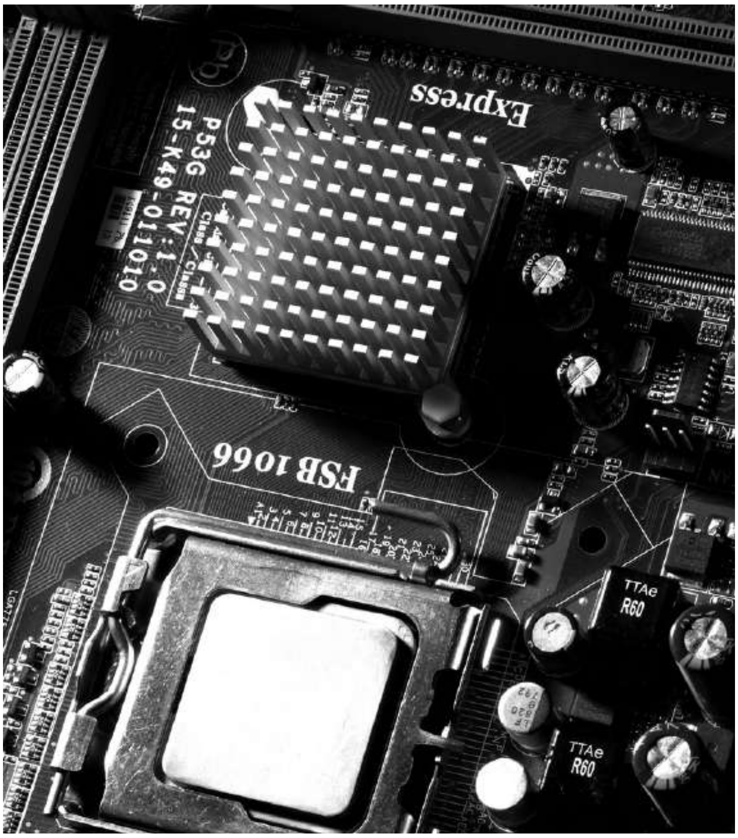
Maratha Vidya Prasarak Samaj's

Karmaveer Adv. Baburao Ganpatrao Thakare College of Engineering

Udoji Maratha Boarding Campus, Near Pumping Station, Gangapur Road, Nashik

Permanently Affiliated to Savitribai Phule Pune University Vide Letter No.:CA/1542 &

Approved by AICTE, New Delhi- Vide Letter No.: 740-89-32(E) ET/98 AISHE Code-C-41622



COMPUTER DEPARTMENT

Presents

VOL 1 • ISSUE 1 • 2018-19

TECHNICAL MAGAZINE

Computer Department

Vision

To be the center for excellence for training the world-class engineers to work with multi-disciplinary domain based on the state-of-the-art of technology enabled academic system blended with industrial and business practices.

Mission

To educate and train undergraduate students in Computer Engineering by instilling excellence to fulfill professional and social requirements in business and industry on the platform of scientifically designed academic processes.

Editorial Team

Mr. Pushkar P. Shinde
Editor-in-chief

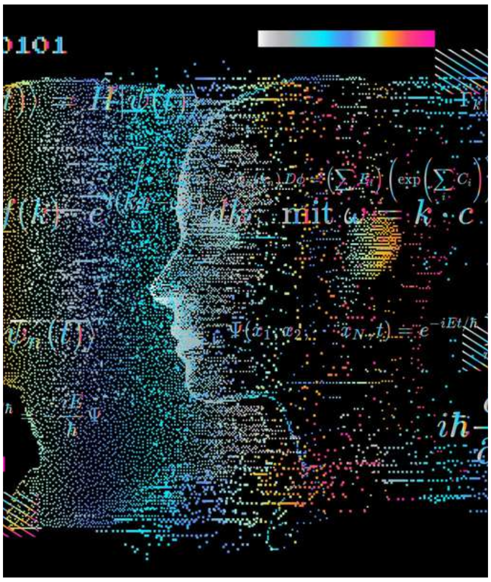
Piyush Sonar
SE Computer
Editor

Program Educational Objectives

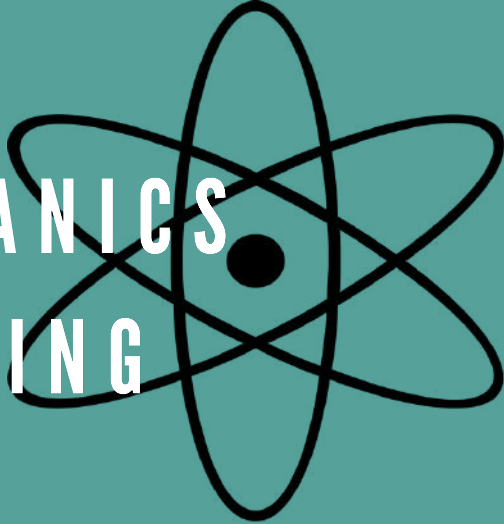
1.To inculcate computational and programming skills in the field of Computer Engineering.
2.To prepare the graduates to fulfill professional requirements in industry.
3.To motivate students to solve problems related to society.

TECH MAGAZINE

CONTENTS



HOW QUANTUM MECHANICS CAN CHANGE COMPUTING



A brief introduction to quantum physics –

In our regular lives, we are used to things existing in a well-defined state: A light bulb is either on or off, for example. But in the quantum world, objects can exist in a what is called a superposition of states: A hypothetical atomic-level light bulb could simultaneously be both on and off. This strange feature has important ramifications for computing.

The smallest unit of information in classical mechanics and, therefore, classical computers is the bit, which can hold a value of either 0 or 1, but never both at the same time. As a result, each bit can hold just one piece of information. Such bits, which can be represented as electrical impulses, changes in magnetic fields, or even a physical on-off switch, form the basis for all calculation, storage and communication in today's computers and information networks.

What Is Quantum Computing ?

Quantum computing is an area of computing focused on developing computer technology based on the principles of quantum theory (which explains the behaviour of energy and material on the atomic and subatomic levels). Computers used today can only encode information in bits that take the value of 1 or 0—restricting their ability.

Quantum computing, on the other hand, uses quantum bits or qubits. It harnesses the unique ability of subatomic particles that allows them to exist in more than one state (i.e., a 1 and a 0 at the same time).

Understanding Quantum Computing -

Superposition and entanglement are two features of quantum physics on which these supercomputers are based. This empowers quantum computers to handle operations at speeds exponentially higher than conventional computers and at much lesser energy consumption.

The field of quantum computing started in the 1980s. It was then discovered that certain computational problems could be tackled more efficiently with quantum algorithms than with their classical counterparts.

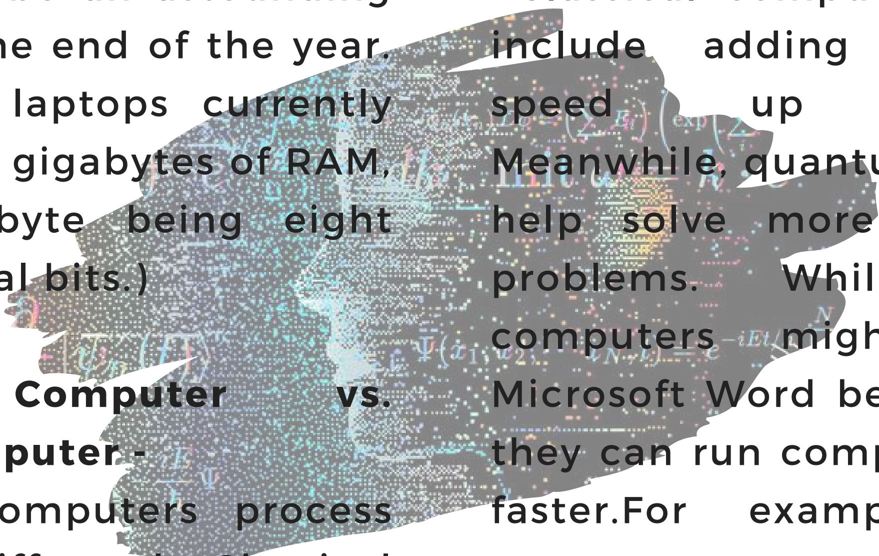
Quantum computing could contribute greatly in the fields of finance, military affairs, intelligence, drug design and discovery, aerospace designing, utilities (nuclear fusion), polymer design, artificial intelligence (AI) and Big Data search, and digital manufacturing.

Its potential and projected market size has engaged some of the most prominent technology companies to work in the field of quantum computing, including IBM, Microsoft, Google, D-Waves Systems, Alibaba, Nokia, Intel, Airbus, HP, Toshiba, Mitsubishi, SK Telecom, NEC, Raytheon, Lockheed Martin, Rigetti, Biogen, Volkswagen, and Amgen.

Computing with qubits -

Qubits, however, can be set up using a quantum-mechanical property called entanglement so that they are dependent on each other even when they are far apart. This means that operations performed on one qubit by a quantum computer can affect multiple other qubits simultaneously. This property – akin to, but not the same as, parallel processing can make quantum computation much faster than in classical systems.

Large-scale quantum computers that is, quantum computers with hundreds of qubits do not yet exist, and are challenging to build because they require operations and measurements to be done on a atomic scale. IBM's quantum computer, for example, currently has 16 qubits, and Google is promising a 49-qubit quantum computer – which would be an astounding advance by the end of the year. (In contrast, laptops currently have multiple gigabytes of RAM, with a gigabyte being eight billion classical bits.)



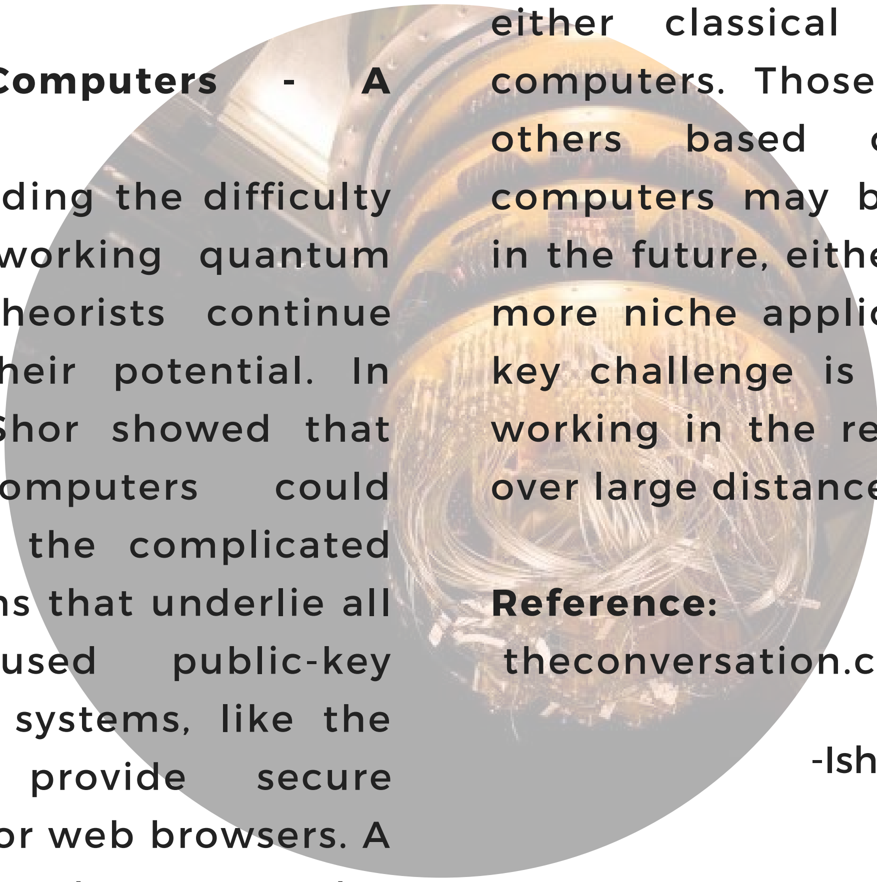
Quantum Computer vs. Classical Computer -

Quantum computers process information differently. Classical computers use transistors, which are either 1 or 0. Quantum computers use qubits, which can be 1 or 0 at the same time. The number of qubits linked together increases the quantum computing power exponentially. Meanwhile, linking together more transistors only increases power linearly.

Classical computers are best for everyday tasks that need to be completed by a computer. Meanwhile, quantum computers are great for running simulations and data analyses, such as for chemical or drug trials. These computers must be kept ultra-cold, however. They are also much more expensive and difficult to build.

Classical computing advances include adding memory to speed up computers. Meanwhile, quantum computers help solve more complicated problems. While quantum computers might not run Microsoft Word better or faster, they can run complex problems faster.For example, Google's quantum computer that's in development could help with many processes, such as speed up machine-learning training or help create more energy-efficient batteries.

As well, quantum computers can help improve radars and their ability to detect such things as missiles and aircraft. Other areas include the environment and using quantum computing to keep water clean with chemical sensors



Quamtum Computers - A powerful tool

Not withstanding the difficulty of building working quantum computers, theorists continue to explore their potential. In 1994, Peter Shor showed that quantum computers could quickly solve the complicated math problems that underlie all commonly used public-key cryptography systems, like the ones that provide secure connections for web browsers. A large-scale quantum computer would completely compromise the security of the internet as we know it. Cryptographers are actively exploring new public-key approaches that would be “quantum-resistant,” at least as far as they currently know.

Interestingly, the laws of quantum mechanics can also be used to design cryptosystems that are, in some senses, more secure than their classical analogs. For example, quantum key distribution allows two parties to share a secret no eavesdropper can recover using either classical or quantum computers. Those systems and others based on quantum computers may become useful in the future, either widely or in more niche applications. But a key challenge is getting them working in the real world, and over large distances.

Reference:

theconversation.com

-Isha Suhas Kulkarni
FE Computer

ROLE OF DOCKER IN INDUSTRY

ABSTRACT

Docker is an open platform for developing, shipping, and running applications. Docker enables you to separate your applications from your infrastructure so you can deliver software quickly. With Docker, you can manage your infrastructure in the same ways you manage your applications. By taking advantage of Docker's methodologies for shipping, testing, and deploying code quickly, you can significantly reduce the delay between writing code and running it in production. Docker is different. Originally a proprietary system that started as a project by Solomon Hykes at dot Cloud, Docker was shifted to open source in the first part of 2013. Its popularity grew steadily and exploded in 2014.

INTRODUCTION

Docker provides the ability to package and run an application in a loosely isolated environment called a container. The isolation and security allow you to run many containers simultaneously on a given host.

Containers are lightweight and contain everything needed to run the application, so you do not need to rely on what is currently installed on the host. You can easily share containers while you work, and be sure that everyone you share with gets the same container that works in the same way.

DOCKER CONTAINER

A container is a standard unit of software that packages up code and all its dependencies so the application runs quickly and reliably from one computing environment to another. A Docker container image is a lightweight, standalone, executable package of software that includes everything needed to run an application: code, runtime, system tools, system libraries and settings.

Container images become containers at runtime and in the case of Docker containers - images become containers when they run on Docker Engine. Available for both Linux and Windows-based applications, containerized software will always run the same, regardless of the infrastructure. Containers isolate software from its environment and ensure that it works uniformly despite differences for instance between development and staging.

HOW DOCKER WORKS?

Docker uses a client-server architecture. The Docker client talks to the Docker daemon, which does the heavy lifting of building, running, and distributing your Docker containers.

The Docker client and daemon can run on the same system, or you can connect a Docker client to a remote Docker daemon. The Docker client and daemon communicate using a REST API, over UNIX sockets or a network interface. Another Docker client is Docker Compose, that lets you work with applications consisting of a set of containers.

DOCKER HUB

Docker Hub is a cloud-based repository in which Docker users and partners create, test, store and distribute container images. Through Docker Hub, a user can access public, open source image repositories, as well as use a space to create their own private repositories, automated build functions, and work groups. This page gathers resources about Docker Hub and how to push and pull container images to and from Docker Hub. (https://hub.docker.com/)

WHO USES DOCKER?

√ NETFLIX
√ PayPal
√ Pipedrive
√ Stripe
√ Yale
√ Snow Flake
√ AT&T
√ Adobe

CONCLUSION

Docker is popular because it has revolutionized development. Docker, and the containers it makes possible, has revolutionized the software industry and in five short years their popularity as a tool and platform has skyrocketed. The main reason is that containers create vast economies of scale. Docker Cloud is a cloud service that allows development and IT operations teams to deploy and manage their Dockerized applications in production.

REFERENCES

✓ https://www.docker.com/

✓ "Docker overview". Docker Documentation. Docker, Inc. Retrieved February 26, 2018.

✓ https://docs.docker.com/get-started/overview/ ✓ "IBM and Docker Announce Strategic Partnership to Deliver Enterprise Applications in the Cloud and On Prem". IBM. December 4, 2014. Retrieved April 20, 2015.

-Neeraj Nawale
FE Computer

TOP 5 FRAMEWORKS FOR WEB APPLICATION

Web Application Framework or simply "web framework" is a software framework that is designed to support the development of web applications including web services, web resources, and web APIs. Frameworks are, in short, libraries that help you develop your application faster and smarter! Nowadays, the number of Web Frameworks has increased greatly. To help you pick up the most suitable one for your Web Application, we have compiled a list of the 10 best frameworks available online, in your preferred language.

1. **Ruby on Rails**

Ruby on Rails is an extremely productive web application framework written by David Heinemeier Hansson. One can develop an application at least ten times faster with Rails than a typical Java framework. Moreover, Rails includes everything needed to create a database-driven web application, using the Model-View-Controller pattern. Websites using Ruby on Rails are Groupon, UrbanDictionary, Airbnb, Shopify, Github.

2. Djang

Django is another framework that helps in building quality web applications. It was invented to meet fast-moving newsroom deadlines while satisfying the tough requirements of experienced Web developers. Django developers say the applications are it's ridiculously fast, secure, scalable, and versatile. The language used is Python. Websites using Django are Disqus, Pinterest, Instagram, Quora, etc.

3.Angular(Also, known as Angular JS)

Angular is a framework by Google (originally developed by Misko Hevery and Adam Abrons) that helps us in building powerful Web Apps. It is a framework to build large-scale and high-performance web applications while keeping them as easy-to-maintain.

There are a huge number of web apps that are built with Angular. The language used is Javascript. Websites using Angular are Youtube on PS3, Weather, Netflix, etc

4. ASP.NET

ASP.NET is a framework developed by Microsoft, which helps us build robust web applications for PC and mobile devices. It is a high-performance and lightweight framework for building Web Applications using. NET. All in all, a framework with Power, Productivity, and Speed. The language used is c#. Websites using ASP.NET are GettyImages, TacoBell, StackOverflow, etc.

5.METEOR

Meteor or MeteorJS is another framework that gives one a radically simpler way to build real-time mobile and web apps. It allows for rapid prototyping and produces cross-platform (Web, Android, iOS) code. Its cloud platform, Galaxy, greatly simplifies deployment, scaling, and monitoring. The language used is javascript. Websites using Meteor are HaggleMate, WishPool, Telescope, etc.

REFERENCE:

- https://www.geeksforgeeks.org/top-10-frameworks-for-web-applications/

BIG DATA

Computer data is information processed or stored by a computer. This information may be in the form of text documents, images, audio clips, software programs, or other types of data. Computer data may be processed by the computer's CPU and is stored in files and folders on the computer's hard disk.

At its most rudimentary level, computer data is a bunch of ones and zeros, known as binary data. Because all computer data is in binary format, it can be created, processed, saved, and stored digitally. This allows data to be transferred from one computer to another using a network connection or various media devices. It also does not deteriorate over time or lose quality after being used multiple times.

What is data processing?

Data processing is, generally, "**the collection and manipulation of items of data to produce meaningful information**." In this sense it can be considered a subset of information processing, "**the change (processing) of information in any manner detectable by an observer**."

Data processing, Manipulation of data by a computer. It includes the conversion of raw data to machine-readable form, flow of data through the CPU and memory to output devices, and formatting or transformation of output. Any use of computers to perform defined operations on data can be included under data processing. In the commercial world, data processing refers to the processing of data required to run organizations and businesses.

Data processing Functions:

- **Validation** – Ensuring that supplied data is correct and relevant.
- **Sorting** – "arranging items in some sequence and/or in different sets."
- **Summarization** – reducing detail data to its main points.
- **Aggregation** – combining multiple pieces of data.

- **Analysis** – the "collection, organisation, analysis, interpretation and presentation of data."
- **Reporting** – list detail or summary data or computed information.
- **Classification** – separation of data into various categories.

History Of data processing:

1. Manual Data Processing

In **manual data processing**, data is processed manually without using any machine or tool to get required results. In manual data processing, all the calculations and logical operations are performed manually on the data. Similarly, data is transferred manually from one place to another. This method of data processing is very slow and errors may occur in the output. Mostly, is processed manually in many small business firms as well as government offices & institutions. This method is avoided as far as possible because of the very high probability of error, labour intensive and very time consuming. This type of data processing forms the very primitive stage when technology was not available or it was not affordable. With the advancement in technology the dependency on manual methods has drastically decreased.

2. Mechanical Data Processing

In **mechanical data processing** method, data is processed by using different devices like typewriters, mechanical printers or other mechanical devices. This method of data processing is faster and more accurate than manual data processing. These are faster than the manual mode but still form the early stages of data processing. With invention and evolution of more complex machines with better computing power this type of processing also started fading away. Examination boards and printing press use mechanical data processing devices frequently.

3. Electronic Data Processing

Electronic data processing or EDP is the modern technique to process data. The data is processed through computer; Data and set of instructions are given to the computer as input and the computer automatically processes the data according to the given set of instructions. The computer is also known as electronic data processing machine.

This method of processing data is very fast and accurate. For example, in a computerized education environment results of students are prepared through computer; in banks, accounts of customers are maintained (or processed) through computers etc.

a. Batch Processing

Batch Processing is a method where the information to be organized is sorted into groups to allow for efficient and sequential processing. Online Processing is a method that utilizes Internet connections and equipment directly attached to a computer. It is used mainly for information recording and research. Real-Time Processing is a technique that has the ability to respond almost immediately to various signals in order to acquire and process information. Distributed Processing is commonly utilized by remote workstations connected to one big central workstation or server. ATMs are good examples of this data processing method.

b. Online Processing

This is a method that utilizes Internet connections and equipment directly attached to a computer. This allows for the data stored in one place and being used at altogether different place. Cloud computing can be considered as a example which uses this type of processing. It is used mainly for information recording and research.

c. Real-Time Processing

This technique has the ability to respond almost immediately to various signals in order to acquire and process information. These involve high maintenance and upfront cost attributed to very advanced technology and computing power. Time saved is maximum in this case as the output is seen in real time. For example in banking transactions.

Example of real time processing

- Airline reservation systems
- Theatre (cinema) booking
- Hotel reservations
- Banking systems
- Police enquiry systems
- Chemical processing plants
- Hospitals to monitor the progress of a patient
- Missile control systems

What is big data?

Big data is a field that treats ways to analyze, systematically extract information from, or otherwise deal with data set that are too large or complex to be dealt with by traditional data processing application software. Data with many cases (rows) offer greater statistical power, while data with higher complexity (more attributes or columns) may lead to a higher false discovery rate. Big data challenges include capturing data, data storage, data analysis, search, sharing, transfer, visualization, querying, updating, information privacy and data source.

To really understand big data, it's helpful to have some historical background. Here is Gartner's definition, circa 2001 (which is still the go-to definition): Big data is data that contains greater variety arriving in increasing volumes and with ever-higher velocity. This is known as the three Vs.

The Vs of Big Data

Volume (Data at rest): The amount of data matters. With big data, you'll have to process high volumes of low-density, unstructured data. This can be data of unknown value, such as Twitter data feeds, click streams on a webpage or a mobile app, or sensor-enabled equipment. For some organizations, this might be tens of terabytes of data. For others, it may be hundreds of petabytes.

Velocity (Data in motion): Velocity is the fast rate at which data is received and (perhaps) acted on. Normally, the highest velocity of data streams directly into memory versus being written to disk. Some internet-enabled smart products operate in real time or near real time and will require real-time evaluation and action.

Variety (Data in many forms): Variety refers to the many types of data that are available. Traditional data types were structured and fit neatly in a relational database. With the rise of big data, data comes in new unstructured data types. Unstructured and semi structured data types, such as text, audio, and video, require additional pre-processing to derive meaning and support metadata.

Veracity (Data in doubt): It is the extended definition for big data, which refers to the data quality and the data value. The data quality of captured data can vary greatly, affecting the accurate analysis.

Data must be processed with advanced tools (analytics and algorithms) to reveal meaningful information. For example, to manage a factory one must consider both visible and invisible issues with various components. Information generation algorithms must detect and address invisible issues such as machine degradation, component wear, etc. on the factory floor.

How Big Data Works?

Big data gives you new insights that open up new opportunities and business models. Getting started involves three key actions:

1. Integrate

Big data brings together data from many disparate sources and applications. Traditional data integration mechanisms, such as ETL (extract, transform, and load) generally aren't up to the task. It requires new strategies and technologies to analyze big data sets at terabyte, or even petabyte, scale.

During integration, you need to bring in the data, process it, and make sure it's formatted and available in a form that your business analysts can get started with.

2. Manage

Big data requires storage. Your storage solution can be in the cloud, on premises, or both. You can store your data in any form you want and bring your desired processing requirements and necessary process engines to those data sets on an on-demand basis. Many people choose their storage solution according to where their data is currently residing. The cloud is gradually gaining popularity because it supports your current compute requirements and enables you to spin up resources as needed.

3. Analyze

Your investment in big data pays off when you analyze and act on your data. Get new clarity with a visual analysis of your varied data sets. Explore the data further to make new discoveries. Share your findings with others. Build data models with machine learning and artificial intelligence. Put your data to work.

Technologies:

A 2011 McKinsey Global Institute report characterizes the main components and ecosystem of big data as follows:

- Techniques for analyzing data, such as A/B Testing, machine learning and natural language processing.
- Big data technologies, like business intelligence, cloud computing and databases
- Visualization, such as charts, graphs and other displays of the data

Multidimensional big data can also be represented as data cubes or, mathematically, tensors. Array Database System has set out to provide storage and high-level query support on this data type. Additional technologies being applied to big data include efficient tensor-based computation, such as multilinear subspace learning, massively parallel-processing (MPP) databases, search-based applications, data mining, distributed file systems, distributed databases, cloud and HPC-based infrastructure (applications, storage and computing resources) and the Internet. Although, many approaches and technologies have been developed, it still remains difficult to carry out machine learning with big data.

Who uses Big Data?

Government:

When government agencies are able to harness and apply analytics to their big data, they gain significant ground when it comes to managing utilities, running agencies, dealing with traffic congestion or preventing crime. But while there are many advantages to big data, governments must also address issues of transparency and privacy.

Health Care:

Patient records. Treatment plans. Prescription information. When it comes to health care, everything needs to be done quickly, accurately – and, in some cases, with enough transparency to satisfy stringent industry regulations. When big data is managed effectively, health care providers can uncover hidden insights that improve patient care.

Manufacturing:
Armed with insight that big data can provide, manufacturers can boost quality and output while minimizing waste – processes that are key in today's highly competitive market. More and more manufacturers are working in an analytics-based culture, which means they can solve problems faster and make more agile business decisions.

Retail:
Customer relationship building is critical to the retail industry – and the best way to manage that is to manage big data. Retailers need to know the best way to market to customers, the most effective way to handle transactions, and the most strategic way to bring back lapsed business. Big data remains at the heart of all those things.

Scope of Big Data:
Big data is influencing the IT industry like few technologies or trends have done so before. If analyzed effectively, massive information caches can help companies improve their decision-making and compete on another level. However, managing big data is a difficult endeavour, according to a recent report by Microsoft.

"Big data absolutely has the potential to change the way governments, organizations, and academic institutions conduct business and make discoveries, and its likely to change how everyone lives their day-to-day lives," said Susan Hauser, a corporate vice president at Microsoft.

Conclusion:
As the career paths available in big data continue to grow so does the shortage of big data professionals needed to fill those positions. In the previous sections of this chapter the characteristics needed to be successful in the field of big data have been introduced and explained. The characteristics such as communication, knowledge of big data concepts, and agility are equally as important as the technical skill aspects of big data.

Big data professionals are the bridge between raw data and useable information. They should have the skills to manipulate data on the lowest levels, and they must know how to interpret its trends, patterns, and outliers in many different forms. The languages and methods used to achieve these goals are growing in strength and numbers, a pattern unlikely to change in the near future, especially as more languages and tools enter and gain popularity in the big data fray.

Regardless of language, method, or specialization, big data scientists face a unique technical challenge: working in a field where their exact role lacks a clear definition. Within an organization, they help to solve problems, but even these problems may be undefined. To further complicate matters, some data scientists work outside any specific organization and its direction, like in academic research. Future chapters will explore concrete applications of big data across multiple disciplines to demonstrate how diversely big data scientists can work.

References:
https://www.ibm.com/analytics/hadoop/big-data-analytics
https://planningtank.com/computer-applications/data-processing#
https://www.oracle.com/big-data/guide/what-is-big-data.html
https://en.wikipedia.org/wiki/Big_data

- Yashraj Nikam
FE Computer

FUZZY LOGIC

Fuzzy Logic | Introduction

The term fuzzy refers to things which are not clear or are vague. In the real world many times we encounter a situation when we can't determine whether the state is true or false, their fuzzy logic provides a very valuable flexibility for reasoning. In this way, we can consider the inaccuracies and uncertainties of any situation.

In boolean system truth value, 1.0 represents absolute truth value and 0.0 represents absolute false value. But in the fuzzy system, there is no logic for absolute truth and absolute false value. But in fuzzy logic, there is intermediate value too present which is partially true and partially false.

ARCHITECTURE

Its Architecture contains four parts :

RULE BASE: It contains the set of rules and the IF-THEN conditions provided by the experts to govern the decision making system, on the basis of linguistic information. Recent developments in fuzzy theory offer several effective methods for the design and tuning of fuzzy controllers. Most of these developments reduce the number of fuzzy rules.

FUZZIFICATION: It is used to convert inputs i.e. crisp numbers into fuzzy sets. Crisp inputs are basically the exact inputs measured by sensors and passed into the control system for processing, such as temperature, pressure, rpm's, etc.

INFERENCE ENGINE: It determines the matching degree of the current fuzzy input with respect to each rule and decides which rules are to be fired according to the input field. Next, the fired rules are combined to form the control actions.

DEFUZZIFICATION: It is used to convert the fuzzy sets obtained by inference engine into a crisp value. There are several defuzzification methods available and the best suited one is used with a specific expert system to reduce the error.

Membership function

Definition: A graph that defines how each point in the input space is mapped to membership value between 0 and 1. Input space is often referred as the universe of discourse or universal set (u), which contain all the possible elements of concern in each particular application.

There are largely three types of fuzzifiers:

Singleton fuzzifier

Gaussian fuzzifier

Trapezoidal or triangular fuzzifier

What is Fuzzy Control?

It is a technique to embody human-like thinkings into a control system. It may not be designed to give accurate reasoning but it is designed to give acceptable reasoning.

It can emulate human deductive thinking, that is, the process people use to infer conclusions from what they know.

Any uncertainties can be easily dealt with the help of fuzzy logic.

Advantages of Fuzzy Logic System

This system can work with any type of inputs whether it is imprecise, distorted or noisy input information.

The construction of Fuzzy Logic Systems is easy and understandable. Fuzzy logic comes with mathematical concepts of set theory and the reasoning of that is quite simple.

It provides a very efficient solution to complex problems in all fields of life as it resembles human reasoning and decision making.

The algorithms can be described with little data, so little memory is required.

Disadvantages of Fuzzy Logic Systems

Many researchers proposed different ways to solve a given problem through fuzzy logic which lead to ambiguity.There is no systematic approach to solve a given problem through fuzzy logic.

Proof of its characteristics is difficult or impossible in most cases because every time we do not get mathematical description of our approach. As fuzzy logic works on precise as well as imprecise data so most of the time accuracy is compromised.

Application

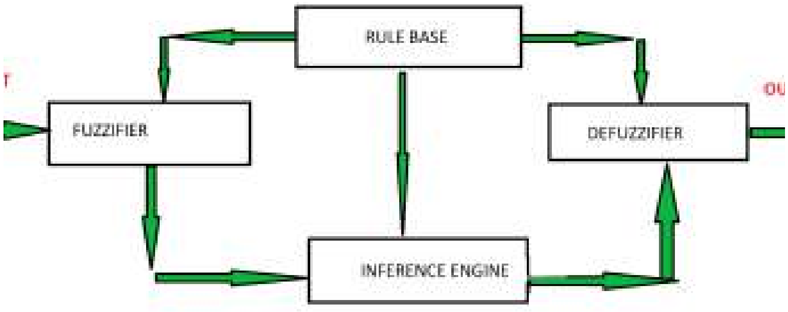
It is used in the aerospace field for altitude control of spacecraft and satellite. It has used in the automotive system for speed control, traffic control. It is used for decision making support systems and personal evaluation in the large company business.

It has application in chemical industry for controlling the pH, drying, chemical distillation process.

Fuzzy logic are used in Natural language processing and various intensive applications in Artificial Intelligence.

Fuzzy logic are extensively used in modern control systems such as expert systems.

Fuzzy Logic is used with Neural Networks as it mimics how a person would make decisions, only much faster. It is done by Aggregation of data and changing into more meaningful data by forming partial truths as Fuzzy sets.



FUZZY LOGIC ARCHITECTURE

-MINAL MAIN
FE COMPUTER