PKI in e-Procurement: A Case Study

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Under the Aegis of

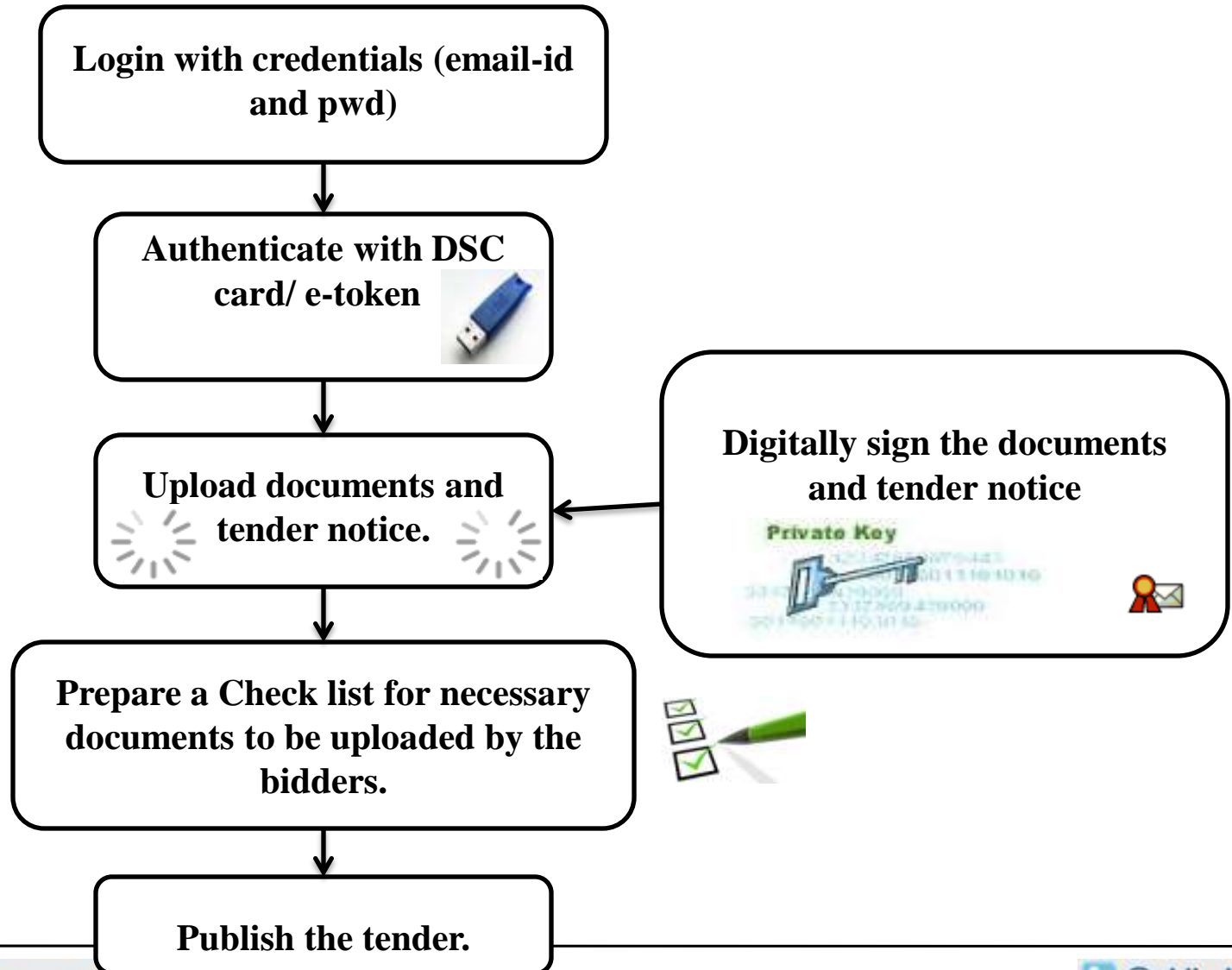**Controller of Certifying Authorities (CCA)**
Government of India

Agenda

- Tender Creation
- Bid Submission
- Bid Opening
- Technical Evaluation
- Financial Evaluation
- Award of Contract

Tender Creation Flow

Login with credentials (email-id and pwd)

Authenticate with DSC card/ e-token

Upload documents and tender notice.

Digitally sign the documents and tender notice

Private Key

Prepare a Check list for necessary documents to be uploaded by the bidders.

Publish the tender.

Tender Creation Flow

WELCOME

PLEASE ENTER USERNAME AND PASSWORD

EMAIL ID : tenderer@gmail.com

PASSWORD : ****************

SUBMIT

Tender Creation Flow

WELCOME
TO
E-PROCUMENT

Authenticate with DSC e-token

Tender Creation Flow

WELCOME
TO
E-PROCUMENT

TENDER NOTICE
Bids invited for supply and installation…….

Digitally sign the documents and tender notice.

Tender Creation Flow
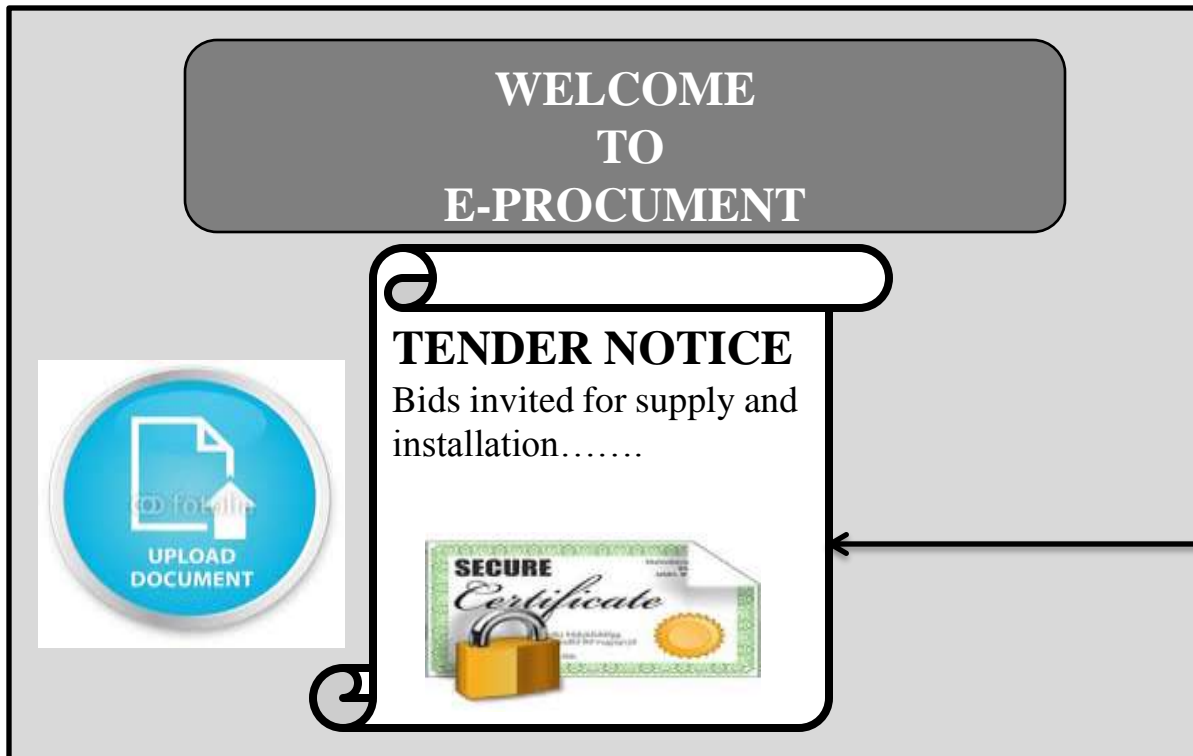
**WELCOME
TO
E-PROCUMENT**

Check list for necessary documents to be uploaded by the bidders.

✓ **Document for technical specification.**

✓ **Document for financial specification.**

Tender Creation Flow

WELCOME
TO
E-PROCUMENT

☑ **Notice inviting tender for procurement of item1.**

PUBLISH

Bid Submission Flow

Login with credentials (email-id and pwd) → **Authenticate with DSC card/ e-token**

Authenticate with DSC card/ e-token → **View tender**

View tender → **Proceed for bid submission.**

Proceed for bid submission. → **Upload necessary documents**

Digitally sign the documents
Private Key

Digitally sign the documents → **Upload necessary documents**

Upload necessary documents → **Freeze bid submission.**

NOTE: The documents that are uploaded by the bidder are encrypted with tenderer's public key, so that tenderer can only decrypt.

Public Key

Bid Submission Flow

BIDDER LOGIN

WELCOME

PLEASE ENTER USERNAME AND PASSWORD

EMAIL ID :   bidder@gmail.com

PASSWORD :   ****************

SUBMIT

Bid Submission Flow

BIDDER AUTHENTICATION

**WELCOME
TO
E-PROCUMENT**

Authenticate with DSC e-token

Bid Submission Flow

BIDDER VIEW TENDER

WELCOME TO E-PROCUMENT

Bidder proceeds for bid submission.
Notice inviting tender for procurement item1.

Notice inviting tender for procurement

Notice inviting tender for procurement

Document 1
Technical specification: abcdef
Price:12345

Document 2
Technical specification: uvwxy
Price:98765

Bid Submission Flow

BIDDER ENCRYPT THE DOCUMENT

**WELCOME
TO
E-PROCUMENT**

Bidder encrypt the documents with the public key of the tenderer.

Document 1

Technical specification: abcdef

Price:12345

Encrypted Document

jaskhfIashfk jfdkjahfwaia fkjainag

Bid Submission Flow

BIDDER SUBMIT TENDER

**WELCOME
TO
E-PROCUMENT**

✓ **Your bid has been successfully submitted.**

Bidder freezes the bid and no modification can be done.

Freeze It

SUBMIT

Tender Bid opening Flow

Login with credentials (email-id and pwd) → **Authenticate with DSC card/ e-token** → **Decrypt bids.**

Open bid. → **Verify the documents of the bidder.** → **Process conformation.**

Digitally sign the documents and tender notice → **Upload technical bid opening date.** → **Submit**
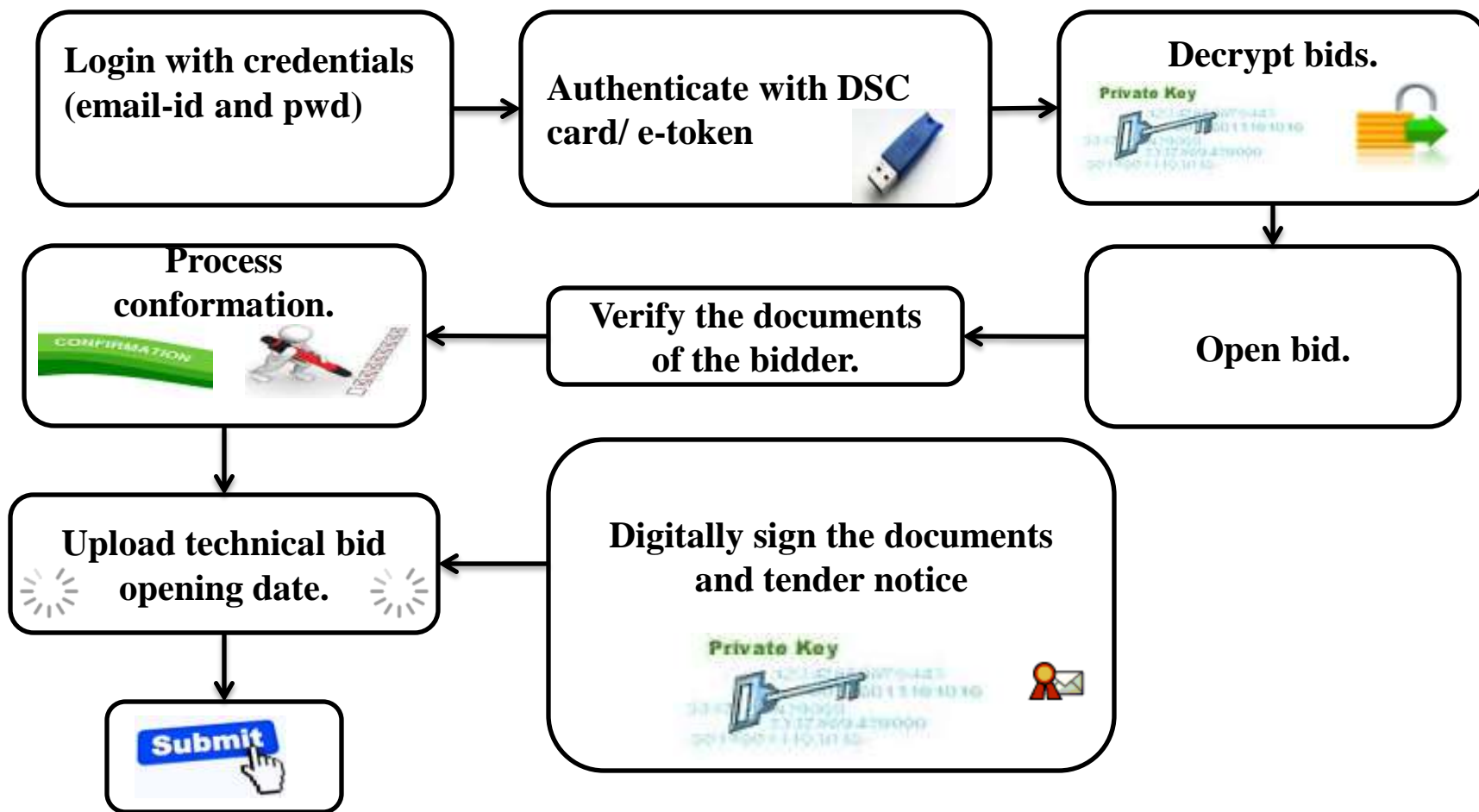
Tender Bid opening Flow

TENDERER LOGIN

WELCOME

PLEASE ENTER USERNAME AND PASSWORD

EMAIL ID : tenderer@gmail.com

PASSWORD : ****************

SUBMIT

Tender Bid opening Flow

TENDERER AUTHENTICATION

WELCOME
TO
E-PROCUMENT

Authenticate with DSC e-token

Tender Bid opening Flow

TENDERER DECRYPTS AND OPENS BID

**WELCOME
TO
E-PROCUMENT**

Decrypt the bids that has been submitted by the private key of the tenderer.

Open the bids that has been submitted.

Tender Bid opening Flow

TENDERER VERIFIES DOCUMENTS

WELCOME
TO
E-PROCUMENT

Verification of documents of the bidder.

Document 1
submitted by bidder.

Document 2
submitted by bidder.

Tender Bid opening Flow

WELCOME TO E-PROCUMENT

Select the technical bid opening date: 28/04/2015

☑ **Technical bid opening date has been uploaded successfully.**
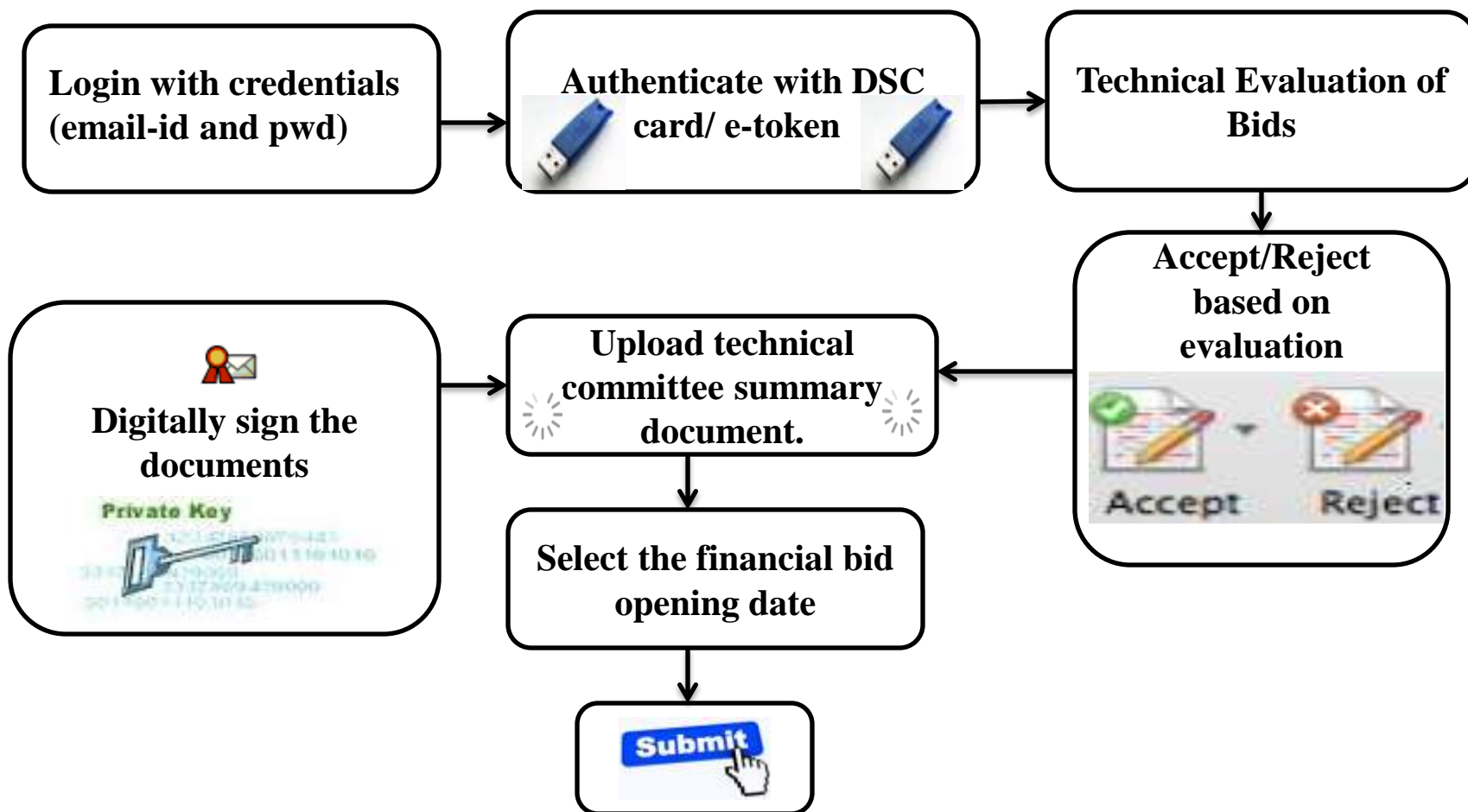
SUBMIT

Technical Evaluation flow

Login with credentials (email-id and pwd) → **Authenticate with DSC card/ e-token** → **Technical Evaluation of Bids**

Accept/Reject based on evaluation

Accept — Reject

Digitally sign the documents

Private Key

Upload technical committee summary document.

Select the financial bid opening date

Submit

Technical Evaluation flow

TENDERER LOGIN

WELCOME

PLEASE ENTER USERNAME AND PASSWORD

EMAIL ID : tenderer@gmail.com

PASSWORD : ****************

SUBMIT

Technical Evaluation flow

TENDERER AUTHENTICATION

**WELCOME
TO
E-PROCUMENT**

Authenticate with DSC e-token

Technical Evaluation flow

CCA

CDAC

TENDERER EVALUATE BID

WELCOME TO E-PROCUMENT

Technical evaluation of bids.

EVALUATION

Accept or reject the bid.

ACCEPTED

REJECTED

Technical Evaluation flow

TENDERER ACCEPT OR REJECT BID

WELCOME
TO
E-PROCUMENT

Technical evaluation of bids.

Accept or reject the bid.

Technical Evaluation flow

TENDERER UPLOADS SUMMARY

**WELCOME
TO
E-PROCUMENT**

**TECHNICAL
COMMITTEE
SUMMARY
DOCUMENT**

UPLOAD DOCUMENT

SECURE Certificate

Digitally sign the technical committee summary document.

Digital Signature Certificate

Technical Evaluation flow

QUALIFICATION OF BIDS

**WELCOME
TO
E-PROCURMENT**

N number of bids are received. Among the received bids **X** number of bids qualify for next round.

☑ Quotation from bidder 1.

☐ Quotation from bidder 2.

☑ Quotation from bidder 3.

.
.

☐ Quotation from bidder 4.

☑ Quotation from bidder 5.

Technical Evaluation flow

TENDERER SUMBITS SUMMARY
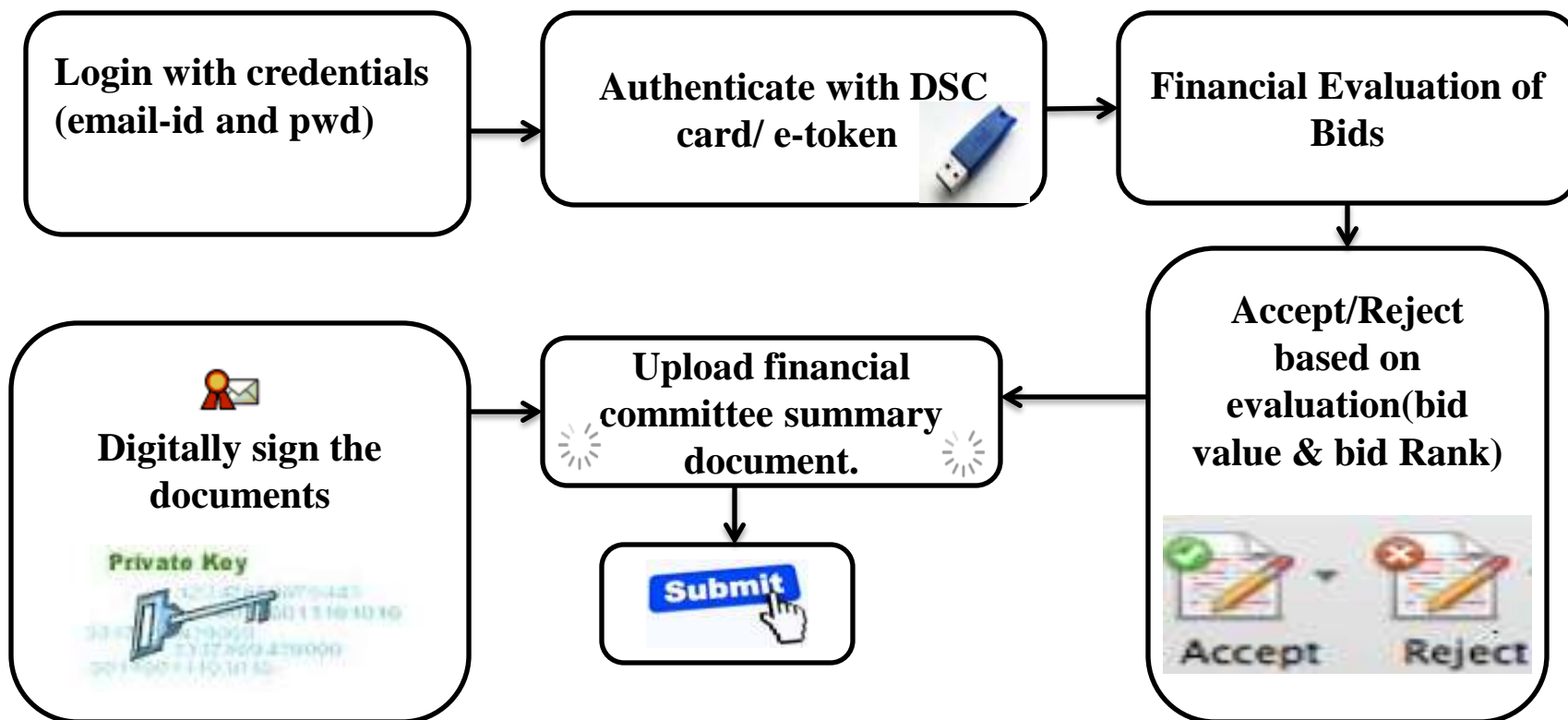
**WELCOME
TO
E-PROCURMENT**

Select the financial bid opening date: 30/04/2015

☑ **Financial bid opening date has been uploaded successfully.**

SUBMIT

Financial Evaluation flow

```
┌─────────────────────┐      ┌─────────────────────┐      ┌─────────────────────┐
│ Login with          │      │ Authenticate with   │      │ Financial           │
│ credentials         │ ───▶ │ DSC card/ e-token   │ ───▶ │ Evaluation of Bids  │
│ (email-id and pwd)  │      │                     │      │                     │
└─────────────────────┘      └─────────────────────┘      └─────────────────────┘
                                                                     │
                                                                     ▼
┌─────────────────────┐      ┌─────────────────────┐      ┌─────────────────────┐
│ Digitally sign the  │ ───▶ │ Upload financial    │ ◀─── │ Accept/Reject       │
│ documents           │      │ committee summary   │      │ based on            │
│                     │      │ document.           │      │ evaluation(bid      │
│ Private Key         │      │                     │      │ value & bid Rank)   │
│                     │      │      Submit         │      │  Accept   Reject    │
└─────────────────────┘      └─────────────────────┘      └─────────────────────┘
```

Financial Evaluation flow

TENDERER LOGIN

WELCOME

PLEASE ENTER USERNAME AND PASSWORD

EMAIL ID : tenderer@gmail.com

PASSWORD : ****************

SUBMIT

Financial Evaluation flow

TENDERER AUTHENTICATION

**WELCOME
TO
E-PROCUMENT**

Authenticate with DSC e-token

Financial Evaluation flow

TENDERER EVALUATE BID

**WELCOME
TO
E-PROCUMENT**

Financial evaluation of bids.

Accept or reject the bid.

Financial Evaluation flow

TENDERER ACCEPT OR REJECT BID

**WELCOME
TO
E-PROCUMENT**

Financial evaluation of bids.

Accept or reject the bid.

Financial Evaluation flow

TENDERER UPLOADS SUMMARY

WELCOME
TO
E-PROCUMENT

FINANCIAL COMMITTEE SUMMARY DOCUMENT

UPLOAD DOCUMENT

SECURE Certificate

Digitally sign the financial committee summary document.

Digital Signature Certificate

Financial Evaluation flow

TENDERER SORTS THE BIDS

**WELCOME
TO
E-PROCUMENT**

Tenderer sorts the bids based on the quote value.

1. Quotation from bidder2 of value Rs.20000.

2. Quotation from bidder1 of value Rs.22000.
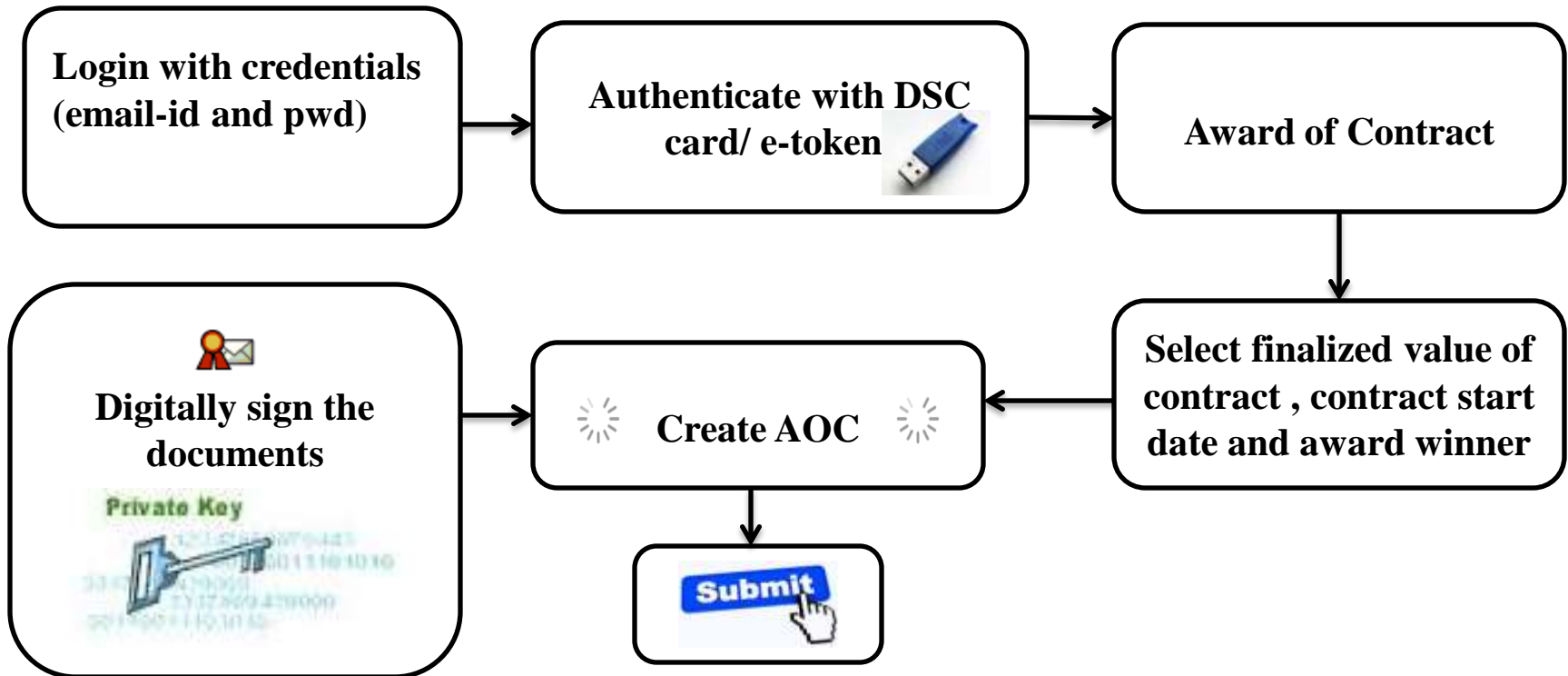
3. Quotation from bidder3 of value Rs.23000.

Financial Evaluation flow

TENDERER SUBMITS SUMMARY

**WELCOME
TO
E-PROCUMENT**

☑ **Financial committee summary document been uploaded successfully.**

SUBMIT

Award of Contract (AOC) flow

```
┌─────────────────────────┐      ┌─────────────────────────┐      ┌─────────────────────────┐
│ Login with credentials  │ ───> │ Authenticate with DSC   │ ───> │   Award of Contract     │
│ (email-id and pwd)      │      │ card/ e-token           │      │                         │
└─────────────────────────┘      └─────────────────────────┘      └─────────────────────────┘
                                                                                │
                                                                                ▼
┌─────────────────────────┐      ┌─────────────────────────┐      ┌─────────────────────────┐
│  Digitally sign the     │ ───> │      Create AOC         │ <─── │ Select finalized value  │
│  documents              │      │                         │      │ of contract , contract  │
│  Private Key            │      │                         │      │ start date and award    │
│                         │      │                         │      │ winner                  │
└─────────────────────────┘      └─────────────────────────┘      └─────────────────────────┘
                                             │
                                             ▼
                                         ┌────────┐
                                         │ Submit │
                                         └────────┘
```

Award of Contract

TENDERER LOGIN

WELCOME

PLEASE ENTER USERNAME AND PASSWORD

EMAIL ID : tenderer@gmail.com

PASSWORD : ****************

SUBMIT

Award of Contract

TENDERER AUTHENTICATION

**WELCOME
TO
E-PROCUMENT**

Authenticate with DSC e-token

Award of Contract

AWARD OF CONTRACT

**WELCOME
TO
E-PROCUMENT**

AWARD OF CONTRACT

Value of contract: 20000

Contract start date: 25/04/2015

Contract award winner: XYZ Pvt. Ltd

Award of Contract

TENDERER CREATE AOC

WELCOME
TO
E-PROCUMENT

Create Award Of Contract(AOC)

AWARD OF CONTRACT

Contract of the tender is given to XYZ Pvt. Ltd

SECURE
Certificate

Digitally sign the award of contract.

Digital Signature Certificate

Technical Evaluation flow

TENDERER UPLOADS NOTICE

WELCOME
TO
E-PROCURMENT

☑ The contract has been given to XYZ Pvt. Ltd..

SUBMIT

Thank You

pki@cdac.in