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E-Bidding for Agriculture

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Abstract: *This research work intends to develop a new concept for e-agriculture utilizing web based software. This is a simple e-commerce platform as the world is getting used to it day by day. In this system, farmers/sellers can sell their product by taking a picture of the product, add the details and post it in the website by using their account in the website. And a buyer/wholesaler can buy this product with a bidding system which is to be called e-bidding because the whole process would be taking place electronically or via electronic media like computers, smart phone etc. In this research, we will create an e-bidding system for e-agriculture in order to help the farmers get their actual prices without interfering middleman and the farmers will be more encouraged to produce agricultural products every year which may play positive role in the socio economic development of Bangladesh.*

Key words: *E-bidding, ICT in Agriculture, Online Shopping, E-agriculture, Agriculture in Bangladesh*

1. Introduction

Agriculture is the largest employment sector in Bangladesh. As of 2016, it employs 47% of the total labor force and comprises 16% of the country's GDP. The performance of this sector has an overwhelming impact on major macroeconomic objectives like employment generation, poverty alleviation, human resources development and food security (Wikipedia,2016). In spite of being the largest sector of employment in Bangladesh, the agricultural sector has always been given the less priority by the Government or other organization, institution or personnel. Specially the farmers of Bangladesh seem to get the lowest price consistently by the middlemen whilst they benefit more without having any labor cost or work on a field. Due to these problems in the agricultural sector in Bangladesh, farmers are quitting farming day by day. They are left with no choice but to lead their life otherwise and they are leaving farming profession to join as an industrial worker, daily labor, rickshaw puller etc. It is a great threat to the agricultural sector in Bangladesh. From that ground, the present research aims to provide an idea of e-bidding system for the framers to promote their products online.

2. Relevant Questions

- With all the help from the government (hybrid seeds, ease on loan and interest from the govt. bank) why the farmer can't get enough profit from the relevant agricultural sector?
- Why is the massive variation in price from farmer's side to the user end (consumer end)?

- What or who is causing them the problem of not getting the farmers rightful fair price?
- How this research can resolve this problem once and for all?

To answer those questions, the e-bidding system comes up for the solution.

3. Methodology:

This is a qualitative research work. Most of the data (e.g. the existing system of buying and selling, the problems of the farmers etc.) were collected from news, personal observation and experience. Asthe system is an e-commerce platform or a web application, it used several software such as –

- Html and CSS – for theme and layout
- WordPress – for content management
- PHP – as a programming language or coding
- Sublime text- as code editor
- MySQL- for database
- Apache- as web server

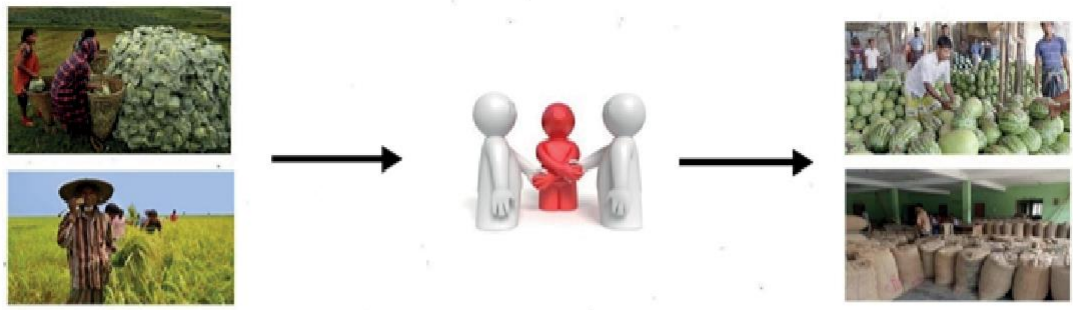
4. Existing System & Requirement Analysis

Requirements analysis is the activity of elaborating basic requirements established during the inception, elicitation and negotiation tasks. Requirements analysis results in the software specification detailing the operational characteristics, interface with other system elements, and constraints that the software must meet (Moertin, Nugroho & Suhok, 2014). Now in a developing country like Bangladesh, the farmers sell their products in a traditional way, a manual way which is –

- Farmer has products
- Middlemen/Intermediary buys it from the farmer
- Middlemen/Intermediarysells it to the wholesaler for selling it to the end user.

Let us show it in a picture-

Figure 1: Current system/existing system



In this traditional buying and selling system, the middlemen always buy the products from the farmer at a very low price and sell it directly to the wholesaler far higher than the buying price. The most shocking thing is this that the middlemen don't own anything, neither the farming land nor the stock. They are not worried about the hard work of the farmer or the business risk of a wholesaler. Without anything he gets the most benefit of all.

There are several systems or e-commerce platformsfor buying/selling agricultural products throughout the world but none of them uses e-bidding. They use fixed price quota for selling products. In e-bidding system, farmers are easily uploading their detail information including pictures & video clips of the agricultural products. After adding a product, when it is ready to publish on the website there will be a button to "bid" with a price range for starting the bid. On the other hand, a buyer needs to bid in order to buy this product. Several or multiple buyer can "bid" on this product. This is how the seller or farmer can get a competitive and fair price because only the farmer has the ability to set price quota.

The functional requirements of this e-commerce platform are-

- Farmer/seller as actor
- E-bidding system as system functionalities
- Wholesaler/buyer as actor

The non-functional requirements are the e-commerce platforms or the websites requirements, such as – coding, database management, domain and hosting etc.

5. Proposed System

The only purpose of this research is to remove the middlemen and give the farmers their right, their right to get the fair price.

After analyzing the problem in agricultural sector in Bangladesh, especially the farmer's problem of getting the fair price of their agricultural products, we propose an online buying and selling system or an e-commerce platform where:

• Farmers\sellers can sell their product directly to the wholesaler/buyer via online

• And in the buying procedure there will be an e-bidding system for negotiation, where the farmer/seller will get competitive price from several interested buyers throughout the country.

With the blessing of the technology, this e-commerce platform of "e-bidding system for agriculture" is going to make a great difference to the agriculture sectors as well as to the farmers who were always left behind to get the fair price from the market.

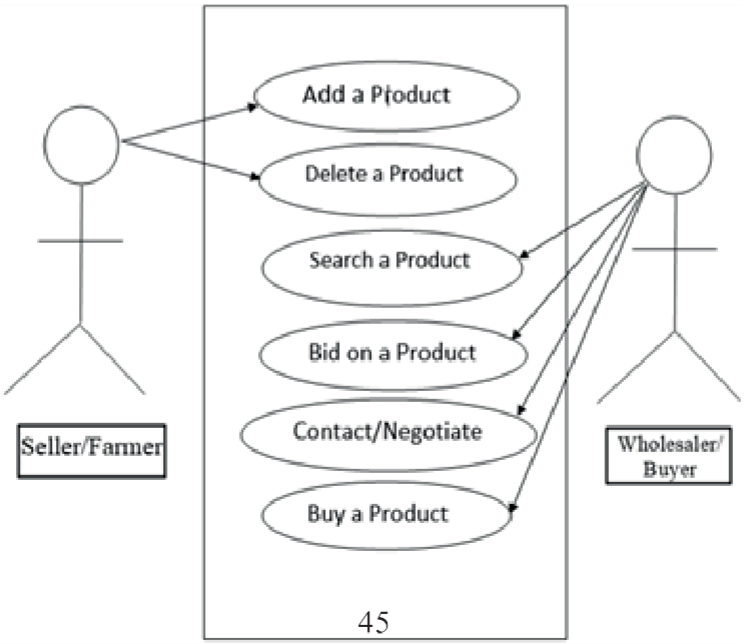
6. System Analysis & Design

System analysis refers to those kinds of activities of producing or creating a specification for a system and then it will be used for system designing (Tudor & Tudor, 2002). System Design refers to those kinds of activities of producing or creating a system based on the system analysis of the proposed system (wikipedia.org, 2016). There is a phrase to summarize analysis & design which is-do the right thing (Analysis) and do the things right (Design). There are several tools to determine the process of the system, but this research paper only discusses the Use Case and Entity-Relationship Diagram (ERD) for proposed system.

A use case diagram is a graphic depiction of the interactions among the elements of a system.

As an e-commerce platform, there must be an actor as buyer or seller and there will be some products which they will buy or sell. E-bidding is just a function to moderate their selling and buying procedure. The figure below can easily show the use case diagram of the system that is developing the proposed system-

Figure 2: Use case for e-bidding



In this diagram, there are two actor-seller and buyer. There are some functionalities. A seller can- add a product and delete the product. And the buyer can – search the product, bid on a product, contact the seller, negotiate with the seller and finally buy the product. The functionalities can be called as the functional requirements of the system. An entity-relationship diagram (ERD) is a graphical representation of an information system that shows the relationship between people, objects, places, concepts or events within that system(Searchcrm.techtarget.com, 2016). The entity relation diagram shows the relation between the entities and its attributes. It also illustrates how the attributes of these entities are stored in the database. It is a pure graphical representation of the whole system.

The system we are developing has four major and two minor entities with their attributes. The 4 major entities are-

- System name
- Seller
- Buyer
- Products

And the two minor attributes are –

- Bid on product
- Bidden product
- Here is the full and final Entity Relation Diagram for our e-bidding system showing the relation between the entities and its attributes-

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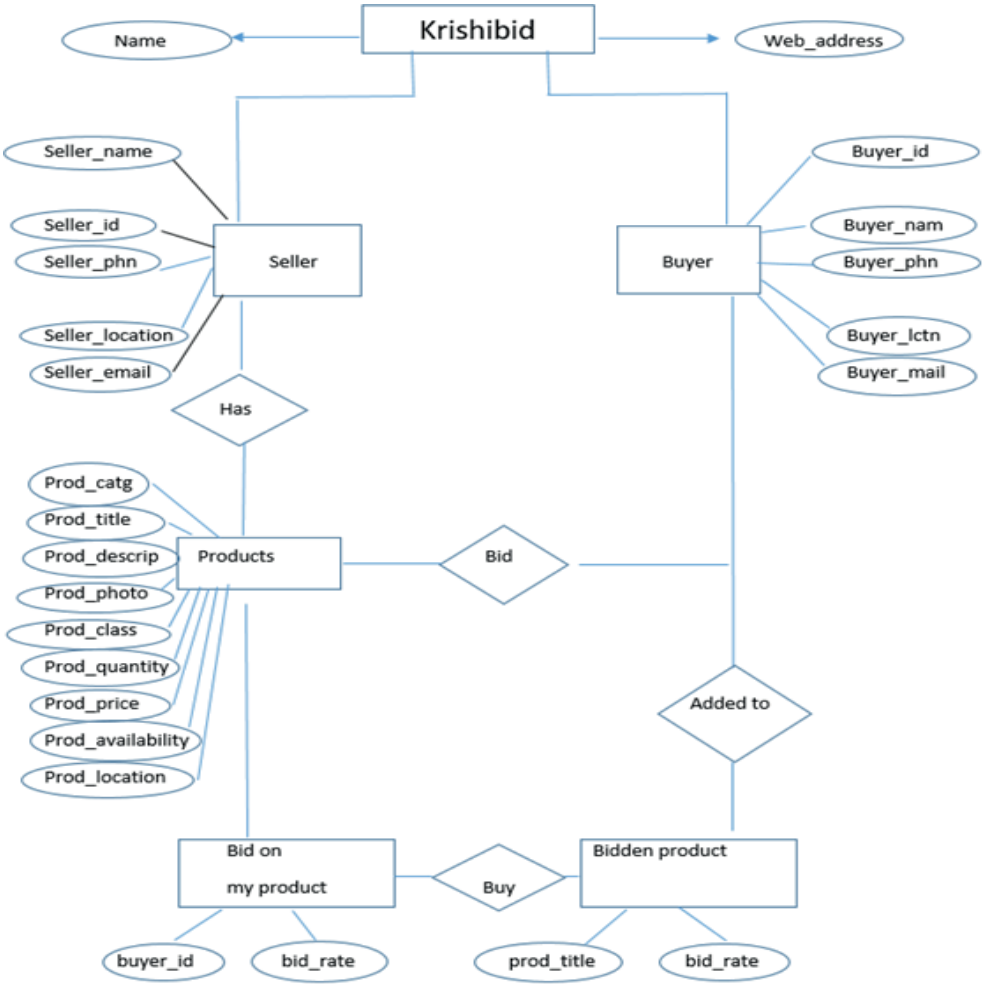
Figure 3: the full ERD



System analysis and design is a great tool in software or system engineering. It is like a blueprint of a system which everyone can understand every word of it, from business management to system developer, designer, analyst, coder or any other stakeholder.

7. System Development

System Development is the core part of any system or software. System development is the process of coding or computer programming, documenting, testing of an application in order to develop the system or application according to requirement and system analysis. System development includes the maintaining and writing the source code of a system or software. Therefore, software development may include research, new development, prototyping, modification, reuse, re-engineering, maintenance, or any other activities that result in software products (Wikipedia.org, 2016).

8. Implementation & Testing

The implementation and testing are in order after successful completion of the development. There are several kinds of software like desktop application, mobile application, and web application. Each type of software testing skills, steps are different from each other. This research paper has analyzed several steps that are essential to test software. This step is important because it helps to check the outputs, test the system for error or mistakes, re-design or re-develop if needed. Only after a successful testing a project is ready to go for implementation and for final release in the market.

Most commonly there are 6 steps for testing in web platform (Gurus99.com, 2016).

- Functionality testing
- Usability testing
- Interface testing
- Compatibility testing
- Performance testing
- Security testing

9. Critical Appraisal

The SWOT analysis is a method or stage where a system/software's Strength, Weakness, Opportunity and Threats are being analyzed. This stage is very important for a software/system performance in future. The research paper has discussed SWOT analysis to know the success of the proposed system as well as lacking of the system for the better understanding of the users and the stakeholder.

Strength –

- User convenient e-commerce platform.
- General language is Bangla. So, it will be easy for the farmers.
- Verified users, farmers (seller) and wholesaler (buyer).
- E-bidding for getting fair and comparable price
- Free from the middlemen

Weakness-

- Different types of users use different types of images of their product, it slows the page loading time.

Opportunities-

- A new and large marketplace for the farmers of Bangladesh.
- It will create employment.

- Going to be a great knowledge-based resource.
- A revolution for the agriculture sector in Bangladesh.
- This e-bidding system can be applied for other platforms too.

Threats-

- Lack of proper technological support
- Infrastructure is still on the developing mode in the root level, specially farmer level.
- Lack of proper knowledge about internet as well as e-commerce or e-bidding system.
- Internet usage rate is still high in Bangladesh.

10. Conclusion

Bidding simply means asking for a comparable price excluding the fixed price quota for a product. Competitiveness among the buyers with a dynamic price is a compulsory issue in e-bidding. Therefore, e-bidding means doing the bid electronically. E-bidding system exists all over the world mostly for the B2B platform or Government Procurement platform. Such as – second hand car industry in UK, Defense Construction in Canada, Power Distribution and Procurement sector in India but for Bangladesh, it is totally a new but could be an effective sector as we are now trying to achieve the Sustainable Development Goals (SDG) in ICT sector. The e-bidding system for agriculture is a part of the research to find a solution to help the poor farmers in developing countries like Bangladesh. As part of the vision 2021 of 'Digital Bangladesh" by the Government of Bangladesh, every sector is going analog to digital such as – e-GP, e-TIN, e-Tender, e-passport etc. all these for making the life better, comfortable, time efficient and less corrupted. Following this digital trend and along with the vision of Government, e-bidding system for agriculture is going to make a huge difference. As Bangladesh is an agricultural country, 47% of its population is directly connected to agriculture and it covers 16% of national GDP, this is the largest sector in Bangladesh. There are several systems/software like mobile helpline, farmer query system, market linkage program, crop diagnostic application, seed variety recommendation, crop statistics app etc. but these are all for pre-production of agriculture. However, our e-bidding system is going to help the farmer and agriculture sector in their post-production stage, get them their rightful, fair and competitive price as they deserve it. E-bidding for agriculture is the first time in Bangladesh and with the right help and support "e-bidding for agriculture" is going to boost up the agriculture sector in the developing countries like Bangladesh. There are over all three types of beneficiaries in this system – the farmer/seller, the wholesaler/buyer and the normal people in the users end. For the farmer, using this e-bidding system can get them a fair price. For the buyer, they can buy product from a farmer with a negotiable price and also buy single or various products

from various farmers and use this system as knowledge based resource. And on the user end, an individual can buy a product with more transparency.
Here are some suggestions for future research –

- Add more categories like livestock, agricultural land, machinery etc.
- Along with original photo, a seller(farmer) could use an original video of his product.
- Mobile apps should be introduced.
- Live messaging (webRTC) and user feedback system.

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