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- **Introduction:**
  - An online auction is an auction which is held over the internet. Online auctions come in many different formats, but most popularly they are ascending English auctions, descending Dutch auctions, first-price sealed-bid, Vickrey auctions, or sometimes even a combination of multiple auctions, taking elements of one and forging them with another. The scope and reach of these auctions have been propelled by the Internet to a level beyond what the initial purveyors had anticipated. This is mainly because online auctions break down and remove the physical limitations of traditional auctions such as geography, presence, time, space, and a small target audience this influx in reachability has also made it easier to commit unlawful actions within an auction In 2002, online auctions were projected to account for 30% of all online e-commerce due to the rapid expansion of the popularity of the form of electronic commerce.[1]

- **Auction Styles:**
  There are six different basic types of online auctions:-

    - **English Auctions:**
  - English auctions are where bids are announced by either an auctioneer or by the bidders and winners pay what they bid to receive the object. English auctions are claimed to be the most common form of third-party on-line auction format used and is deemed to appear the most simplistic of all the forms.

    - **Dutch Auctions:**
  - Dutch auctions are the reverse of English auctions whereby the price begins high and is systematically lowered until a buyer accepts the price. Dutch auction services are usually misleading. However, with actual on-line Dutch auctions where the price is descending, it was found that auctions have on average a 30% higher ending price than first-price auctions with speculation pointing to bidder impatience or the effect of endogenous entry on the Dutch auction.

    - **First-price Sealed-bid:**
  - First-price sealed-bid auctions are when a single bid is made by all bidding parties and the single highest bidder wins, and pays what they bid. The main difference between this and English auctions is that bids are not openly viewable or announced as opposed to the competitive nature which is generated by public bids.

- **Vickrey Auction:**
    - A Vickrey auction, sometimes known as a second-price sealed-bid auction, uses very much the same principle as a first-price sealed bid. However, the highest bidder and winner will only pay what the second highest bidder had bid.

- **Reverse Auction:**
    - Reverse auctions are where the roles of buyer and seller are reversed. Multiple sellers compete to obtain the buyer's business and prices typically decrease over time as new offers are made. They do not follow the typical auction format in that the buyer can see all the offers and may choose which they would prefer. Reverse auctions are used predominantly in a business context for procurement. Reverse auctions bring buyers and sellers together in a transparent marketplace.

- **Bidding fee Auction:**
    - A bidding fee auction (also known as a penny auction) requires customers to pay for bids, which they can increment an auction price one unit of currency at a time. On English auctions for example, the price goes up in 1 pence (0.01 GBP) increments. There has been criticism that compares this type of auction to gambling, as users can spend a considerable amount of money without receiving anything in return (other than the spent bids trying to acquire the item) The auction owner (typically the owner of the website) makes money in two ways, the purchasing of bids and the actual amount made from the final cost of the item.[2]

- **User Experience (UX):**
    - A lot of people when they hear about the user experience they think it's only about the design of the website or if the site is friendly or not. User experience is not just about the look of the website it's the whole journey from entering the sites until you close it. UX includes beside design the way information is architecture and ease of usability by users. Also, the accessibility and the pleasure when interacting with the website. We looked over some well-known online auctions sites to see the feeling of using their sites and we noticed that:

        - Ebid.net had too much information and it was a little bit complicated. Also, if you want to buy something the photos are not clear.

        - Ubid.com sites was way too simple and it doesn't show a lot of information about the sellers and buyers the feeling we got from this sites is that it's a fake website.

- Ebay.com is a good example of an excellent UX. Although that some users might think it's hard to use but if you try to buy a thing once we assure you that it well be easier the next time. The way of the design and the information organizing is perfect.

- **Items Policy:**

  Each company that serve product must have items policy. The idea for these policies is to protect both of customers and company rights. Online auction specially has deferent policies than other shops. If we want to review the most important policies for online auction it will be as follow:

  - **Listing policy and return policy:**
    - Listing policy:
      o Prohibited or restricted items

  Each online auction website has an items policy regarding listed items. Some items are not allowed to be listed earth because the website policies or because of country policy. This are some of the prohibited or restricted items:
  - Tobacco
  - Alcohol
  - Drugs
  - Police and emergency service equipment's.
  - Illegal, stolen, confidential documents (passports, social security card, birth certificate,)
  - Human body parts.
  - Gambling items.
  - Any object of Iranian, Cuban or North Korean origin.

    - Links Policy:

  To protect the auction website members, some links are not allowed to be listed that redirect customers to a site other than the auction website, even if the link is not clickable. This policy is to protects members from malicious sites and spam. Links could be a video on other website or a shipping company, but they all should be one of the auction accredited websites.

    - Return Policy

  Sometimes the items sold on the bid are not the same as they were described on the bidding or even totally different items. Auction website should have an obvious policy to protect themselves and to protect their customers from any problem happened from the bidding.

- **Payment Method or Model:**
  - As we know e-commerce businesses are different than other shops even on payment methods. There are different kinds of payment on the internet such as (PayPal, Visa, Master Card, American Express, Apple pay, and others).
    - Online auction website takes payment from both seller (listers) and buyer (bidder). Sellers pay for signing up on the website and for listing products as will. Buyers paying for the product and the website transfer the money for the sellers after taking the commotion.
  - Each auction website has his own policies and payment methods. You can see on some website what is the allowed payment types, what is restricted and what is not allowed.

    - Some allowed payment methods:

| PayPal | PayPal Credit | Credit card | Debit card |
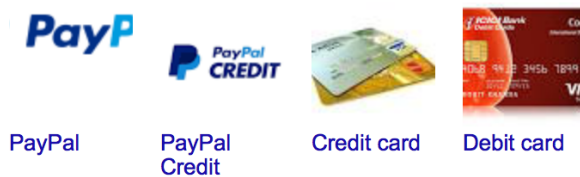
    - Restricted payment methods:
  - Like bank to bank transfer, checks, money order and some online payment services (Allpay.net, CertaPay, Nochex.com…).

  - For sure there are some methods that are not allowed like sending cash through mail and other not authorized payment methods.

- **Revenue Model:**
  Online auction generate money not from selling items from the website, yes, they take commotion, but they don't own the items. So, we can say that online auction can follow one or more from the next three revenue models:

    - **Subscription model:**
  - With this model users that want to sell or list their products have to sign up on the website and choose a subscription plan with a monthly payment as subscription fees.

    - **Fixed fees:**
  - On this model user (lister) pay fixed fees to the auction website for each item he wants to list, like taking 3$ for each item to list.

- **Commotion model:**
- With this model, the auction website will take a percentage from each completed transaction for bidding on listed items. This percentage will be deducted from the closing bid price and give the rest amount for the lister user. For example, (closing price 200$, commotion = 5% * 200 = 10$).

- **Accounting (profit and loss per (sale, customer, etc.))**
  - Accounting or accountancy is the measurement, processing, and communication of financial information about economic entities.[5] Accounting is used in websites to measure the profitability and losses of the site and the quantity sold and the remaining quantity. And these expenses will be saved in the database.

  - Example:

ebay

Invoice Request

Dear silvermania,

Send Invoice

I have purchased the following from you on eBay. Please send me an invoice with the total amount that I owe you.

Click to send an invoice to the buyer.

Thank You,
kad61

Item #	Item Title	Quantity	Price	Amount
400962212125	1 CUTE PAIR OF STERLING SILVER BUTTERFLY STUD EARRINGS style# st117	1	$3.50	$3.50
331610885498	ELEGANT .925 STERLING SILVER TURQUOISE RING size 8 style# r2153	1	$8.50	$8.50
331610147939	CUTE .925 STERLING SILVER SWIRLY HEART RING size 8 style# r0283	1	$6.50	$6.50
400962910697	PRETTY STERLING SILVER ABALONE SHELL RING size 8 style# r1660	1	$6.00	$6.00

Please send me a total for the 4 items; hoping that you will combine shipping on these items. Thanks, Kim

I would like to have the items shipped to the address below:
Kim DeSota
1724 County Road A
Liberty Center, OH 43532-9604 United States

Email reference id: [#6e11ee6ca6254bb1980955a4b81d0971#]

- **Customer Database**
  - The database is one of the necessary components to build a program or a website. And it's usually differs depending on the kind of program you're developing. In order to build an excellent database, we decided to observe some of the available online auction sites and try to identify the entities needed to our website.

  - We noticed that we will need to record information into the database about the:
    - Customer (Sellers and Buyers)
    - Order (Sell/Buy)
    - Product
    - Employee
    - Shipment
    - Category

The next photo represent the entities and attributes of the database we are going to build:

Customer:

CustomerID	FirstName	LastName	Phone	BirthDate

Order:

OrderNumber	SellerID	BuyerID	ProductNumber	ShipmentNumber

Product:

ProductNumber	Price	ProductInfo	CategoryID	SellerID

Employee:

EmployeeID	EFirstName	ELastName	Salary	Position

Shipment:

ShipmentNumber	Date	Address	EmployeeID	CustomerID

Category:

CategoryID	CategoryTitle

* We might add some entities and attributes in the future if it's necessary

- **Analytics**
  - Web analytics is the measurement, collection, analysis and reporting of web data for purposes of understanding and optimizing web usage. However, Web analytics is not just a process for measuring web traffic but can be used as a tool for business and market research, and to assess and improve the effectiveness of a website.[6] All big sites use analytics to compare their performance with the past years or other sites to improve their performance. Some websites offer tools to their sellers to inform them about the most trafficked hours to help seller sale more and get a higher bids.

- **Recommendation System**

  A recommendation system is a subclass of information filtering system that seeks to predict the "rating" or "preference" a user would give to an item. Recommendation systems are utilized in a variety of areas including movies, music, news, books, research articles, search queries, social tags, and products in general.[7] Next is some famous websites with information about their recommendation systems:

  - **eBay Recommendation System:**
    - The recommender system at eBay is based on user's personal taste profile, which describes the set of things that the user likes, and the set of things that the user does not like. Taste profile is based on the assumption that likes and dislikes are correlated. The purpose of using taste profiles is to reduce the computation time by reducing the dimension of the problem.[8]

  - **Amazon Recommendation System:**
    - The retail giant's recommendation system is based on a number of simple elements: what a user has bought in the past, which items they have in their virtual shopping cart, items they've rated and liked, and what other customers have viewed and purchased.[9]

- **Conclusion:**
  - In conclusion, after analyzing the available auction websites and observing the features and tools they use. We can now start choosing the way our haray website is going to be and what skills are needed from us to build this site step by step.

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[3] eBay Website, Access Date: September 30th, 2018 - URL: https://www.ebay.com/help/policies/rules-policies-buyers/rules-policies-buyers?id=4206

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