EMERGING TRENDS AND TECHNOLOGIES IN ARTIFICIAL INTELLIGENCE

Abstract

With the faster growing technology, Computer Science emerging the different new technologies in different fields. Out of all fields, Artificial Intelligence is one of the newer technologies which have emerging features like machine learning, Internet of Things-IoT, Robotics, etc. Here we have to mention chapter 1includes different trends in Artificial Intelligence, its types, How it works, Challenges in Artificial Intelligence, AI Based Cybersecurity, AI Analytics, Computer Vision Technology, Natural Language processing(NLP), AI for Code Generation, Predictive Analytics, its benefits, models, tools and techniques, Prescriptive Analytics, How Prescriptive Analytics works, advantages and disadvantages of Prescriptive Analytics .

Keywords: Artificial Intelligence, AI Analytics, Cybersecurity, NLP, Predictive Analytics, Prescriptive Analytics.

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I. INTRODUCTION

Artificial Intelligence is an emerging trend of Computer Science where it can process the creation and application of salgorithm built into a dynamic computing environment.

Basically it has three components:

- Computational systems
- Data and its management
- Sophisticated AI algorithms (code)

II. TRENDS IN AI

With the growing advancements in AI, it has progressing rapidly with several trends in the near future. Following are some trends:

1. **Explainable AI:** Explainable AI (XAI) specifies the ability of AI systems to analyse their decision-making process in a way that humans can understand. As AI systems become more enlightened and start making decisions that have a significant impact on people's lives, it is becoming increasingly important to understand how these decisions are made. XAI will play a crucial role in ensuring that AI is used ethically and transparently.

2. **Edge AI:** Edge AI outlines the application of AI algorithms on local devices as opposed to sending processing data to the cloud. This approach is becoming increasingly popular as it can reduce latency and improve efficiency. Edge AI especially for various applications such as self-driving cars, drones, and IoT devices.

3. **AI and Healthcare:** AI has extensive potential to reorganize healthcare. From early disease detection to personalized treatment plans, AI basically used for healthcare professionals make more accurate diagnoses and provides better patient care. AI especially ease to reduce the burden on healthcare systems by automating administrative tasks and freeing up doctors and nurses to focus on patient care.

4. **Challenges in AI:** While the future of AI is auspicious, there are different challenges that need to be addressed.

III. HOW WILL ARTIFICIAL INTELLIGENCE CHANGE THE WORLD

From smartphones to chatbots, we are already using AI in our daily life. AI is evolving day by day. It observes our routine including our likes or dislikes and our purchases. Then AI specialists, or we can say AI developers, research all that data to train machines on how to learn from it and predict what we want.

Following are some predictions done by the USC researchers based on their analysis.

1. **Heathcare:** The research analysis suggests that AI programs with computer vision will allotters and well-equipped hospitals to analyse data. Based on that analysis, doctors can customize health care according to individual patient's genes.

AI will be able to diagnose major diseases like brain tumors and will suggest which cancer treatment will be suitable before it worsens. Several types of research are underway to develop AI-powered applications. Those applications are aimed to help doctors diagnose and treat patients with better medical care.

You can expect a different future in healthcare as it will adopt robots to interact with the patient. They will check the patient's health condition and assess the need for a doctor's appointment. AI will make our life simple with our clinical and healthcare history.

2. **Retail:** According to research, the adoption of ai-powered business intelligence in the decision-making process will make a huge impact on business growth and performance. In the future, AI-powered drones will deliver packages up to 5 pounds in less than 30 minutes.

Amazon has already started working on this project with proper safety and reliability measurements for package delivery. There is no fixed date for this delivery to get on the road, but you can expect the autonomous delivery of goods with drones in the next decade.

Apart from autonomous delivery, future retail with AI will get individualized with virtual racks. The racks will get customized according to previous history and purchases made by customer choice.

3. **Entertainment:** In the future, users will be able to order a movie that will be completely customized according to their desire. Even working independently, AI will assist humans in their own creative patterns like helping writers to avoid writer's block by providing suggestions.

Furthermore, in the present era, Artificial intelligence is still in action in the form of Google Assistant, Siri, and Cortana. They are able to handle most home devices connected to the internet over voice commands.

IV. TOP ARTIFICIAL INTELLIGENCE TRENDS

1. **DALL-E:** Earlier this year, Silicon Valley-based research lab OpenAI unveiled DALL-E, which surprised the internet.

In terms of artificial intelligence, this tool is getting considered one of the most advanced systems on the market for creating images. The system works as you can create hyperrealistic photographs or artwork by typing a description.

DALL-E is currently unavailable to the public. Researchers, academics, journalists, and artist testers are the only ones who can access to use this system.

The company has recently announced that it will invite more people to the event. As it moves from research to beta, the company plans to accept 1 million people from its waiting list.

2. **Google Imagen:** Imagen is a new text-to-image AI from Google Research. This system creates photorealistic images based on the input text.

   Using text input, Google has demonstrated an artificial intelligence system that can generate images. Using AI, users can enter any descriptive text and have it turned into an image. Developed by the Google Brain Team, the Imagen diffusion model delivers "unprecedented levels of photorealistic precision and language understanding."

   The Imagen is currently not available publicly, but Google has shared several examples of how this AI system works. In order to evaluate the performance of the text-to-image model, Google created a benchmark named Draw Bench that is comprehensive and challenging. With this DrawBench, Imagen can get compared to VQ-GAN+CLIP, DALL-E 2, and Latent Diffusion Models. According to DrawBench, humans prefer Imagen compared to its rivals.

3. **Conversational AI:** Conversational AI is a trending technology that enables speech-based interaction between users and platforms. It is used for better engagement. It requires software such as speech recognition, speech synthesis, NL (natural language processing), and ML.

   Back in 2021, research from Report Linker concluded that the conversational AI market size will grow from US$6.8 billion to US$18.4 billion by the year 2026.

   This technology is mainly getting used in AI-based customer support service, continuous customer engagement, and chatbots.

4. **AI Based Cybersecurity:** The World Economic Forum recently declared cybercrime as a potential risk to global wealth and requested all countries to oppose it.

   As cyberattacks are growing, AI is helping cybersecurity operation analysts to face them and stay ahead of threats. AI technologies like Threat Intelligence, ML, and NLP are learning continuously from millions of research papers and blogs to provide a rapid solution to cut down the attack.

   As our life is incomplete without machines, we are becoming vulnerable to cybercrimes. The main reason behind this is that our devices are connected to the internet and giving an opportunity for the attacker to exploit its loopholes. To prevent this, AI can play a vital role in tracking suspicious activity by network traffic pattern analysis.

5. **AI Analytics:** AI analytics, with the help of ML algorithms, keeps monitoring and analyzing a large amount of data to automate the work normally done by the data analyst. In other words, analytics is a process of taking raw data as input and applying some data analysis methods to result in meaningful data patterns.

   It is a subset of Business Intelligence that uses ML techniques to find new data patterns and relations between them. The goal behind this is not to replace human data analysts but to improve speed, performance, and productivity.

Augmented analytics is another form of analytics that could be the future of analytics. It uses AI and ML to monitor and discover data patterns without any help from data scientists. Sectors such as forecasting demand, predictive maintenance, and business monitoring are the businesses that leverage AI analytics the most.

6. **Computer Vision Technology in Businesses:** The most popular feature among companies is computer vision. A Gartner survey found that one-third of computer vision companies that offer technology services plan to invest $1 million or more in AI-based technology over the next two years.

   The same survey concluded that an average of US$679000 will get invested in the computer vision industry. AI in the computer vision field deals with the machine to understand images and videos.

   These AI algorithms with computer vision work similarly to human imagery. and are generally trained to track, observe and understand the object and learn patterns to identify and classify different objects using complex data sets.

7. **Natural Language Processing:** Natural Language Processing (NLP) is the heart of the text generation method. It allows the computer to understand the meaning of human spoken text or speech. AI assistants like Google Assistant, Siri, Alexa, and Microsoft's Cortana are the best examples of NLP.

   Tech AI companies like Google and Microsoft use the NLP-based BERT model for their search engine to work smoothly. This model helps technologies like AI assistants to understand what people are saying and respond accordingly.

   The advanced feature of NLP like OpenAI's Generative Pretained Transformer, or GPT-3, is a machine learning model powered by neural networks that generate any text from internet data. The system takes a small amount of text as input and outputs large volumes of pertinent and sophisticated machine-generated text.

   It can create significant amounts of quality data with only a small amount of input text. The GPT-3 can get used to create articles, stories, news reports, poetry, and dialogue.

   The NLP program automates the translation process between human-understandable language and computer language. To perform this operation, it manipulates unstructured data or words in the form of conversion and processes it.

8. **AI for Content Generation:** Today AI content creation platforms offer writing system-generated content like blog posts and marketing email copy. The process includes the human giving AI a prompt like keywords and a short description of their content needs. The machine then generates multiple pieces of content in a few seconds.

   As a result, you will have many pieces of content in no time compared to human writers. There are multiple AI content generation tools available, and most are free to use. These tools are capable of writing all sorts of content.

9. **No Code Apps:** No-code AI platforms are taking place in this growing industry. It allows small companies to use various powerful technological tools only available to large enterprises.

Developing AI-based models from scratch requires time and knowledge in that area. That's where no-code platforms come into the limelight. This platform simplifies the hard tasks by reducing the entry barrier.

Google Cloud auto ML, Google ML Kit, CreateML, MakeML, and Super Annotate are the most demanding no-code AI platforms you can take leverage with according to your need.
Using predictive analytics in the future, we can turn data into future insights.

V. PREDICTIVE ANALYTICS

Predictive analytics, which are fully based on past data and analytics methods like desktop learning, can assist your organization in forecasting future results. We can define predictive analytics as a kind of statistical analytics that is largely focused on forecasting future outcomes using historical data and analytics techniques like statistical modeling and machine learning. With a high degree of precision, predictive analytics is a science that can produce future insights. Modern predictive analytics tools and models enable any business to leverage historical and current data to accurately predict trends and behaviors milliseconds, days, or years in the future.

1. **Predictive Analytics in Business:** Massive data, data mining, statistical modeling, machine learning, and numerous mathematical operations are just a few of the approaches and technology that predictive analytics draws strength from. Businesses use predictive analytics to sift through recent and historical data to find trends and forecast events and conditions that must occur at a specific period, based on given parameters. Agencies can find and exploit patterns in internal data using predictive analytics to identify threats and opportunities. For instance, correlations between numerous behavioral characteristics might be discovered using models. Such approaches enable the assessment of the threat or promise introduced within a specific set of circumstances, assisting in the formulation of informed decisions throughout a situation.

2. **Benefits of Predictive Analytics:** Predictive analytics draws its power from a wide range of methodologies and technology, including mass Predictive analytics has improved the accuracy and dependability of future-looking analyses. Therefore, it can assist adopters in learning how to purchase and earn money. Predictive trends are commonly used by retailers to forecast their stock requirements, change supply schedules, and create store layouts that would maximize sales. Predictive analytics are frequently used by airlines to determine ticket rates that account for past travel trends. In order to maximize occupancy and revenue, hotels, restaurants, and other players in the hospitality industry can utilize the technology to predict the number of visitors on any given night. Businesses may boost sales and customer responses by employing predictive analytics to make their advertising more effective. Predictive analytics can also be used to identify and thwart certain forms of criminal activities before any real harm is done. By employing predictive

analytics to learn about consumer behaviors and actions, a company can spot outlier behaviors like the fraudulent use of savings cards, corporate espionage, and cyberattacks.

3. **Predictive Analytics Use Cases:** Businesses employ predictive analytics for an almost endless variety of purposes. The science finds adopters in a variety of sectors, including banking, healthcare, retail, hospitality, pharmaceuticals, automotive, aerospace, and manufacturing.

   Here are a few ways that organizations are using predictive analytics:

   - **Aerospace:** Estimate how unique maintenance methods would affect an aircraft's availability, uptime, fuel efficiency, and dependability.
   - **Automotive:** Include historical data on product durability and failure in upcoming vehicle manufacturing plans. Studying driver behavior will advance driving assistance technologies and, eventually, self-sufficient automobiles.
     Forecast long-term rate and demand ratios for the energy sector. Determine the impact of weather-related occurrences, equipment failure, restrictions, and other factors on provider costs.
   - **Financial Services:** Create models for deposit threat. Identify patterns in the financial markets. Determine how new laws, regulations, and rules will impact various markets and demographic groupings.
   - **Manufacturing:** Estimate the cost and location of computer failures. Optimize raw fabric deliveries depending on anticipated future demand.
   - **Law Enforcement:** Identify neighborhoods that may also require additional security at specific times of the year using crime-style statistics.
   - **Retail:** Track an online customer in real-time to determine whether or not providing additional product information or incentives will increase the likelihood of a successful transaction.

4. **Predictive Analytics Examples:** Organizations throughout all industries leverage predictive analytics to make their offerings extra efficient, optimize maintenance, discover conceivable threats, and even keep lives. Here are three examples:

   - **Rolls-Royce Optimizes Protection Schedules and Reduces Carbon Footprint:** One of the biggest manufacturers of jet engines in the world, Rolls-Royce, has implemented predictive analytics to help significantly reduce the amount of carbon that its engines emit while also maximizing preservation to help customers keep their planes in the air longer.

   - **DC Water Drives Down Water Loss:** Predictive analytics are being used by the District of Columbia Water and Sewer Authority (DC Water) to reduce water loss in its system. Its main tool, Pipe Sleuth, analyzes photos of tiny diameter sewer pipes, classifies them, and then generates a situation analysis report using a sophisticated, deep learning neural network model.

   - **PepsiCo Tackles Provide Chain with Predictive Analytics:** PepsiCo is reworking its ecommerce income and subject income groups with predictive analytics to assist it be aware of when a retailer is about to be out of stock. The agency has created the

Sales Intelligence Platform, which combines retailer information with PepsiCo's grant chain facts to predict out-of-stocks and alert customers to reorder.

- **Predictive Analytics Tools:** Predictive analytics equipment supply customers deep, real-time insights into an nearly limitless array of commercial enterprise activities. Tools can be used to predict a number kinds of conduct and patterns, such as how to allocate sources at unique times, when to fill up inventory or the pleasant second to launch a advertising campaign, basing predictions on an evaluation of facts accrued over a length of time.

  Some of the pinnacle predictive analytics software program systems and options include:

  ➢ Alteryx Analytics Automation Platform
  ➢ Amazon SageMaker
  ➢ H20 AI Cloud
  ➢ IBM SPSS
  ➢ RapidMiner
  ➢ SAP Analytics Cloud
  ➢ SAS Viya
  ➢ TIBCO

VI. PREDICTIVE ANALYTICS MODELS

Models are the basis of predictive analytics — the templates that permit customers to flip previous and present day records into actionable insights, growing advantageous long-term results. Some normal kinds of predictive fashions include:

- **Customer Lifetime Value Model:** Pinpoint clients who are most probable to make investments greater in merchandise and services.
- **Customer Segmentation Model:** Group clients based totally on comparable traits and buying behaviours.
- **Predictive Maintenance Model:** Forecast the probabilities of fundamental gear breaking down.
- **Quality Assurance Model:** Spot and forestall defects to keep away from disappointments and more fees when supplying merchandise or offerings to customers.

1. **Predictive Modelling Techniques:** Model customers have get admission to toan nearly infinite vary of predictive modeling techniques. Many strategies are special to particular merchandise and services, however a core of conventional techniques, such as choice trees, regression — and even neural networks — are now broadly supported throughout a vast vary of predictive analytics platforms.

   Decision trees, one of the most famous techniques, count on a schematic, tree-shaped graph that's used to decide a route of motion or to exhibit a statistical probability. The branching technique can additionally exhibit each viable result of a specific choice and how one preference may additionally lead to the next.

Regression strategies are regularly used in banking, investing, and different finance-oriented models. Regression helps customers forecast asset values and be aware of the relationships between variables, such as commodities and inventory prices.

On the slicing area of predictive analytics strategies are neural networks — algorithms designed to discover underlying relationships inside a statistics set through mimicking the way a human idea functions.

2. **Predictive Analytics Algorithms:** Predictive analytics adopters have handy get admission to to a large vary of statistical, data-mining and machine-learning algorithms designed for use in predictive evaluation models. Algorithms are usually designed to clear up a precise commercial enterprise trouble or sequence of problems, decorate an current algorithm, or furnish some kind of special capability.

Clustering algorithms, for example, are properly applicable for purchaser segmentation, neighbourhood detection, and different social-related tasks. To enhance consumer retention, or to boost a advice system, classification algorithms are normally used. A regression algorithm is usually chosen to create a savings scoring gadget or to predict the effect of many time-driven events.

3. **Predictive Analytics in Healthcare:** Healthcare businesses have emerge as some of the most enthusiastic predictive analytics adopters for a very easy reason: The science is assisting them retailer money.

Healthcare companies use predictive analytics in countless ways, which includes intelligently allocating facility sources primarily based on previous trends, optimizing body of workers schedules, figuring out sufferers at chance for a high-priced near-term readmission and including brain to pharmaceutical and provide acquisition and management.

Healthcare consortium Kaiser Permanente has used predictive analytics to create a health facility workflow device that it makes use of to pick out non-intensive care unit (ICU) sufferers that are probable to hastily deteriorate inside the subsequent 12 hours. NorthShore University Health System has embedded a predictive analytics device in patients' electronic clinical archives (EMRs) that helps it pick out which chest ache sufferers must be admitted for commentary and which sufferers can be despatched home.

VII. HOW HAVE TO AN COMPANY START WITH PREDICTIVE ANALYTICS?

Predictive analytics requires some work to get started, but any business can complete the task if they remain committed to the process and are willing to invest the time and money required to move the project forward. An excellent method to decrease start-up costs and shorten the time before financial gains begin to accrue is to launch a limited-scale pilot project in a traditional business zone. Once a mannequin is put to use, it often requires little protection because it keeps producing useful information for years. Prescriptive analytics, which suggest, are another futuristic trend in artificial intelligence. Utilizing more advanced techniques and tools to analyze data and content is known as prescriptive analytics.

1. **Two Elements Using the Increase of Prescriptive Analytics:** In the past, prescriptive evaluation required significant infrastructure investments and science knowledge of difficult-to-find records in order to build proprietary algorithms. Cloud data warehouses can now affordably provide the storage, power, and speed you require. Additionally, modern AutoML tools (automatic laptop learning) make it simple for you to create, educate, and set up unique desktop mastering models. Prescriptive analytics is a type of data analytics that aims to respond to the question, "What do we want to do to gain this?" It involves utilizing technology to aid groups in making better decisions through the analysis of uncooked data. Prescriptive analytics proposes a course of action or strategy by taking into account data regarding realistic settings or scenarios, accessible resources, past performance, and current performance. It is workable.

   - A form of statistical analytics called prescriptive analytics aims to respond to the question, "What do we want to do to acquire this?"
   - It uses computer learning to help businesses choose a course of action based on predictions made by a computer program.
   - Predictive analytics, which uses data to determine short-term results, collaborates with prescriptive analytics.
   - When utilized successfully, it can aid organizations in coming to decisions based on evidence and probability-weighted estimates rather than solely on gut feeling.
   - Prescriptive analytics is not error-proof because its outputs can only be as good as their inputs.

2. **How Prescriptive Analytics Works:** Prescriptive analytics aims to provide an answer to the question, "How did we get here?" It relies on artificial intelligence (AI) methods, such as computer learning (the ability of a computer program without additional human input), to detect and benefit from the data it gathers while continuously changing.

   It is possible to process a lot of the data that is already available thanks to machine learning. Computer programs adapt automatically to use new or more knowledge as it becomes available, doing so much more quickly and thoroughly than human skills could. Prescriptive analytics complements predictive analytics, a type of statistical analysis that relies entirely on statistics and modeling to forecast future performance.

3. **Advantages and Disadvantages of Prescriptive Analytics**

   - **Advantages:** Through the clutter of current uncertainty and shifting situations, prescriptive analytics can minimize. It can help prevent fraud, limit risk, increase productivity, achieve business objectives, and win over more devoted consumers. When properly applied, it can help businesses make decisions based entirely on thoroughly examined data rather than jumping to hasty, instinctual beliefs. Prescriptive analytics helps groups better understand the level of risk and uncertainty they confront than they would if they relied only on averages. It can simulate the possibility of several outcomes and show the likelihood of each. By using it, organizations can better understand the likelihood of worst-case scenarios and draw diagrams in accordance with that understanding.

- **Disadvantages:** However, prescriptive analytics is no longer error-free. If businesses know what to ask and how to respond to the responses, it is only beneficial. As a result, it is only positive if the inputs are true. Invalid entry assumptions will result in inaccurate output effects. Only temporary solutions should use this facts analytics structure. No long-term decisions involving this capacity may be made using prescriptive analytics. This is because if more time is required, it becomes even more unreliable.

Pros
- Prevents fraud, reduces risk, and will increase effectivity amongst different things.
- Simulates effects and suggests possibly of each.

Cons
- Only as advantageous as the inputs.
- Not appropriate for long-term predictions/solutions.
- Some massive statistics vendors supply outcomes whilst others don't.

4. **Types of Data Analytics:** Data analytics is an automatic system that makes use of algorithms. It analyses uncooked facts and approves the consumer to make conclusions about that information. Prescriptive analytics isn't always the solely kind of information analytics. There are a number of others that we talk about below.

  ➤ **Descriptive Analytics:** In order to better understand any changes that occur in a firm, descriptive analytics examines historical data and interprets it. Price changes, income growth patterns, customer data, and revenue from subscribers are important information units that are typically employed in descriptive analytics.

    This framework of extensive statistics aims to provide an answer to the question, "What happened?" After having said that, company leaders can use this knowledge to recognize their advantages and disadvantages. They are able to refine their business plans and make better decisions as a result. When combined with other types of analytics, such as prescriptive analytics, descriptive analytics can be a helpful enterprise solution.

    They can develop strategies, a suitable course of action, and perhaps even how to do it by using this type of data analytics.

  ➤ **Diagnostic Analytics:** The goal of this type of record analytics is to answer the question, "Why did this happen?" As a result, it needs far more extensive and many statistics inputs. However, there is some degree of guessing involved because businesses use it to identify the causes of particular trends. For instance, it investigates whether or not a positive market pressure and revenue are related, as well as whether or not a successful advertising campaign increased or decreased the sales of a certain product.

5. **Examples of Prescriptive Analytics:** Prescriptive analytics can be useful for many data-intensive government organizations and agencies. This includes businesses in the financial services and health care sectors, both of which have substantial human error

costs. Prescriptive analytics should be applied, for example, to determine whether a neighborhood hearth branch should advise inhabitants to leave a specific area when a wildfire is nearby.

➢ Use data from searches and social sharing for related topics to forecast whether a specific article will be well-liked by readers.
➢ Modify an employee training program in real-time based on how the employee is responding to each course.

Here are some scenarios where prescriptive analytics can be employed.

- **Prescriptive Analytics for Airlines**: Imagine that you are the airline's chief executive officer (CEO) and that your goal is to increase revenue. By automatically altering ticket rates and availability based solely on important parameters, such as customer demand, weather, and gas prices, prescriptive analytics can help you achieve this.

    The algorithm can consistently lower rates while being careful not to do so too low given this year's higher oil prices when it notices, for example, that pre-Christmas ticket sales from Los Angeles to New York are trailing last year's.

    The algorithm may also automatically raise ticket prices when it determines that there is a greater-than-normal demand for tickets from St. Louis to Chicago owing to the icy road conditions.

- **Prescriptive Analytics in Banking:** One of the sectors that can benefit most from prescriptive analytics is banking. That's because businesses in this region are constantly looking for ways to better serve their customers while ensuring their continued profitability. The banking sector can benefit from using prescriptive analytical equipment by: Developing trends for customer relationship management; enhancing cross-selling and upselling strategies; and
  ➢ Identify flaws that could also lead to losses, such as those in anti-money laundering (AML)
  ➢ Create important safety and regulatory activities, such as compliance reporting

Marketing Prescriptive Analytics

    Similar to banks, the advertising industry relies heavily on data analytics. Prescriptive analytics can help marketers stay ahead of consumer trends.

    Interior and exterior advertising departments can get a competitive edge by making use of prior advancements and results.

    By utilizing prescriptive analytics, business owners may create great campaigns that target specific clients at specific times, such as, for example, marketing to a specific demographic during the Super Bowl. Additionally, businesses can learn how to communicate with particular customers as well as how to effectively price and discount their goods and services.

- **What Does Prescriptive Analytics Mean?**

  A framework of records analytics called prescriptive analytics aids businesses in making better and more informed decisions. Its goal is to aid in providing answers to inquiries concerning what has to be done in order to bring about a future manifestation. It uses computer learning (with very little, if any, human involvement) to analyze raw data on past developments and performance in order to determine workable courses of action or novel approaches, usually for the near future.

- **Why Is Prescriptive Analytics So Important for Businesses?**

  Prescriptive analytics is essential for organizations because it allows them to look back at their past performance and ask, "What do we want to do to get to this point?" For organizations that need to turn things around, especially those that are having trouble with poor overall performance indicators, it is essential. They are able to develop strategies, choose the right course of action, and perhaps even estimate how long it will take them to achieve these objectives by using this type of data analytics.

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