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BIG DATA ANALYSIS AND MODELS AS A UNIQUE OPPORTUNITY FOR SOLVING BUSINESS PROBLEMS

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Annotation. The article analyzes the introduction into practice of a large volume of digitized information - Big Data, which is a variety of data coming at a higher rate and the volume of which is constantly growing, which provides a completely new approach to solving business problems.

Keywords: Big data, storage platforms, information architecture, volumetric storage, new discoveries, business challenges.

As we have mentioned in our publications earlier, big data is a variety of data arriving at a higher rate, the volume of which is constantly growing. And they are attributed three main properties - diversity, high arrival rate and large volume [1].

And in simple words, big data is larger and more complex data sets, especially from new data sources. The size of these datasets is so large that traditional processing programs can no longer handle them. However, this big data can be used today to solve business problems that could not be solved before [2].

Big data also has its advantages:

1. Big data makes it possible to get more complete answers because it provides more information.
2. More detailed answers mean you can be more confident in the reliability of the data obtained, which provides a completely new approach to problem solving [3].

Still, how exactly does big data work? Big data allows you to extract valuable new insights that open up new opportunities and business models. But in order to get started with big data, you must first perform three actions.

1. Integration

Big data technology makes it possible to combine data from disparate sources and applications. Traditional integration mechanisms such as data extraction, transformation, and loading (ETL) tools are no longer up to the task. New strategies and technologies are needed to analyze data sets as large as terabytes, or even petabytes. And during the integration phase, data is added, processed and formatted to make it easier for enterprise analysts to work with it.

2. Management

Big data requires voluminous storage. The storage solution can be hosted on-premises or in the cloud, or both. You can store data in your preferred format and apply the desired processing requirements (and necessary processing mechanisms) to data sets as needed. Most organizations choose their own storage solution depending on where the data is currently stored. Today, cloud storage has begun to grow in popularity because it supports current computing requirements and allows resources to be leveraged on an as-needed basis.

3. Analysis

Investing in big data will pay off when you start analyzing the data and taking action based on the insights you gain. In doing so, bring a new level of transparency by visually analyzing diverse data sets. Use deep data analysis to make new discoveries. Share your discoveries with others. Create data models using machine learning and artificial intelligence. Put your data into action.

Next, let's give some examples of big data use cases. And as we've already discovered, big data can be applied to a wide variety of businesses, from customer interaction to analytics. Here are just a few of the practical use cases below.

Product development. Companies like Netflix, Procter & Gamble, and others are using big data to predict consumer demand. They classify key attributes of existing and discontinued products and services and model the relationships between these attributes and the commercial success of offerings to create predictive models for new products and services. In addition, P&G utilizes data and statistics from focus groups, as well as social media, from market tests and trial sales, and then launches new products [4].

Maintenance Management. Factors that predict mechanical failures can be hidden in the depths of structured data, such as year, make and model of equipment, or in unstructured data, such as logs, sensor data, error messages and engine temperature information. By analyzing indicators of potential problems before they occur, organizations can improve the cost-effectiveness of maintenance and maximize the life of parts and equipment.

Interaction with customers. The battle for customers is in full swing. Today, it's easier than ever to get accurate data on customer experience. Big data allows you to extract useful insights from social media, website traffic and other sources, so you can improve your customer interactions and make your offerings as useful as possible. And this will ensure an individual approach, reduce the outflow of the client base and prevent problems from arising.

Detecting unauthorized access and meeting regulatory requirements. When it comes to security, it's not just a couple of hackers: you have entire teams of experienced professionals against you. And regulations and security standards are constantly changing. Big data allows you to identify fraud patterns and collect significant amounts of data to accelerate regulatory reporting.

Machine learning. Machine learning is one of the most popular topics of discussion today. And data, especially big data, is one of the reasons for this popularity. And as of today, we can already train machines instead of programming them. It is the availability of big data that has made this possible [5].

Operational efficiency. Operational efficiency is rarely a hot topic, but this is where big data plays its most significant role. Big data allows you to access and analyze production data, customer sentiment and revenue, and analyze these and other factors to reduce downtime and predict future demand. Big data also enables better decisions to be made based on market demand.

Innovation implementation. Big data allows you to identify interdependencies between users, institutions, and companies, implement them, and identify new ways to apply the insights. It is necessary to constantly use the results of data research to improve the efficiency of financial decisions and planning, to study the trends and desires of customers to produce new products and services, to implement dynamic pricing. As you can see, the possibilities of big data are truly limitless.

Thus, after analyzing the material above, we can suggest best practices when working with big data (*which we recommend adhering to in order to create a solid foundation for working with big data*).

1. Align big data insights with business objectives. Larger data sets enable new discoveries. It is therefore important to plan investments in talent, organization and infrastructure based on clearly defined business objectives to ensure continued investment and funding. To understand if you're on the right track, ask yourself how big data supports business and IT priorities and contributes to critical goals. For example, it could be filtering web logs to understand online shopping trends, analyzing customer feedback on social media and customer service interactions, and exploring statistical correlation techniques and matching them to customer, product, manufacturing and design data [6].

2. Use standards and guidelines to address skills gaps. Skills gaps are one of the most significant barriers to realizing value from big data. This risk can be mitigated by integrating big data technologies, plans, and decisions into the IT management program. Standardizing the approach will help manage costs and resources more effectively [7]. When implementing big data solutions and strategies, it is important to assess the required level of competence in advance and take steps to address skill gaps. This may involve training or retraining existing staff, hiring new specialists, or using consulting firms.

3. Optimize knowledge transfer through centers of excellence. Use centers of excellence to share knowledge, monitor and manage project communication. Whether you are starting or continuing with big data, hardware and software costs should be spread across all parts of the organization. This structured and systematized approach helps to empower big data and increase the maturity of the information architecture as a whole.

4. Harmonizing structured and unstructured data brings the greatest benefits. Analyzing big data is valuable on its own. But you can extract even more useful insights by matching and integrating low-density big data with the structured data you already use [8].

No matter what data you collect: customer, product, equipment or environmental data, the goal is to add more relevant pieces of information to benchmarking and analytical summaries, and provide more accurate conclusions. For example, it is important to distinguish the attitudes of all customers from those of the most valuable customers. This is why many organizations see big data as an integral part of their existing business intelligence toolkit, data warehousing platforms and information architecture.

Keep in mind that big data processes and models can be performed and developed by both humans and machines. The analytical capabilities of big data include statistics, spatial analysis, semantics, interactive exploration and visualization. Using analytical models allows you to relate different types and sources of data to make connections and extract useful insights.

Ensure the productivity of data science labs. Discovering useful insights in data is not always without challenges. Sometimes we don't even know exactly what we're looking for. This is normal. Management and IT professionals should be sympathetic to the lack of a clear purpose or requirement.

At the same time, data analysts and data scientists need to work closely with business units to be clear about where the gaps are and what the business requirements are. High-performance work environments are required to enable interactive data exploration and the ability to experiment with statistical algorithms. Ensure that test environments have access to all necessary resources and are properly controlled.

5. Align with the cloud operating model. Big data technologies require access to a wide range of resources for iterative experimentation and ongoing production tasks. Big data solutions cover all areas of operations, including transactional, master, benchmark, and summary data. Test environments for analyses must be created on demand. Resource allocation management plays a critical role in ensuring control of the entire data flow, including pre-processing, post-processing, integration, database summarization and analytical modelling. A well-planned private and public cloud provisioning and security strategy is a key to supporting these evolving requirements.

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