ESTIMATION EXCELLENCE FOR CAPITAL PROJECT FIRMS

Abstract

The gestation period for executing capital projects varies between 12 to 60 months. A tender for such a massive project needs to be submitted between 15 to 90 days. The key aspects of bidding for a capital project are to go through hundreds of pages of tender documents, understand the specifications and collaborating with internal and external stakeholders such as vendors, within a limited period. This comes with a lot of inherent risks and uncertainties. Companies failing to effectively face the tender estimation process end up losing the margins due to time overruns during execution, project mismanagement and under-estimation of items, leading to delayed closure of the project. These issues can have havoc on the company's financials and thereby the share price.

We propose a solution through a mix of Artificial Intelligence (Textual Analytics), Robotic Process Automation (RPA) and Vendor portal for receiving, comparison of offers, and storage of documents to excel the estimation process. The solution is Simple, Scalable, Repeatable, and Competitive.

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Introduction

Companies that are in the business of capital projects such as power plant builders, Balance of Plant (BoP) contractors and desalination plant builders wherein estimation of such projects shall range between thousands to billions of dollars, worry a lot about Order Intake (OI). Strong Order Intake over successive quarters increases the good perception of the firm and thereby satisfies stakeholders interest. The sales pipeline certainly needs to be robust to increase the order intake and thereby revenue. But to convert the opportunity in the sales pipeline to a firm order, the proposals, and estimation teams play a pivotal role in arriving at an effective techno-commercial response to the Request for Proposal process (RFP).

The Sales and Marketing division engages with the customers & gets their pre-qualification done. The various stages of the tendering process are mentioned in Chart-1:
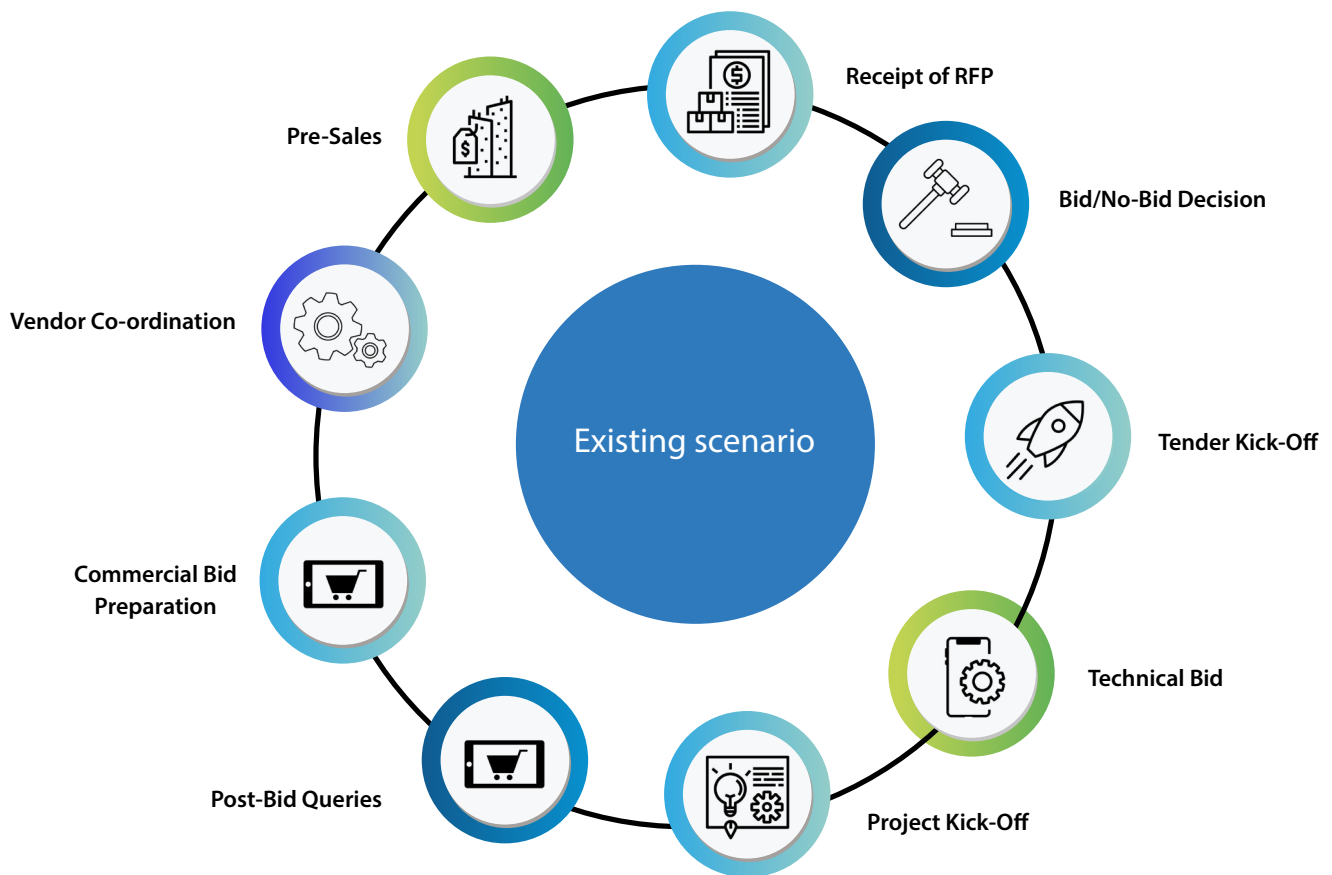

Chart-1: Various stages of a tendering process

Proposals & Estimation team sometimes referred to as Commercial project management acts as the Order Intake contributor. The tendering personnel working in a specific department (say Electrical & Instrumentation) for any big enterprise (of the order of 3000 + organization) works on an average of 10-15 bids at any point in time. It becomes technically impossible for them to start from the beginning for all the tenders and go through the various stages as mentioned in Chart-2. Also, based on the research about the companies working on capital projects, the profit after taxes tends to be of the order of 6%1 & and thus need for automating the workflow shall help them in minimizing the human efforts needed in proposals & estimation.
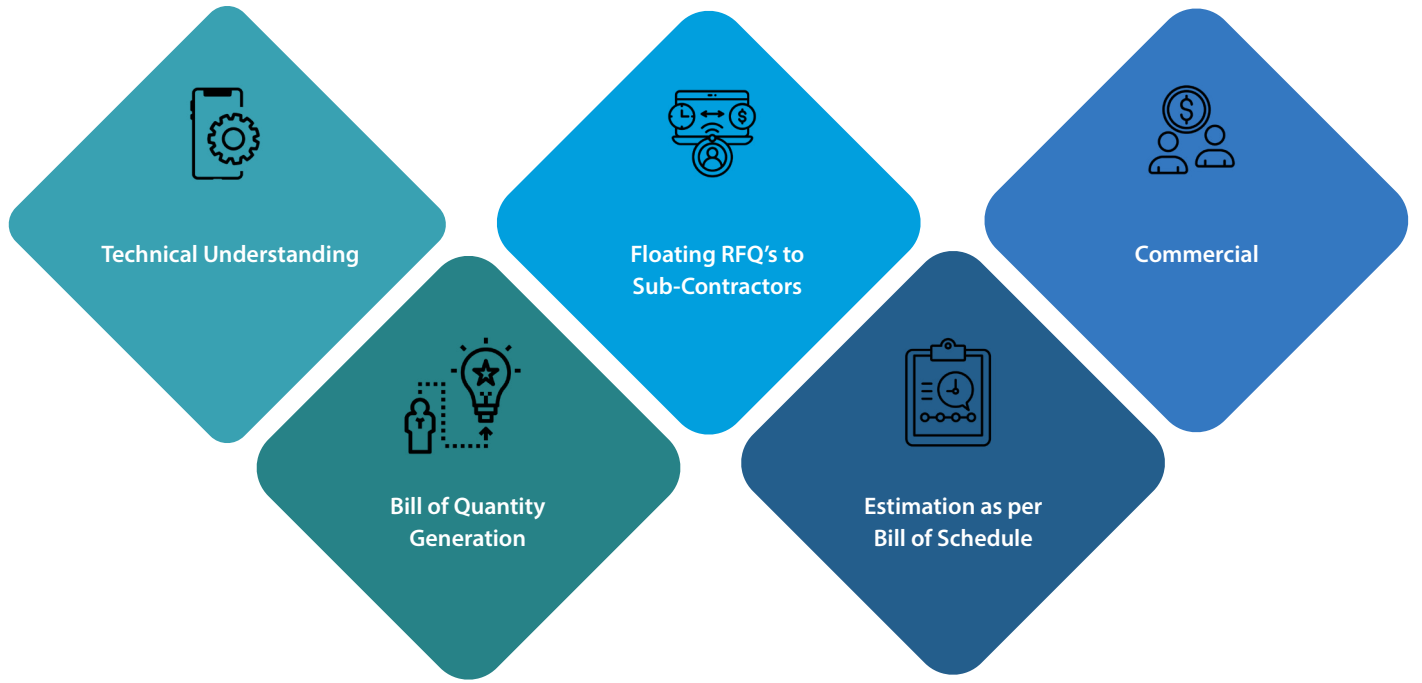
Chart-2: Various stages of an estimator

Thus, for a growing enterprise, there is a need for a digital solution that supports the estimation team to match the demand which not only helps them bag more orders but also:

Ensuring timely completion of the bids

Going the extra mile by preparing multiple sub-variants to the solution to appease the client

To have lesser transition time between the Estimation and Execution Phase upon emerging as the Lowest Bidder (L1) during bid submission.

Lesser variance while bidding as any underestimation or overestimation will hit the bidder (by heavily impacting project margins or not winning orders consecutively in the market respectively)

Pain Pointers in Estimation & Tendering Process

Consumption of Manhours:

Estimation teams run through the various aspects of the tender, preparing the bill of quantities, reaching out to vendors for a new quote, and going through long-running spreadsheets for estimation.
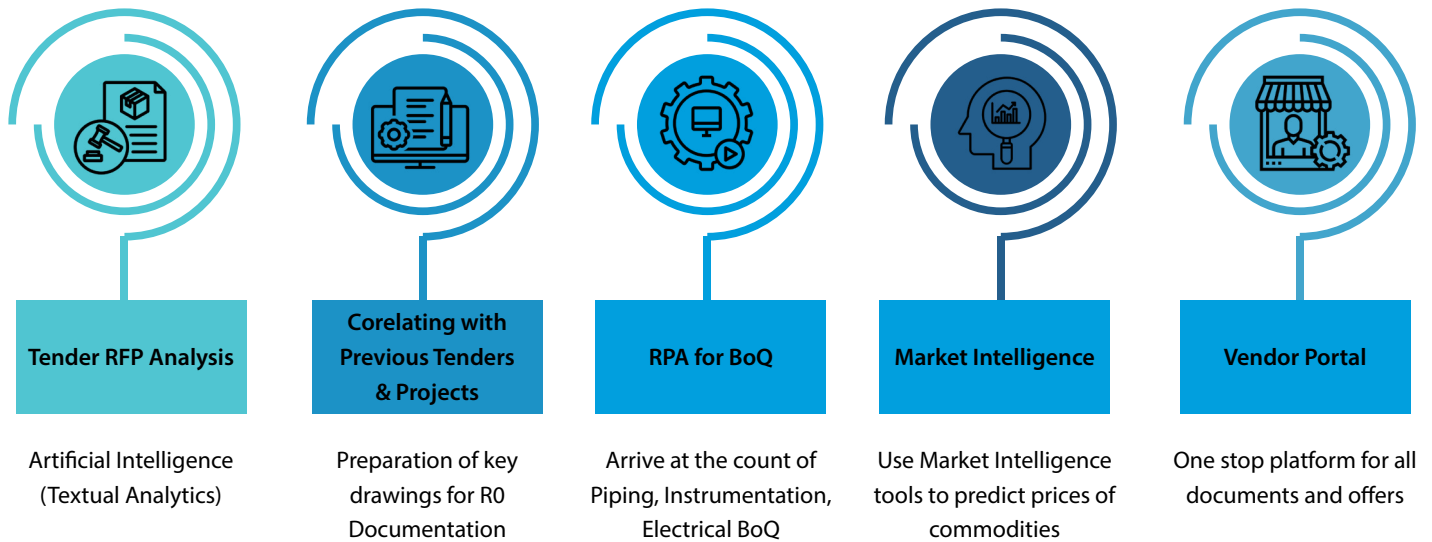
High Reliance on Vendor Quotations:

In an ideal scenario, experienced estimators should be involved in multiple probing methodologies to predict the right commodity price. However, currently, that is not the case owing to multiple bids on their plate, multiple stakeholders/departments ownership, and tight timescales. External factors such as Material price escalation due to COVID or Russia- Ukraine Crisis had crippled the execution of various capital projects.

Non-Standardized approach:

Often most heavy engineering/EPC/Construction firms struggle in having a standardized approach for the estimation & execution of projects. There is no single standard dataset to adhere to, which can continue for the entire project life cycle from bidding till the handover of the project. Project managers are chosen based on their previous expertise and they choose to follow the approach that they are comfortable with, which creates a lot of process variance during execution.

Proposed Solution

Tender RFP Analysis	Corelating with Previous Tenders & Projects	RPA for BoQ	Market Intelligence	Vendor Portal
Artificial Intelligence (Textual Analytics)	Preparation of key drawings for R0 Documentation	Arrive at the count of Piping, Instrumentation, Electrical BoQ	Use Market Intelligence tools to predict prices of commodities	One stop platform for all documents and offers

The need of the hour is to have a cutting-edge solution that would enable capital project executing firms to gain more market intelligence about a prospective bid in lesser time while also achieving consistent and fact-based cost breakdowns. Artificial Intelligence tools involving text analytics shall help the estimation team to understand the various sections of the tenders, the key specifications to adhere and the technologies to be adopted for the project delivery. It shall deliver the output of the entire project at an R0 level in a user-friendly format such as tables & charts.

Upon checks and corrections by technical teams, this can further be fine-tuned to have the RFP Level diagrams such as Process Flow Diagrams (PFDs), Piping & Instrumentation Diagrams, SLDs, etc. needed for various teams to arrive at estimation.

Robotic Process Automation (RPA) can address Bill of Quantity challenges faced by these clients by deploying standard templates. For Example, RPA Bots can calculate the entire piping to be laid out across the site as part of the firefighting network taking inputs fro
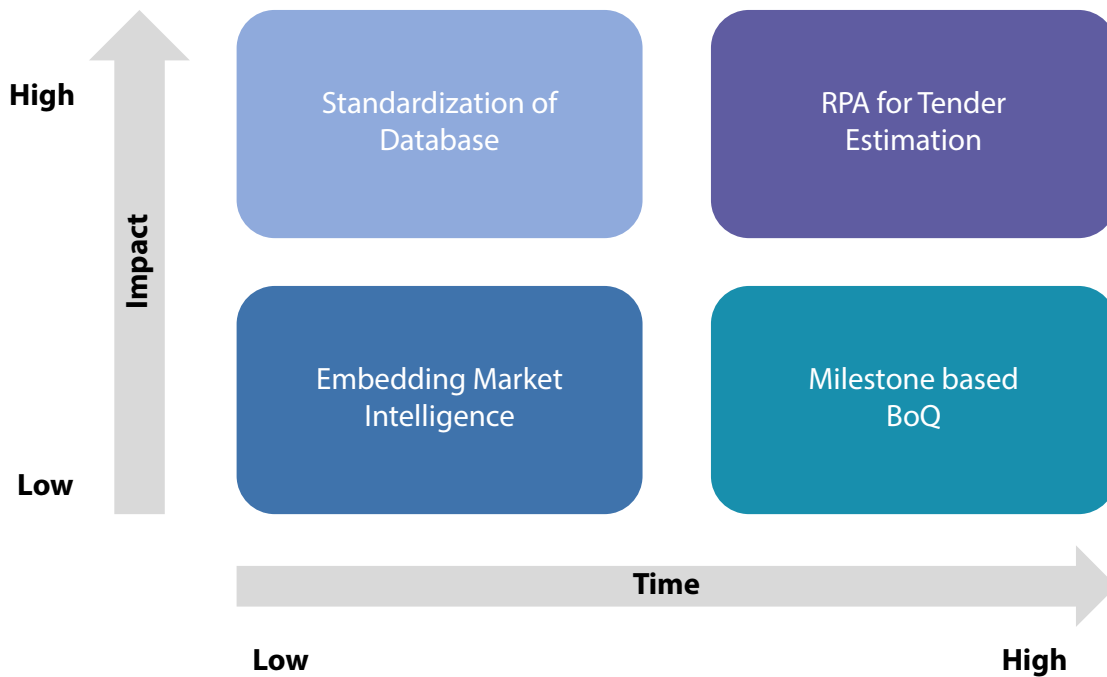
the P&ID's, Plant Layouts & through new-age navigation tools like Google Maps & Gen-AI

Analytics shall help the customer to bank on the data based on purchase orders placed on similar projects in previous engagements or by benchmarking the commodity index to a similar time in the past. The same shall be used to compare the prices obtained from the vendors. Through this, Infosys is trying to bridge the gap between Procurement and Proposals departments. Any past hindrances faced by the project managers while executing the job on-site, while procuring raw materials, or external labor issues faced, can be estimated accurately.

From a futuristic approach, the process of documentation becomes easier through a vendor portal that can be used to upload the corresponding quotes against the specifications requested and to perform techno-commercial comparisons across various vendors. The portal shall also enable vendors to upload their documents for registration and other testing compliance procedures for their quotes to be considered.

Delivery Excellence Framework for Implementation

	Standardization of Database	RPA for Tender Estimation
High		
Impact		
	Embedding Market Intelligence	Milestone based BoQ
Low		
	Low **Time** **High**	

Infosys helps in driving the delivery process through digital innovations & predictive analytics that reduce operating costs. Using the right mix of tools, we work on the ground to ensure that the necessary change management is in place to optimize value on all levels. We have built a 2 X 2 Framework for the implementation of an Execution Excellence transformation journey for the clients by plotting time and impact.
It's good to harvest quick wins and solutions that can be built with support such as Standardization of Database, RPA for tender estimation, and embedding market intelligence.

The implementation approach envisioned by us is led by best practices, rapid, prescriptive, and repeatable delivery steps, tools, templates, predefined content, an agile approach, and native integration to other solutions.

	Explore	Realize	Deploy & Go Live	Hypercare
Key Activities	Fit Gap workshop, training, testing, data migration plan, solution definition, freeze project plan	System setup configuration, extension development, integration development, testing & data migration	User enablement, cut-over plan, post-go-live support plan	Issue resolution, documentation completion, software handover
Deliverables	Solution documentation, system templates, Expert config request, Test strategy, training strategy	Test Defects resolved, E2E testing completed, data dry run completed	Support plan document, data migration complete	High priority Issue resolution
Exit Criteria	Scope ID list, Gap list finalized, training and data strategy finalized	Cut over plan, Testing, Training, Org. readiness, and data migration complete	Deliverables signed-off, hyper care plan agreed, user enablement	Documentation complete, post go-live issues resolved, handover to organization

Conclusions

The proposed estimation excellence shall benefit the CEO's Office, Sales & Marketing Head, Proposals & Engineering team, and project management teams through the following levers:

- Increased Business Agility
- Work on larger sales pipeline
- Build a future-ready team
- Higher Client satisfaction

- Higher Order Intake, Better Revenue
- Higher Return on Investment (RoI)
- Centralization of database.
- Quick turnaround for execution

1. Average Net Profit of Infrastructure-Construction companies above Net Sales of INR 10 billion- (Source: Top Construction - Infrastructure Companies in India, Top Construction - Infrastructure Stocks in India by Net Sales, List of Top Construction - Infrastructure Stocks in India {2023} - BSE (moneycontrol.com))

About the Authors

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HariShankar L is a management consultant with more than 6 years of experience across capital intensive sectors such as Mining, Energy, Water, Cement, etc. He is passionate about working on digital transformation projects that shall scale and sustain the business operations. His focus has been on improving top line and bottom line for various firms through strategic ideation & implementation.

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Over 13 years of experience, Sarath has led large scale transformation projects, enabling end-to-end systems' delivery for clients across the Utilities industry. Sarath brings a rich project management experience and domain expertise in the areas of power generation and distribution. He is well-versed in tendering and delivery of large capital projects in the power industry. He is passionate about Sustainability & Net Zero goals and supports clients in their drive to adopt sustainability initiatives.

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Vignesh is a results-driven management professional with a proven track record of successfully leading and delivering complex projects in the BFSI, Retail and Energy sectors. With a strong background in the management principles and a passion for driving organizational growth, he brings a unique blend of his expertise and strategic vision to every initiative he undertakes.

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