Bendte Fagge
bfagge
Project Part 3
December 10, 2013

System Specifications and Design Aspects for an Online Auction Website

There are several small towns in Rockingham County, North Carolina that have numerous flea markets and antique dealers. Over the years, many of the proprietors of these businesses have discussed building an online auction website that they could use to post certain items they have for sale. After raising funds through a Kickstarter campaign, these business owners decided to hire an information analyst to help them figure out what specifications and design aspects they will need in a system to support an online auction website. Using eBay (http://www.ebay.com) for inspiration, the information analyst provided the following system specifications for this online auction website.

The main types of information needed to run this system include information about users of the system and items being sold. Sellers and buyers are the main users of the system. Each seller and buyer will need to create an account on the auction website in order to sell, bid on, or buy items and must have a unique user name (i.e., the name that others see on the site). Sellers can be buyers and buyers can be sellers, but there must be separate accounts for each. For instance if someone is a seller and a buyer, they must have two separate accounts for whatever function they are doing at the time (i.e., selling or buying). The user name must be unique so that individuals can determine if the seller or buyer is the user they think they are. Sellers are shown in the system by their company name whereas buyers are shown in the system by their username. If a buyer wins an item, then this is the point in which the seller learns their name. In addition to a user name, sellers and buyers must also have a password to access the system as well as provide their contact information including name, e-mail address, mailing address, and phone number. Both of these users will also need to

provide payment information to the system, for example account numbers (e.g., PayPal or credit account). For payments, the site works with PayPal and accepts payments via PayPal or via major credit cards. In addition, sellers do not ship outside of the United States and they will need to track shipment dates as well as arrival dates of shipments to buyers.

A seller can exist in the system without having any items being sold in the system. For example, a seller may sell all items one week and may not receive more stock to post on the auction site until a week later. Buyers can exist in the system without having bid on or bought an item. For instance, a potential buyer can bid on many items, but if they do not win the item, then they do not buy the item.

Queries that a seller may want to know include: finding all items that are active auctions or will be active auctions in the future, finding all items sold in a particular time frame along with the sold price, and viewing comments/feedback from all buyers. Buyers may want to view all items they have ever won. They may also want to see all items up for auction in a particular category and then be able to sort by the date each auction ends. Similar to sellers, buyers may want to view all comments/feedback given to them by sellers.

Another type of system user is an administrator. Administrators must make sure the auction website is functioning at all times. Some of the interactions that must be working include communication between sellers and buyers and adding items to the system. Administrators must also make sure auctions start and end at the correct times and account for time zone differences. Queries that the administrator may be interested in include: viewing system problems by category, viewing problems submitted by both buyers and sellers, and see which administrator is working on which problems.

The other main category of information in the system is information about items being sold. Items must include a unique identifier, title of the item, description of the item, condition of the item, item category (i.e., from a fixed list of categories with only one category applied to each item), starting bid amount, auction start time, and auction end time. Photos of items may be included, but are optional. Bids on items by buyers and the time the bid was placed must be captured by the system. At the end of the

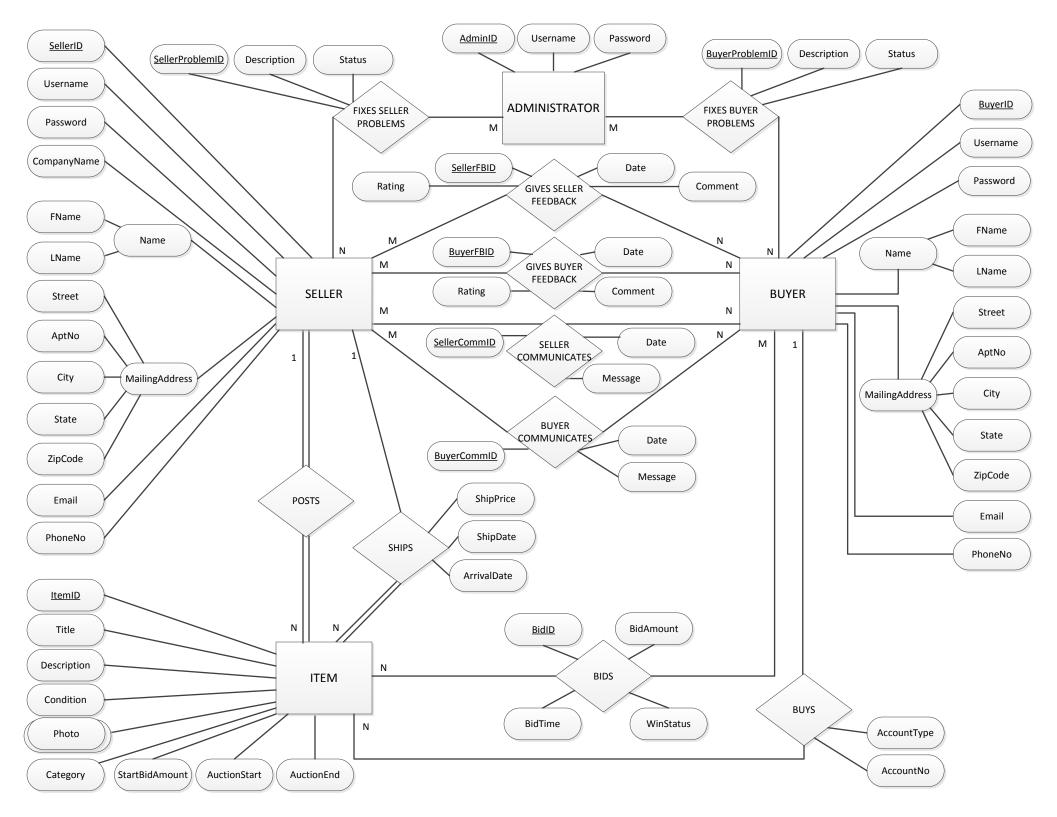
auction, the buyer with the highest bid will need to make a payment transaction with the seller. Once an item has been sold, then it must be removed from the system after a specified amount of time. An item cannot exist in the system without a related seller of the item.

Relationships in the system will include sellers, buyers, and items. Sellers can post items for sale, sell the item, ship items, and give feedback on buyers. Buyers can bid on items, win or lose items, pay for items, and can give feedback on sellers. Both sellers and buyers can provide feedback and ratings for each other, however this information is optional. Sellers and buyers may need to communicate with each other about payment transactions or the buyer may have questions about the item for sale before the auction ends.

While this system doesn't have all the bells and whistles of a system like eBay, this simplified version should be easier to manage for the Rockingham County business owners that want to host items for sale on the auction website.

Reference

http://www.ebay.com. (n.d.). Retrieved September 21, 2013, from eBay: http://www.ebay.com



ADMINISTRATOR

AdminID Username Password

SELLER

SellerID	Username	Passwo	ord	CompanyName	FName	LName	Street	AptNo	City	State	ZipCode	Email	PhoneNo

BUYER

ITEN

ItemID Title Description	Condition	Category	StartBidAmount	AustionStart	AuctionEnd	SellerID	ShipPrice	ShipDate	ArrivalDate
1 1111									
						Buye	rID Acco	ountType	AccountNo

SELLER_FEEDBACK

Sell erFBID	SellerID	BuyerID	Date	Rating	Comment
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BUYER_FEEDBACK

Buyer FBID	SellerID	Buyer\D	Date	Rating	Comment
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SELLER COMMUNICATION

SellerCommID SellerID BuyerID Date Message
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BUYER_COMMUNICATION

BuyerCom	nID	SellerID	Вι	verID	Date	Message

BIDS

	<u>BidID</u>	ItemD	BuyerID	BidAmount	BidTime	WinStatus
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SELLER_PROBLEM

<u>SellerProblemID</u>	AdminID	SelleriD	Description	Status

BUYER_PROBLEM

<u>BuyerProblemID</u>	AdminID	BuyerID	Description	Status

PHOTO

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ADMINISTRATOR

Attribute	Datatype	Domain	Description
AdminID	Integer, Primary key	10 digits	Administrator ID number
Adminstrator.Username	Varchar	15 chars	Administrator username
Administrator.Password	Char	8 chars	Administrator password

SELLER

Attribute	Datatype	Domain	Description
SellerID	Integer, Primary key	10 digits	Seller ID number
Seller.Username	Varchar	15 chars	Seller username
Seller.Password	Char	8 chars	Seller password
CompanyName	Varchar	30 chars	Seller's company name
Seller.Fname	Varchar	15 chars	Seller's first name
Seller.Lname	Varchar	15 chars	Seller's last name
Seller.Street	Varchar	20 chars	Seller's street
Seller.AptNo	Varchar	8 chars	Seller's apartment number
Seller.City	Varchar	20 chars	Seller's city
Seller.State	Char	2 chars	Seller's state
Seller.ZipCode	Varchar	9 chars	Seller's zip code
Seller.Email	Varchar	25 chars	Seller's email address
Seller.PhoneNo	Char	10 chars	Seller's phone number

BUYER

Attribute	Datatype	Domain	Description
BuyerID	Integer, Primary key	10 digits	Buyer ID number
Buyer.Username	Varchar	15 chars	Buyer username
Buyer.Password	Char	8 chars	Buyer password
Buyer.Fname	Varchar	15 chars	Buyer's first name

Buyer.Lname	Varchar	15 chars	Buyer's last name
Buyer.Street	Varchar	20 chars	Buyer's street
Buyer.AptNo	Varchar	8 chars	Buyer's apartment number
Buyer.City	Varchar	20 chars	Buyer's city
Buyer.State	Char	2 chars	Buyer's state
Buyer.ZipCode	Varchar	9 chars	Buyer's zip code
Buyer.Email	Varchar	25 chars	Buyer's email address
Buyer.PhoneNo	Char	10 chars	Buyer's phone number

ITEM

Attribute	Datatype	Domain	Description
ItemID	Integer, Primary key	10 digits	Item id number
Title	Varchar	30 chars	Title of the item being auctioned
Item.Description	Varchar	100 chars	Description of item being auctioned
Condition	Varchar	(Excellent, Good, Fair, Poor)	Condition of item being auctioned
Category	Varchar	(Furniture, Kitchenware,	Since most items generally are related
		Tchotchkes, Toys)	to households the site will only start
			off with a few categories for
			classification.
StartBidAmount	Decimal	5 digits decimal 2 digits	Amount of starting bid for item
AuctionStart	DateTime	Date/time format	Date that auction of item starts
AuctionEnd	DateTime	Date/time format	Date that auction of item ends
Item.SellerID	Integer, Foreign key	10 digits	Seller ID number
ShipPrice	Decimal	5 digits decimal 2 digits	Price of shipping for item
ShipDate	DateTime	Date/time format	Date that item is shipped to buyer
ArrivalDate	DateTime	Date/time format	Date shipped item arrived at buyer's address
Item.BuyerID	Integer, Foreign key	10 digits	Buyer ID number
AccountType	Varchar	16 chars, (PayPal, Visa,	Type of credit card being used to pay
		Mastercard, American Express,	for auction item
		Discover)	
AccountNo	Char	16 chars	Credit card number of buyer

BIDS

Integer, Primary key	10 digits	ID number for an auction bid
Integer, Foreign key	10 digits	Item id number
Integer, Foreign key	10 digits	Buyer ID number
Decimal	5 digits decimal 2 digits	Amount the buyer bid on an item
DateTime	Date/time format	Date that buyer bid on item
Varchar	3 chars, (Yes, No), Defaults to No	Status of item auctioned for a potential buyer who bid on an item
	Integer, Foreign key Integer, Foreign key Decimal DateTime	Integer, Foreign key Integer, Foreign key Integer, Foreign key Decimal DateTime 10 digits 10 digits 5 digits decimal 2 digits Date/time format

SELLER_FEEDBACK

Attribute	Datatype	Domain	Description
SellerFBID	Integer, Primary key	10 digits	ID number for feedback about seller
Seller_Feedback.SellerID	Integer, Foreign key	10 digits	Seller ID number
Seller_Feedback.BuyerID	Integer, Foreign key	10 digits	Buyer ID number
Seller_Feedback.Date	Date	Date/time format	Date that feedback on seller was given
Seller_Feedback.Rating	Integer	1 digit, (1, 2, 3, 4, 5)	Rating of a seller with 5 being the best
Seller_Feedback.Comment	Varchar	75 chars	Feedback in the form of a comment on
			a seller

BUYER_FEEDBACK

Attribute	Datatype	Domain	Description
BuyerFBID	Integer, Primary key	10 digits	ID number for feedback about buyer
Buyer_Feedback.SellerID	Integer, Foreign key	10 digits	Seller ID number
Buyer_Feedback.BuyerID	Integer, Foreign key	10 digits	Buyer ID number
Buyer_Feedback.Date	Date	Date/time format	Date that feedback on buyer was given
Buyer_Feedback.Rating	Integer	1 digit, (1, 2, 3, 4, 5)	Rating of a buyer with 5 being the best
Buyer_Feedback.Comment	Varchar	75 chars	Feedback in the form of a comment on
			a buyer

SELLER_COMMUNICATION

Attribute	Datatype	Domain	Description
SellerCommID	Integer, Primary key	10 digits	ID number for a message sent by a
			seller
Seller_Communication.SellerID	Integer, Foreign key	10 digits	Seller ID number
Seller_Communication.BuyerID	Integer, Foreign key	10 digits	Buyer ID number
Seller_Communication.Date	DateTime	Date/time format	Date that message from a seller was
			sent
Seller_Communication.Message	Varchar	200 chars	Message sent in the system by a seller

BUYER_COMMUNICATION

Attribute	Datatype	Domain	Description
BuyerCommID	Integer, Primary key	10 digits	ID number for a message sent by a
			buyer
Buyer_Communication.SellerID	Integer, Foreign key	10 digits	Seller ID number
Buyer_Communication.BuyerID	Integer, Foreign key	10 digits	Buyer ID number
Buyer_Communication.Date	DateTime	Date/time format	Date that message from a buyer was
			sent
Buyer_Communication.Message	Varchar	200 chars	Message sent in the system by a buyer

SELLER_PROBLEM

Attribute	Datatype	Domain	Description
SellerProblemID	Integer, Primary key	10 digits	ID number for a problem encountered
			in the system submitted by a seller
Seller_Problem.AdminID	Integer, Foreign key	10 digits	Administrator ID number
Seller_Problem.SellerID	Integer, Foreign key	10 digits	Seller ID number
Seller_Problem.Description	Varchar	150 chars	Description of system problem to
			administrator from seller
Seller_Problem.Status	Char	8 chars, (Open, Resolved)	Status administrator uses to note
			whether seller problem is open or
			resolved

BUYER_PROBLEM

Attribute	Datatype	Domain	Description
BuyerProblemID	Integer, Primary key	10 digits	ID number for a problem encountered
			in the system submitted by a buyer
Buyer_Problem.AdminID	Integer, Foreign key	10 digits	Administrator ID number
Buyer_Problem.BuyerID	Integer, Foreign key	10 digits	Buyer ID number
Buyer_Problem.Description	Varchar	150 chars	Description of system problem to
			administrator from buyer
Buyer_Problem.Status	Char	(Open, Resolved)	Status administrator uses to note
			whether buyer problem is open or
			resolved

РНОТО

Attribute	Datatype	Domain	Description
Photo.ltemID	Integer, Foreign key	10 digits	Item id number
Photo	Varchar	50 chars	URL that points to a photo of the item
			being auctioned

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CREATE TABLE Administrator
(AdminID
                 INT(10)
                                   NOT NULL,
                 VARCHAR(15) NOT NULL,
Username
Password
                 CHAR(8)
                           NOT NULL,
PRIMARY KEY (AdminID)
UNIQUE (Username));
CREATE TABLE Bids
(BidID
                       INT(10)
                                         NOT NULL,
                       INT(10)
ItemID
                                         NOT NULL,
                                   NOT NULL,
BuyerID
                 INT(10)
                 DECIMAL(5,2),
BidAmount
BidTime
                 DATETIME,
WinStatus
                 VARCHAR(3) NOT NULL
                                         DEFAULT No,
PRIMARY KEY (BidID),
FOREIGN KEY (ItemID) REFERENCES Item (ItemID),
FOREIGN KEY (BuyerID) REFERENCES Buyer (BuyerID),
CHECK(WinStatus='Yes' OR WinStatus='No'));
CREATE TABLE Buyer
(BuyerID
                                   NOT NULL,
                 INT(10)
Username
                 VARCHAR(15) NOT NULL,
Password
                 CHAR(8)
                           NOT NULL,
         VARCHAR(15),
VARCHAR(15),
Fname
Lname
Street
                       VARCHAR(10),
AptNo
                 VARCHAR(8),
City
                 VARCHAR(20),
State
                 CHAR(2),
ZipCode
                 VARCHAR(9),
Email
                 VARCHAR(25),
                 CHAR(10),
PhoneNo
PRIMARY KEY (BuyerID)
UNIQUE (Username));
CREATE TABLE Buyer_Communication
(BuyerCommID
                 INT(10)
                                   NOT NULL,
SellerID
                 INT(10)
                                   NOT NULL,
BuyerID
                 INT(10)
                                  NOT NULL,
Date
                 DATETIME,
Message
                 VARCHAR(200),
PRIMARY KEY (BuyerCommID),
FOREIGN KEY (SellerID) REFERENCES Seller (SellerID),
FOREIGN KEY (BuyerID) REFERENCES Buyer (BuyerID));
CREATE TABLE Buyer Feedback
(BuyerFBID
                 INT(10)
                                   NOT NULL,
                                   NOT NULL,
SellerID
                 INT(10)
BuyerID
                 INT(10)
                                   NOT NULL,
```

```
Date
                 DATE,
Rating
                       INT(1),
Comment
                 VARCHAR (75),
PRIMARY KEY (BuyerFBID),
FOREIGN KEY (SellerID) REFERENCES Seller (SellerID),
FOREIGN KEY (BuyerID) REFERENCES Buyer (BuyerID),
CHECK(Rating=1 OR Rating=2 OR Rating=3 OR Rating=4 OR Rating=5));
CREATE TABLE Buyer_Problem
(BuyerProblemID INT(10)
                                   NOT NULL,
                                   NOT NULL,
AdminID
                 INT(10)
BuyerID
                 INT(10)
                                   NOT NULL,
                 VARCHAR (150),
Description
Status
                       CHAR(8),
PRIMARY KEY (BuyerProblemID),
FOREIGN KEY (AdminID) REFERENCES Administrator (AdminID),
FOREIGN KEY (BuyerID) REFERENCES Buyer (BuyerID),
CHECK(Status='Open' OR Status='Resolved'));
CREATE TABLE Item
(ItemID
                                   NOT NULL,
                 INT(10)
Title
                 VARCHAR(30),
Description
                 VARCHAR(100),
Condition
                 VARCHAR(9),
Category
                 VARCHAR(11),
StartBidAmount
                 DECIMAL(5,2),
AuctionStart
                       DATETIME,
AuctionEnd
                 DATETIME,
                                   NOT NULL,
SellerID
                 INT(10)
ShipPrice
                 DECIMAL(5,2),
ShipDate
                 DATETIME,
ArrivalDate DATETIME,
BuyerID
                 INT(10)
                                   NOT NULL,
AccountType VARCHAR(16),
AccountNo
                 CHAR(16),
PRIMARY KEY (ItemID),
FOREIGN KEY (SellerID) REFERENCES Seller (SellerID),
FOREIGN KEY (BuyerID) REFERENCES Buyer (BuyerID),
CHECK(Condition='Excellent' OR Condition='Good' OR Condition='Fair' OR
Condition='Poor'),
CHECK(Category='Furniture' OR Category='Kitchenware' OR Category='Tchotchkes' OR
Category='Toys'),
CHECK(AccountType='PayPal' OR AccountType='Visa' OR AccountType='Mastercard' OR
AccountType='American Express' OR AccountType='DISCOVER'));
CREATE TABLE Photo
                                   NOT NULL,
(ItemID
                 INT(10)
Photo
                 VARCHAR(50),
PRIMARY KEY (ItemID, Photo),
FOREIGN KEY (ItemID) REFERENCES Item (ItemID));
CREATE TABLE Seller
(SellerID
                 INT(10)
                                   NOT NULL,
Username
                 VARCHAR(15) NOT NULL,
Password
                 CHAR(8)
                             NOT NULL,
```

```
CompanyName VARCHAR(30),
Fname
           VARCHAR(15),
Lname
           VARCHAR(15),
                       VARCHAR(20),
Street
                 VARCHAR(8),
AptNo
City
                 VARCHAR(20),
State
                 CHAR(2),
ZipCode
                 VARCHAR(9),
Email
                 VARCHAR(25),
PhoneNo
                 CHAR(10),
PRIMARY KEY (SellerID)
UNIQUE (Username));
CREATE TABLE Seller Communication
(SellerCommID INT(10)
                                  NOT NULL,
                 INT(10)
SellerID
                                  NOT NULL,
BuyerID
                 INT(10)
                                  NOT NULL,
Date
                 DATETIME,
Message
                 VARCHAR(200),
PRIMARY KEY (SellerCommID),
FOREIGN KEY (SellerID) REFERENCES Seller (SellerID),
FOREIGN KEY (BuyerID) REFERENCES Buyer (BuyerID));
CREATE TABLE Seller Feedback
(SellerFBID
                 INT(10)
                                   NOT NULL,
SellerID
                 INT(10)
                                  NOT NULL,
BuyerID
                 INT(10)
                                  NOT NULL,
Date
                 DATE,
                       INT(1),
Rating
Comment
                 VARCHAR (75),
PRIMARY KEY (SellerFBID),
FOREIGN KEY (SellerID) REFERENCES Seller (SellerID),
FOREIGN KEY (BuyerID) REFERENCES Buyer (BuyerID),
CHECK(Rating=1 OR Rating=2 OR Rating=3 OR Rating=4 OR Rating=5));
CREATE TABLE Seller Problem
(SellerProblemID INT(10)
                                   NOT NULL,
AdminID
                 INT(10)
                                   NOT NULL,
SellerID
                 INT(10)
                                   NOT NULL,
Description
                 VARCHAR(150),
                       CHAR(8),
PRIMARY KEY (SellerProblemID),
FOREIGN KEY (AdminID) REFERENCES Administrator (AdminID),
FOREIGN KEY (SellerID) REFERENCES Seller (SellerID),
CHECK(Status='Open' OR Status='Resolved'));
```

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Oueries
1. Find all items and their category that Mid-Century Modern Style has for sell.
SELECT Title, Category
FROM Seller, Item
WHERE Seller.SellerID=Item.SellerID AND CompanyName='Mid-Century Modern Style'
GROUP BY CompanyName
HAVING AuctionEnd > Date();
RESULT:
"Hip Lane Coffee Table", "Furniture"
2. What is the average rating of each buyer that has received a rating?
SELECT Username, AVG (Rating)
FROM Buyer, Buyer_Feedback
WHERE Buyer.BuyerID=Buyer Feedback.BuyerID
GROUP BY Username;
RESULT:
"bendz","5"
"carol43", "3.5"
"viva","3"
3. What is the average rating of all sellers of the auction website for the
month of November 2013?
SELECT AVG (Rating)
FROM Seller Feedback
WHERE Date BETWEEN '2013-11-01' AND '2013-11-30';
RESULT:
"3.66666666666665"
4. An administrator wants to know every problem that is currently open whether
it was submitted by a buyer or a seller.
SELECT Description
FROM Buyer Problem
WHERE Status='Open'
UNION
SELECT Description
FROM Seller Problem
WHERE Status='Open';
RESULT:
```

```
"I am having trouble with the Title field for items. It won't let me enter
anything."
"I am unable to send messages to sellers."
"When I try to enter my phone number, the system will not save it."
5. An administrator wants to know every problem that is currently resolved
whether it was submitted by a buyer or a seller.
SELECT Description
FROM Buyer Problem
WHERE Status='Resolved'
UNION
SELECT Description
FROM Seller Problem
WHERE Status='Resolved';
RESULT:
"Can you help me figure out how to place a bid?"
"I am having trouble changing my password."
"Photos of my items are not appearing. Please help."
6. A seller wants to see all communications with the buyer, viva, and the dates
of those messages.
SELECT Date, Message
FROM Buyer Communication, Buyer
WHERE Buyer Communication.BuyerID=Buyer.BuyerID AND Username='viva'
SELECT Date, Message
FROM Seller Communication, Buyer
WHERE Seller Communication.BuyerID=Buyer.BuyerID AND Username='viva'
ORDER BY Date ASC;
RESULT:
"Hi Viva. This pinball game still works really well."
"Hi. Could you tell me if this pinball machine still works?"
7. How many times has the buyer, viva, won an auction?
SELECT Count(WinStatus) AS Total Auction Wins
FROM Bids, Buyer
WHERE Bids.BuyerID=Buyer.BuyerID AND WinStatus='Yes' AND Buyer.Username='viva';
RESULT:
"2"
8. What items in the database contain photos?
SELECT Distinct Title
FROM Item, Photo, Seller
WHERE Item.ItemID=Photo.ItemID;
```

```
RESULT:
```

```
"Mr. Peanut Figure Coin Bank"
"Early Cowgirl Pinball Game"
"Kent Coffey Highboy Dresser"
```

9. The user viva had a disagreement with the seller Blast from the Past. He used to only bid on auction items with them exclusively, but now he wants to only bid on items with sellers that are not Blast from the Past. What sellers can he bid with?

```
SELECT CompanyName
FROM Seller
WHERE CompanyName not in
(SELECT CompanyName
FROM Seller
WHERE CompanyName='Blast from the Past');
```

RESULT:

"Vintage Kitchen"

"Mid-Century Modern Style"

10. Which administrators are currently working on either a problem for a buyer or a problem for a seller?

SELECT Administrator. Username, Description FROM Administrator, Buyer Problem WHERE Administrator.AdminID=Buyer Problem.AdminID AND Status='Open' SELECT Administrator. Username, Description FROM Administrator, Seller Problem WHERE Administrator.AdminID=Seller Problem.AdminID AND Status='Open';

RESULT:

"jsmith", "I am unable to send messages to sellers."

"jsmith", "When I try to enter my phone number, the system will not save it." "tammyf", "I am having trouble with the Title field for items. It won't let me enter anything."

11. Find all sold items and their sold price.

SELECT DISTINCT CompanyName, Title, BidAmount FROM Seller, Item, Bids WHERE Seller.SellerID=Item.SellerID AND Item.ItemID=Bids.ItemID AND WinStatus="Yes" AND AuctionEnd < Date();

RESULT:

"Blast from the Past", "Mr. Peanut Figure Coin Bank", "30" "Blast from the Past", "Early Cowgirl Pinball Game", "90" "Mid-Century Modern Style", "Kent Coffey Highboy Dresser", "375" "Vintage Kitchen", "Fiestaware Light Blue Water Pitcher", "60"

12. Find all items that are an active auction or will be and order them by ascending date.

SELECT CompanyName, Title, AuctionEnd
FROM Seller, Item
WHERE Seller.SellerID=Item.SellerID AND AuctionEnd > Date()
ORDER BY AuctionEnd ASC;

RESULT:

"Mid-Century Modern Style", "Hip Lane Coffee Table", "2014-01-12 12:00:00"