



Digital Transformation of Technical Bid Evaluation Process Using Artificial Intelligence

Introduction

Before we dive into the technical nuances of bid evaluation, it will behoove us to take a step back and understand the context. Bid evaluations are time tested techniques used to determine the most suitable offer for your needs. We use these in everyday lives as well, for purchase of high ticket items or services, with mostly back of the napkin calculations helping us make decisions. It becomes a trifle more challenging as the items or services become larger and more complex, like for instance in industrial, mining or infrastructure building projects. Here is where a more structured approach helps.

A simple definition of bid evaluation is that it is an organized process of examining and comparing bids to choose the best offer that gets you the best product or service for a great price. Traditionally, bid evaluations for goods or services have included preliminary responsiveness checks to qualify the supplier, followed by evaluation for compliance with technical requirements, then a price and financial evaluation leading to a post qualification due diligence for ascertaining the supplier's abilities.

By far, the most important but labor intensive and mind numbing part of this process is evaluating the offer for its technical compliance. Consequently, this paper sets out to describe the evolution of new technology that can radically transform and simplify this process.

For starters, let's understand what this is all about. Technical Bid Evaluation (TBE) is an organized process of evaluation and examination of a supplier's or subcontractors technical bid documents and proposals from a technical point of view.

The TBE assesses the technical capability including quality, experience(references), compliance with specifications, operating cost, and performance liabilities to meet the project requirement as well as execution capabilities. The representation of a technical bid evaluation template below may look familiar to you. In all likelihood, there is a fair chance that you may have gone through a similar exercise of distilling data from oodles of documents to complete technical bid evaluations.

Typical Representation:

DESCRIPTION		SPECIFICATION REQUIREMENTS	Vendor 1	Vendor 2	Vendor 3
1. General					
1.1	Model & Size	per Vendor	64-2T15J4XN-0508SM12V-B	P69T2Bd	CAMT 44/5
1.2	Pump Type	Canned motor pump	CANNED MOTOR PUMP	CANNED MOTOR PUMP	CANNED MOTOR PUMP
1.3	Number of stages	per Vendor	12	10	5
1.4	Quantity	1 operating + 1 installed spare	2	2	2
1.5	Operation [Individual / Parallel / Series]	Individual Continuous	Confirmed	Confirmed	Confirmed
1.6	Pump Design	API 685	Confirmed	Confirmed	Confirmed
2. Area Classification					
2.1	Zone	2	Confirmed	Confirmed	Confirmed
2.2	Gas Group	IIB	Confirmed	Confirmed	Confirmed
2.3	Temperature Class	T3	Confirmed	Confirmed	Confirmed
3. Liquid Properties					
3.1	Liquid	Lean amine	Confirmed	Confirmed	Confirmed
3.2	Aggressive / Due To	.....	N/A	Not applicable	Not applicable
3.3	Self-Igniting	.....	N/A	Not applicable	Not applicable
3.4	Hazardous	Hazardous: H2S	N/A	Not applicable	Not applicable
3.5	Other Properties	.....	N/A	Not applicable	Not applicable
3.6	H2S Presence	1260 ppm	Confirmed	Confirmed	Confirmed

How did we get here?

Let's start at the beginning... A material requisition package consisting of qualifying documents, technical requirements, scope of supply, data sheets, project specifications, inspection requirements, spare part list etc. is created to begin the process of seeking offers from suppliers. This is usually a part of a larger package of request for proposals.

Here's where it gets interesting. It is not necessary that the clients have an immediate requirement or a project that they have won. Request for offers could be made during the proposal or execution stages, each with their own nuances. However, suppliers tend to react to these requests differently based on what is being requested, by who and by when. Consequently, even though the pricing details are fairly good, technical details may be incomplete or sketchy. The engineers at the clients end that needs to evaluate this is manually pouring through PDF offers or specification sheets to select the best technical offer and this takes time, a lot of wasteful time.



What happens next?

To start the process of gathering a supplier's offer for all equipment/items, material requisition (MR) packages are prepared and sent to suppliers based on project requirements.

Based on availability and experience, various suppliers send in their bids/offers and these are shortlisted and evaluated to select the supplier.

What are the typical elements used in the TBE process?

Most organizations will use these or variations of these in the Technical Bid Evaluation Process:

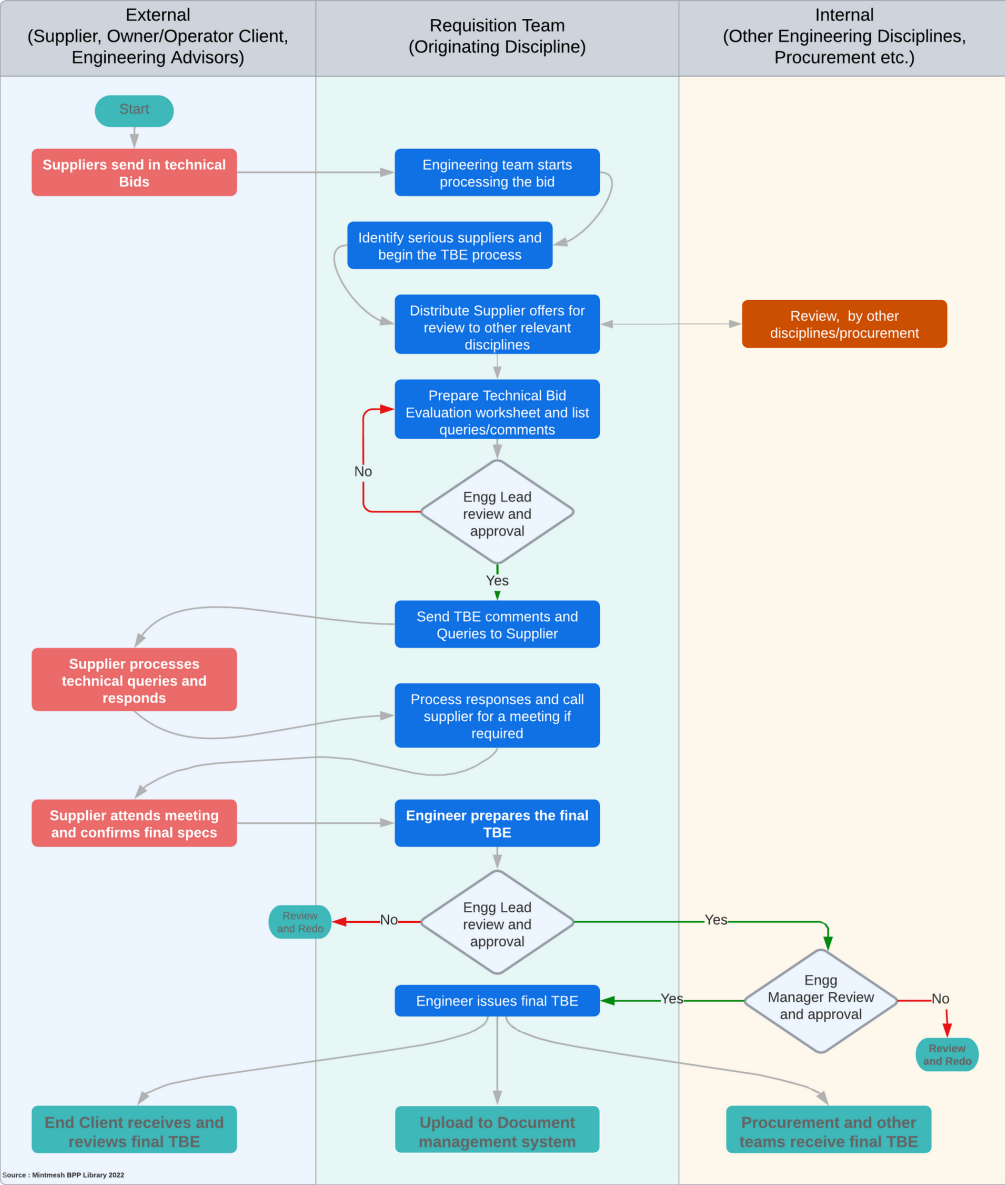
1. Summary Sheets
2. Scope of Supply documents
3. Technical Bid Tabulation worksheets
4. Exclusion, Clarification & Deviation Lists
5. Technical Query (TQ) documents
6. IDC (Inter-Discipline Checks)
7. Email communications

What are currently prevailing TBE practices?

Current Work Process/ Workflow of TBE

Today, a TBE process generally begins with the receipt of Supplier Offers. Requisition Engineers shortlist these offers based on examination of requirements specified in the MR package. Once, offers are shortlisted, these are shared internally with other disciplines for Inter Departmental Checks, and to collect comments or clarifications that need to be discussed with the supplier.

A Representative Workflow



Why are manual processes challenging for engineers?

1. TBE sheet preparation is a manual time-consuming process as engineers need to review data for each tag from multiple documents in various formats and enter this data into an excel worksheet including inputs received from other engineering disciplines.
2. Engineers need to quickly analyze supplier offers to determine suitability and compliance with the requirements. This involves reading and analysing several documents to make a decision. This is an extremely time-consuming process thereby disincentivizing engineers from seeking technical bids from many more suppliers.
3. Collecting and reviewing inter-discipline comments on the supplier's offer is extremely manual and done mainly via email and excel documents for each discipline. Due to the nature of the collaboration via email and excel, it is very difficult to track and revisit comments that were instrumental in any decision-making by the engineer.
4. Technical queries and responses are done entirely via email and excel, thereby resulting in poor version management, data entry overhead and missed responses. It is also very onerous to track and revisit responses for review, audit or commercial purposes.
5. Engineers can't systematically ensure that TBE sheets are filled in by the supplier due to the lack of controls, notifications, and alerts resulting in longer lead times to evaluate an item.

Is Digital Transformation the Answer?

It is a resounding yes.

This business process has been seriously underserved by technology. Augmented decision making using software tools is being used in various other fields with increasing degrees of maturity. Productivity and effectiveness gains have long been enjoyed by industries such as finance, banking, manufacturing etc in their core businesses. The AI revolution has arrived in the engineering industry as well. Read on, to hear about how AI is evolving and helping engineers in this process.

Digital Evolution through Artificial Intelligence:

Based on current market trends, organizations are spending millions to embark on the journey towards digital transformation. Organizations have taken various initiatives using available tools and software applications to increase productivity, optimize cost and improve quality in today's hyper-competitive era.

With advancement of technologies like AI and Engineering Language Processing, knowledge engineering can now be used to transform the process of technical bid evaluations.

TBE processes, being a very tedious and time-consuming process, can be ably served by automation using artificial intelligence, eventually assisting to reduce the overall cost of project execution.

Benefits of using AI/Software in the TBE process

1. AI-enabled tools, like RUDY, can assist users to quickly conclude on the suitability of a supplier's offer by comparing critical operating parameters, design data, and scope of supply in minutes using knowledge engineering and engineering language processing.
2. Digital collaboration platforms for interdisciplinary communications allows all interdisciplinary collaboration to happen seamlessly and in real-time. Besides, these conversations always live on for review and analysis.
3. AI-enabled software engines can autopopulate TBE data from datasheets and requisition documents within minutes. Engineers can start doing real engineering work while the paperwork is read by digital tools in minutes.
4. Collaboration suites helps users track, notify and manage correspondence efficiently with external agents and suppliers while also providing the convenience for suppliers to respond quickly.
5. Digital twinning of technical documents is done automatically for reference and analytics. Digital twins of TBE can be published directly to suppliers for their responses, ensuring minimum slippage between requirements and offers





Auxiliary Benefits of Digital Transformation in the TBE Process:

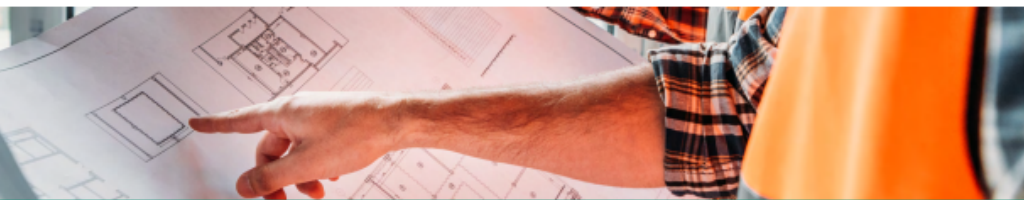
1. A **single system of record (SSOR)** for all activities, and correspondence for technical bid evaluations. This enables easy & quick access to information whenever required.
2. Seamless internal and external **collaboration platform**.
3. Eliminates dependency on **legacy knowledge**.
4. Easy auditability as all data is available in a single system.
5. **Progress dashboard** for executive review and embedded analytics for quick decision-making
6. Instant **actionable insights** into the TBE process for supplier performance/response quality.
7. Auto-reminders, notifications and alerts for all users in the system
8. **Shorter TBE cycles** and higher operational effectiveness of the overall project.

Which brings us to...

The answer is **digital transformation**, but a transformation that does not disrupt existing processes and practices. If this digitization serves as a job aid for an engineer to augment their decision-making ability, it would give them back considerably more time, to do more impactful activities. Any digital transformation is only as good as its adoption by a willing user community.

Adoption is generally ensured if the change is not disruptive. Today's AI solutions are intuitive and effective to solve a single problem very well. These digital platforms will be a powerful tool in the hands of engineers that are doing technical bid evaluations manually today.

Many large customers and EPCs are moving to digitize this aspect of their business and are seeing incredible results of more than 41% savings in time. Digital transformation is here to stay and provide value to the engineering community.



Connect today to learn more about the role RUDY can play in your digital transformation journey.

Mintmesh – Engineering for the Future

