# Trends, Application, Challenges and Technology of Big Data

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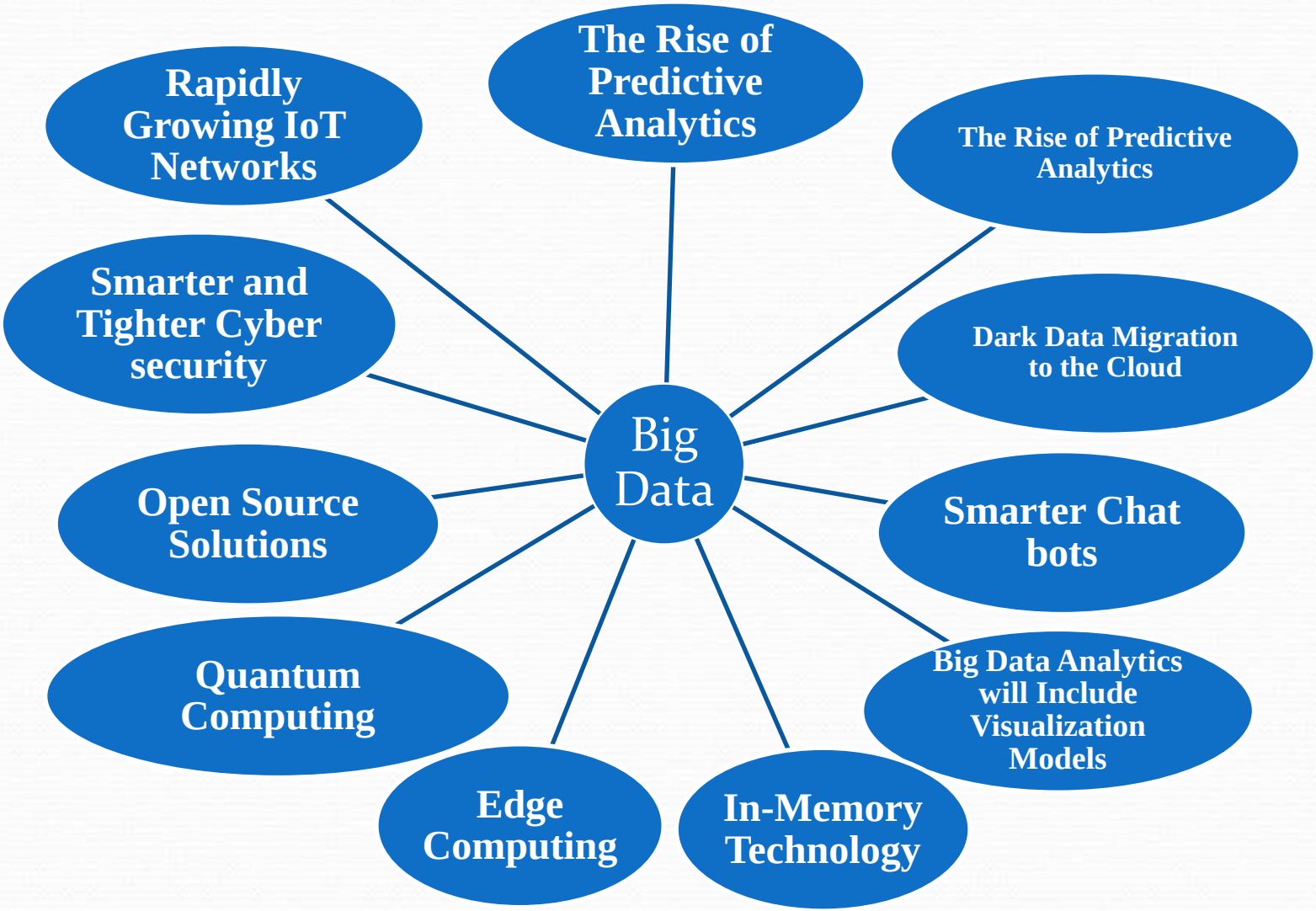
# Trends in Big Data



# Cont...

## 1. Rapidly Growing IoT Networks

- IoT will create a network of varied devices that will also lead to a pooling of varied types of data. IoT Data Security will be a new challenge put across with Big Data Security professionals.
- The task of Big Data organizations to create a checkpoint to audit the devices that are added to the network.
- IoT is going to generate huge amounts of data that must be managed and analyzed by the Big Data organizations to provide better IoT solutions.

## 2. The Rise of Predictive Analytics

- Big data analytics is a strategy for businesses to achieve their targets.
- They use the necessary analytics tools to process big data and determine the reasons why certain events happen.
- Predictive analysis through big data can help predict what may occur in the future.

## 3. Artificial Intelligence and Machine Learning

- AI and Machine learning technology helping businesses transform through various use cases such as real-time ads, fraud detection, pattern recognition, voice recognition, etc.
- Machine learning algorithms will become faster and more accurate helping enterprises make more appropriate predictions.
- Companies, both large and small, are now utilizing AI functionalities like chatbots to automate specific processes. Since there are prebuilt AI applications.

## 4. Dark Data Migration to the Cloud

- Information that is yet to be transformed into digital format is called dark data.
- These analog databases are expected to be digitized and migrated to the cloud, so they can be used for predictive analytics that benefits businesses.
- Digitization of the dark data stored in the form of paper files, historical records, or any other non-digital data recording formats.

## 5. Smarter and Tighter Cybersecurity

- Organizations have focus on strengthening information confidentiality.
- Big Data companies help organizations to use data analytics as a tool to predict and detect cyber security threats.
- Big data can be integrated into a cyber security strategy. A security log data can provide information about past threats, which companies can use to prevent and mitigate future attempts.
- IoT is also a cause for concern with possibilities of cybersecurity issues.

## 6. Open Source Solutions

- There are many public data solutions available, such as open source software, that have been making considerable improvements to speed up data processing.
- They now have features that allow access and response to data in real time.
- Open source applications are cheaper and will cut costs for your business.

## 7. Smarter Chatbots

- Chatbots are now being deployed by companies to handle customer queries to deliver more personalized interactions while eliminating the need for actual human personnel.
- Bots process large amounts of data to provide relevant answers based on the entered keywords by customers in their queries.
- They’re also able to pick up and analyze information about customers based on a conversation.

## 8. Quantum Computing

- Through quantum computing we can crunch billions of data at once in just a few minutes.
- Such immensity and speed cut big data processing time and giving companies the opportunity to make timely decisions to achieve more desired results.

## 9. Edge Computing

- With edge computing, the big data analysis happens not in the data center or cloud, but close to the IoT devices and sensors.

- For companies, this means better performance since there's less data flowing in the network and fewer cloud computing costs.
- Storage and infrastructure costs also decrease because the company can choose to delete irrelevant IoT data.

## 10. Streaming Analytics

- The ability to process and analyze a data set while still it is in the process of creation.
- This means gleaning(obtain information) insights which are exactly up-to-the-second(constituting the very latest information) without having to replicate datasets.

## 11. Big Data Analytics will Include Visualization Models

- Data discovery now is not just about understanding the analysis and relationships but also represents ways of presenting the analysis to reveal deeper business insights.
- Compelling and captivating visualization models will become the choice for processing big data sets making it one of the most significant big data trends.

## 12. Business Intelligence

- Use of Business Intelligence from the Cloud will increase.
- Analytics will provide improved data visualization models and self-service software.
- Decisions regarding expansion into new markets and geographies will be based on Big Data.

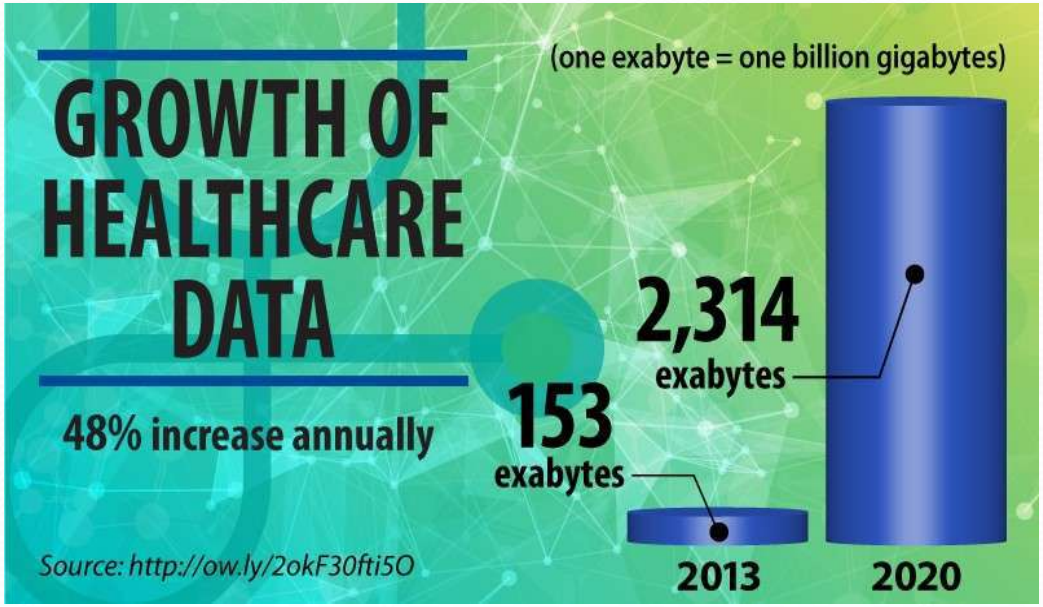
## 13. In-Memory Technology

- One of the technologies that companies are investigating in an attempt to speed their big data processing is in-memory technology.
- In a traditional database, the data is stored in storage systems equipped with hard drives or solid state drives (SSDs).
- In-memory technology stores the data in RAM instead, which is many, many times faster.

# Applications of Big Data

## Big Data Applications in Healthcare

- With mHealth, eHealth and wearable technologies the volume of data is increasing at an exponential rate





## Big Data Applications in Manufacturing

- It requires an enormous amount of data and advanced prediction tools for a systematic process of data into useful information.

# Big Data Applications in IoT

- Data extracted from IoT devices provides a mapping of device inter-connectivity.
- Such mappings have been used by various companies and governments to increase efficiency.

## Big Data Applications in Government

The use and adoption of Big Data within governmental processes allows efficiencies in terms of cost, productivity, and innovation. Addressing some of the major areas:

- **Cyber security & Intelligence**

  It relies on the ability to analyze large data sets in order to improve the security of computer networks.

- **Crime Prediction and Prevention-**

  Real-time analytics to provide actionable intelligence that can be used to understand criminal behaviour, identify crime/incident patterns, and uncover location-based threats.

- **Pharmaceutical Drug Evaluation-**

  Big Data technologies to access large amounts of data to evaluate drugs and treatment.

- **Scientific Research-**

  The National Science Foundation has initiated a long-term plan to:

  - Implement new methods for deriving knowledge from data

- Develop new approaches to education
- Create a new infrastructure to “manage, curate, and serve data to communities”.

- **Weather Forecasting-**
  - The NOAA (National Oceanic and Atmospheric Administration) gathers data every minute of every day from land, sea, and space-based sensors.
  - Daily NOAA uses Big Data to analyze and extract value from over 20 terabytes of data.

- **Tax Compliance-**

  Big Data Applications can be used by tax organizations to analyze both unstructured and structured data from a variety of sources in order to identify suspicious behavior and multiple identities. This would help in tax fraud identification.

- **Traffic Optimization-**
  - Big Data helps in aggregating real-time traffic data gathered from road sensors, GPS devices and video cameras.
  - The potential traffic problems in dense areas can be prevented by adjusting public transportation routes in real time.

# Big Data Challenges

1. Dealing with data growth
2. Generating insights in a timely manner
3. Recruiting and retaining big data talent
4. Integrating disparate data sources
5. Validating data
6. Securing big data

# Big Data 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

# Conclusion

In this presentation cover the trends in big data and different application area of big data, cover the challenges and technology.

# Thank You