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Select a database in use today (real or imagined) and identify the elements of “data” stored therein and describe how the database organizes the “data” into “information”.

The Amazon online retail website is an excellent example of how a primary database system might be organized in a real-world setting. Some data that may be stored in this database include the user's name, address, form of payment, current shopping list items, past purchases, and how much certain items in the shop cost. Some backend data that the website uses for not the user could be the possible locations stored in a database for the particular item the customer wants. Some information in the backend may include shipping routes, employees and their information, and product details such as how many have been sold, how many have been shipped successfully, and how the product could have been refunded and returned.

This data can be turned into information by using the items from the database and turning them into reports, graphs, and other forms of context. An example of this can be if an item is being sold much more than another item and has a data point that says it has been sold more than another. Therefore, it can be assumed that this product is doing the best and should be focused on consumers, with this, companies can better market towards a targeted audience. If one customer buys similar types of production, then advertise products to them by default based on that type of product. This can also be used again in a backend aspect for storage level and stockage. If this item is readily available to be sold, the data can give information to the right people to determine if there is enough quantity of the product to keep posting it for sale.

Give contrasting examples of "data" and "information" that illustrate the meaninglessness of "data" without context and organization. Talk about the value the "information" provides once the component data is given context.

An example of meaningless data without the proper context could be a series of numbers that represent lines that make a graph over a period of time. This graph has no meaning; it could be a stock chart or how many people buy a product over time. It makes more sense if you give it context, for example, saying that this graph represents how many users are actively using a website over some time at a specific time. The value of data representing information in a contextual form is significant because it can lead to better decisions, for example. Businesses always use graphs to figure out the situation of a particular aspect. Without the context, the data is meaningless, and there is nothing that can be acted upon.

Briefly describe the hierarchical and network pre-relational data models. Explain their shortcomings in relation to the relational model. Considering this, what do you think of XML as a model for data storage?

Hierarchical data models use a rigid structure following a tree-like diagram. Single parents and multiple children can be applied to a data point. The shortcoming of this model is that it follows a rigorous structure, which can limit the amount of data in some cases. Network data models follow a more flexible approach. It allows each data point to have multiple parents and multiple children. The shortcoming of this model is that it can be very complicated with an extensive web of data, as many points can be connected to each other, making it overwhelming and difficult to understand at times. These models share a similar shortcoming, which results in very complicated designs that can hinder time performance. XML data models can take up large amounts of space due to their text-prioritized design, which would require more significant

amounts of storage to hold the information and longer times to process vast amounts of data. It could also be very versatile as it simplifies reading data models, although it comes at the expense of large amounts of space and slow processing times.