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"Development and Implementation of an Online Book Bidding and Resale Platform for University Student"

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1. ABSTRACT

With college academics moving quickly, students try to get affordable resources that help them get the needed learning materials properly. Now, students are able to use a marketplace where they can trade educational documents such as textbooks and scholarly texts, among themselves. The bidding system offered by the platform results in more participation from students in their textbook deals. Students get to use the platform's accessible design which works for people familiar with technology as well as those who are new to the field. As well as providing user bids, the platform offers sustainability support by encouraging students to trade books as opposed to having them stay unused. The cost of textbooks has risen so much that it is now a big problem for students everywhere. Many students must decide to pay for education materials or daily needs because the cost of books is too high for them. Using traditional ways to get college books such as bookstores and libraries, means that costs go up and operations cannot be maintained. Having to update their materials because of new editions makes textbooks much more costly for students. Many students still prefer old-fashioned books to digital textbooks and Open Educational Resources (OERs) when gathering study materials for schoolwork. Because of the resale system, students are able to get materials for school at a better price and without problems. Because of enhanced security, reliable materials can be found and exchanged by using personal search tools and accessing information from the member community. The platform encourages sharing ideas at school, helps students save money and makes learning more environmentally friendly. There is a plan to help students during their studies by connecting each book to a new audience. Our mission is to academic resource swapping through collective membership.

Keywords- Online Auction System; Book Resale Web site; Educational Market Place; Student to Student Trading; Used Textbooks

2. INTRODUCTION

People who want to study at higher education levels benefit from knowledge discovery along with a range of possibilities but face major financial obstacles. students face one critical problem due to the continuous increase in textbook and academic material prices. Students now face financial stress due to necessary study resources because they must decide between buying required books or paying for their daily expenses.

Students face financial stress because campus bookstores and library resources create an unsustainable situation since they are overly expensive to purchase. The constant production of new publishing editions along

with online resources causes costs to escalate beyond students' budgets making resource acquisition more challenging. Students now seek different methods to obtain academic resources through lower-cost avenues because of the difficult challenges they face. Digital textbooks together with Open Educational Resources (OERs) have become popular learning resources because they offer students affordable convenience.

Multiple factors including educational specifications and personal learning methods and the lack of access to digital tools and constant internet access make students choose printed textbooks instead of digital versions. The "Online Book Bidding and Resale Platform" creates a student-founded framework to address problems students encounter while obtaining textbooks.

The resale of textbooks through authorization assists the students to obtain some saving in the book purchase and it also creates social links and relationship towards the environment of the academic world. Through its bidding function the platform delivers both affordability and user involvement throughout the textbook acquisition process which promotes community support. The research examines Online Book Bidding and Resale Platform from its design principles to major characteristics and underlying programming framework. The system examines security aspects while handling development difficulties and defines prospective future additions to the program. Students will redefine their approach to study material sharing and acquisition through the "Online Book Bidding and Resale Platform" which focuses on affordability and accessibility of academic resources.

3. PROPOSED SYSTEM

People who prefer to buy books gain access to an extensive list of publications which contain details like titles and authors and book quality as well as bidding progress.

- Bid Submission

  Every person who wants to acquire a book through the platform can provide a bid proposal. Through advanced algorithms the platform manages bid enhancement processes while it tracks time periods and delivers real-time status reports about current bids.

- Auction Insights

  Through its comprehensive auction display platform users gain access to complete information about active sales including full inspection of previous bids along with real-time visibility of remaining auction time and most advanced current offer.

- Transaction Management

  The platform handles the transactions by confirming successful bids followed by secure payment processing alongside the organization of information that connects the book winner with the book owner.

- Book Listings for Sale

  The platform allows individual sellers to post books for sale by requiring information about their books and both initial bidding values and auction term specifications.

- Inter-User Communication

  Customers and vendors can establish safe message platforms through the platform to talk about items, bargain prices and solve transaction-specific details. The rewritten material retains the original concepts through different verbalization alongside new syntactical organization.

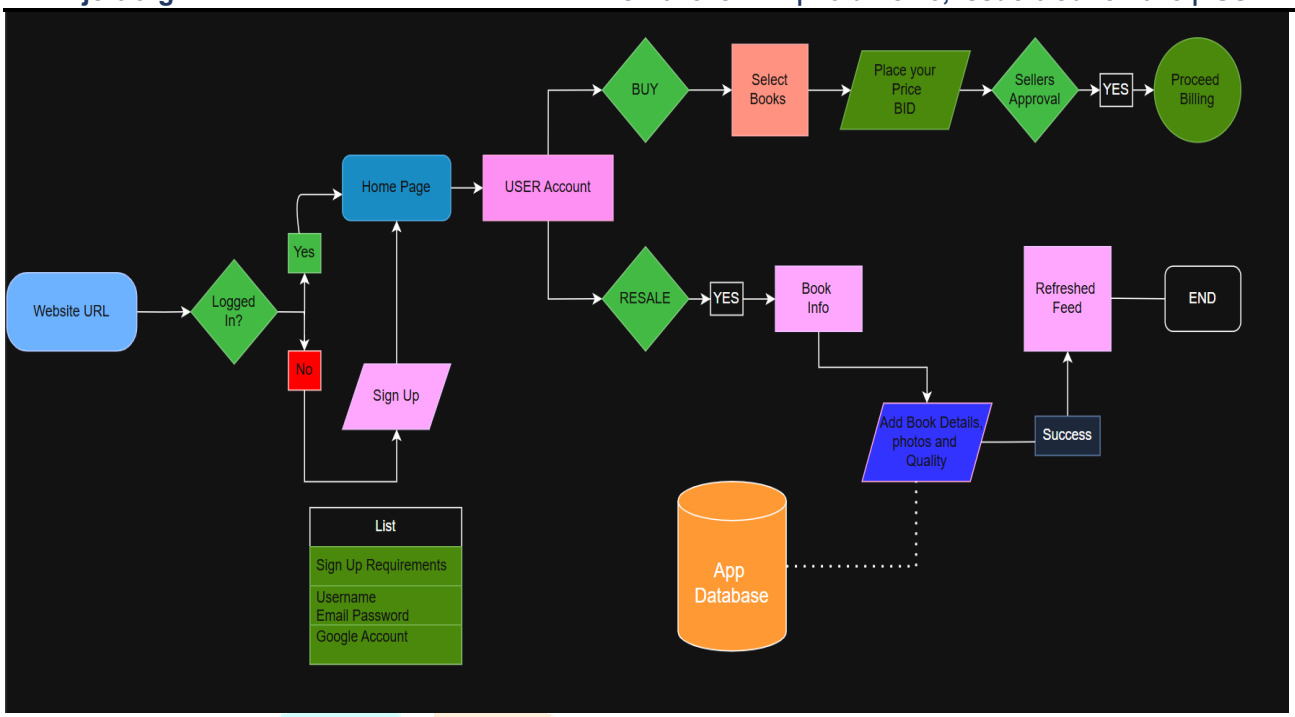

Fig.1 ER Diagram

4. LITERATURE REVIEW

Advances in the areas of online auctions and recommendation engines have been demonstrated methods of creating intelligent, adaptive and secure computer systems. Another problematic aspect within such systems is to present relevant recommendations when the information on the user is limited. The collaboration filtering algorithms in tandem with similarity functions such as the Jaccard similarity have enabled personalised recommendation by using the behavioural patterns of users even within sparse data contexts [1].

Personalization has also been improved further with the use of deep learning tools such as Keras that allows personalization on a user-by-user basis in terms of interaction with the platform in real-time [2]. The combination of the classical Quick Sort-like algorithms and user behavior analysis has demonstrated better accuracy and speed of processing and ranking on data-intensive user applications [3]. In the same way, a combination of content-based and collaborative filtering through such approaches as the KNN and matrix factorization has increased diversity and minimized biased suggestions [4].

Dynamic pricing systems such as the Dutch and the descending clock auction are employed in auction models to help elicit fairness and active use of user interventions in updating the prices in real-time [5], [6]. The reinforcement learning method has been employed to predict the bidding behaviour, streamline the flow of transactions [7], [8]. Blockchain has become a safe strategy to guarantee transparency and safety of the bidding system since traceable unchangeable transactions are registered [4], [10].

With these innovations, there has been a very low focus on applying the innovation to academics especially in textbook resale. The current project aims to fill in that gap and construct a trust-based secure bidding service aimed at the specifics of students and focused on the principles of trust, fairness, and relevance to studies.

5. METHODOLOGY

A. Technologies

Our online book bidding system design is based on a highly technical technology that will provide fast outputs and at the same time allows the users to interact with ease within the system. These are the key technologies that help the system to work:

Django: The framework is based on Python Django web framework since it enables programmers to develop apps rapidly using a simple design philosophy. The choice of Django framework by developers is due to its provision of a fundamental structure containing various assistance tools to develop web applications. The platform also has security measures that are inherent to the platform and ensures that developers do not make security mistakes when they build online projects.

SQLite: SQLite is the internal database that the platform utilizes. SQLite provides a C language library which provides a reliable engine of SQL database that is high performance and small secure set up. After SQLite was developed the database system was ranked the best in the whole world and it helps in supporting various applications as well as big projects too. SQLite generates in-lined SQL database content as opposed to the ordinary SQL systems that require standalone server mechanisms. SQLite uses normal disk files directly and modifies them.

B. Algorithms

1. Hashing Algorithm

Hashing turns all input data types into a specific text string that contains fixed-size hash values. A specific formula named hash function performs the hash generation. Hash functions function as one-way transformations which make it practically impossible for computers to recover input data from its hashed result. The one-way nature of hashing helps to protect important data and enhances secure password handling plus search optimization.

Example of a Simple Hash Function (Pseudocode):

```
def simple_hash(input_string): hash_value = 0
for character in input_string: hash_value += ord(character)
    return hash_value % 256
```

This is a simple hash function that adds up the ASCII values of all characters in the input string, takes the modulus 256 to assure the hash value into some definite size.

2. Dynamic Bidding Algorithm

Dynamic bidding algorithms employed in online advertising platforms handle the adjustment of the addresses of the bids automatically depending on the predicted efficiency of their participation in the process of achieving a desired effect, for example, the click, the conversion, the display of the exhibition. These algorithms are also considering a number of different factors, such as user behavior, context of ad placement and past performance data in order to optimize real-time bid. Basic Concept of a Dynamic Bidding Algorithm (Pseudocode):

```
def dynamic_bid(base_bid, conversion_probability, target_roi):
adjusted_bid = base_bid * (conversion_probability * target_roi) return adjusted_bid
```

In the foreground this algorithm modifies the base bid by multiplying it by the product of conversion probability and target return on investment (ROI). We thus ensure that the bid amount is optimal with regards to conversion probability as well as ROI objectives of the advertiser.

3. Ascending Clock Auction Algorithm

An ascending clock auction is a kind of auction, in which the price of the object which is subjected to auction gradually rises till there is only one participant left, and he/she wins the object at the price which is set at the moment. This is a type of auction that implies bidders to bid truthfully because they will withdraw once the price goes above their estimation of the object.

.is_willing to pay

def ascending_clock_auction(start_price, price_increment, bidders):
current_price = start_price while len(bidders) > 1:
for bidder in bidders:
if not bidder.is_willing_to_pay(current_price):
bidders.remove(bidder)
current_price += price_increment
winner = bidders[0] return winner, current_price

bidding down process stops when there is only one bidder left, and he/she gets the item at the prevailing price. All these algorithms have their purpose in the field of their application and use the principles of computer science and mathematical optimization to create an efficient and effective result.

6. RESEARCH METHODOLOGY

The proposed business, the ‘’Online Book Bidding and Resale platform’’, provides the book listing processes optimized to create a trustworthy student community within the university members. Book sellers start business by listing their stock with required information such as book titles along with author details and physical condition and starting price points. This is because users can comfortably search across several books which they can consider before making bids. The bidding process works in a safe manner to the buyers because they place their secret bids when deciding on the highest level of offer to remain competitive. After the bidding has been closed the seller is provided with the contacts of the highest bidder in order to finalize the trade. A feedback system can also be created to enable users to share their experiences on the platform to enhance reliability and users experience to build trust within the community. The entire system facilitates the processes of acquiring and reselling textbooks as well as developing an affordable and sustainable model of managing academic resources

7. RESULT AND ANALYSIS

The home page of the platform will show all the books listed in the system and their current prices as shown in the attached figure.

The listings as well are organized in such a way that the user can navigate further since the platform segregates it into Books Notes and Solution Keys.

The username of the user at hand is listed boldly at the upper left hand side of the page to personalise the browsing experience as a whole.

The right-side users are granted two accessibility features that provide them with a chance to add new listings or Wishlist items.

This optimisation makes the user experience very simple.. The filter option lies at the bottom of the web logo and this provides the user with an advantage of, sorting books based on their year of publication..

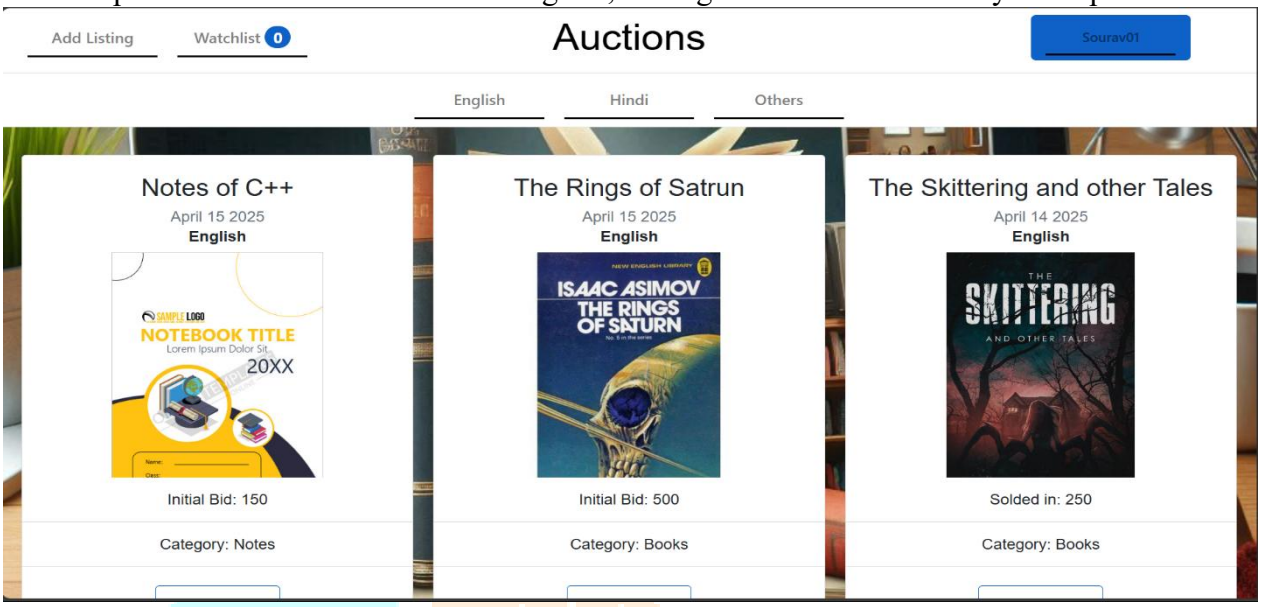

Fig 2. Homepage

The bidding screen which has been shown in the figure below provides the bidders with a position to place bids on the items and see the updated price on each item available on the list. The interface also has a feature of adding a listing to favourite, which helps users to recall their favourite listing and access it later.

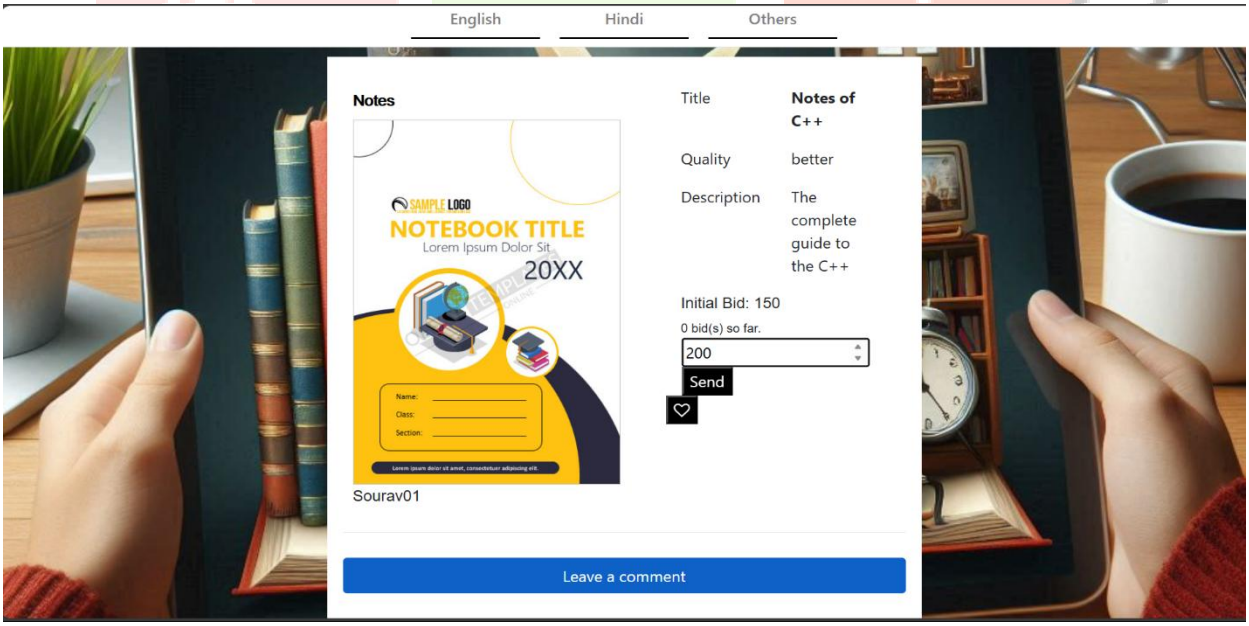

Fig 3. Bidding Interface

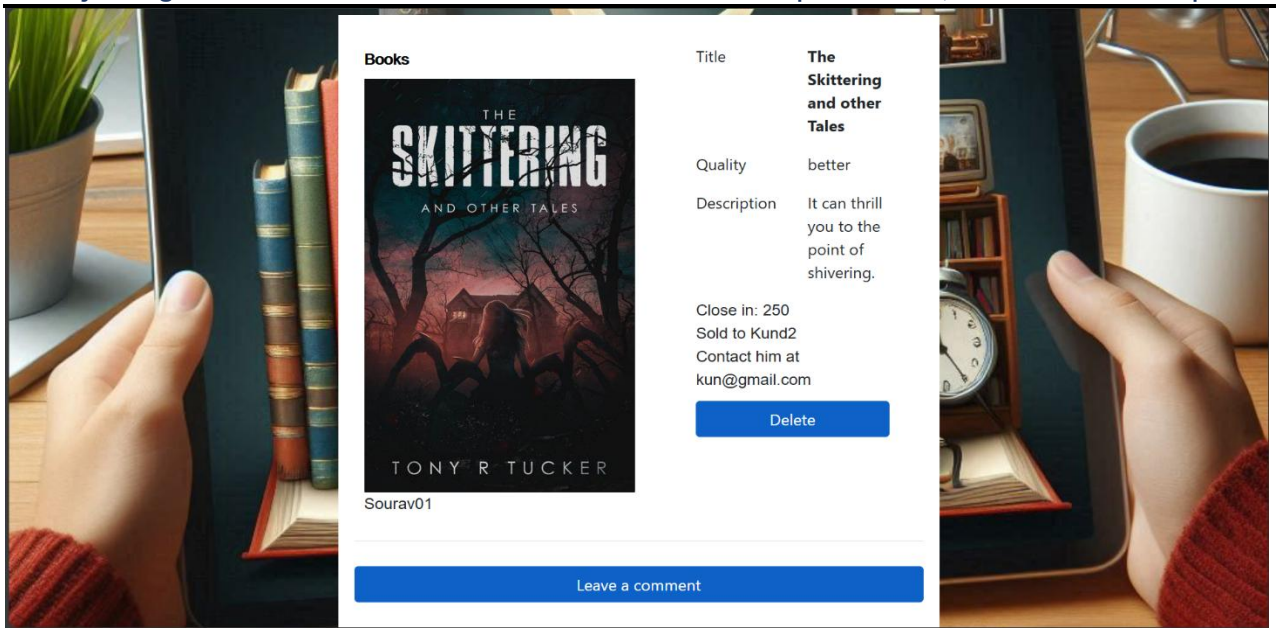

Fig 4. Winner announcement (viewable to seller)

8. CONCLUSION

The home page of the platform will show all the books listed in the system and their current prices as shown in the attached image. The fact that the platform separates listing into the categories of Books Notes and Solution Keys allows the users to navigate through the offering more easily. To further customize the browsing experience of the user, the username of the logged in user is displayed in the top left section of the page. The two accessibility features are provided to the users on the right side of the screen as they allow them to add new listings or wish list items. This improvement makes the user experience easy. The filter option just below the logo of the web page allows the user to sort books according to the year of publication.

9. ACKNOWLEDGMENT

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