

Current Trends and Future Prospects of Online Bidding in Construction: A Survey of Owners and Contractors Organizations in USA

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Abstract

With the advancements in Information and Communication Technologies (ICT), the use of online bidding is steadily increasing in the construction industry. Online bidding allows contractors to prepare and submit project bids electronically in encrypted format via a secure network, thereby resulting in substantial time and cost savings. This paper will first discuss the concept of online bidding with its advantages over the traditional paper-based bidding. Then two types of online bidding systems, namely traditional online bidding and reserve auction bidding, will be discussed with their pros and cons. At the end, findings of a research project which investigated the current status and future prospects of online bidding in the U.S. construction industry will be presented.

Keywords

Online bidding, Reverse auctions, Bidding process, Information technology

1. Introduction

The bidding process is one of the most important phases of a construction project. The major objective of construction companies is to expand business volume by successful bidding on projects. For this purpose, companies must prepare bid proposals very carefully. The traditional bidding process is time consuming and requires substantial monetary and human resources. With the advancements in Information and Communication Technologies (ICT), the use of online bidding (also called E-bidding) systems is steadily increasing in the construction industry. Online bidding system allows contractors to prepare and submit project bids electronically in encrypted format via a secure network, thereby resulting in substantial time and cost savings. Many client organizations in the United States are now requiring the use of online bidding for their projects and its popularity continues to grow (Teel, 2007).

Online bidding was first introduced in the early 1990's with small one-way bid programs. One-way electronic bid systems allowed bid packages to be downloaded from a website, with bids returned on paper, and sometimes with a requirement that they be accompanied by files on a disk (Sawyer, 2001). These programs were designed to increase the efficiency and ease to which contractors could receive bid packages. As the construction industry has progressed, so has the technology. In 1993 the first two-way online bidding system was developed for the Georgia State Department of Transportation. This system

allowed bidders to submit a bid through an online bidding system, and permit clients to receive and open bids online. Two-way online bidding systems do not allow any other bidders, nor the client, to view the bid prices until the due date and time. This setup ensures the security of the system to stop any act of fraud and hacking. Figure 1 explains the concept of two-way online bidding.

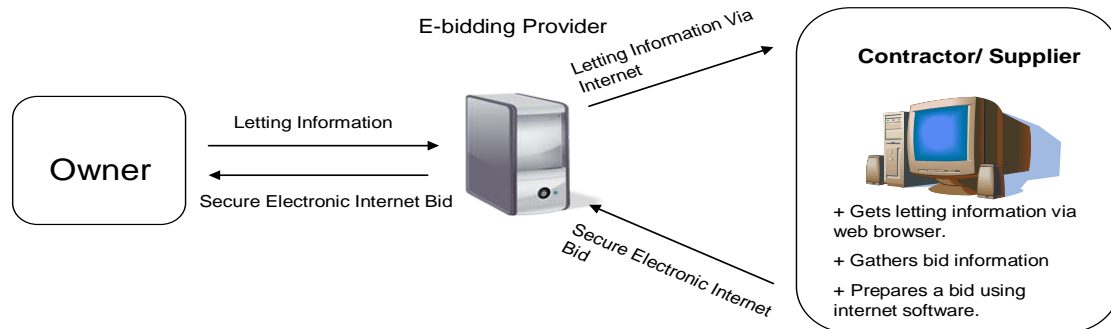


Figure 1: How the Two-Way Online Bidding Systems Work!

Online bidding has several advantages over the traditional paper-based bidding. The traditional method demands a person (or persons) carry the final bid and subsequent documents to the bid opening location. Obviously this creates the risk of car trouble, personal injury, or some other unforeseen circumstances that may inhibit the bid from being delivered on time. Though some of these concerns may have least probability of occurrence, anyone who has worked in the construction industry could probably testify to one of these situations. On the contrary, online bidding can reduce risk and save crucial time as evident from the following example (Sawyer, 2001).

“Late one night, a Kentucky specialty contractor bidding a \$2-million guardrail job in Georgia learned that one of its suppliers had dropped a key price. The bids were scheduled to be opened in just a few hours in Atlanta, and the contractor had to act fast. The company president didn't sweat it. He went on the Internet, recalled his bid, changed it and won the work.”

2. Types of Online Bidding

There are two types of two-way online bidding namely *Traditional Online Bidding (TOB)* and *Reverse Auction Bidding (RAB)*. The following sections will explain each type with its pros and cons.

2.1 Traditional Online Bidding

Traditional Online Bidding (TOB) allows contractors to prepare and submit project bids electronically in encrypted format. The contractors can edit their bids till the last moment to incorporate latest prices of various items. However, the bid price is revealed to other bidders only at the time of bid opening. For example, a general contractor may be asked to submit a bid on the 1st of March at 2:00 p.m. The general contractor will prepare and submit the bid on the internet via a secure network. The bid cannot be seen or previewed by the owner, or competing contractors, until 2:00 p.m. on March 1st.

In the United States, one of the commonly used systems for traditional online bidding is *Bid Express* (www.bidx.com). Bid Express uses several security features to insure the security of the submitted bid information. Strong encryption methods are used which make files unreadable if they are intercepted. An owner does not receive electronic bids until the bid opening. Before the bid opening, the bid data is maintained in a “locked box” by Bid Express (Williams, 2007).

2.2 Reverse Auction Bidding

In the Reverse Auction Bidding (RAB), each bidder's price is displayed to other bidders, and bidders may modify their bids based on the price quotes submitted by other bidders. An example of this situation would include general contractor X submitting a bid for \$10,000 and then general contractor Y recognizing that bid price and submitting his bid for a lower amount such as \$9,000. This process would continue until 2:00 p.m. on March 1st. At this time the bidding contractors would no longer be allowed to adjust their bids and the lowest bidder would be selected. There are many online auction service providers. Two examples are Hedgehog (www.hedgehog.com) and Iasta (www.iasta.com).

Typically the only information given to the bidding contractors during RAB process is that a new lower number has been submitted, whereas the identity of the contractor submitting the number is not revealed. This bidding process has been used throughout the United States for products and materials, but is now being used on a limited basis for construction services. Table 1 summarizes the pros and cons of reverse auction bidding as suggested by a study from the National Electrical Contractors Association (NECA).

Table 1: Pros and Cons of Reverse Auction Bidding (Source: NECA, 2002)

Reverse Auction Bidding		
Category	Pros	Cons
Cost	Creative Solutions/ Estimating	Overly Optimistic
Bid	Cut Contractor Profit	Contractor Default
Value/ Commodities/ Service	Low Price/ Contract Assured Value	Construction NOT a Commodity

Reverse auction bidding generally has received poor reviews from the contractors. Many contracting organizations argue that the reverse auction process encourages contractors to initially submit inflated prices and that the final low bid price obtained from the auction is not guaranteed to be the best price. Alternatively, it may be possible that a highly competitive market forces contractors to submit unrealistically low prices that will require them to construct the project at low quality (Williams, 2007).

Of the two online bidding types, the traditional online bidding is widely accepted and commonly used by owner and contracting organizations in the United States.

3. Current Trends and Future Prospects of Online Bidding

To investigate current trends and future prospects of online bidding in the U.S. construction industry, a questionnaire survey was conducted. The questionnaire was designed based on the skip-logic method, in which the selection of the next question is based on the answer of the previous question. The skip-logic method prevents respondents from answering questions which they are not qualified to answer. The questionnaire was divided into five sections as follows: (1) Company's background; (2) Information about bidding methods; (3) Information about online bidding, if used; (4) Perceptions of users about online bidding; and (5) Reasons for not using online bidding.

The questionnaire was sent to 211 randomly selected owner and contracting organizations in the United States. Forty four (44) valid responses were received till the survey closing date yielding a response rate of 21%. Key findings of this survey are as follows:

Of the 44 respondents, 20 (46%) were owner organizations while 24 (54%) were contracting organizations thus representing a good mix of both organization types. Thirty four percent (34%) of

respondents were using online bidding in majority of their projects at the time of survey. Of these 34% respondents, 92% were using traditional online bidding while only 8% were using reverse auction bidding as shown in Figure 2. These statistics supported our initial hypothesis that the majority of construction organizations in the United States are using traditional online bidding methods.

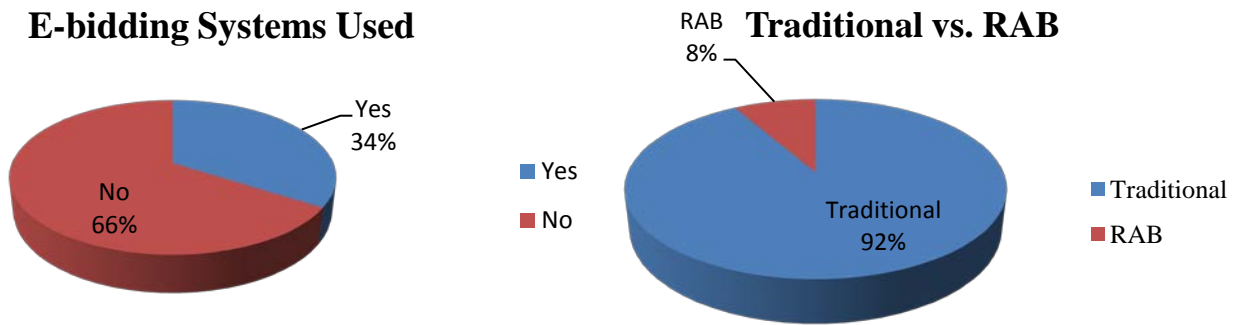


Figure 2: Usage of Online Bidding Systems in the United States' Construction Industry

When asked about the reliability of online bidding systems, all respondents were agreed that the online bidding systems are reliable and secure. Table 2 indicates the respondents' opinions about online bidding as compared to the traditional bidding.

Table 2: Respondent's Satisfaction about Online Bidding

Statement	Agreement Level ¹	
	Mean	Standard Deviation
Online bidding is more reliable and secure than the traditional bidding	5.0	0.0
Online bidding is economical than the traditional bidding	4.0	1.0
Online bidding process is more productive than the traditional bidding	4.5	0.5
I plan to use online bidding in all future projects	4.5	0.50

¹Agreement level was measured on a scale of 1-5 where 1 represents strongly disagreed and 5 represents strongly agreed.

For the sixty six percent (66%) respondents who were not using online bidding at the time of survey, the major reasons were:

- Clients do not require online bidding
- Data security concerns
- High implementation costs

- Do not know about online bidding

However, 75% of these respondents indicated that they might use (or would like to try) online bidding in their future projects.

4. Concluding Remarks

The research results indicated that the online bidding is a reliable, cost effective and more productive alternate to the traditional paper-based bidding. Online bidding offers many benefits to contractors such as capability of easily obtaining project plans and documentation at a low-cost, and reduced bidding costs because it is not necessary for anyone to travel to an owner's office to submit a bid. Of the two types of online bidding, the traditional two-way bidding systems are used by majority of construction organizations. Though some owners are also using reverse auction bidding but it has not received good reviews from the construction stakeholders. Based on the results of the questionnaire survey and other anecdotal evidences it may be predicted that the online bidding can replace traditional paper-based bidding in the next 10-20 years. Such change would help to improve the productivity of the construction industry.

References

- National Electrical Contractors Association (NECA). (2002). "NECA's Minneapolis Chapter Explores "Reverse Auction Bidding" Online at <http://www.necanet.org/news/index.cfm?fa=show&articleID=626>, Accessed on November 26, 2009
- Sawyer, T. (2001). "States Turn onto Web for Highway Bidding." *Engineering News Record*, 246 (8), 53-54.
- Teel, J. (2007). *E-bidding in the Construction Industry: The Current State*, unpublished capstone project, Auburn University, Auburn, Alabama
- Williams, T. (2007). *Information Technologies for Construction Managers, Architects, and Engineers*. Thomson Delmar Learning, Ney York