Problem Statement

Product Dissection for top leading Platforms

Welcome to this case study on dissecting and designing products for top leading platforms. In this case study, you will delve into the intriguing world of schema design for a prominent platform of your choice. Your task is to choose a top leading platform, research its features, and meticulously craft a schema design that encapsulates the essence of its functionality. By focusing on key entities, attributes, and relationships, you will gain invaluable insights into how data architecture drives the platform's effectiveness.

Step 1: Choose a Leading Platform
Select a leading platform of your choice, which could span various domains such as social media, e-commerce, finance, or any other industry. This choice will form the foundation of your exploration into its schema design.

Step 2: Research:
Thoroughly research the platform you have selected. Investigate its core features, functionalities, and user interactions. Identify the top features that define its user experience and contribute significantly to its popularity.

Step 3: Product Dissection and Real World Problems solved by the platform
In this step, you will meticulously analyse the platform's standout features and how they provide innovative solutions to real-world challenges. By identifying key functionalities that resonate with users, you'll unravel how the platform effectively addresses problems and enhances user experiences. This dissection will serve as the foundation for understanding how the schema design aligns with the platform's core objectives.

Step 4: Case Study on the real world problems and approach to solving them
In this pivotal step, you will expand on the real-world challenges uncovered in Step 3 through a comprehensive case study. Delve into specific instances where users encountered difficulties and showcase how the platform's unique features provided effective solutions. By dissecting the approach taken by the platform to overcome these challenges, you'll gain a deeper appreciation for the platform's user-centric design philosophy and how it shapes the schema design.

Step 5: Schema Design Based on Top Features
Based on the features you have identified, craft a schema design that reflects the platform's data structure. Focus on the key entities, attributes, and relationships that underpin the chosen features. Your schema should capture the essence of how the platform organises and utilises its data.

Step 6: Rationale Behind the Design
While creating the schema design, consider the rationale behind the platform's choices. Reflect on why certain entities and relationships were chosen and how they align with the platform's goals. This will help you understand the strategic decisions driving the schema's architecture.

Step 7: Create an ER Diagram
Utilise tools like the Miro platform or similar applications to create an illustrative Entity-Relationship (ER) diagram. This diagram should vividly depict the entities, attributes, and relationships present within your schema design. The ER diagram will serve as a visual representation of your insights.

Step 8: Presentation of Findings
Present your findings in a clear and concise manner. Showcase your understanding of how the schema design impacts the platform's functionality and user experience. Explain how your chosen features are integrated into the schema and how the schema's structure supports the platform's objectives.

Task Details:

1. **Answer Submission:** Your submission should include well-structured solutions for all provided questions related to product schema designs.

2. **Video Creation:** Create an informative and engaging video where you thoroughly explain the Case Study.

3. **Depth and Clarity:** Ensure your solutions are detailed and showcase your understanding of product schema design principles. Similarly, in the video, provide clear explanations that are easy to understand for a wide audience.

4. **Creativity Encouraged:** You are welcome to utilise visuals, diagrams, or creative elements to enhance the clarity and impact of your explanations.

Note:

1. Duplicate this document and proceed to write your solutions and prepare your video.
2. Include the video link in this document before final submission.

Best of luck in completing this project and showcasing your prowess in dissecting and designing product schema for leading platforms! **For reference, we have also conducted a case study on Instagram, which you can find below. This case study will provide you with valuable insights into how schema design plays a pivotal role in shaping the functionality and success of a prominent platform.**

Video Presentation of this case study : SQL.mp4

Product Dissection for amazon

Company Overview:

Amazon.com Inc (Amazon) is a provider of online retail platforms. The company provides apparel, auto and industrial items, beauty and health products, electronics, grocery, games, jewellery, kids and baby products, music, sports goods, toys, and tools. It also offers related support services including home delivery and shipping, cloud web hosting and other web related services. The company also provides Amazon Web Services, such as database, computer, storage, and other services, to government agencies, start-ups, enterprises, and academic institutions. Amazon merchandises its products through company-owned online and physical stores. It also manufactures and commercialises various electric devices such as Kindle e-readers, fire tablets, fire TVs, echo, Alexa, and other devices. The company allows authors, musicians, filmmakers, and others to publish and sell content. Amazon is headquartered in Seattle, Washington, the US.

Product Dissection and Real-World Problems Solved by amazon:

Amazon’s online business is vast and expanding rapidly, causing traditional retailers like Walmart and Target to heavily invest in e-commerce to compete. While technology evolves and trends emerge, the core customer needs remain largely unchanged, driven by physical and psychological factors. Despite advancements like mobile ordering and delivery services, many people still prefer to see, smell, and touch their food before consuming it. Amazon Go addresses these fundamental preferences by combining technology with the tangible aspects of shopping, offering a more immediate and sensory-rich experience.

People generally dislike waiting, making fast delivery a key factor in e-commerce. While many are willing to accept deliveries within a few days or even hours with services like Prime Now, some still prefer driving to a physical store for immediate access to products. Despite the growth in online shopping, over 85% of the market remains in physical stores. Amazon aims to outperform this by using self-flying drones to deliver small, lightweight packages within 30 minutes. With more than 75% of items fitting this profile and the average store trip taking about 30 minutes, drones offer a scalable and cost-effective solution, leveraging machine learning for efficient operation rather than human pilots.
In conclusion, Instagram's product design has successfully tackled real-world problems by creating a platform that nurtures creativity, fosters connections, and offers a space for Amazon Alexa is part of a competitive landscape with Google Assistant, Siri, and others, driving improvements in voice-based services. These technologies are increasingly integrated into various aspects of daily life, including homes, cars, and mobile devices. In the

near future, it's likely that most online interactions will use natural language and voice commands. Saying, “Alexa, get me a Lyft,” or “Hey Google, call my mother” offers a more intuitive experience than using screens and touch gestures.

Case Study: Real-World Problems and amazon’s Innovative Solutions

Amazon, a trailblazer in e-commerce and technology, has significantly reshaped the retail landscape by offering innovative solutions to a range of real-world problems. By addressing customer pain points and leveraging cutting-edge technology, Amazon has set new benchmarks for convenience, efficiency, and user experience. From accelerating delivery times with Prime Now and autonomous drones to simplifying shopping with Amazon Go and enhancing cloud infrastructure with AWS, Amazon's advancements continually redefine industry standards and meet evolving consumer needs.

Problem 1: Inconvenience of Traditional Shopping

Real-World Challenge: Consumers often find shopping at physical stores inconvenient, especially when they need items quickly and don't want to wait in long lines.

amazon’s Solution:
Amazon Go addresses this by providing a cashier-less shopping experience. Customers enter the store, pick up items, and leave without waiting to check out. The store uses sensors and computer vision technology to track purchases, automating the checkout process and reducing the friction associated with traditional retail.

Problem 2: Overwhelming Product Choices

Real-World Challenge: Consumers face difficulty navigating vast product catalogues and finding relevant items among countless options.

amazon’s Solution:
Amazon employs sophisticated search algorithms and machine learning to personalise product recommendations. By analysing browsing history and user preferences, Amazon delivers tailored search results and suggestions, making it easier for customers to discover and purchase products that meet their needs.

Problem 3: Long Delivery Times

Real-World Challenge: Traditional delivery services often involve lengthy wait times, which can frustrate customers needing quick access to products.

amazon’s Solution:
Amazon has revolutionised delivery logistics with services like Prime Now, offering same-day or two-hour delivery for many items. To further expedite deliveries, Amazon is developing autonomous delivery drones that promise to deliver small packages in under 30 minutes.

This innovation aims to surpass traditional delivery speeds and meet the growing demand for immediate gratification

Problem 4: Scaling IT Infrastructure

Real-World Challenge: Businesses need scalable and reliable IT infrastructure to support growing data and computing demands.

amazon's Solution:
Amazon Web Services (AWS) offers a scalable cloud computing platform that provides a wide range of services, including computing power, storage, and database management. AWS allows businesses to scale their infrastructure efficiently and cost-effectively

Conclusion:

Amazon's innovative approach to solving real-world problems highlights its leadership in both e-commerce and technology. By addressing key challenges such as long delivery times, shopping convenience, and complex technology interfaces, Amazon has set new industry standards. Services like Prime Now, Amazon Go, and Alexa showcase the company's commitment to enhancing customer experience and operational efficiency. Additionally, Amazon Web Services (AWS) exemplifies the company's ability to support scalable IT infrastructure for businesses. Through these advancements, Amazon not only meets the evolving needs of its customers but also drives the future of retail and technology.

Top Features of amazon:

1. **Personalised Recommendations:** Amazon's recommendation engine uses machine learning to suggest products based on browsing history, previous purchases, and user preferences, helping users discover relevant items.

User Accounts: Amazon allows users to create personal accounts, offering features like usernames, addresses, payment methods, and order history. This personalises the shopping experience and streamlines transactions.

2. **Prime Membership:** Amazon Prime offers benefits such as free two-day shipping, access to streaming services (Prime Video and Prime Music), exclusive deals, and early access to Lightning Deals, enhancing overall user experience and loyalty

3. **Product Listings:** A core feature of Amazon is its vast catalogue of products. Users can browse and search for items, view detailed descriptions

4. **Voice Shopping with Alexa:** Amazon Alexa allows users to shop using voice commands, making it easy to add items to their cart, place orders, and manage their shopping list through voice interactions.

5. **Order Tracking:** The order tracking feature provides real-time updates on the status of purchases, including shipping progress, estimated delivery times, and delivery notifications, enhancing transparency and convenience.

Schema Description:

The schema for Amazon involves various entities that represent key aspects of its e-commerce platform. These entities include Users, Products, Orders, Reviews, Carts, and more. Each entity has specific attributes that define its properties and relationships with other entities, reflecting how Amazon organises and manages its data.

Attributes Entity:
Users are at the core of Amazon . The user entity contains information about each user:

- **UserID (Primary Key)**: A unique identifier for each user..
- **Username**: The chosen username for the user's account.
- **Email**: The user's email address..
- **Full_Name**: The full name of the user.
- **Address**: The user's shipping address.
- **PaymentMethod**:The payment methods associated with the user's account.

Product Entity:
Posts capture the visual content shared on the platform:

- **PostID (Primary Key):** A unique identifier for each product
- **ProductName**: The name of the product.
- **Description**: A detailed description of the product..
- **Price**: The cost of the product..
- **StockQuantity**:The number of units available in inventory.
- **ImageURL**: URL to the product's image.

OrderItem Entity:
Comments enable users to engage in conversations around posts:

- **OrderItemID (Primary Key):** A unique identifier for each order item..
- **OrderID (Foreign Key referencing Order Entity):** The order to which the item belongs.
- **Quantity:** The number of units ordered.
- **Price:** The price of the product at the time of the order..
- **ProductID (Foreign Key referencing Product Entity):** The product being ordered.

Cart Entity:
Represents a user's shopping cart.

- **CartID:** A unique identifier for each cart

- **UserID (Foreign Key referencing User Entity):** The user who owns the cart.
- **CreationDate:** The date when the cart was created.
- **TotalAmount:** The total amount of items in the cart.

CartItem Entity:
Represents items in a user's cart.

- **CartItemID (Primary Key):** A unique identifier for each cart item.
- **ProductID (Foreign Key referencing Product Entity):** The product added to the cart.
- **Quantity:** The number of units added to the cart.
- **Price:** The price of the product at the time it was added to the cart.

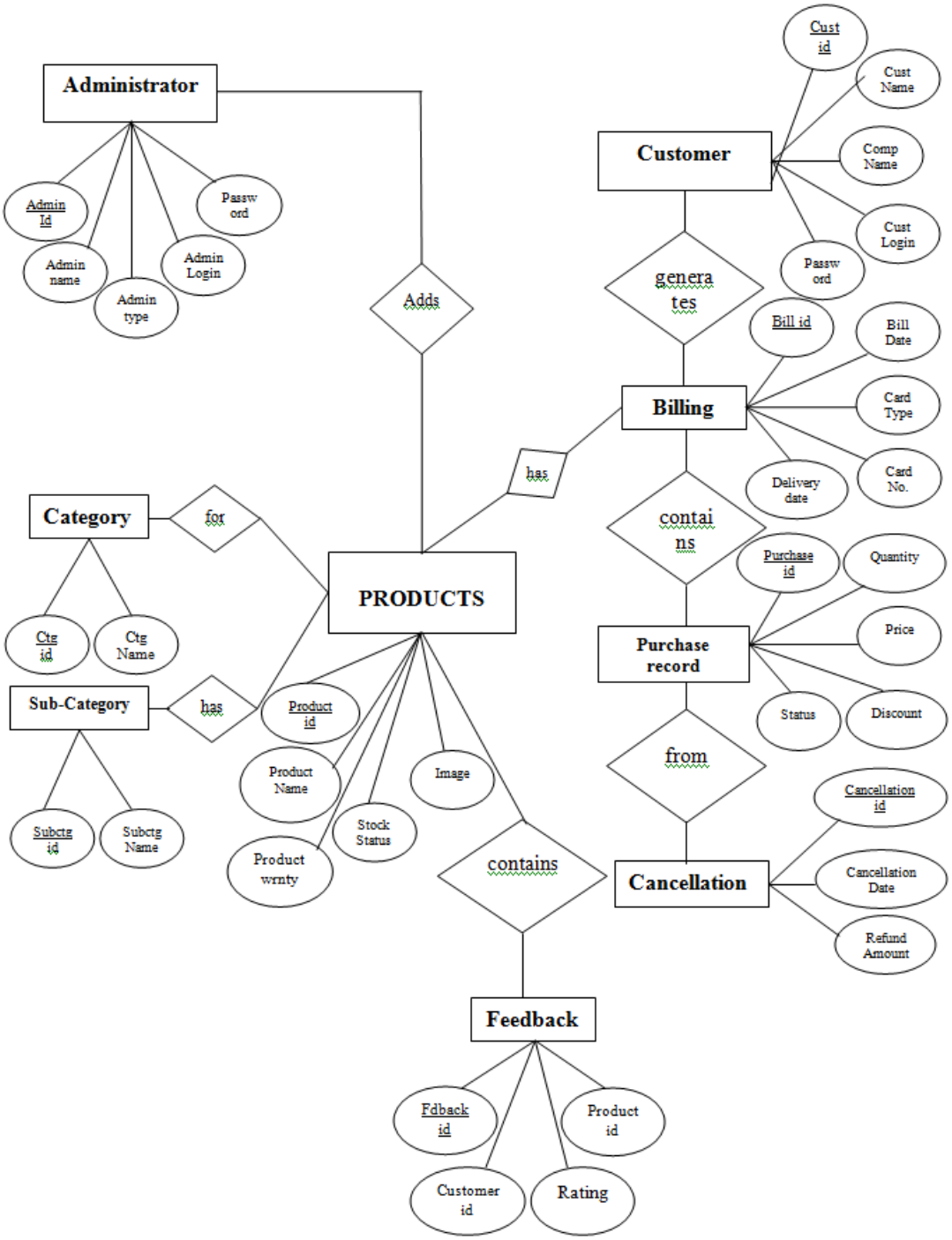
Relationships are:

- **Users place Orders –**Each user can place multiple orders
- **Orders contain OrderItems –** Each product can appear in multiple order items,Each order item corresponds to a single product

- **OrderItems are Products –** Each order item corresponds to a single product
- **Reviews are for Products –** Each review corresponds to a single product,Each product can have multiple reviews

ER Diagram:

Let's construct an ER diagram that vividly portrays the relationships and attributes of the entities within the amazon schema. (ER) diagram for a platform like Amazon involves identifying the key entities, their attributes, and the relationships between them. Below is a simplified representation of an ER diagram for an e-commerce platform like Amazon. This will include entities such as Users, Products, Orders, and Categories, among others.



Conclusion

Amazon has fundamentally transformed the retail and technology landscapes by addressing key customer needs and leveraging advanced technologies to offer innovative solutions. Through its various features and services, such as swift delivery options, personalised recommendations, and intuitive voice interactions, Amazon has set new benchmarks for convenience, efficiency, and user experience. By focusing on real-world problems, like the demand for immediate gratification and the complexities of online shopping, Amazon has effectively bridged the gap between traditional and digital retail. Its schema design reflects a

deep understanding of user behaviour and operational needs, ensuring a seamless and engaging shopping experience. As Amazon continues to innovate, it reinforces its position as a leader in the e-commerce sector, demonstrating how technology can continually adapt to meet evolving consumer expectations.