An Indepth Understanding of e-Procurement: A Case Study Approach

Shaikh Imtiyaj, N.R Biswal, T.P Ray, Dr A.K Hota
Dept. of CSE, C.V. Raman College of Engineering, BPUT, Bhubaneswar, Odisha, India
Scientist, Ministry of Electr & IT, Bhubaneswar, Odisha, India
Scientist, Ministry of Electr & IT, Bhubaneswar, Odisha, India
Scientist, Ministry of Electr & IT, Bhubaneswar, Odisha, India

I.   Introduction:

The science market has become open and accessible to all in the international community without any restriction; the rapid explosion in Information Technology has played a vital role in this mission. The use of Information Technology particularly web based internet applications to enhance the access to and delivery of government information and services to their citizens, public agencies, employees, business partners, financial institutions and government departments. The rapid growth of competition in the market and the consequent changes in economic conditions impose organizations and firms to implement new technologies to stay competitive. The Central, State Government, Judiciary, Autonomous Bodies, Boards & Corporations, PSUs, Joint Ventures, Statutory Bodies, Commissions and Councils have invested in numerous initiatives throughout the length and breadth of the country aimed at extending the benefits of information revolution to rural and remote area. The Government envisions providing good governance by establishing a Committed, Accountable, Responsive, Inspiring, Nationalist, and Genuine Government - CARING Government. e-Procurement is one of the best vehicles that are being gainfully used in reaching the goal of CARING governance

The rapidly changing pace of the global business world compels organizations to take quick, decisive action when considering new technological developments. The technological developments and movement toward a global marketplace over the past decade have forced companies to restructure their business practices in order to gain competitive advantage or even to survive. One aspect of the restructuring has been the transition of several business processes into the electronic environment of cyberspace, commonly referred to as e-Business. While e-Business includes all aspects of doing business in an electronic environment, two specific areas deal primarily with external transactions, specifically the e-Commerce and e-Procurement processes. The benefits include decreased administration and overhead costs, decreased labor hour cost per transaction, more accurate and timely business intelligence, more timely payment, and enhanced cash flow management. However the most striking benefit will be to get organizations to analyze their procurement processes.

e-Governance : Objective
◆ Providing information speedily to all citizens
◆ Improving transparency
◆ Improving public services such as transportation, power, health, water, security and municipal services etc.
◆ Reduce Corruption

e-Governance development models :
The e-Governance Models are
◆ G2C : Government to Citizens
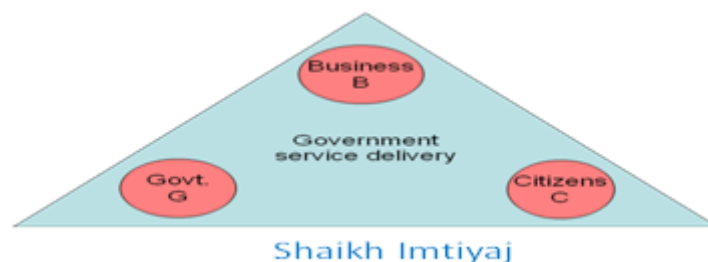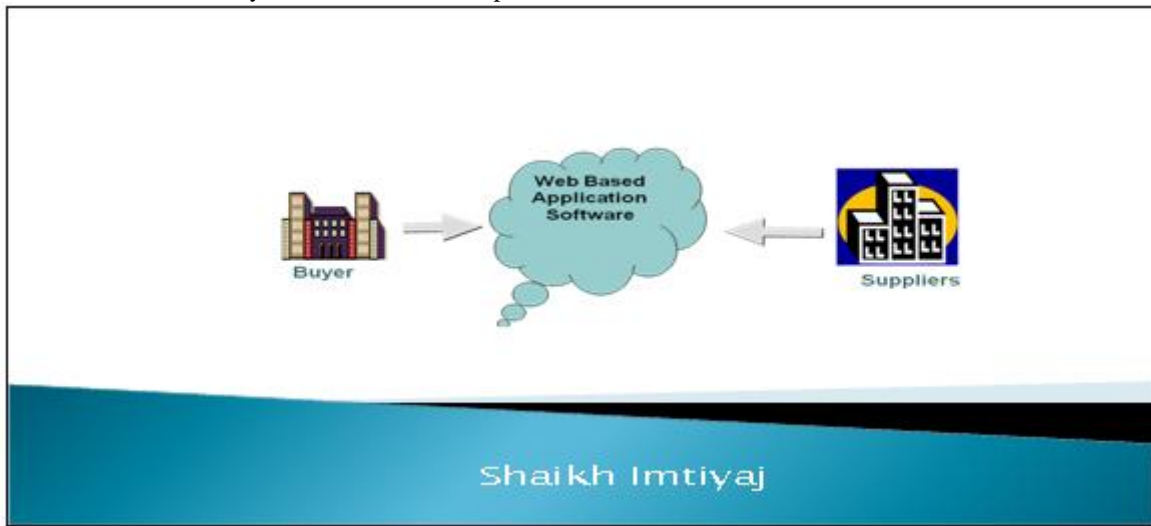◆ G2B : Government to Business
◆ G2G : Government to Government

Figure 1: Governance Development Model

e-Procurement :
A major Government to Business e-Governance initiative to bring transparency in public procurement process is e-Procurement.
e-Procurement, commonly known as Electronic procurement.

Figure 2: e-Procurement Cycle

e-Procurement is the business-to-business or business-to-consumer or business-to-Government purchase and sale of Supplies, Works and Services using the Internet. e-Procurement caters to the online tendering process from online tender creation to award of contract(AOC). Using e-Tendering the Departments can create the tender, publish the tender, receive bids, open the tenders, evaluate tenders and finally publish award of contract. Using e-Tendering, the bidders can search tenders, submit bids online and track the status of their bids. Timely and efficient delivery of e-Governance services is an important aspect. Indian IT-Act 2000 has mandated the usage of Digital Signature Certificate (DSC) for e-Procurement.

e-Tendering Process :
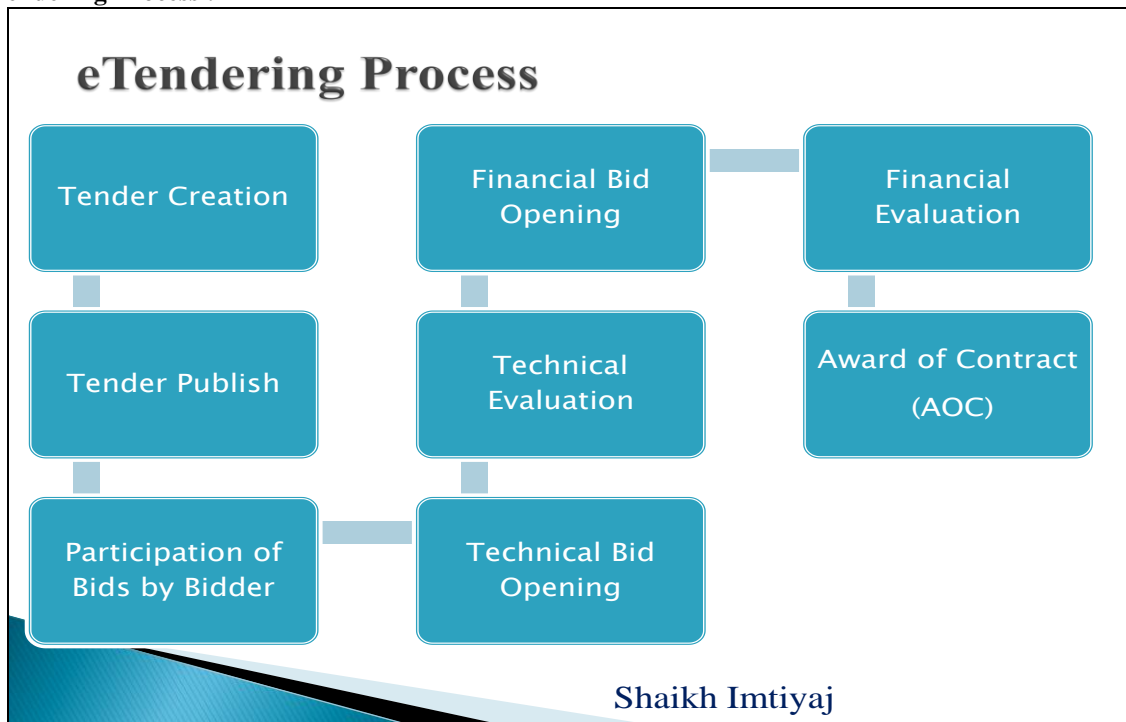
Figure 3: e-Tendering Process

e-Procurement: Responsibilities

- **Creater of the Tender: -** The Tender will be created by the officer by using his/her Digital Signature Certificate, as per approved by the Department Nodal Officer.
- **Publisher of the Tender**:- He will be normally the Head of the Dept (HOD) of the concerned technical department and will be the responsible person for timely and accurately hosting of tender on the portal
- **Opener of the Tender:** - The tender will be decrypted and opened with the Digital Signature Certificates of each opener as identified during publishing the tender. Each opener will have to access one by one for bid opening. The Tender technical core committee members will be normally the openers of tender as decided by the Nodal Officer.
- **Evaluator of the Tender: -** The Evaluator is the person who will evaluate the tenders and upload the final decision of the Tender Evaluation Committee.
- **Auditor:** He will be given privileged access to audit tendering process.

Benefits of e-Procurement:
For data encryption and security purposes, the Digital Signature Certificate is essential to operate in e-Procurement.
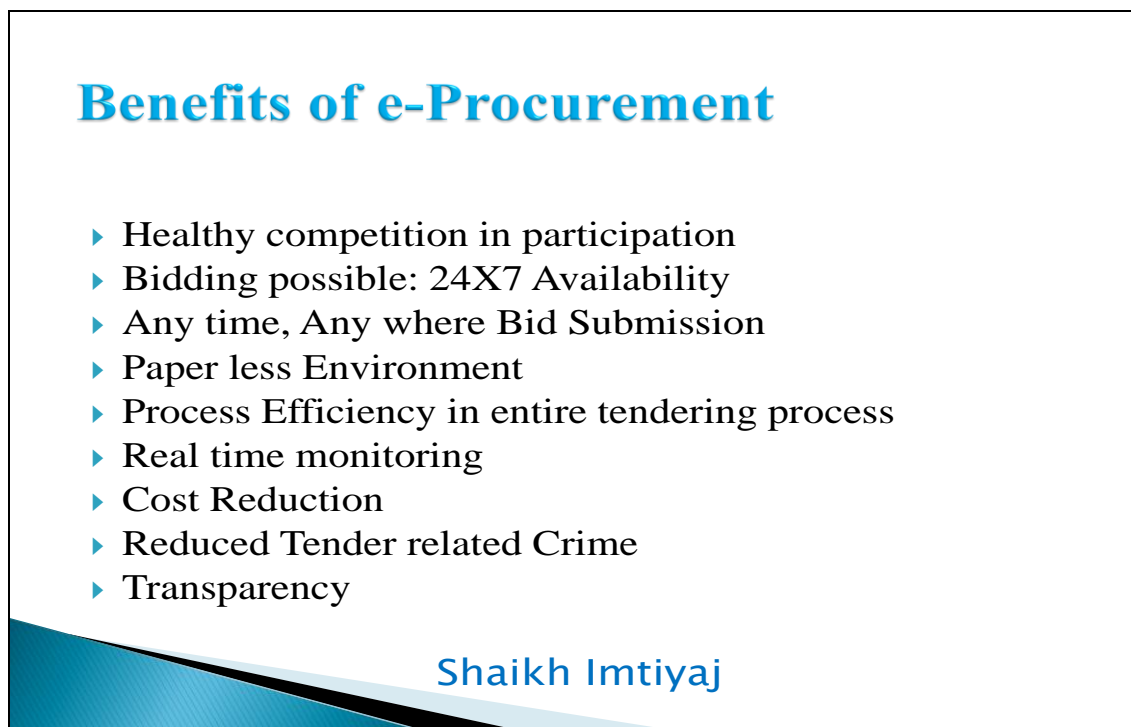
Figure 4: Benefits of e-Procurement

e-Procurement Risk :

   Digital Signature Certificates (DSC) can be presented electronically to prove the identity, to access information or services on the Internet or to sign certain documents digitally. DSC provides Authorization, Authentication, Privacy, Non repudiation and Integrity. IT Act 2000 in Government of India gives legal validity to electronic transactions that are digitally signed. A DSC provides high level of security for online transactions. You can use certificates to encrypt information such that only the intended recipient can read it. You can digitally sign information to provide assurance to the recipient that it has not been altered in transit, and enable verification that you actually sent the message.

e-Procurement Trends in India :

Figure 5: e-Procurement Trends in India

Algorithm Implementation:
DSC is based on MD5 algorithm from Cryptography. MD5 is Message Digest algorithm, which takes as input a message of arbitrary length and produces as output a 128-bit "message digest" of the input. MD5 is more secure than MD4.

```
import java.security.*;
class Md5FeeduDemoTest {
  public static void main(String[] a) {
    try {
      MessageDigest md = MessageDigest.getInstance("MD5");
      System.out.println("Message Digest5 information: ");
      System.out.println("   Algorithm = "+md.getAlgorithm());
      System.out.println("   Provider = "+md.getProvider());
      System.out.println("   toString = "+md.toString());

      String input = "";
      md.update(input.getBytes());
          byte[] output = md.digest();
      System.out.println();
      System.out.println("MD5(\""+input+"\") =");
      System.out.println("   "+bytesToHex(output));

      input = "xyz";
      md.update(input.getBytes());
          output = md.digest();
      System.out.println();
      System.out.println("MD5(\""+input+"\") =");
      System.out.println("   "+bytesToHex(output));

      input = "abcdefghijklmnopqrstuvwxyz";
      md.update(input.getBytes());
          output = md.digest();
```

```
            System.out.println();
            System.out.println("MD5(\""+input+"\") =");
            System.out.println("   "+bytesToHex(output));

        } catch (Exception e) {
            System.out.println("Exception: "+e);
        }
    }
  }
  public static String bytesToHex(byte[] b) {
    char hexDigit[] = {'0', '1', '2', '3', '4', '5', '6', '7',
                '8', '9', 'A', 'B', 'C', 'D', 'E', 'F'};
    StringBuffer buf = new StringBuffer();
    for (int j=0; j<b.length; j++) {
      buf.append(hexDigit[(b[j] >> 4) & 0x0f]);
      buf.append(hexDigit[b[j] & 0x0f]);
    }
    return buf.toString();
  }
}
```

Conclusion and Future Work:

e-Procurement reduces the tender related crimes is certainly a significant achievement on the way to a better, cleaner, honest and developed nation. This study focuses on different opportunities of G2B initiatives in India. The basic objective of research is to provide a model for better implementation of e-Governance application.

References

[1].   Shaikh Imtiyaj, N.R Biswal, T.P Ray, Dr A.K Hota , "Digital Signature Certificate: A blessing for e-Governance Application in Human Development", International Journal of Advanced Research in Science, Engineering and Technology,Vol. 2, Issue 1 , pp 350-355,January 2015
[2].   William S.," Cryptography and Network Security, Principles and Practice", Prentice Hall of India, 2005.
[3].   Dhiren R. Patel ,"Information Security Theory and Practice" , 2008 Edition
[4].   Atul Kahate, "Cryptography and Network Security", Second Edition
[5].   Cryptography Engineering: Design Principles and Practical Applications by Niels Ferguson, Bruce Schneier, Tadayoshi Kohno
[6].   www.eprocure.gov.in/eprocure/app, last visited 07th Dec 2015
[7].   https://tendersodisha.gov.in/nicgep/app , last visited 07th Dec 2015
[8].   "Digital Signature," available at: http:// http://nicca.nic.in , last visited 05th Feb 2015
[9].   "e-Governance," available at http:// india.gov.in , last visited 07th Dec 2015
[10]. "e-Procurement," available at http:// demoeproc.nic.in , last visited 07th Dec 2015