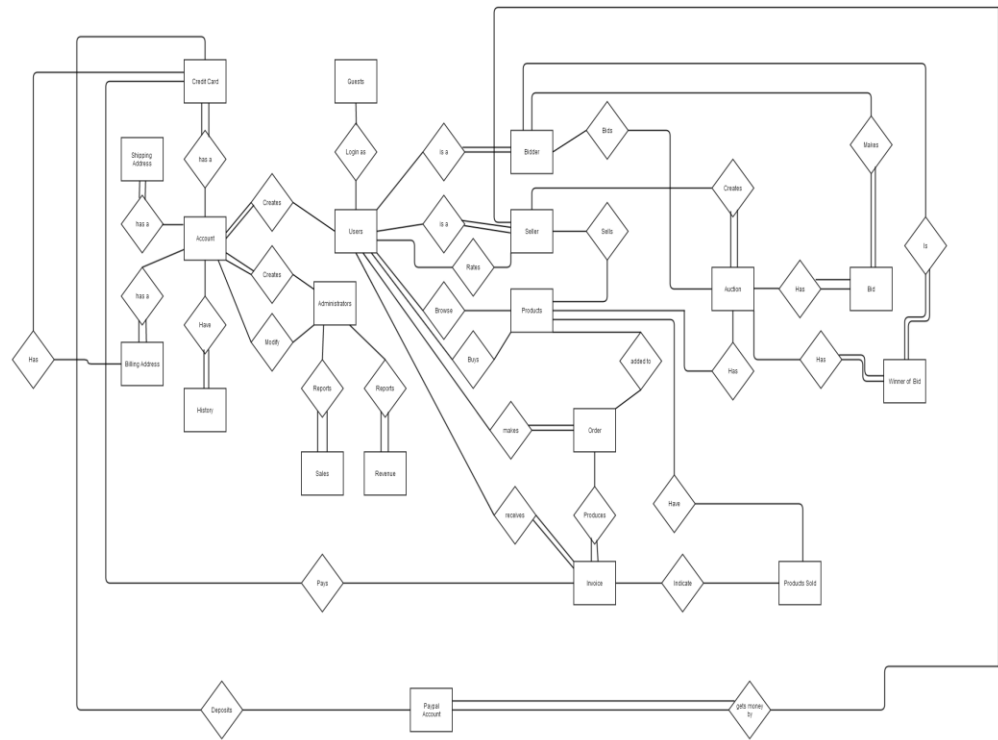


**ER Diagram:**



## **Entities and it's attributes:**

**Users**(userId, accountId, invId)

Users can view, browse, buy or sell products that are in the application. They can post products they want to sell and they can also place bids on products that are up for auction. Users can also be guests but they cannot buy or sell; they can only browse and view products. The users receive a invoice of the order that they placed so the users are linked to the invoice entity. The users can also rate the users that sell products.

**Administrator**(adminId, accountId, revId, saleId)

Administrators can create accounts for users, modify them and view reports on sales and revenues of the products by day, week or month. We have the administrators account Id in order to view the administrator's information and we link the administrator to the reports they have seen or created. To link them to the reports we have the revenue Id and the sale Id.

**Account**(accountId, shippingId, billingId, creditId, histId, username, password, email, firstName, lastName, phoneNum, typeAccount)

The Account belongs to a user or an administrator. They describe the persons information depending on the type of account (either user or administrator). If they are users, they have a shipping Id, billing Id and credit Id. Both users and administrators have username, password, email, name, lastname and phone number. The account is related to the shipping and billing addresses in order to send the items to the desired address and bill them for the price of the products they want. The account is also related to the credit card entity so that they can pay the products for which they receive a invoice.

**Guest**(guestId)

The guest is a user that can only view or browse products but we keep a history of the number of users that visit the page and browse it.

**Bidder**(bidderId, userId, bidId)

The user can be a bidder and bid on products that are up for auction. They are linked to the user and the bid that they make on the auction.

**Seller**(sellerId, userId, aucId, rate)

The user can be a seller and post products that they want to auction in the page. They are linked to the user that sells a product and to the auction that they created so that they can receive updates.

**Revenue**(revId, prodSoldId, daySold, prodPrice)

The administrators can view the total revenue of products sold so this revenue entity has the products sold, the day it was sold and the price of the product. This can help us to later calculate the total revenue by day, week or month.

**Sales**(saleId, prodSoldId, daySold)

Administrators can view the total sales of the products that have been sold. In order to have the total products sold we need the product sold and the day it was sold so the sales are linked to the product sold entity.

**Products**(prodId, type, instPrice, bidPrice, prodName, prodModel, prodPhoto, prodBrand, dimensions, description)

The products are for the users to buy, sell, browse and view. The sellers can create a auction of a product and the other users can bid on them and buy them. Products have the type of product, the instant price that the seller indicates, the starting bid price, the name of the product, the model of the type of product, a photo, the brand, dimensions and description.

**Order**(ordId, accountId, prodId, )

The order is for the user to place an order of products that they want to buy. The order saves the products to be sold and the Id of the account that makes the order.

**Invoice**(invId, ordId, credId, totalPrice, billId)

The invoice saves the information of the products that were sold. It holds the order, the credit card that is used, the billing address Id and the total price of the order. The invoice is a billing that the user will receive once they place the order of the products. The invoice is related to the order, the credit card, and the billing address.

**Credit card**(credId, accountId, billId, credNum, secNum, expDate, )

The credit card entity holds the credit card number, the security number and the expiration date of the user by linking it to the account of a user. We have the account Id of the user so that we can link the credit card to the user and we also have the billing address Id in order to verify the authenticity of the credit card used by the user.

**Shipping address**(shipId, accountId, urb, numHouse, street, City, zipcode, country,)

The shipping address entity holds the address where the products bought by a user will be sent. The entity holds the urbanization, number of house, street, city, zipcode and country to which they want the products mailed to. The shipping address must be linked to the account entity in order to identify the user that has this shipping address.

**Billing address**(billId, accountId, urb, numHouse, street, city, zipcode, country)

The billing address entity holds the address to which the billing of the order placed will be sent so that the user can pay for the products. The entity holds the urbanization, the number of the house, street, city, zipcode and country. The billing address is linked to the account of the user in order to identify the user that needs to pay for the order.

**History**(histId, accountId, prodId, bidId)

The users have a history of the products that they have bought or sold and the bids that they have placed on a product. They are linked to the account entity with the account Id in order to identify the user.

**PayPal**(paypalId, credId, sellerId, amountPaid)

The paypal entity is to hold the payment of the user that bought an item from a seller so that the seller can claim the money owed. Paypal is linked to the credit card entity and the seller entity so that we can have the money from the credit card and place it in the account of the seller.

**ProductsSold**(prodSoldId, prodId, sellerId, bidderId, price, daySold)

The ProductsSold entity saves the products that were sold. It is linked to the product entity, the seller and the bidder. The product Id is to know which product was sold, the seller Id is to know the user that sold the product and the bidder Id is to know the user that won the bid and bought the product.

**Auction**(aucId, prodId, sellerId, bidId, winnerId, startPrice, buyNowPrice, timeLeft)

The auction entity holds the starting price of a product, the buy now price of the product and the time left for the bidders to bid on the product of the auction. The sellers can create an auction to sell a product and therefore we need the seller id. We also need the product Id in order to know which product is up for auction so that the bidder can see the product. The entity is also linked to the bid entity so that we can have the current bids made on the auction. We also need the winner Id so that we can alert who won the auction with the highest bid so we link it to the winnerOfBid entity.

**Bid**(bidId, bidderId, aucId, bidPrice)

The Bid entity holds the offers made by the users that bid on the auction so it holds the price that the bidder offered for the auction. We need the bidder Id and the auction Id so that we can know which users are bidding on a certain auction and the price they offer. In order to do this we need to link the Bid entity to the bidder entity and the auction entity.

**winnerOf Bid**(winnerId, bidderId, aucId, prodId, winningBidPrice)

The winnerOfBid entity is to have a history of the winners of bids and this way we can alert the user that they won the bid. The entity is linked to the bidder, auction and product entities. With the bidder Id we can inform the bidder of the win, with the auction Id we can inform the seller of the win and with the product Id we can know the product that was up for auction.