ASHESI UNIVERSITY

Database Management System CS323

Final Project: Task 1 Group Submission

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July 12, 2024

https://youtu.be/pbuU3Gr9dog

Npontu Customer Database: Enhancing Customer Feedback and Product Improvement

Task 1.1. Case Study: Npontu Customer Database

It is a typical Monday morning at Npontu. The Customer support team is already handling numerous customer inquiries. One of its loyal customers, Sarah, is struggling with her recently purchased software. Hoping for a quick resolution, Sarah contacts customer support, unfortunately, she ends up repeating her issue to multiple agents. None of whom have access to her past interactions and purchase history. Frustrated, Sarah wonders why such a reputable tech company lacks a more efficient system for handling customer concerns.

Around the same time, Npontu's product developers are working on an update for a key product. But they're struggling to find the best improvements because feedback is scattered across emails, support tickets, and social media. Without a central system for feedback, they might miss out important insights that could significantly make the product much better. This anecdote from Npontu Technology's troubles in its database management cries for a solution. Thus, the company needs a new database system to store the vast, complicated expense of data for its business, operations, and clients as well.

This is why Our Team is developing a smarter customer database. Imagine a system where Sarah's purchase history, feedback, and past interactions are readily available in one place. When she calls customer service, the agent instantly sees her entire profile, and resolves her issues quickly and efficiently. With this personalised service, Sarah feels valued and impressed by the efficient service.

This new customer feedback system is a game-changer for the Npontu’s product development team. They have direct access to what users really want. They can now access structured

feedback from all customers, identify common pain points, and prioritize updates that will deliver the most significant impact. This systematic approach allows continuous improvement, ensuring Npontu's products and services stay in perfect sync with what customers really value.

Company Background

Npontu Technologies is a Ghanaian technology company registered in 2016 whose central goal is to empower businesses of all sizes. They achieve this by providing innovative solutions that use automation and data analytics to optimize performance (Npontu Technologies, 2024). This frees their clients to focus on achieving their goals. Npontu delivers a wide range of digital technology solutions, encompassing four large categories:

1. Artificial intelligence and big data: Npontu provides predictive analytics, natural language processing, AI chatbot, sentiment analysis, data cleaning, and segmentation services.

2. Platforms and app development: The company develops and deploys multiple bespoke, project-based, off-the-shelf software platforms, such as the enterprise resource planning software Kedebah.

3. Value-added services: Npontu provides bulk SMS, email provision, and payment services that add value to existing services their clients already offer.

4. IT consultancy: The company offers technology advisory services to clients relating to technology assessment, solution planning, etc.

Npontu Technologies' clients are mainly private businesses, running the range from small-to-medium scale business to large corporations like MTN, Societe Generale, Total

Energies, and more among them. Npontu also serves Ghanaian government departments in the sale of its services.

Database Operations Overview:

For the Npontu Customer Database, it is organised to take data mostly relating to 4 major areas: customer demographics, product information, client feedback on the products, and product purchase information. These would allow data on these important components of Npontu's business operation to be gathered and retrieved effectively, as the following detailed look into the database's operations show:

1. Client demographics:
    a. Retrieve all client data or data of specific clients based on their name.
    b. Retrieve and sort by highest frequency the specific client or client type that purchases a specific product i.e. most popular product
2. Product information:
    a. Retrieve all product data or data of specific products based on their name.
    b. Retrieve department team working on each product
    c. Retrieve and sort by lowest to highest cost and price of each product
3. Client feedback on products:
    a. Retrieve all feedback data or specific pieces of feedback based on the name of the client that made them
    b. Retrieve average and max rating of all products or specified product
4. Product purchase information:
    a. Retrieve all purchase data or specific purchase data based on product name, customer name or purchase date.

Task 1.2. Conceptual Database Design

List of assumptions made during conceptual database design

- Each customer can be either a Government entity or a Non-Government entity, but not both.
- All products fall into one of three categories: AI, IT Consult, or Apps.
- Feedback is categorised into LowRating, MediumRating, or HighRating, with no overlap.
- Each product is developed by only one development team at a time.
- The system does not track historical changes in product prices or development team assignments.
- All purchases are associated with a single product and customer.
- The system does not track partial or incomplete purchases.
- Feedback is always associated with both a customer and a product.

Enterprise rules represented by the EER Diagram

a. Customer-Purchase relationship:

- A customer can make zero or many purchases.
- Each purchase is made by exactly one customer.

b. Product-Purchase relationship:

- A product can be involved in zero or many purchases.
- Each purchase involves exactly one product.

c. Customer-Feedback relationship:

- A customer can give zero or many pieces of feedback.
- Each piece of feedback is given by exactly one customer.

d. Product-Feedback relationship:

- A product can receive zero or many pieces of feedback.
- Each piece of feedback is about exactly one product.

e. Customer specialization (Government and Non-Govt):

- Each customer must be either a Government customer or a Non-Government customer, but not both.

f. Product specialization (AI, ITConsult, Apps):

- Each product must be categorized as either AI, ITConsult, or Apps, but only one of these.

g. Feedback specialization (LowRating, MediumRating, HighRating):

- Each piece of feedback must be categorized as either LowRating, MediumRating, or HighRating, but only one of these.

h. Product-DevTeam relationship:

- A product is developed by exactly one development team.
- A development team can develop zero or many products.

Npontu Customer Database is guided by four core principles:

- **Consistency**: Every interaction is marked by a steadfast commitment to quality and reliability.

- **Speed**: Swift solutions and responses are provided to value customers' time.
- **Accuracy**: Meticulous attention to detail ensures precision in every task.
- **Positive Results**: Success is measured by the positive outcomes achieved for clients.

Database Design Considerations:

This project utilizes MySQL for database management. It involves interconnected tables for customers, purchases, products, and feedback, for promoting data integrity and smooth application functionality.

Security Measures:

This project prioritizes data security. Sensitive information like passwords and payment details will be shielded with encryption. These measures will secure user data and maintain trust.

Technologies:

Moreover, our project leverages Python for backend development and a combination of HTML, CSS, and JavaScript for the user interface. Additionally, popular web frameworks and libraries will enhance user-friendliness for database interaction.

The video link to our presentation: https://youtu.be/pbuU3Gr9dog

The video link to our User Interface: https://youtu.be/sr65PQHTCw8

Reference

Npontu, T. (n.d.). *NPontu Technologies | AI & Big Data Solutions*. Npontu Technologies. https://npontu.com/