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Database Design Report One

Introduction

The rise and rapid growth of technology and the internet has led to huge advancements in sharing assets on a global scale, and created a platform where people of all ages could express themselves and retain new information. Its emergence has made it easier than ever to access billions of information. Whether people want to advance their education, pursue a new career path, make business transactions, or communicate with others, technology has been able to assist people globally with just a click of a button. The creation and consumption of data accessible from computers and mobile devices have been enticing in our modern society, to the point that our daily lives have become dependent on it. According to an article, “How Much Data Is Created Every Day in 2020?,” Jacquelyn Bulao stated that in the last two years “90% of the world’s data has been created.” Additionally, Bulao shared that “2.5 quintillion bytes of data are produced” by people every day. Endless amounts of information is being circulated every day. Searches on the internet browsers, reactions to posts, purchases, and personal information are tracked and stored. The storage and tracking of personal information and actions online may be unfavorable, however, this easy access to data, on the other hand may play a beneficial role for

businesses. Data helps businesses enhance their services and efficiency in the workplace. It assists in analyzing customers' behaviors, and improves marketing. Furthermore, it could keep track of employees' payroll, vacations, and product inventory. The organization and monitoring of such a wide assortment of data may seem like an arduous task for businesses. However, with the utilization of databases, businesses are able to swiftly search through collections of information at any moment.

A database is “an organized collection of structured information, or data,” that is stored “electronically in a computer system” (Oracle, n.d.). It is a tool that businesses use to format data in an organized and accessible way. Though it may seem that businesses just need to simply enter data, databases actually require a lot of planning. When developing a database, businesses have to construct a design that is clear, accessible, and adaptable to new data overtime. The data stored have to maintain accuracy and integrity. Furthermore, data within databases should not be redundant, and should accommodate easy data processing and reporting (Microsoft, n.d.). In order to explore this database design process, phase 1 of this project challenges students to devise a database design and model that can be easily understood, and can be later translated and utilized for future phases. It is not only our team's goal to learn and understand the design process, but to also produce a database design that is user friendly, and can preserve data overtime.

Database Description:

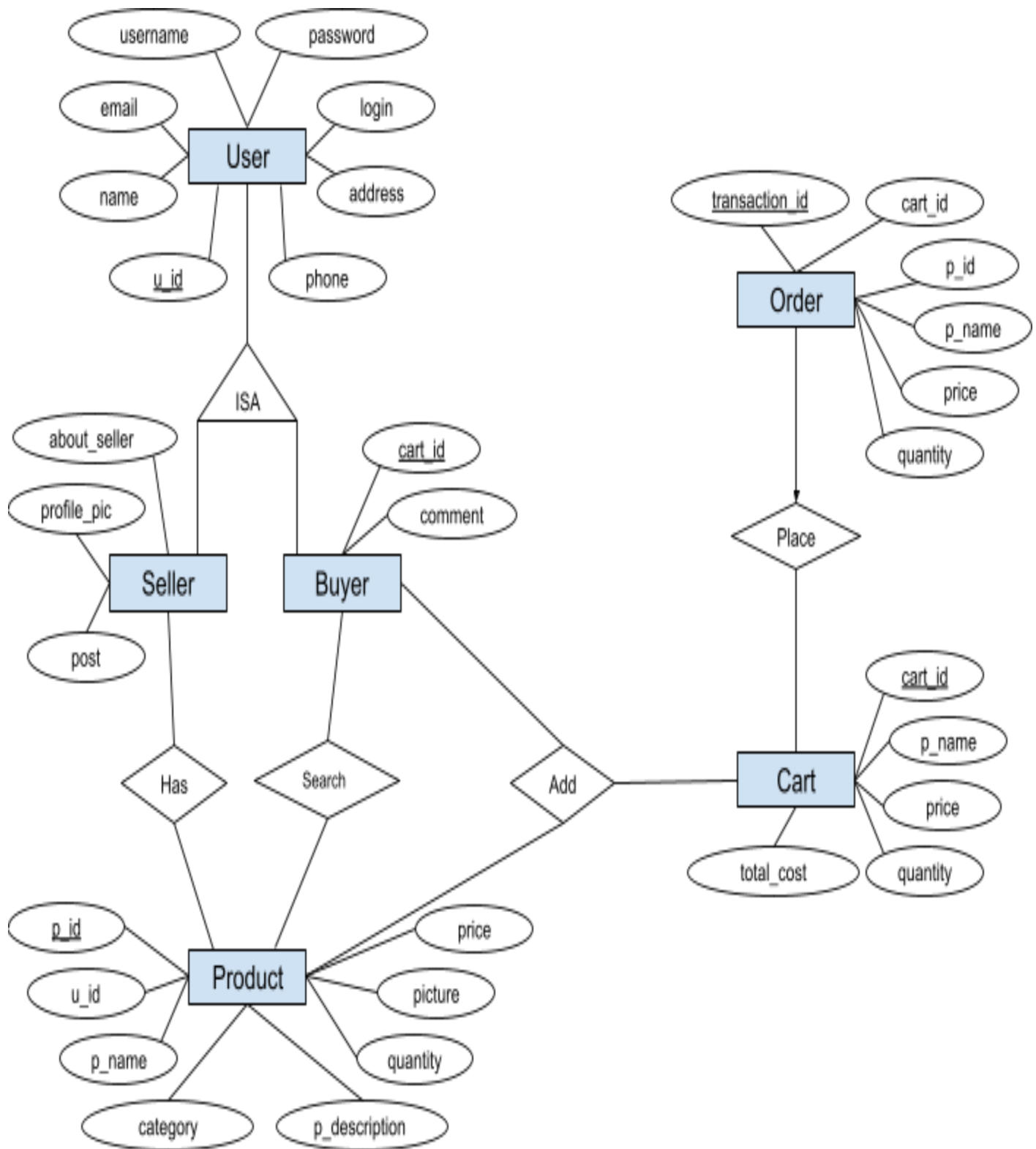
For phase 1, our team envisioned a database for a hypothetical online chocolate shop. Our online chocolate shop, ChocoBunnies, sells an assortment of chocolates that customers can choose

from. The seller posts each chocolate product with their corresponding price and picture. For the customers, they can add the chocolates they want to buy to their cart, and edit the quantity they want. Customers can then make their transaction, and leave reviews for the chocolate products they bought.

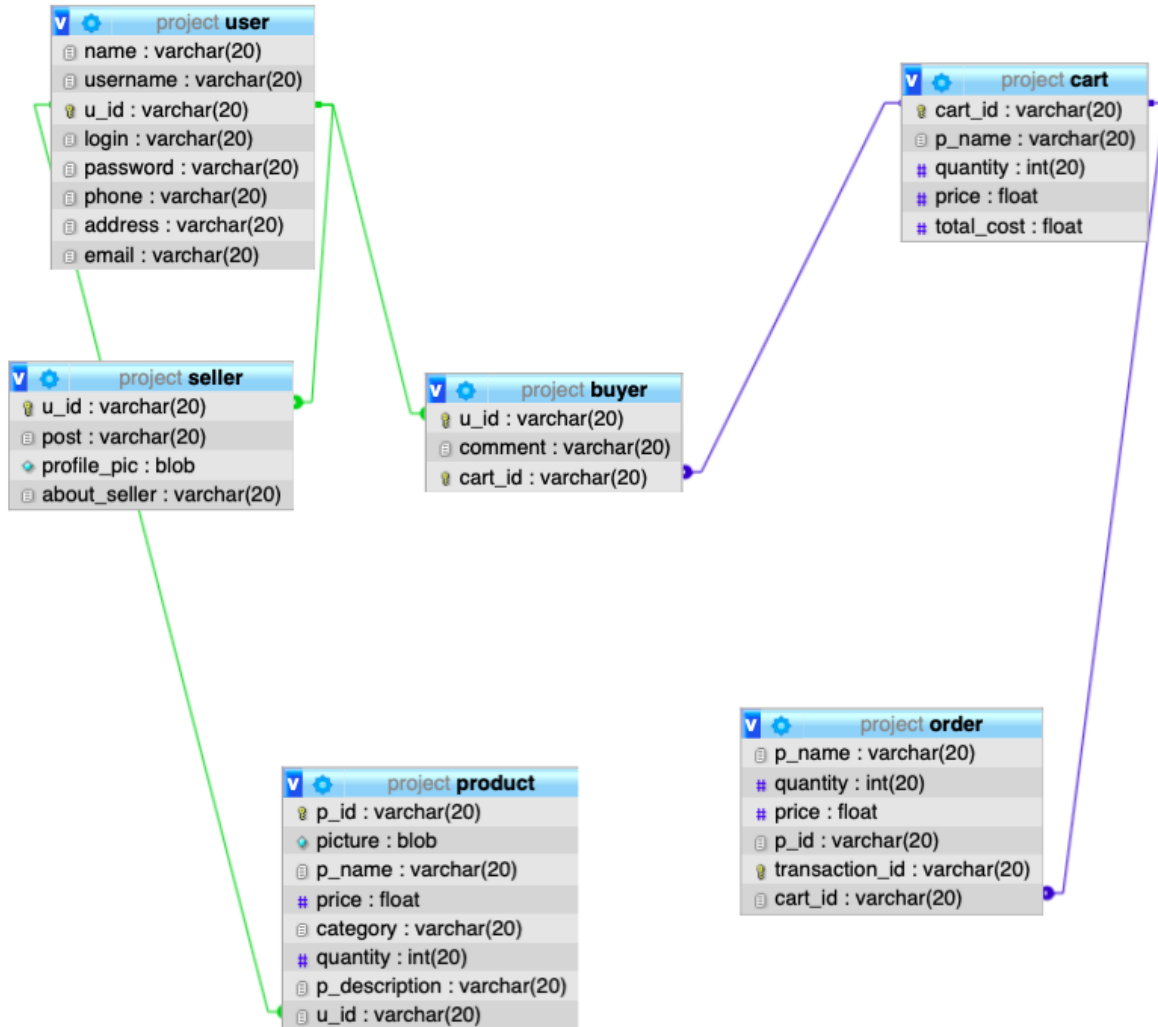
Data Requirements:

For an online store that needs to handle services for both sellers and buyers, a variety of data requirements should be present to make the login, product posts, and transaction process run smoothly. One of the first events that users can encounter when entering an online shop is the user login process. User would be an entity set that contains attributes such as the user's name, email, address, phone, username, password, login, and user ID (u_id). These attributes would help store a user's login information whether they just signed up for a new account, or a returning user. Additionally, the u_id attribute would be the unique key of the user entity set to help distinguish users. However, since the online shop will have two different types of users, the seller and buyer, a many-to-many ISA relationship is needed. The user entity would have an ISA relationship with a seller entity set, and a buyer entity set. If the user is a seller, the seller would be able to have a profile picture, an about me page, and the ability to post products. In order to keep track of those features, the seller entity set would have a profile_pic, about_seller, and post attributes. On the other hand, buyers do not need to worry about having a profile, about me page, and the ability to post products. Instead, buyers need a cart to keep track of the products they want to buy, and the ability to comment on products. The buyer entity set would have a cart_id, and a comment attribute. The cart_id will act as the unique key for the buyer entity set to distinguish buyers' carts while they shop.

After establishing the requirements for the seller and buyer entity sets, one entity set that both the buyer and seller would have a relationship with is the product entity set. The product entity set is required for when the seller wants to post a new product, and when the seller wants to search for or add a product to their cart. The product entity would require attributes such as product ID (p_id), product name (p_name), category, product description (p_description), quantity, picture, and price. Whenever a seller has a new product, they would have to fill in the required information to post the item. It would be a many-to-many “has” relationship between the seller and product. When a customer wants to search for a product, the customer can type in any of the product entity’s attributes to find the product. It would be a many-to-many “search” relationship between the buyer and product. Other than the search relationship. The buyer and product entity set are also part of a ternary “add” relationship with the cart entity set. When a buyer adds a product to their cart, they would be able to see the quantity of each product, the product name, price of each object, and the total cost. The cart entity set would have a cart_id attribute as the unique key, p_name, price, quantity, and total_cost. Lastly, the cart entity set would have a “place” relationship with an order entity set, where each order can be placed for at most one cart. The order entity set would store all transaction and order summary information. The order entity set would have a transaction_id, cart_id, product ID (p_id), product name (p_name), price, and quantity attributes. The transaction_id attribute would act as the unique key for the order entity set.

ER diagram

Relational Schemas



User (u_id:String, name:String, username:String, login:String, password:String, phone:String, address:String, email:String)

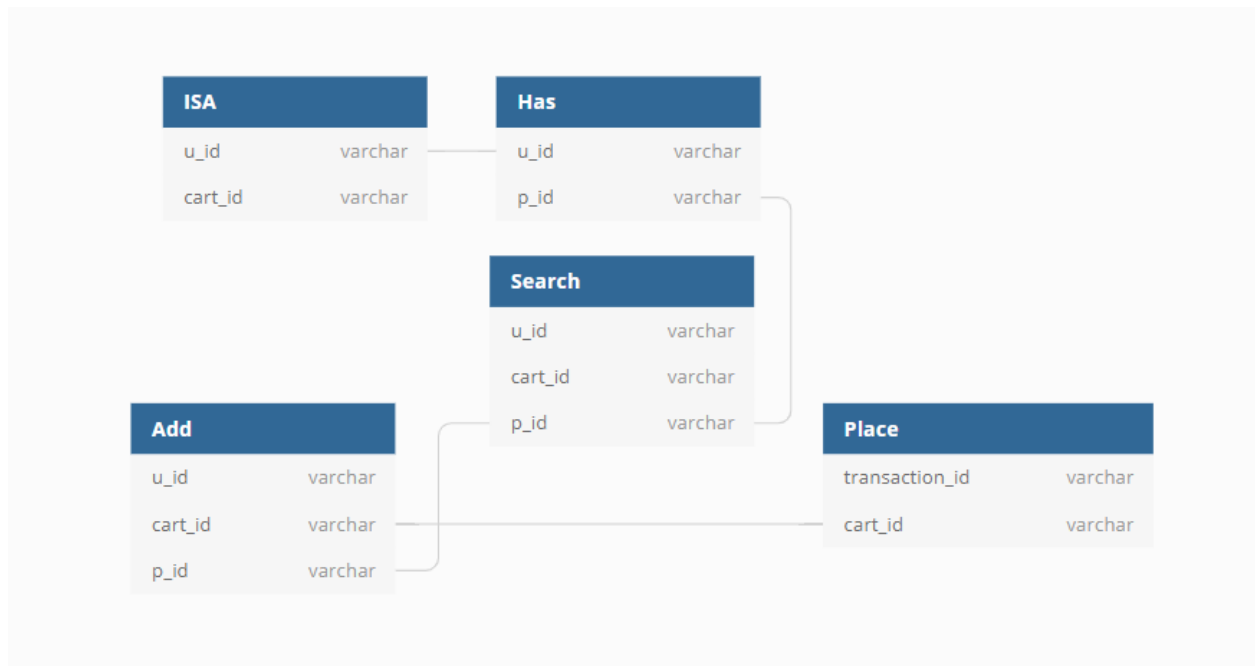
Buyer (u_id:String, cart_id:String, comment:String)

Seller (u_id:String, post:String, profile_pic:Blob, about_seller:String)

Product (p_id:String, picture:Blob, p_name:String, price:Float, category:String, quantity:Integer, p_description:String, u_id:String)

Cart (cart_id:String, p_name:String, quantity:Integer, price:Float, total_cost:Float)

Order (transaction_id:String, p_name:String, quantity:Integer, price:Float, p_id:String, cart_id:String)



ISA (u_id:String, cart_id:String)

Has (u_id:String, p_id:String)

Search (u_id:String, cart_id:String, p_id:String)

Add (u_id:String, cart_id:String, p_id:String)

Place (transaction_id:String, cart_id:String)

References

Bulao, Jacquelyn. "How Much Data Is Created Every Day in 2020? [You'll Be Shocked!]."

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support.microsoft.com/en-us/office/database-design-basics-eb2159cf-1e30-401a-8084-bd4f9c9ca1f5#:~:text=A%20good%20database%20design%20is,and%20integrity%20of%20your%20information.

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