimental session typically comprised of 4 trials of complete display of GUI from 0 to 9.

Figure 1 Snapshot of GUI software

The record of the displayed number was maintained for reference during analysis and pattern matching. The six Electrodes [C3, C4, P3, P4, O1, O2] were spread over the surface of the scalp and recordings taken as shown in figure 2. As the architecture of the brain varies with different locations, EEGs can vary depending on the location of recording electrodes. The 10-20 system for electrode placement was used. Electrodes consist of flat discs connected to an isolated wire. They have identifying names; those on the left side have odd numbers,while those on the right have even numbers. Those near the midline have smaller number and the more lateral ones have larger numbers. The names include the first letter of the place where the electrode is placed. A body earth and reference electrode was placed on forehead and behind the two ear lobes.

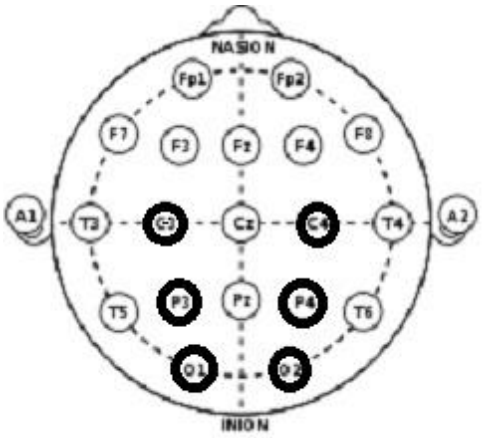


Figure 2International 10-20 System.

3. EXPERIMENTAL ANALYSIS

The EEG recordings were captured according to the time of numbers generated on the GUI. The readings were statistically analyzed. There are four frequency bands associated with the EEG signals. All fours bands with their functionalities are listed in table 1[7].Type Frequency (Hz) Normally Delta up to 4 Has been found dominant . during some continuous . attention tasks . (Kirmizi-Alsan et al. 2006).

Delta	Upto 4	Has been found dominant during some continuous attention task
Theta	4-<8	Appears in drowsiness or arousalcondition in children and adults
Alpha	8-13	Found to be prominent in relaxedreflecting condition
Beta	13-30	Has been found in alert workingactive, busy or anxious thinking,or active concentration.

Table 1

By observing the above table, we concentrated on the beta signals of all 6 electrodes for recognizing the number. The Linear Discriminate analysis (LDA) is used technique for data classification and dimensionality reduction.It easily handles the case where the Within-class frequencies are unequal and their performance has been examined on randomly generated test data. This method maximizes the ratio of between-class variance to the within-class variance in any particular data set thereby guaranteeing maximal seperability. The use of Linear Discriminate Analysis for data classification is applied for

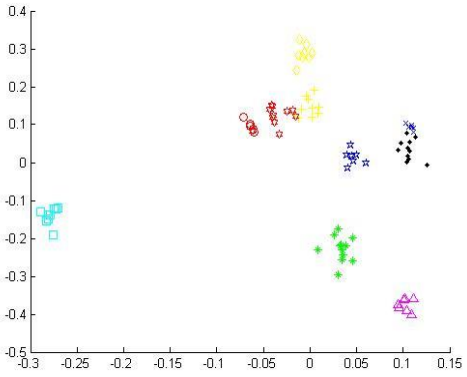
classification of all ten numbers in hopes of providing better classification.

3. 1 Linear Discriminant Analysis

Linear Discriminate Analysis is a well known scheme forfeature extraction and dimension reduction. It has beenwidely used in many application such as face recognition,image retrival, microarray classification. LDA projects thedata onto a lower dimensional vector space such that theratio of the between class distance to the within class distance is maximized, thus achieves maximum discrimination In this section we give a brief overview of LDA. Given a matrix A $\in R^{Nxn}$,LDA aims to find a transformation G $\in R^{Nxl}$ that maps each column a_i of A, for $1 \leq i \leq n$,inthe N-dimensional space to a vector bi in the l-dimensionalspace. That is G : $a_i \in R^N$– > bi = $G^T a_i \in R^l (l < N)$.LDA aims to find a vector space G spanned by g_i whereG = [g1, g2, ..., gl] such that each a_i is projected onto G by$(g_1^T .a_i, ..., g_l^T .a_i)^T \in R^l$.Assume that the original data in A partitioned into k classesas A={π1, π2, ..., πk} where π_i contains n_i points from theith class, and$\sum_{i=1}^{k} ni = n$.LDA aims to find the optimaltransformation G such that the class structure of the original high dimensional space is preserved in the low dimensional space.In general if each class is tightly grouped, but well separated from the other classes , the quality of considered to behigh. In discriminate analysis,two scatter matrices,called aswithin class (Sw) and between-class (Sb) matrices,are defined to quantify the quality of cluster as follows:

$$S_w = \sum i = 1^k \sum x \in \pi_i (x - m_i)(x - m_i)^T$$

$$S_b = \sum i = 1^k \; n_i(m_i - m)(m_i - m)^T$$



Where m_i= 1/ni$\sum$ x $\in \pi_i$, x is the mean of the i^{th} class and m=1/n $\sum$ i = 1^k $\sum$ x $\in \pi_i$, x is the global mean. It is easy to verify that trace (Sw) measures the closeness of the vectors within the classes, while trace (Sb) measures the separation between classes. In the low dimensional space resulting from the linear transformation G. Following fig shows the classification between all ten numbers using LDA.

Table 2 Cluster information for digit-0

X	Y	Distance
0.009345304	0.146554217	0.00173175
0.004600992	0.190279302	0.044421612
0.002613943	0.119080978	0.026853037
-0.015974174	0.126782597	0.019170542
0.002046017	0.143718024	0.002693518
-0.012309459	0.118067418	0.027864866
-0.001831391	0.16674048	0.020915166
-0.00399276	0.175422066	0.029578819
0.008251523	0.131259941	0.01471351
-0.008728191	0.140959334	0.005179706

Table 3 Cluster information for digit-1

X	Y	Distance
0.10556187	0.092780159	0.892034621
0.108956621	0.098769387	0.108096731
0.102586447	0.102800257	0.108370003
0.109214756	0.094587284	0.107971648
0.110702266	0.080517333	0.108737101
0.110771811	0.091228471	0.107988423

Table 4 Cluster information for digit-2

X	Y	Distance
-0.071657797	0.118855752	2.064233941
-0.059679576	0.079266029	0.06640923
-0.060944056	0.088589154	0.0646092
-0.064059149	0.100504574	0.064233974
-0.06422791	0.095662257	0.064120202

Table 5 Cluster information for digit-3

X	Y	Distance
0.033023337	-0.216806208	2.967154352
0.025831311	-0.191152628	0.049507489
0.034719774	-0.230433225	0.032944856
0.035286891	-0.242466776	0.035839879
0.030460636	-0.176275263	0.061432444
0.038398107	-0.219918769	0.033888766
0.030093411	-0.295907593	0.075285118
0.033914114	-0.257668797	0.04415992
0.008611601	-0.229308429	0.032886938
0.046122641	-0.199057629	0.043910618
0.032441393	-0.219236813	0.034061349

Table 6 Cluster information for digit-4

X	Y	Distance
0.106170996	0.008582216	0.109173676
0.106455117	0.029202167	0.106278734
0.094237603	0.033249004	0.106172412
0.107391128	0.053851901	0.108006657
0.097335901	0.051552319	0.107608082
0.103391254	0.002143946	0.110850564
0.112964122	0.068202389	0.111537759
0.104665908	0.017862476	0.107391538
0.105397885	0.03798667	0.106243846
0.103889666	0.07681857	0.11447277
0.125966442	-0.005270887	0.113205502

Table 7 Cluster information for digit-5

X	Y	Distance
0.094518544	-0.376140081	0.102412108
0.10926193	-0.402113181	0.105710814
0.095446697	-0.383721881	0.102709334
0.102108748	-0.358177657	0.103935726
0.111014104	-0.359184742	0.10376865
0.10362122	-0.391175965	0.103543356
0.100911711	-0.360858853	0.103512001

Table 8 Cluster information for digit-6

X	Y	Distance
-0.270065467	-0.120582608	0.279034339
-0.275168887	-0.190852811	0.282838685
-0.272497005	-0.121874184	0.278945084
-0.282869031	-0.152648228	0.278586642
-0.280299761	-0.149256902	0.27845947
-0.289437658	-0.129829569	0.27852678
-0.280595973	-0.137219096	0.278341433
-0.275055981	-0.123247558	0.278856707
-0.278908234	-0.139062298	0.278325755

Table 9 Cluster information for digit-7

X	Y	Distance
-0.006184281	0.288569302	0.006936393
0.002584997	0.288516075	0.006926387
-0.012229276	0.281901656	0.008650977
-0.000774436	0.277459933	0.011915866
-0.013930104	0.244369448	0.043407343

Table 10 Cluster information for digit-8

X	Y	Distance
0.060633103	-0.001665551	0.048034799
0.039195481	0.018609772	0.04591758
0.039899897	0.018918486	0.045953781
0.049835774	0.018478181	0.045902772
0.043304969	0.045390794	0.055730577
0.040549933	-0.013297798	0.052845252
0.046466675	0.004727574	0.046431341
0.045062187	0.015858738	0.04568593

Table 11 Cluster information for digit-9

X	Y	Distance
-0.038325603	0.105353283	0.040072479
-0.061910567	0.084167441	0.052919664
-0.043219111	0.141868736	0.040665166
-0.018216401	0.13934876	0.039556107
-0.040717985	0.149051529	0.044462838
-0.015769521	0.123110194	0.035999717
-0.039299496	0.123725927	0.036007622
-0.024726075	0.136379504	0.038420726
-0.040201565	0.12078939	0.036064511
-0.041009397	0.152440997	0.046533148
-0.032597518	0.076277799	0.058947345

All data points in a single cluster are called as cluster feature(CF).Let CF is a data structure summarizing informationabout all points in the dataset,

$$CF = (n, LS)$$

where LS is linear sum of n data points.

Ie $(\sum_{i=1}^{n} xi \sum_{i=1}^{n} yi)$

n is the number of data points in data set.

Mean of data set provides the center of (x_0, y_0) of the distribution. Then the distance of each point in a cluster from the center of cluster is given by

$$\sqrt{(xi - xo)2 + (yi - y0)2}$$

The radius of cluster is calculated as

$$\sum_{k=0}^{n} \sqrt{(xi - xo)2 + (yi - y0)2}/\text{n}$$

So the resultant values of center and radius for different clusters is as follows

Digit	X	Y	Distance
0	-0.0016	0.145886	0.019312253
1	0.107965628	0.093447148	0.238866421
2	-0.064113698	0.096575553	0.065449459
3	0.032867432	-0.22817591	0.288061438
4	0.106169638	0.034016434	0.109176504
5	0.10241185	-0.375910337	0.103655998
6	-0.278322	-0.140508139	0.279101655
7	-0.006807753	0.287239623	0.157660533
8	0.045618502	0.013377525	0.048312754
9	-0.035999385	0.122955778	0.042695393

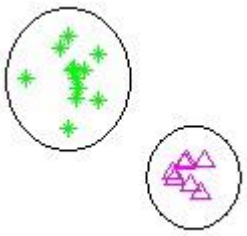


Figure 4 Snapshot of Clusters for different digits.

4.Result and Conclusion

Linear Discriminate Analysis is a well known scheme for feature extraction and dimension reduction.Recording are sampled at 250 Hz for 90 sec so length of data is very large.Butit is transformed using fourier transformation into frequencydata.For each digit we get 6 scaling exponent β respondingeach channel.The data is filtered by bandpass filter.The

effective component of EEG is usually supposed to be concentrated at 1-30 HZ and frequency of baseline excursion iscomparatively lower (1 HZ) and the frequency of power interruption and EMG interruption is higher(>=50HZ).so weset the parameters as Low filter 1 Hz,High filter 70 Hz ,Number of channels:06,Sweep speed 30 mm/s and Montage: BPPARA (R).Considering the calculation results for the samedigit, the results of one subject during each trail are comparatively consistent. Table 1 to 12 displays the data pointsof the clusters for digits 0 to 9.Table 13 displays the centerand radius for digits 0 to 9.The β frequency is different fordifferent digits. There is well separation between the clusters of digits.In this study ,we proposed an effective methodfor extracting properties of EEG data. This study is usedto effectively extract eeg features mainly we concentratedon beta frequency bands.In earlier studies we were concentrated on 19 electrodes. Here now we actually concentrateon 6 electrodes and we get excellent clusters for the digitrecognition.Our study is foundation for using Brain Computer Interface in security systems

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PERSON IDENTIFICATION USING EEG SIGNAL

Dipashri Sisodiya

Dept of Computer Science
P.R.Ghogrey Science College.
Dhule.

Rakesh Deore

Dept of Computer Science
P.R.Ghogrey Science College.
Dhule.

Abstract

In this work we use Electroencephalogram (EEG) signal to identify the different traits of Person. The main purpose is to analyze the Alpha rhythm of EEG signal related to left hemisphere and right hemisphere regions of the Brain. We have selected 10 right handed subjects in the age of 18 and 25. In this study we record EEG signal of different subjects recognizing the images of number of known people displayed on the screen. This study suggests that the Alpha rhythms in left hemisphere are more active right hemisphere. Further we observed that in the left hemisphere the electrode F7 is more active, so we concentrate on this single electrode data. We get an average recognition rate of 80% using Linear Discriminate Analysis. The database generated in our study is used to interface brain with any machine such as computer mobile device etc.

Keyword:- EEG, LDA, Mobile, Person

1. Introduction

The Human Computer Interaction (HCI) is media of communication between the user and Computer[1] . EEG signal is a unique measure of the Brain electrical function[2]. This electrical signal is generated due to electrical potential produce by the brain[3].EEG spectrum contains characteristics waveform. These waveform are divided into 4 frequency bands such as delta (0-4 Hz), Theta (4-8HZ), Alpha (8-13 Hz), Beta (13-30Hz). In this study we try to translate EEG signal features into appropriate commands. These commands are used to control mobile devices.

2. Materials and Method

When we see any person, it induces thoughts in mind. These thoughts are dependent not only on people but also on sensitivity for that person. Understanding of these induced brain signals will have useful information for training mobile devices to distinguish different types of people. Figure 1 shows the proposed model for HCI system.

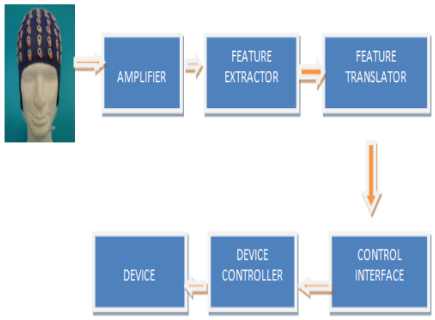


Figure 1. Proposed HCI Model

3. Subject Selection

EEG recordings of 6 right handed male subject in a group of (18-25) are taken. All subjects are normal without any mental disorder. They have normal vision.

4. Experimental Setup

In this study, we select 10 subjects. We explained the design and operation of the experiment. Brain signal measured from 19 electrode mounted on scalp. Figure 2(a) shows the EEG acquisition system. Figure 2(b) shows the 10-20 system for electrode

placement. Figure 2(c) shows emotive epoch headset. Figure 2(c) shows sample EEG.

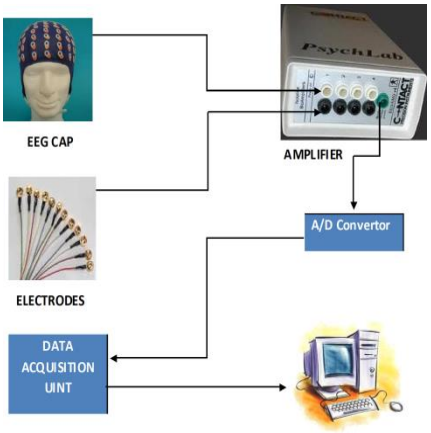
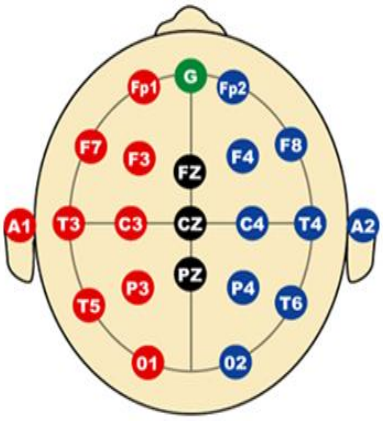
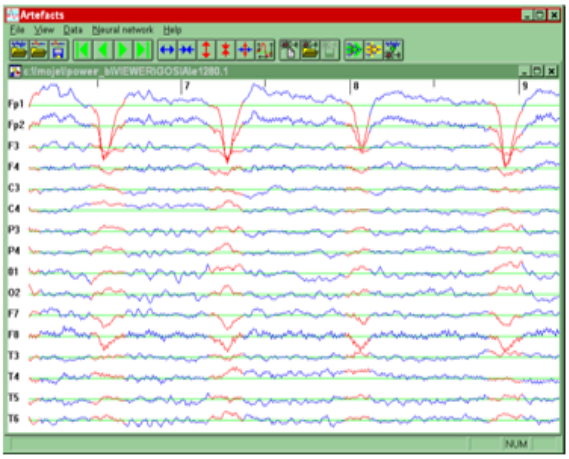


Figure 2 a). EEG Acquisition System



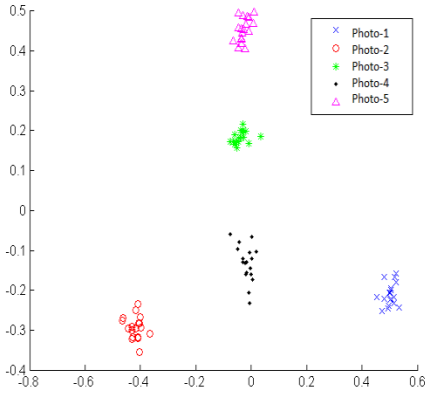
b) 10-20 System for electrode placement

c) EEG acquisition device

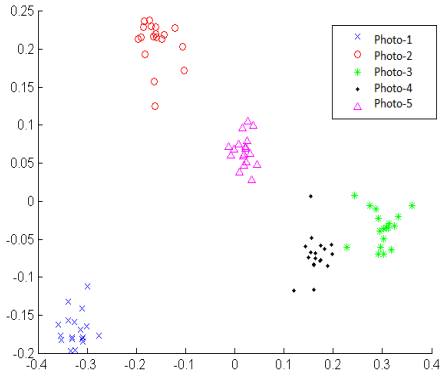


d) Sample EEG signal

5. Result and Discussion



3. a) Graph for Subject-I



b) Graph for subject -2

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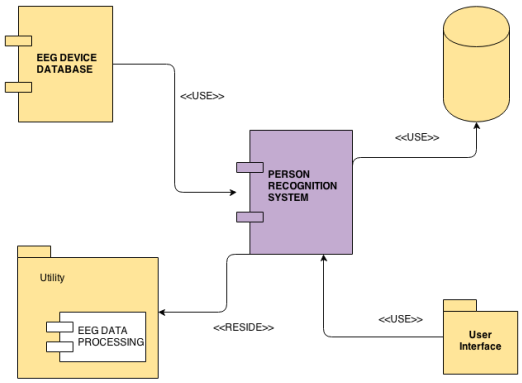

c) Component diagram for the system

From the graph-1 and graph-2 it is cleared that we get distinct cluster for each photo. So it is cleared that it is possible to differentiate the image of each person. Thus we developed person identification system using EEG.

6. CONCLUSION

This study suggests that the alpha rhythms in left hemisphere are more dominant over right hemisphere. So we conclude that the left region of the Brain give more response to person identification rather than right hemisphere. Further we observed that in the left hemisphere the electrode F7 is more active , so we concentrate on this single electrode data. We get an average recognition rate of 80% using Linear Discriminate Analysis.

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EMOTION ANALYSIS USING EMOTINET KNOWLEDGW BASE TECHNOLOGY: A SURVEY.

Mrs. Swapnali G. Waghulade

Department of Computer Science & I.T.
Bhusawal Arts, Science & P. O. Nahata Commerce College,Bhusawal,
Dist.: Jalgaon, Maharashtra, India

ABSTRACT:

In Natural Language Processing using computational linguistics researcher's assume speakers hold some affective value or emotions. Emotion have fixed value. It may be good or bad meaning. It is the combination of small words. The automatic detection of emotion is difficult to examine. But in Natural Language Processing the challenge of automatically detecting emotion from text has been tag from many perspectives.This article presents the EmotiNet knowledge base technology to detect the emotion in the text of human being.This article survey of EmotiNet knowledge base technology determine the appropriate capturing and storing the structure and semantics of real situation and predict the emotional responces triggered by action presented in that text.

KEYWORDS: EmotiNet, Emotion analysis, Emotion Detection, knowledge base, appraisal theory, action chain.

I. INTRODUCTION

Emotion are fundamental to human nature. Today's web communication is widely used by human being. For these purpose researcher's are research on emotion analysis. Emotion analysis capture the intrinsic knowledge of any domain in an easy to understand machine interpretable standard formalization.

Emotion analysis technology describe mood, attitude, opinion and emotion in digital media in image, video, audio and text.

A good example of emotion analysis is "mother and her baby". When a baby is born they cry and calm and smell. When baby is hungry he sense his mother and turn his head towards his mother's breast. Mother and baby mirror newtrons start learning facial expressions. Mother understand all emotions of baby by it's cry and calm text. She understand that her baby is hungry. I think this is god gifted natural emotion analusis technology give to mother to understand it's baby.

Now a days the natural emotion in the text are detect using EmotiNet technology.

EmotiNet knowledge base is resource for detection of emotion from text based on common sense knowledge on concepts. EmotiNet is knowledge base is action chain started with the design of the core of knowledge.

Emotion analysis is divided into six basic emotions are :

Anger, Disgust, Fear, Happiness, Sadness, Surprise.

That recognized emotional text and face recognition related to these emotional states.

Mainly Emotion analysis is divided into three major categories.

1. Is appraisal based model in appraisal theory of psychology.
2. Corpus based studies include methods such as keyword spotting lexical affinity and stastical Natural Language Processing to identify the emotions.

Is knowledge based model is used to determine the emotion in the text.

.

II. LITERATURE REVIEW:

Alexandra Balahur,Jesús M. Hermida, Andrés Montoyo, Rafael Muñoz is told that in EmotiNet: A Knowledge Base for Emotion Detection in Text Built on the Appraisal Theories:- EmotiNet is technology that detect emotion from text based on common sense knowledge on concepts, their intraction and their affective consequences.It's core of the resource is built from emotion triggering concepts.It's predict the emotional responses triggered by action presented in text.

Building and Exploiting EmotiNet, a Knowledge Base for Emotion Detection Based on the Appraisal Theory Model. In IEEE Transaction on affective computing.:- In this paper says that's EmotiNet Technology appropriate for capturing and storing the structure and the semantics of real events and predicting the emotional responses triggered by chains of actions.

Detecting Emotions in Social Affective Situations Using the EmotiNet Knowledge Base. In: 8th International Symposium on Neural Networks, ISNN 2011,, May 29–June 1, 2011, Guilin, China.Is says EmotiNet storing affective reaction to real life context action chains described in text and the methodology.

III. EMOTINET:

EmotiNet technology is work on these all Emotion analysistypes.EmotiNet is use to store action and chain and their corresponding emotional labels from several situation.EmotiNet helps to extract general patterns of appraisal.

Some criteria is used to extract emotion from text.Steps of emtionextraxtion is given below:

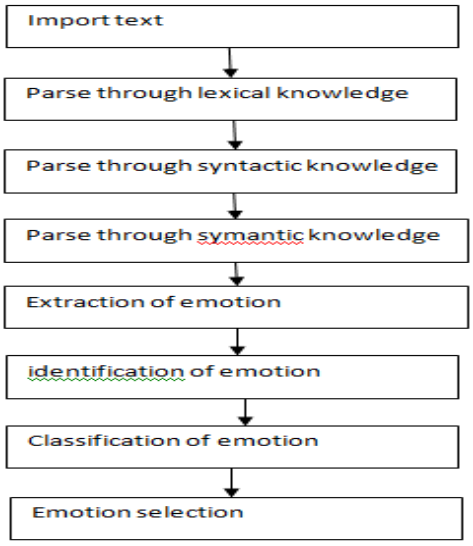

Figure 1. Emotion Extraction

First import the text from the outside world through keyboard. After that lexical lexical analyser modify text into symbols or tokens. Lexical analyser analysis the text using morphological knowledge. Then the text parse through syntactic analyser. syntactic analyser is examine structured knowledge in the text. Structured construct according to the instruction of formal grammer which define the language syntax. After that symantic analyser analysis the phase in compiler adds semantic information to the parse tree and build the symbol table.This phase perform symantic type checking.Then extract the emotion from the text.Indentify which type of emtion are expressed from the text.Classify the emotion and select which type of emotion is actually expressed by the text.

IV. CONCLUSION:

Survey of emotion analysis using EmotiNet technology tells that we can detect the emotion of the text in human being. In future works on this topic new model, new concept, new technology and new knowledge is use to improve the extraction of emtion detection process. In future using this technology read the human emotion in the text and solve the human untold problems and also examine the weakness , illness of human body by it's text.

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A REVIEW: A SARVEY OF IPR ISSUES

Miss. Vrushali S. Shrigondekar[1]
1.Department of Computer Science & IT
Bhusawal Arts, Science & P.O. Nahata Commerce College, Bhusawal

Miss. Bhavana M. Patil[2]
2.Department of Computer Science & IT
Bhusawal Arts, Science & P.O. Nahata Commerce College, Bhusawal

ABSTRACT:

Intellectual property rights (IPR)have been define as ideas invention and creative expression based on which there is a public preparedness to donate the status of property. IPR provide certain exclusive rights to the inventor or creators of that property in order to unable them to reap marketable benefits from their creative efforts or status. There are several types of intellectual property protection like Patent, Copyright, Trademark. Patent is a recognition for an invention, which satisfies the criteria of global novelty, non-obviousness, and industrial application. IPR is prerequisite for better identification planning, commercialization, rendering, & there by protection of invention or create

I. INTRODUCTION

IPR issue have different types of sign they are used on any product to show all reserved are copied. in this system information or any product are freely available to anyone but not one person copy that because at IPR issue. Distributed IPR is propose system for regulating intellectual property that replace the copy based model at copyright with a right based model.

A new government for our digital word that still grand the original author some singular right for limited term but also allow consumers to obtain right to the product and common right to access for all. Copyright originated in an age, were expression at the intellectual product in physical form such as book, music CD, picture, it helps to limited and regular the copyright at creative product means that it simply doing work at protecting our physical content no one it can access.

II. BEGGING OF IPR

The laws and administrative procedure relating to IPR have there root in Europe. The trends of granting patents started in the fourteenth century. In judgment to other European countries in some, matter England was technologically progressive and used to attract artisans from else where, on special terms.

The first copyright seemed in Italy. Venice can be measured the cradle of IP system as most lawful thinking in this area was done here, laws and system were made here for the first time in the word and other countries followed in due course.Patent in india is more then 150 year old the inaugural one is the 1856 acts, which is based on the British patent system and it has provided the patent term at 14 year followed by numerous act and modification.

III. ISSUES IN IPR

Several IPR issues are indicated by following signs

COPYRIGHT

TREADMARK

PATENT

TREAD SCREATE

IV. INTELLECTUAL PROPERTY RIGHT(IPR)

Intellectual property is a property that arises from the human intellect. It is a product of human

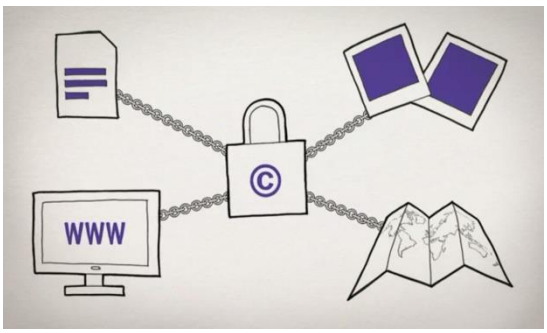
creation. Intellectual property comprises to distinc forms literary and artist work and industrial property.

V. TYPES OF IPR

(a) COPYRIGHT

The world first copyright law was the statute of Anne started in England in 1710. This act introduced by the first time for any developer to do work win the owner at its copyright because at protecting to our product.

The intellectual property right office was created in an effort to create a central international point at deposit for on publish work from around the world via it's copyright registration services.



The pertains to people in creative field such as writing, music, or designing and protect their work from plagiarism. The exclusive right given by law for a certain term at year to an author, composer etc. to print publish and sell copies at original work.
Example of copyright - copyright (word)+Date Copyright 2008

Application of copyright

- Literary
- Film
- Dramatic
- Music
- Artistic
- Sound Recording

Prohibited of copyright

- Ideas
- Facts
- Recipes
- The Phone Book
- Name, Title, Short Phase

(b) TRADE MARK

The trade mark register was established in 1994 and presently it administer the trade mark act 1999 and the rule there under. It act as a resource an information center as is a facilitator in matter relating to trade mark in the country. The objective of the trade mark act 1999 is to register trade mark applied for in the country to provide for better protection of trade mark for goods and service and also to provide fraudulent use of the mark.

The act came into effect on September 15,2013 it represented the trade mark merchandise marks Act 1958.

A symbol, logo, word, sound, color, design or other device that is used to identify a business or a product in commerce.

(c) PATENT

The first patent act of the US congress was passed on April 10,1790 titled an act to promote the progress at useful arts,it first produced on July 31,1790 to Samuel Hopkins for method at producing potash.
Patent is a certificate it is obtain only when we create unique produced for sale.
Advantage of patent:

1.no one can access your product for sale.
2.patent holder can sell his/her right.

3.patent can be use for only discovering new product or idea might be patentable.

Example of patent

If the new use is based on unknown property at the existing product, patent attorneys call this a process patent.

(d) TRADE SECRETE

Trade secret is a formula, practice, process, design, instrument, pattern, commercial method or compilation of information not generally known or reasonably ascertainable by other by which a business can obtain an economic advantage over competitors or customer. Who do not know or use it. The U.S fulfill its obligation by offering trade secrete protection under state laws.

VI. CONCLUSION

✓ By using this type we can safetly produced our any product,information,design. and no one can access our rights, if it can access then we can prove to showing them IPR system.

✓ We can have our production(unique) then use for protection patent system.

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A COMPARATIVE RESEARCH ON SOFTWARE ENGINEERING MODELS

Prof. Vaishali A. Patil
Department of Computer Science &IT
P.O.Nahata College,Bhusawal,425-201,India
Email: vaishalip457@gmail.com,Mob No:9049507812

ABSTRACT:
Software is defined as collection of program,procedures,rules,data and associated documentation. The software is developed keeping in mind certain hardware and operating system consideration commonly known as platform And engineering means systematic procedure to develop software. Some of the software characteristics are, it can be engineer or developed and second thing is software is complex in nature.

KEYWORDS: Software development model, waterfall model

Introduction

1) Functional model represent the quality base preparation of software design
2) It works for *equivalent* Data & Function information gathering, Analysis & Design
3)In procedure oriented, stress is given on function rather than data & in object oriented, stress is on data rather than function.
4) Because of this software quality is affected either in data or function.
5) By using Functional Model it's possible to avoid this problem.

Goals

1)Improve the quality of software.
2)Minimize the maintenance of software.

Diagram of SDLC Model

Phases of Model

1)Requirement Gathering & Analysis:-

1)Gathering Information of system according to essential data& function.
2)Analysis of data & function according to the user requirements.
3)Specially perform the function analysis. For full fill the user requirement loop is used.
4)Form the documentation of all function & their types.

2)Design:-

1)According to analyzed data & function, a sample design of entire system is created in this phase.
2)Functions are organized by identification & interaction in between them.
3)Function analysis is the systematic process of identifying, describing & relating the function a must perform in order to be successful.
4)Design loop works to full fill all needs of function information for design.
5)System verification checks the design with actual system for enhancement of quality.

3)Coding:-

1)Implementation of design in to code is done with a proper object oriented programming language.
2)Software developed with the intension of reusability, extensibility & robustness.
3)After completion of programming code, code conformation is done by using function with Their design.

4)Testing:-

1)Testing is done to remove the errors in programming code.

2)But in system verification most of the errors are removed by us therefore required testing time should be minimum

3)And for handling the interface errors we apply Black box/Function testing.

4)Functional testing works on "can user do this" or "does this particular feature work"

5)Again we check all the interactions of function for quality assurance.

5)Maintenance:-

1)Specially, we are trying to avoid the corrective maintenance.

2)Only for new implementations, we are using maintenance phase.

Advantages:-

1)Data & functions are having equal priority.

2)System verification avoids most of the errors.

3)Implementation of new module is easy.

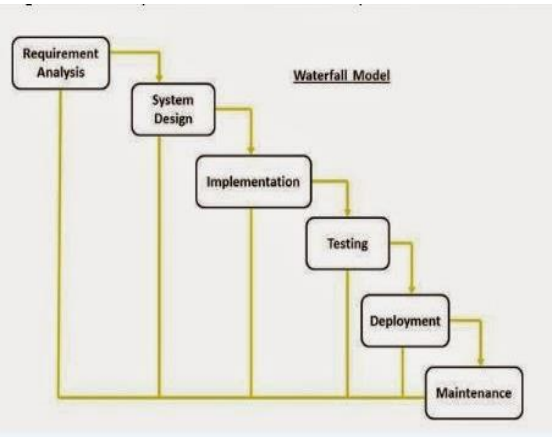
4)Reusability of module is possible.

5)Flexibility of function is good.

Waterfall Model:-

The waterfall model is a the first development modeltobe used in software engineering.It is also known as Linear Sequential Life Cycle Model.It is very simple to understand and easy to use.In waterfall model,phases must be complete sequentially so that phase completed full and then next phase begin.

Waterfall model provide systematic and sequential approach of software development that begins from requirement gathering and improvement design,implementation,,testing,deployment and maintenance.



Requirements Analysis:- Requirement Analysis is the first phase of waterfall model which start with understand the requirement from customers so that software meets this specifications.In this phase requirement are collected ,analyzed and then prepare proper documentation which helps further development process.

System Design:- First design the Hardware and Software as per the requirement of every part of system.Algorithm and defining the scope and objectives of each logical model are developed.Then with the help of logical representative technique technique design the logical modules for eachprocess of system.

System Implementation:- This is the important phase of software developmet process in which actual coding is started.A software program is written base upon the algorithm designed in the system design phase.Each unit is developed and then tested for its functionality.

System Testing:-In the system tesing a series of test and test cases are considered to check for errors,faults and bugs.The various tools and software are used for testing in order to make sure it is error free.

System Deployment and Maintenance:-This is the last phase of waterfall model.Once the testing is done then system is deployed and ready to use or deployed in customer environment.

After the software has been deployed it is the duty of system analust provides maintenance to customer while problem comes during running system or problem comes from any other reasons.

Advantages of Waterfall Model:

1) Waterfall model is very simple and easy to understand and use.
2) Steps ececution is sequential and completed one at a time so that no chance to forgot some process or part of system for development.
3) If requirement specification is clear,the small project can be well developed.
4) Results and process are well documented.
5) Each step has a specific a review process so that no chances for mistake.

Disadvantages of Waterfall Model:

1) Difficult to integrate risk management.
2) It is often difficult for the customer to state all requirements.
3) Maximum chances of hazard and doubt.
4) Poor model for long and ongoing project and not a good for complex and object oriented projects.

Comparison between Functional model & other model

1) In Waterfall model, Iteration problem occurs in designing phase that doesn't occurs in Functional model
2) In RAD model, sufficient human power require but not in functional model.
3) And RAD mean Rapid Development, if **commitment lack** then RAD project fail such thing does not happen in Functional model

4) Spiral model doesn't work well for smaller projects but our model works well for any type of projects (Complex, Object oriented)

SDLC (system development life cycle) vs Waterfall model:-

1. Testing Activities are carried out in each and every phase therefor the cost of the bugs will get reduced
2.There is feedback

1.Testing Activities are carried out at the end of the phase therefor the cost of the bugs will be high
2.There is no feedback

Which Model is better? Why?

Waterfall model is better because this model is only appropriate when the requirements are well-understood and changes will be fairly limited during the design process**.**

Which Model is mostly used for software development?

Waterfall model is mostly used for large systems development projects where asystem is developed at several sites.Waterfall model very simple to understand and easy to use.In waterfall model,phases must be complete sequentially that phase completed full and then next phase begin.

Conclusion:-

SDLC model shulod be choosen for that particular project.selecting the correct life cycle model is extremely important in a software industry as the software has to be delivered within the time deadline & should also have the desired quality.

Waterfall model and therefore is sequential.it is error free due to the mathematical specification and because of its error free nature it is suitable for satety critical systems.it however is costly and requires special experts to develop**.**

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A REVIEW: EMAIL SECURITY

Prof. Pooja S. Deshmukh[1]
1.Department of Computer Science and IT, BASPONC College, Bhusawal 425-201 (MS)
poojadeshmukh879@gmail.com

Prof. Yogita G. Patil[2]
2.Department of Computer Science and IT, BASPONC College, Bhusawal 425-201 (MS)
patilyogitag1994@gmail.com

ABSTRACT

Now a day's, network security has become very essential. For those securities Simple Mail Transport Protocol is the most commonly used protocol for e-mail delivery. But, it less security features like privacy, verification and integrity of e-mail message. To make e-mail communication secure, e-mail servers adopted one or more security features. The security protocols provide a most security but it also has several restrictions. A structure for evaluating the e-mail security system has been developed in this paper. The improvements include adding blacklist into the Policy Maker, using PKI to confirm and manage the keys in the non-intrusive loom etc.

KEYWORDS: E-mail security, E-mail security protocols, S/MIME, Policy Maker.

I. INTRODUCTION

Now a day's email is become more tolerable in industry so the importance of email security become more important. Security contains management of email storage, data recovery. When data is large then managing and storage takes lots of time that will brunt the user and lost

Productivity. Email security becomes more vital in organization, business, government and every field. Email security refers to protecting from various attacks. The structural design of network is main part while securing email. Many organization uses firewall to avoid the attacks. To understand the email security research first we need to understand its environment. Simple Mail Transport Protocol (SMTP) was designed for a smaller community of users. This time several

Technology and policies changes were made to SMTP server powerful to make email secure.

II. SECURITY ISSUES IN E-MAIL SYSTEMS

Privacy: The content of email is in simple text design. While it is transmitting it never decrypted so data can be easily exposed if one can get access of your mailbox and one can knows how to tap network and flow. It is a plain text so everyone can be read the data.

Consistency: Consistency means changes the original data. E-mail is mainly stored in plain text and also transmitted in plain text. So anyone can easily lacerate the way of email transmission and change the original data without being notice by sender and receiver. For this we needs some security.

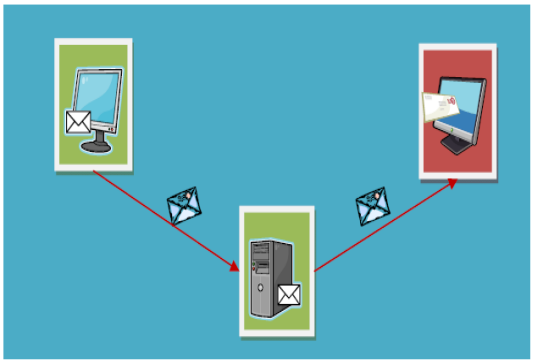

Figure 1: Security diagram of E-mail system

A) SMTP

Security in information technology is defined as to protect information against illegal exposure as well as unauthorized revision. User needs to take care about possibility of malevolent and deceitful attacks by hackers as well as force of viruses and denial-of-services attack.

Some of approaches that is helpful for security of your system includes:

A. Verification

Techniques can be used to recognize and confirm if anyone is seeking to access illegal system.

B. *Access control*

Users can be controlled to make sure they only access data and Services for which they have been authorized.

C. Encryption

Techniques that jumble data is used to protect information while transmit data over network.

D. Firewall

Firewall is mostly used to discriminate the internal and external information access. Firewall prevents the outsiders to right to use information within organization. By using this we can prevent our device against unauthorized data.

E. Interference detection

Techniques that check the system and network to check whether someone is demanding to access network without authentication.

III. LIMITATIONS OF SECURITY PROTOCOLS

For space to yourself and verification of sender SMPT provide need of security. Using many mediators like routers, gateways and mail servers we can pass Email from sender to recipient which is in pure text layout. Thus it is very difficult to both substantial and virtual malevolent attackers who can access to email & can read it. Still when these are deleted by the users from
their mailboxes E-mail Service Providers (ESPs) have capability to stock up copies of e-mail messages. All the copies are saved in particular directory.

It is possible to send spam and phishing e-mails because there is no such system to endorsement and not even have security feature for message reliability. There may be numerous problems because of Spam like exploitation of storage space, computational resources, network concurrence, official issues, and other related attacks like widen of viruses, and Denial of Services attacks. To make connections safe and private, SMTP servers integrate one or more security features but it has several restrictions. There are many encryption techniques for e-mail security which can use user to encrypt messages, some of them are Secure Multi-purpose Internet Mail Extensions (S/MIME), Privacy-Enhanced Mail (PEM), Pretty Good Privacy (PGP) etc.. The use of PEM is very unimportant because it lacks suppleness. Use of PGP is intermittent and it is based on PKI scheme and limited to a smaller group of people. To add cryptographic defense services to email system we can use S/MIME protocol and it is so useful. It requires CA for installation. S/MIME signatures are "isolated signatures", the signature information is split from the text being signed.

IV. DIFFERENT TYPES OF SECURITY ATTACKS

A. **Passive Attacks :**

Passive attacks crack the entire email system using pragmatic data. For Example, sender and receiver both have plain text of information which is already known to the attacker. Some properties of Passive Attacks:

I. Trammel: It involves accessing the information of an email and making it accessible to someone other than the sender or prospective recipient. It also called “Man in the middle” attack.

II. Traffic investigation: This technique that appear like communication prototype between entities in a system.

B. Active Attacks

In this attack the attacker sends information to both sender and receiver or occasionally completely cut off the data tributary. Active attack has some properties:

I. Interruption: Attacker prevents the original sender to access the site, attacker prohibit the sender from to use site.

II. Alteration: Information is transmitted in simple text. Attacker mostly changes data during transmission. Attacker decrypted the data and can lacerate the system.

C. DOS Attacks

Network Security is an important issue in the attack on DOS. If anyone has a security preliminary knowledge, he can easily launch an attack on the network. Other attacks take longer, but this attack does not take time and does not plan to execute. DOS attacks can be a very surrogate company network. This attack is checking the availability of the main work and sends a request to the network continuously. Bandwidth, TCP connection, which is mainly used to attack any network, is the main part for the cyclone attack network. Zombie is the network of multiple users in the same network, where this attack has started. The computer is infected with attacks but the users are unaware of this thing

V. WHAT ARE THE INTIMIDATION TO EMAIL SECURITY

A. Viruses

Email security contains multiple issues. Virus is most high risk problem in network. Virus has potential to destroy entire data at a time. When virus creates in any email it can be bring down entire mail and harm the data. Many issues are affects system but virus is stronger than any other problems. Virus is staying extended and destroys data instantly. It does not eliminate by any antivirus product. Virus leaves its collision for long time and improvement takes large amount of money

.

B. SPAM

SPAM is also issue in network security. Spam is also recognized as junk email. SPAM mail contains malevolent code which affects mail system instantly. SPAM mail contains virus which down the whole system. Users cannot request any mail but them getting number of mails of inadvertent user which can be a SPAM mail.

VI. THE POLICY MAKER APPROACH

The Policy Maker is a policy idiom for describing the trust and organization the access control. It takes the user's testimonial and access queries as inputs, performs the conformity checking on the inputs and returns simple "Yes/No" answers to the queries. It integrates the Policy Maker engine into the mail transport agent (MTA) layer of the presented e-mail structural design. So the Policy Maker can perform the security inspection when the MTA routing and queuing the statement. The paper claims by adding the Policy Maker engine into the MTA layer can provide the encryption of the messages without the user's notices (which means encrypt e-mail messages automatically). That's because the standard format of current e-mail can form queries to the Policy Maker naturally and the security e-mail system they provided can search the database for corresponding certificates or keys automatically. The Policy Maker will provide the encryption and decryption according to the policies particular the user. For example, if the user puts the keyword "confidential" in the message header, the Policy Maker will ensure the message is sent only when the receiver's public key is available. For the arriving messages, the user could classify policy such as only display the messages from Bob when the messages are encrypted. The Policy Maker will evaluate the messages from Bob. If the messages are not encrypted, the user is not able to see them at any condition.

The primary goals of this loom are to afford the encryption and decryption silently as well as tough security. The user will not be implicated with the cryptographic issues such as key or certificate managing once the policy has been defined. The resultant goal of this loom is to give the user flexibilities when he or she specifies the strategy. Because the Policy Maker can survive with PGP certificates or, so the user is not leaping any type of certificate, hence the suppleness will be provided as well.

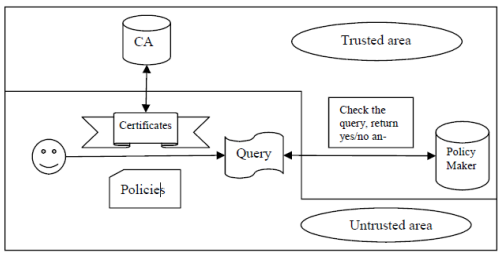

Figure 2: Policy Maker approach

VII. Conclusion

From the last the minority years the need of email security has also enlarged. Internet has become an important part of our daily life and along with that we deal with emails in our day to day work. By using E-mail system many persons do their official works. As more and more users connect to the internet it attracts a lot of criminals, and this criminal hack the users data. Today, everything is connected to internet from simple shopping to defend secrets so there is need of network protection. Billions of dollars of dealings happens every hour over the internet, this need to be protected at all costs. Even a small unobserved decent attack in a network can have very inopportune affect, if companies records are leaked, it can put the users data such as their banking details and credit card information at danger, numerous software's such as interruption detection have been which prevents these attacks, but most of the time it's because of a individual error that these attacks arise. Most of the attacks can be simply prevented, by following many simply methods as outlined in this paper. As new and more complicated attacks arise, researchers across the world discover new methods to prevent them.

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A REVIEW: IMPORTANCE OF SOFTWARE TESTING IN SOFTWARE DEVELOPMENT LIFE CYCLE

Prof. Sweta G.Sonawane
Department of Computer Science & I.T.
P. O. Nahata College, Bhusawal
Dist.: Jalgaon, Maharashtra, India
Email- sonawanevidya1995@gmail.com

Prof. Vidya S. Barhate
Department of Computer Science & I.T.
P. O. Nahata College, Bhusawal
Dist.: Jalgaon, Maharashtra, India
Email- barhatevidya029@gmail.com

ABSTRACT

SDLC is used to Simplify the development of a large Software Product in a Systematic, Cost –effective, Well-defined way. In SDLC information goes through a series of phases from creation or formulation to implementation. Testing is an important part of software development. The major aim of testing that it involves checking , and intent to find error in program execution , that there should be no inconsistencies in the software development model any where throughout the process. In My Paper I have explain various phases of SDLC model and What is the importance of testing in Software development life cycle, Different types of testing and software Process Framework Activities.

KEYWORDS: Software Process Framework Activities, Software Development Life Cycle, Software Testing

I.INTODUCTION:

Software Process Model is composed set of activities whish establish a framework for software engineering. This Generic Framework Activities are- Communication, Planning, Modeling, Construction and Deployment and Umbrella's 7 activities also establishes. There is major importance of testing in the part of SDLC and it is better to introduce testing in the early stage of SDLC phases so it help to identify the defects in the early stage and try to avoid the finding bugs & get resolve in the last critical stage. In testing we try to make software defect free.

II.Framework Activities:-

1. Communication: Before any technical task can start, it is important to communicate and collaborate with the customer (i.e. stakeholder). The intent is to understand customer's objectives for the software project and then we gather requirements that help to define software features and its factions.
2. Planning: In planning activity we create a "map" that will help guide the project team to make the journey. The map-called as software project plan which defines the software engineering work by discuss the technical task to be conducted, the work products to produced, a work schedule, resources that will be required and risk are possible.
3. Modeling: When we have an problem we create "sketch" of that thing so that we will understand the big picture. If required, we refine the sketch into greater and detail for better understand the problem and how we are going to solve it. The Software Engineer does the same thing by creating models for better understand Software requirements and design that will we achieve those requirements.
4. Construction: In this activity combines code generation either its manual or programmed and testing that is required to discover and display errors in the code.
5. Deployment: When the Software product (as a complete entity or as half completed increment) is delivered to the customer. That

who evaluates the delivered product and provides feedback based on that evaluation.

Umbrella activities are applied throughout the Software project which helps a Software team to manage and control progress, quality and risk.

Umbrella Activities:-

1. Risk management— Determine risks that may affect the outcome of the Product quality or the project.
2. Software quality assurance — To ensure software quality we required to define and conduct the activities.
3. Measurement— Measurement defines and collects process, project, and Product measures that help the team that meets stakeholders' needs when delivering software; Measurement Can be used in coincidence with all other framework and umbrella activities.
4. Technical reviews—Determine software engineering work products in an effort to discover and remove errors before they are propagated to the next activity.
5. Software configuration management— Software configuration management control the effects of change.
6. Software project tracking and control—The software team allow to manage progress against the project plan and to take any necessary action to maintain the schedule.
7. Reusability management—defines criteria for work product reuse (including software components and modules) and establishes mechanisms to achieve reusable components.

A software development process or life cycle is a structure imposed on the development of a software product. There are several models for such processes, each describing approaches to a variety of tasks or activities that take place during the process. 'Software development life cycle,' these six steps include planning, analysis, design, development & implementation, testing & deployment and maintenance.

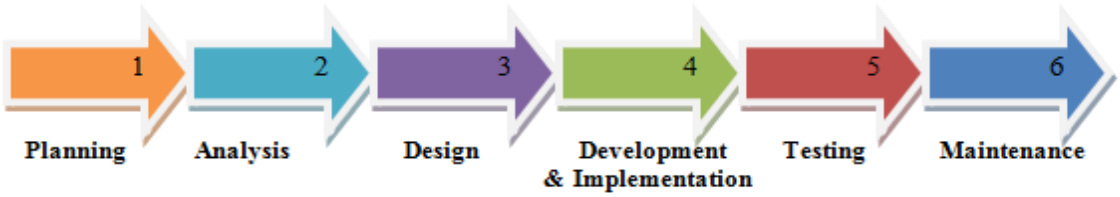

Figure: Software Development Life Cycle

1. **Planning**: Without an perfect planning, calculating the strengths and weaknesses of the project, development of software is meaningless. Planning kicks off a project perfect and affects its progress positively.

2. **Analysis**: This step is about analyzing the performance of the software at various stages and making notes on additional requirements. Analysis is very important to proceed further to the next step.

3. **Design**: Once the analysis is complete, the step of designing takes over, which is basically building the architecture of the project. This step helps remove possible flaws by setting a standard and attempting to stick to it.

4. **Development & Implementation**: The actual task of developing the software starts here with data recording going on in the background. Once the software is developed, the stage of implementation comes in where the product goes through a pilot study to see if it's functioning properly.

5. **Testing**: The testing stage assesses the software for errors and documents bugs if there are any.

6. **Maintenance**: Once the software passes through all the stages without any issues, it is to undergo a maintenance process wherein it will be maintained and upgraded from time to time to adapt to changes. Almost every software development Indian company follows all the six steps, leading to the reputation that the country enjoys in the software market today.

III.Benefits of Software Testing

When testing is introduced in the early stage, the cost of fixing the bug can be reduced. Cost of fixing the bug becomes larger when a bug is not found at the right time.

Improve Your Software

The role of testing in software development begins with improved reliability, quality and performance of the software. Software testing has now become a part of programming so that the developers are able to rectify errors right from the beginning stage. It is a stage where the developers find bugs in the software and make the software bug free.

It help a developer to check out whether the software is performing the right way and to satisfy that software is not performing what it is not assume to do.

Testing can be done in two ways: Manual testing and automated testing.

1) Manual testing: - Manual testing is done by human testers who check codes and bugs in software process manually.

2) Automated testing:-Automated testing is the process performs using computer programs to execute a system.

IV.Importance of Testing in SDLC

In **SDLC** stage there are some most importance things as described below:

- Recognition of Error and Faults

Testing step is one step which resolves the errors and faults in the software application. These errors may be in unit level or in system level. After going through so many testing the application will be free of errors that may be disturbing the application.

- Statistics to Shareholders and Status of Organization

Testing stage helps to know the condition of product and work standards. The stakeholders get better data through testing stage about utility value too.

- Enhancement in Product Standards

Testing can help to know the real result and the probable result. It also helps to pick up the standards of the software. With proper testing an application can come out of bugs and build up ideal software for the end-users.

- Technical Significance

Testing segment is significant for technical characteristics of any SDLC, as the software then completed with technically satisfied.

- To Succeed of any Contentious Programmers

Ideal testing functions and tools aid to evolve up the product in business and keep programmers away from the other contestant. Going though all stages of testing, the software application will be more bugs free, protected and technically sound.

- Free from any Risk

Whenever going to develop any software, testing is an essential part. When develop software without any testing then it may cause lots of risks to the end users. To free everyone from any risk, it is essential that to go under all testing stages.

- Enhanced Standards

Appropriate tested application provides additional assurance of build up with best software. Moreover, it refines standards of application as incessant and all types of testing stages have prepared a protected and harmless software application that could be worn by the end users.

- Confirmation and Corroboration

One of the major targets of testing stage in SDLC is for confirmation and corroboration. Testing is greatly used in confirmation and corroboration method. Depending on the result we can compare among standards of several software application.

- Credibility Evaluation

Testing stage also insist this important issue. If the software application has gone through all the testing types (like unit testing, regression testing etc.), the application will surely be a reliable one. So, testing evaluate credibility of software application. Testing provides the greatest analytical process to give equipped testing on product ensuing in a credible product.

- Demonstrate Accessibility and Feasibility

One of the most significant targets of testing is to demonstrate the product is both accessible and functional. Accessibility testing is where the application is delivering to a select assembly of users and their functioning with the application is noticed. All type of a user's communication with the application, like easiness of applies and whenever users are getting troubles, are preserved and examined.

- Avoid Fault Immigration

In the first stage of SDLC, most of the faults have been found. If the faults can be noticed earlier, then these may be prohibited from immigrating to the following progress stage. If the errors could be discover previously then the saving of software development cost will be vast.

- Commercial Significance

A full tested software application will have excellent business aspects. As all are like to work with reliable and trusted application in commercial.

V.Testing Types in SDLC:

1. Unit Testing: In unit testing each module of software is test separately and defects finding errors.

2. Integration Testing: Various individual modules are tested and then units are grouped as one;

this testing is performed to detect errors from overall system.

3. Regression Testing: Regression testing means rerunning test cases from existing test suites to

build confidence that software changes have no unintended side-effects. Regression testing is

the approach of integration testing.

4. System Testing: System testing is actually a series of different tests whose primary purpose is to

fully exercise the computer-based system. Subsystems are integrated to build up the entire system.

5. Alpha and Beta Testing: Alpha testing is the testing done by test teams at development

organization after the acceptance testing. Beta testing carried out by selected group of

friendly customer's real environment.

6. Acceptance Testing: Acceptance testing is the system testing performed by the customer to determine whether to accept or reject the delivery of the system.

7. Stress Testing: Stress testing is a software testing activity that determines the robustness of software by testing beyond the limits of normal operation.

8. White Box Testing (Structural testing): White box testing is the testing of software solutions internal coding and infrastructure. Test group must have complete knowledge of the internal structure of software and tests are derived from knowledge of the software's structure and implementation.

9. Black Box Testing (Functional testing): Black box testing is the testing technique whereby the internal workings of the item being tested are not known by the tester. Functional testing refers to testing that invokes only observations of the output for certain input values, and there is no attempt to analyze the code, which produces the output. Internal structure of the program is ignored.

10. Ad-Hoc Testing: It is performed without planning or documentation and its main work is to find errors that are not uncovered by other types of testing.

11. Automated Testing: Using automation tools to write and execute test cases is known as automation testing.

12. Grey Box Testing: Grey box testing is a software testing technique that uses a combination of black box testing and white box testing.

13. User Acceptance testing (UAT): It is performed by the end users of the software. This testing happens in the final phase of testing.

14. Security Testing: Security testing tests the ability of the software to prevent unauthorized access to the resources and data. Hence, software testing is one of the major parts of the SDLC and it should be carried out effectively for the quality of the product.

VI.CONCLUSION:

Software Development Life Cycle model is a structure imposed on the development of a software product. In software process model composed of different framework activities which establish framework for software engineering. There are different activities involved in SDLC such as Planning**,** Analysis, Design, Development & Implementation, Testing, and Maintenance. Software testing plays a vital role in each and every phase of SDLC.Testing has a important part in SDLC although the testing also upgrades the standards of the software and programmed by accept error prior in the software. It also improves the quality of organization.

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SURVEY OF DIFFERENT TYPES OF CAPTCHA

Miss Neha. K. Zadkhande[1]
1.Department of Computer Science
P.O. Nahata College, Bhusawal, 425201,
North Maharastra University Jalgoan , India.
kharedipti318@gmail.com
nehazadkhande26@gmail.com

Miss Dipti.V. Khare[2]
2.Department of Computer Science
P.O. Nahata College, Bhusawal, 425201,
North Maharastra University Jalgoan , India.
kharedipti318@gmail.com
nehazadkhande26@gmail.com

ABSTRACT

Captcha that is completely automated turing test to all computers and humans apart is common security measured used to distinguish between humans and a phony . A captcha should distinguish human users from automated browsing applications, preventing automated tools from abusing online services.

KEYWORDS: CAPTCHA, AI, CaRP

I. WHAT IS A CAPTCHA?

The CAPTCHA that is "**Completely Automated Public Turing test to tell Computers and Humans Apart**" is a common security measure used today against automated attacks. That is a CAPTCHA is a test intended to distinguish human users from automated browsing applications, and thus prevent automated tools from abusing online services. CAPTCHAs do it by asking users to perform a task that is quick and simple for humans and, ideally, impossible for automated software.

For example, CAPTCHA implementations assume it's easy for a human and difficult for a computer to recognize textual content in a noisy image or, likewise, recognize spoken words in a noisy audio recording.

II. CONSIDERATIONS IN IMPLEMENTING CAPTCHAS

1. Home grown VS existing implementation:-

An important question raise when there is needs to be addressed is which CAPTCHA implementation mechanism to use in order to minimize the chances of it being broken. One approach is to create your own proprietary CAPTCHA. Creating our own home-grown CAPTCHA is a costly and time-consuming process, with the risk of ending up with an inefficient solution. The other approach to integrating CAPTCHA in a Web application is to use an existing, widely used service, like CAPTCHA Such a service has a power of supporting developers who keep improving and adapting it. The service is not necessarily stronger than any home-brewed CAPTCHA, but enjoys the benefit of its being widely spread: when a CAPTCHA service provider identifies it is being bypassed in one Web application, it can update at once all the Websites using the same service. Thus, a site enjoys protection against new tools before it is even attacked by them.

2. Visual CAPTCHA vs. Audio CAPTCHA :-

Today more progress growing in implemention of a visual CAPTCHA, in which a string of letters is presented over a noisy background. The characters can be distorted, in different colors, sizes, orientations or fonts, to make the work of separating them from the background and from each other more difficult. Similarly, an audio CAPTCHA contains a recording of voiced words, letters, or numbers in a noisy background. Also,Audio CAPTCHAs are generally easier for breaking by machine learning algorithms.

Here, the user is required to decipher the text from the noise. One of the reasons to use an audio CAPTCHA in addition to the more common, visual CAPTCHA, is that to make the Internet more accessible to people suffering from visual impairment. This is specifically important in the case of governmental sites, providing every-day services otherwise inaccessible. One of the few government agencies in Brazil that they implements an audio CAPTCHA was chosen as the target in an experiment designed to check blind and partially blind users ability to navigate through the site and complete certain tasks.

3. Novel Approaches to CAPTCHAs:-

One problem that might occur when as CAPTCHAs become more and more sophisticated , they might become too difficult to use even for the average human. Users might find such CAPTCHAs annoying and avoid sites that use them. For this reason, site administrators need to maintain a delicate

balance between the site's security and the user experience. One approach to minimize this nuisance is to prompt CAPTCHA challenges only after suspicious activity was recognized, or to adjust the difficulty of the CAPTCHA according to the attributes of each user's observed behavior.

For example, the nuCAPTCHA service gives legitimate users easy CAPTCHAs, and gives dubious users progressively more difficult CAPTCHAs. This maximizes usability for legitimate users while providing high security against automated access.

Captcha as Graphical Passwords

The new security primitive based on hard AI problems, namely, a novel family of graphical password systems which built on top of Captcha technology.we call this Captcha as graphical passwords (CaRP). CaRP is both a Captcha and a graphical password scheme. CaRP addresses a number of security problems, such as online guessing attacks, relay attacks, and, if combined with dual-view technologies, shoulder-surfing attacks. Notably, a CaRP password can be found only probabilistically by automatic online guessing attacks even if the password is in the search set. Also,CaRP offers a novel approach to address the well-known image hotspot problem in popular graphical password systems, such as PassPoints, that leads to weak password choices. CaRP is not a panacea, but it offers reasonable security and usability and appears to fit well with some practical applications for improving online security.

Adavantages :-

The most significant primitive invented is Captcha, which distinguishes human users from computers by presenting a challenge, i.e., a puzzle, beyond the capability of computers but easy for humans.

Captcha is now a standard Internet security technique to protect online email and other services from being abused by bots.

CaRP provide protection against online dictionary attacks on passwords, which have been for long time a major security threat for various online services.

CaRP also offers protection against relay attacks, an increasing threat to bypass Captchas protection.

MODULE:-

- Graphical Password
- Captcha in Authentication
- Overcoming Thwart Guessing Attacks
- Security Of Underlying Captcha

Disadvantages:-

CaRP exist paradigm has achieved just a limited success as compared with the cryptographic primitives based on hard math problems and their wide applications.

As audio CAPTCHAs are generally easier for breaking by machine learning algorithms6 , this raises the question whether their implementation is worthwhile ,while they expose the site to greater risk at the expense of usability.

The prevalence of the CAPTCHA service in many sites might also make it a target for strenuous cracking attempts. Once it's broken, all the sites using it are exposed.

All the efforts to create more sophisticated CAPTCHAs target the abilities in which humans still perform significantly better than computers.

III. CONCLUSION

CAPTCHAs can be useful for the sites security,as they must be balanced with the importance of keeping a positive user experience.

Users who face difficult or annoying CAPTCHAs will eventually leave the site. This can be avoided by:

• Using novel CAPTCHA methods that make the CAPTCHA into something enjoyable, like a mini-game.

• Minimizing the number of CAPTCHA challenges that allow only legitimate users. The idea is to present a CAPTCHA only when users exhibit suspicious behavior. To detect such, the site should use the automation detection mechanism.

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SOFTWARE DEVELOPMENT LIFE CYCLE MODELS A COMPARATIVE ANALYSIS

Mrs. Pooja Aniket Rathi
P.O.Nahata college,Bhusawal
Poojah1990@rediffmail.com

ABSTRACT

Software Development Life Cycle(SDLC) Models are the framework used to analyse, design, develop and test the software. They define a set of guidelines which are to be followed during the development. Thes designed a software is systematically, according to the need of custo their time schedule. Different types of software development life cyc are waterfall model, spiral models and Rapid application developme model. Each of these models has its own Advantages and disadvant main aim of this research paper is to study different aspects of models and compare them so as to help the developers to choose suitable method according to the situation.

KEYWORDS: SDLC, waterfall, iterative, rapid application development (RAD)s, spiral model.

I. INTRODUCTION

Software development life cycle (SDLC) is a met which the quality software can be developed in the given time and according to the customer expectations. Software development life cycle (SDLC) pure quality product. software development processes include various steps like requirements and analysis, system analysis, system design, coding, testing, implementation, maintenance. It is the choice of the developer or the team of developers to choose the SDLC model. Each SDLC model may have advantages and disadvantages in different situations. The challenge is to determine which model should be selected under certain circumstances.

II. SOFTWARE DEVELOPMENT LIFE CYCLE MODELS

1)Waterfall Model:

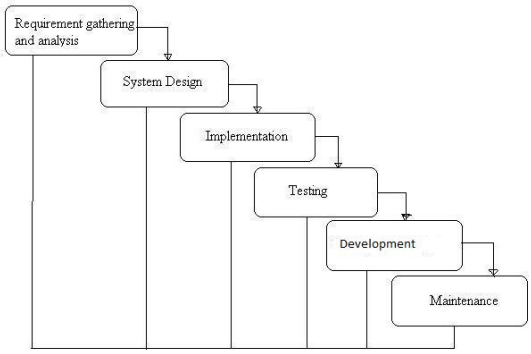
I)The waterfall model is the first process model to be introduced. It is very simple to understand & use.

II)All stages of this model are design in the form of casecode of waterfall, hence it is known as "waterfall model".

III)this model represent the software process model in the linear sequencial from life cycle model.

IV)In waterfall stages are not overlap means when one stage is completed, onther is started

III. DIAGRAMATIC REPRESENTATION OF WATERFALL model:



IV. The Sequencial phase in waterfall are-

1) Requirement analysis- All information of system can be collected in this phase & documented &requirement Specification document.

Then all information is analysis& converted in pure form i.e. functional specification document is prepared & then passes to next phase.

2) System Design- System design is a multy step process, which is different characteristics like (form report & design) Algorithm, data structure interface representation& architecture.

The design process translates the information system into actual representation system into the actual representation software product which is very easy to understand for user & programmer. Then this design phase passed to implementation phase.

3) Implementation- By using System Design, initially the small Programmes means unit developed and integrated to form a complete software product. Then itself programmers can test own developed test

and code or unit & pass the software for detail testing to the testing Phase.

4) Testing – In this all Units, their relationship & complete system is checked to find any fault & failure. All Logical error & validations are also tested.

5) Development (Installation) - Once the functional and non-functional testing is done, The Product is developed or Installed in Customer environment or released in Market.

6) Maintenance – After Installation different issue are comes with software Product & all those issues are handle by maintenance phase like errors/ exception in software, changes in system client requirement & updating in software product.

Advantages of waterfall model-

1) Simple & easy to understand & use also easy for documentation.
2) works well on simple & small project.
3) Phases are processes & completed one at a time.
4) It allows modulation & controls.

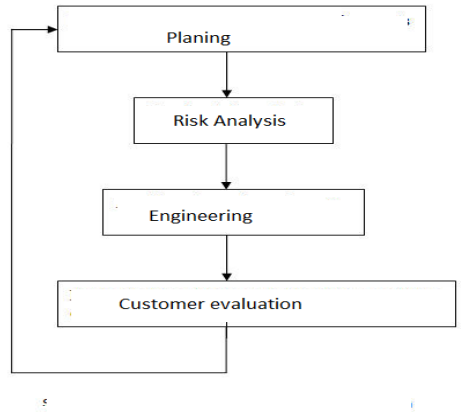
Disadvantages of waterfall model-

1) This model does not allow much repeat ion of phases.
2) High amount of risk & uncertainty.
3) Most good for the complex & large system.
4) Cannot work an dynamic system.
5)The customer require high patience because through waterfall model software development require more time.

Spiral Model/Process model/ Risk driven model:

1)The spiral model is developed on the basis of prototype & waterfall model.
2)In interaction of spiral model, stop follows the phase wise linear approach.
3)Spiral model is defined by 4 major activities-
Planning, Risk analysis , Engineering , Customer Evaluation.

Diagrammatic representation of Spiral model:



Phases in spiral are-

1)Planning – Determination of objectives, alternatives,onstaits.I planning we estimate ,schedule,cost& resources require for the interaction

2)Risk analysis- Analysis of the alternative& identification resolution of risk. In risk analysis we identify the estimate & monitor technical& manegment, risk increase in cost.

3) Engineering- Development of the "next level" product .
In engineering we design the software, develop the coding ,test it & display on the client site.

4) **Customer evaluation-** Assessment of the result of engineering.
In customer evaluation we take the feedback of customer about the software product & maintained it.

4)when software development process start, the team member moves around the spiral in clockwise direction, being from centre. The first circuit around the spiral might result in development of a product specification, next circuit around the spiral used to developed a prototype & then finally a more software product hesitated version of software is developed.

5) Unlike other model can be adopted to apply through life of computer software.

6) the spiral model used to developed realistic & large scale system development.

Advantages of spiral model-

1) spiral model is interactive in nature
2) used to developed simple & complex problem
3) Provide customer evaluation process
4)Risk factor are already sloved

Disadvantages of spiral model-

1) Sometime it require more time
2) Generally it works on realistic projects
3)Require expert analyser & team members.

RAD (Rapid application Development) model:

I) IN Rad ,we used minimum planning and develop the s/w in rapid form, Here all the functions modules / units are developed in the parallel & then integrated in complete s/w product for faster delivery.
II) because of minimum preplanning it is easy to implement changes in development process.
III) In Rad, initially analyst construct the team of developers for this he appoints intelligent developers, domain experts and other If resources for faster working.
IV) Rad model contains following phases-
Business modelling (BM), Data modelling (DM), process modelling (PM), Application Generation (AG) Testing and turnover (TT).components, this reduce the overall testing time & expenses .CASE TOOL are used in all task for faster application generation.

5)Testing & turnover- The overall testing time is automatically reduce in RAD model because
- we reuse the existing tested program component.
- Each team already test their module in details.
So ,in this phase the data flow & relationship in all modules are tested by software tester & then install it in customer environment.

Advantages of spiral model-

1) Reduce development time.
2) It is generally reusable in future.
3) Satisfy customer commitments.
4) Team member recognise their abilities & hidden skill of rapid fire activities.
5) Unique module development improves the quality of software.

Disadvantages of spiral model-

1) Only modularised system developed by RAD.
2) Require expert team member.
3) Cost of software development is high .Cost of product is also high.
4) If software is not developed in given time, then RAD projects are fail.
5) If require high technical support.

COMPARISION OF DIFFERENT SDLC MODELS

Sr.No	Feature	Waterfall	Spiral	RAD
1	Requirement	Beginning	Beginning	Time box release
2	Planning	Yes	Yes	Not require
3	Documentation	Yes	Yes	Not necessary
4	Handle large project	Not necessary	Yes	Not necessary
5	User involvement	At beginning	High	At beginning only
6	Return to early phase	No	Yes	Yes
7	Cost	Low	High	Low
8	Modification	Difficult	Easy	Easy
9	Duration	Long	Long	Short
10	Testing	After coding	After each phase	After coding
11	Risk	High	Medium to high	Low
12	Maintenance	Easy	Hard	Easy
13	Reuse	Up to extent	Up to extent	Yes
14	Framework	Linear	Iterative, linear	Linear

CONCLUSION -

In this research paper various models like waterfall, Spiral, RAD(Rapid application)model have been studied and various features like requirement specification, cost, risk factor, user involvement, rate of success, simplicity, risk, maintenance are analysed. Each model has its own advantages and disadvantages. From the analysis as shown in the above table, the developer can choose the appropriate software development life cycle model according to the requirements.

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