UDC 004.773

APPLYING OF BIG DATA ANALYTICS IN INTELLIGENT TRANSPORT SYSTEMS

Babenko V.O., Drozdyk Ye.V.
Kharkiv National Automobile and Highway University, Kharkiv

There are several basic and advanced types of data structures, all designed to arrange data to suit a specific purpose. Data structures make it easy for users to access and work with the data they need in appropriate ways. Most importantly, data structures frame the organization of information so that machines and humans can better understand it.

In computer science and computer programming, a data structure may be selected or designed to store data for the purpose of using it with various algorithms. In some cases, the algorithm's basic operations are tightly coupled to the data structure's design. Each data structure contains information about the data values, relationships between the data and in some cases functions that can be applied to the data.

For instance, in an object-oriented programming language, the data structure and its associated methods are bound together as part of a class definition. In non-object-oriented languages, there may be functions defined to work with the data structure, but they are not technically part of the data structure.

Software engineers use algorithms that are tightly coupled with the data structures such as lists, queues and mappings from one set of values to another. This approach can be fused in a variety of applications, including managing collections of records in a relational database and creating an index of those records using a data structure called a binary tree.

Some examples of how data structures are used include the following:

Storing data. Data structures are used for efficient data persistence, such as specifying the collection of attributes and corresponding structures used to store records in a database management system.

Managing resources and services. Core operating system (OS) resources and services are enabled through the use of data structures such as linked lists for memory allocation, file directory management and file structure trees, as well as process scheduling queues.

Data exchange. Data structures define the organization of information shared between applications, such as TCP/IP packets.

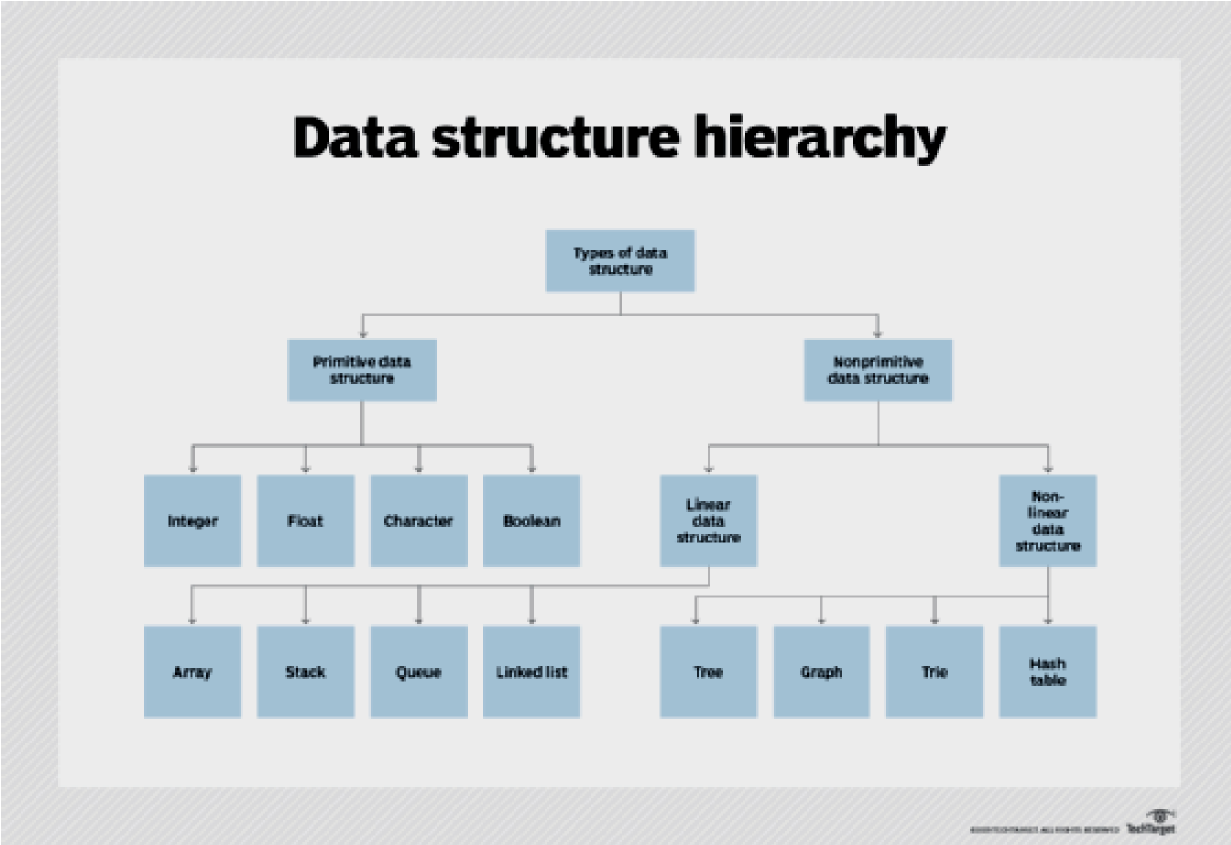

Figure 1 – Data structure design

Ordering and sorting. Data structures such as binary search trees – also known as an ordered or sorted binary tree – provide efficient methods of sorting objects, such as character strings used as tags. With data structures such as priority queues, programmers can manage items organized according to a specific priority. Indexing even more sophisticated data structures such as B-trees are used to index objects, such as those stored in a database.

Searching. Indexes created using binary search trees, B-trees or hash tables speed the ability to find a specific sought-after item.Scalability. Big data applications use data structures for allocating and managing data storage across distributed storage locations, ensuring scalability and performance. Certain big data programming environments – such as Apache Spark – provide data structures that mirror the underlying structure of database records to simplify querying.

As more organizations adopt big data platforms, concern mounts that application development may suffer from the lack of good practices for managing the data powering those applications. When we talk about big data management in relation to big data platforms (like those combining commodity hardware with Hadoop), it's clear that big data technologies have created a need for new and different data management tools and processes.

This is the crux of the issue. Any big data management strategy must include technology to support stream processing that scans, filters and selects the meaningful information for capture, storage and subsequent access.

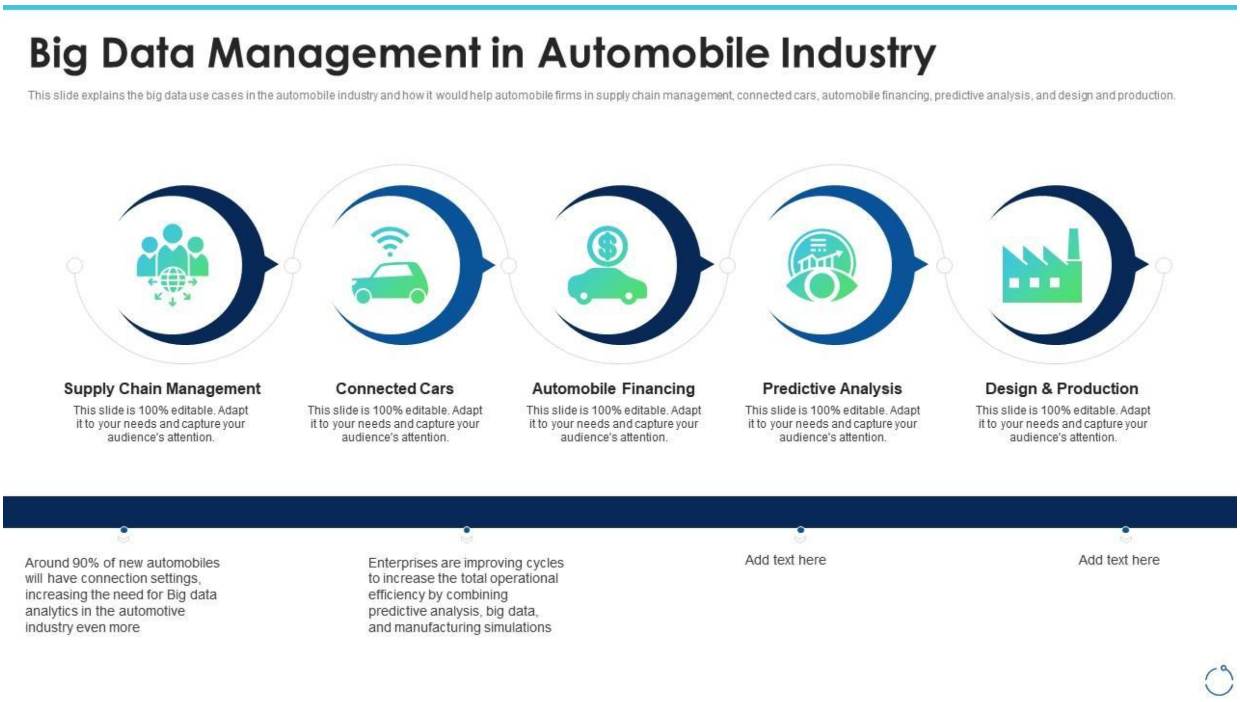

Figure 2 – Example of Big Data management in Automobile industry

Managing big data not only subsumes many of the conventional approaches to data modeling and architecture, it entails a new cadre of technologies and processes to enable broader data accessibility and usability. A big data management strategy must embrace tools enabling data discovery, data preparation, self-service data accessibility, collaborative semantic metadata management, data standardization and cleansing, and stream processing engines. Being aware of these implications can dramatically speed the time-to-value of your big data program.

The phenomenon of Big Data exacerbates the tension between potential benefits and privacy risks by upping the ante on both sides of the equation. Any project can fail for any number of reasons: bad management, poor budget management, or just a lack of relevant skills. However, big data projects bring their own specific risks. Disturbingly Currently Only 13% of Companies Achieve Full-scale Implementation of Their In-house Big Data Projects

Such a low success rate should be concerning for organizations embarking on big data projects since many businesses are choosing to adopt big data without a clear understanding of what the return on investment (ROI) will be.

Big data enables the designers to develop web applications that are more engaging and effective in delivering useful information to the users.

As more and more businesses continue to rely on the internet to promote their services and products, big data can help their manager to make better decisions. However, they require the right tools and skills to analyze and understand the data.

Our comprehension from the program that we could build any application in our computer but it require us to have data designed well beside the structure of the application.

Reference:

1. N. Carr, The Big Switch: Rewiring the World, from Edison to Google.W. W. Norton & Co., New York, 2020.
2. The Research and Application of Network Teaching Platform Based on Cloud Computing, Z. Tao and J. Long, International Journal of Information and Education Technology, Vol. 1, No. 3, August 2011
3. https://www.selecthub.com/big-data-analytics/types-of-big-data-analytics/

ІНФОРМАЦІЙНА СИСТЕМА ДЛЯ ПОБУДОВИ ЛОГІСТИЧНИХ ЛАНЦЮГІВ

Барашков Владислав Сергійович

Харківський національний автомобільно-дорожній університет

У сучасному світі інформаційні технології відіграють ключову роль у багатьох сферах діяльності, зокрема в логістиці. Одним з найбільш ефективних інструментів для побудови та управління логістичними ланцюгами є графові бази даних, такі як Neo4j. Ця стаття присвячена використанню Neo4j для побудови логістичних ланцюгів, опису її основних функціональних можливостей та переваг, а також прикладу реального застосування.

Інформаційні технології у логістиці

Логістика – це комплексний процес планування, реалізації та контролю ефективного та економічного переміщення і зберігання товарів, послуг і інформації від точки походження до точки споживання. Логістичні ланцюги, або ланцюги постачань, є основою цього процесу, забезпечуючи взаємодію між постачальниками, виробниками, дистриб'юторами та кінцевими споживачами.

Логістичні ланцюги включають різні етапи, такі як закупівля сировини, виробництво, зберігання, транспортування та доставка готової продукції. Ефективне управління цими етапами вимагає точного планування, координації та контролю, що можна досягти завдяки використанню сучасних інформаційних технологій.

Використання інформаційних технологій у логістиці дозволяє оптимізувати процеси, підвищити ефективність управління та знизити витрати. Основні напрями використання ІТ у логістиці включають:

1. Автоматизація процесів: Використання спеціалізованого програмного забезпечення для автоматизації логістичних операцій, таких як складування, обробка замовлень та управління запасами.

2. Системи управління ланцюгами постачань (SCM): Інтеграція інформаційних систем, що дозволяє ефективно планувати, виконувати та контролювати логістичні операції на всіх етапах ланцюга постачань.