Relational Database: What it is, how to use it, and why.

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Introduction:

Greetings, Mr. Johnson:

I am glad you requested to learn more about my proposal, and the method I suggest using. To get you more familiar with this proposed plan, I shall dive deeper into the world of relational databases. A relational database is defined as “a type of database that stores and provides access to data points that are related to one another.” (Oracle.com, par.1). It involves placing data in two or more separate tables and connecting them by giving every row in the first table a key, which is a special identification. This “key” is included as information in the second table, so that it can be used in “calling” data. It is essentially a method used to simplify relationships between various data (Oracle.com). There can be 3 types of relationship in this database: A one-to-one relationship involves a single attribute of one table being related to a single attribute of another (Stackby.com). In contrast, one-to-many relationship means one attribute is related to many in the other table (Such as one make of car being driven by many people). In the final, many-to-many relationship, more than one attribute of one table relates to more than one of another (This would be the case if one product was purchased by many people, and many people, in turn, can buy more than one product) (Stackby.com).

Relational databases have many real-world applications, and are utilized by a plethora of businesses, due to their ability to make data access easier (Microsoft.com). This is exactly why a relational database is a great potential solution to the problem of digital transformation, that so many businesses are facing today. This paper will primarily focus on the aspect of digital transformation that involves improving knowledge of our customers. It will provide a detailed analysis of relational databases, examples of their use, and reasons why our company should use them.

Relational Databases and Digital Transformation:

Digital transformation, the transition from conventional operations to digital technology, had already been a challenge for many corporations around the world, before becoming accelerated by the COVID-19 pandemic. Faced with an unexpected disruption in their workflow, companies were forced to quickly adapt to the new normal, changing the way they viewed technology. According to Stackpole (2021), while it was previously thought that online services would never match the effectiveness of face-to-face interactions, “COVID-19 proved that a well-architected digital experience can offer an equivalent or even a more personalized transaction than an in-person engagement.” (Stackpole, 2021, par.6). Given this fact, all that is left to do is discover a way in which this experience could be offered to the customer. This is exactly where relational databases come in. As previously hinted, the main benefit of this type of database is its convenience in organizing data. Calling data from a clearly defined table saves considerable amounts of time for a company like ours, that often deals with large amounts of customers. Specifically in our case, we could utilize the relational model to gain more knowledge about our customers’ preferences. Below, I shall explain in more detail how and why NauticalModels, Inc should take a step into the future.

Inside a Relational Database:

As you yourself know, our company has been a pioneer in museum-quality wooden ship replicas since 1953. Since then, we have gone from writing orders on paper to mainframe data storage in the 90’s. But times have changed, and our customer numbers have grown immensely. To respond to this, and improve our relationship with them, I propose the following: Data analysts would observe user behavior and habits in various situations and provide the collected information to us. Examples of user data to be observed are: General age groups of customers, locations of residence, frequency of clicking on ads for particular ship models, types of models most frequently purchased, and other factors. All this data would then be organized into a database: One table would contain the customer information. This includes the first and last name of the customer, address, email, phone number, city, state, and zip code. The customer table would also include an ID key, to be used for “calling” each customer. A second table would contain information about the product ordered by the customer. This would include things like Product ID, Product Type (Type of Model), Product Size (Small, Medium, or Large), and Product Weight. A third and final table would be titled “Payment”. In this table, details of the payment, such as Payment Type, Payment Date, and Payment Amount, would be included. It would be linked to the other two tables by having a customer ID foreign key, which would identify the customer that made the payment once called.

How Does It Work?

The principle by which the above database would function is very simple: By having all customers and products organized in tables, we will know exactly which customer prefers which product. Let us imagine, for example, that a customer buys a schooner model of a particular size and color. The information about their purchase, as well as their personal information like address and phone number, will be stored in our database. Should a schooner of similar design become available in our store, we could send a personalized add about the new product to the customer who had purchased the older similar version. Since one customer can purchase more than one product, and the same product can be purchased by multiple customers, it is not reliable to access customer data by using a product name. A customer first or last name cannot be used either, since some names can be identical. In this case, customer data is to be retrieved using the “Customer ID” primary key in the customer table. Once the data is pulled up, a personalized advertisement about the new product can be sent to that particular client, preferably via email. In this way, the ads received from us by the user will feel much more intimate and personal, increasing the likelihood that they will shop from us again. To ensure the safety of our customers’ privacy, we shall not share our database information with anyone besides the employee handling the database.

Benefits of a Relational Database:

But why, one would ask. Why would our software engineers to the trouble of creating a relational database, if we can just continue using mainframes? Well, the short answer is, we can’t. With evolving technologies and expanding customers, they are simply not a good option for us anymore. By adopting a relational database as our main tool, we would not only come closer to our customers’ needs, but also have advantage in the challenge of digital transformation, by having our data carefully and conveniently organized in digital form. Should we need to update any of our lists (ex. Add a new customer), such a database will save us a great amount of time and money, as another table or row can be added without deleted without needing to copy the entire list (Hughes, 2022). Moreover, we wouldn’t have to worry about memory or regular data “cleanups”, as there is no limit to the amount of information stored in a relational database. There are also other advantages to this type of database, such as the ability of performing ad hoc drills it when analysis of certain components is needed, or its design being regulated by business rules (as opposed to strictly software development regulations) (Hughes, 2022), which makes it perfect for businesses like ours.

Where This Has Worked:

To cast away any doubt you may still have about this data storage method, allow me to offer several examples of companies and websites in various industries that use relational databases, and have been doing so quite successfully. Take IMDb, for instance. The website is the largest online source of film information, from titles to directors and production details. It uses a type of relational database known as PostgreSQL, which is extremely popular among companies. PostgreSQL has helped IMDb store data about a whopping 6 million films, while making sure the website stays undisturbed by the amount of data, which only keeps increasing every year (Romanowski, 2020). Another media giant, the popular streaming service Netflix, uses both Apache Cassandra and MySQL relational databases. These help the platform store anything from client names to financial data, such as billing (Lopez, 2022). The company is considered the most popular streaming service, with 183 million subscribers globally as of 2020 (Sherman, 2020). Finally, Amazon, perhaps the most influential commerce company in the world, uses no less than three different databases: PostgreSQL, MariaDB, and MySQL (Lopez, 2022). Storing client and product information in those databases seems to be working quite well so far, as, in 2020, Amazon’s Prime branch could boast over 200 million subscribers, with a revenue of $386 billion, showing that the company’s use of proper software made them a reliable and trusted retailer (Curry, 2022).

Conclusion:

Relational databases are not a very new tool, and they are quite a lengthy concept to explain. However, the letter you have read so far was my humble attempt to highlight the best things about the data storage method, in order to show you why and how NauticalModels, Inc. would benefit from organizing its data by such a means. In a time when businesses struggle to keep up with the transition from record books to the screens, we have the chance to get ahead of the competition, and, in addition to providing customers with the best ship models, offer them the most personalized experience to date. I truly hope my analysis will inspire you to, at least, consider using such a database, and including it as part of our upcoming technological optimization. I will be happy to answer any questions you may still have about the matter, and am also curious about what your thoughts, ideas, and plans for it may be. I am glad you took a look at my proposal and hope my extensive descriptions didn’t tire you.

Regards,

Mark Kardash

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