

# **Pre-Qualification and Resource Selection for Subcontracting the Work in a Project <sup>1</sup>**

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*There is an objective reality out there, but we view it through the spectacles of our beliefs, attitudes, and values. This is one reason our beliefs are so important; they shape our interpretation of everything else.*

*~David G. Myers, Social Psychology, 2005*

Once companies are awarded the Project (or are in the process of preparing a proposal for it), they will contract with suppliers and contractors for the construction of certain work or services. This is in general the practice in almost all E-P-C-type companies. The challenge is to determine how to evaluate the interest of such partners in participating in the project and how to evaluate their capabilities.

Some companies issue questionnaires to establish general information on the partner's overall capabilities. They seldom do further screening as per specific scopes and schedule requirements as determined later.

These selections predominantly follow companies' procedures, however, the criteria become difficult when the following clauses start governing the contract:

1. Contractor to take up detailed engineering and procurement activities without any delay.
2. The scope of the contractor shall be reviewed & finalized by PMC.
3. The consultant will also scrutinize any project scope changes and will vet the contractor's change order proposals in line with the Conditions of the Contract.
4. Assist the owner in all disputes arising during the execution of the various contracts for amicable settlement.
5. Feedback, if any, on the performance of Contractors/ Vendors involved in the project.

And the subcontracting decision is more difficult if the following are the governing clauses:

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1. CONTRACTOR GROUP has the experience, capabilities, competent personnel, financial security, and other means and facilities available to efficiently and in a timely manner perform SCOPE.
2. In the event that COMPANY notifies CONTRACTOR of any DEFECTS in any part of SCOPE during the DEFECTS CORRECTION PERIOD and requests correction, CONTRACTOR will promptly and diligently, within the period set by COMPANY and in a manner so as to minimize any downtime or delay to OTHER CONTRACTORS' work or COMPANY's operations, correct and remedy such DEFECTS by performing the following:
  - (i) At COMPANY's discretion re-design, re-engineer, make good, re-do, replace, or amend any item of SCOPE, including any related reopening, removal, uncovering, and restoration; and
  - (ii) Deliver any item of SCOPE not already provided.
3. CONTRACTOR will be responsible for the cost of all investigations and all work required to rectify any DEFECT, except for the cost of correcting any DEFECT during the DEFECTS CORRECTION PERIOD, to the extent that CONTRACTOR can demonstrate is solely due to incorrect RELY UPON INFORMATION, where CONTRACTOR fulfilled all its obligations in connection with such RELY UPON INFORMATION unless COMPANY has issued a VARIATION ORDER or instruction to CONTRACTOR to correct the relevant RELY UPON INFORMATION.
4. COMPANY may suspend the CONTRACT or part of SCOPE for cause by written notice with immediate effect pending COMPANY's decision on termination where COMPANY concludes it has grounds to terminate the CONTRACT for the cause. When suspended for cause, CONTRACTOR will not be entitled to any VARIATION nor be entitled to other compensation or relief for the suspension. COMPANY may recover from CONTRACTOR any costs incurred in connection with securing items related to SCOPE or obtaining alternate sources of supply upon suspension.

The task is not as difficult as it seems, the whole world of the project revolves around three phases:

## Initiation-Execution-Closure

### ▶ Initiation phase

1. Need pre-alignment / agreement with Client / Lead office.
2. Tailored work processes, quality management system, progress measurement, and tracking system
3. Adequate provisions to safeguard IP, and confidential project/licensor information.
4. Change Management: Definition and implementation.
5. Would need robust alignment with a clear definition of expectations.
6. Subcontractor: resources skills, experience, knowledge, availability of tools, software: would need robust shortlisting, the skill mapping process
7. Reimbursable Contracts: The client may seek cost advantage nullifying the Company's commercial advantage.

### ▶ Execution phase

1. Extensive interface management, interaction, and supervision: This may require the deputation of key resource(s) in the sub-contractor office.
2. Close monitoring of material costs incurred in subcontractor designs.
3. Schedule demands v/s design Maturity v/s sub-contractor change orders
4. Need for robust alignment with a subcontractor to clearly define expectations.
5. May need to manage subcontractors conflicting priorities.
6. Never tried before execution model: Will require time to mature the mindset, leadership, work processes, and relationships.
7. Robust conceptual design for Package unit subcontracting

### ▶ Closure phase

Any design review provided to the Contractor shall mean release for content only and shall not relieve the Contractor of responsibility for a thorough review of their design for compliance to applicable local, state, and federal law, and compliance with Project Specifications, Client Standards, and the Project-identified Industry Standards.

The company's role moving forward will be that of the Client Owner's Representative, providing technical review of in-progress and completed design, and providing technical direction as to the owner's expectations and design intent. While the Company may provide review comments for a submittal or review package in this capacity, the Contractor still carries the sole responsibility and liability for the accuracy and safety of the design and remains accountable for the design as the Engineer of Record.

This **Initiation-Execution-Closure (IEC)**, changes as per the project scope but the basic requirements per stage remain the same. We will come to the IEC discussion some other time. What is of utmost concern is, the selection of the right contractor (for the sake of deliberation, we will keep this limited to engineering requirements), though the steps required to qualify a subcontractor is simple and straight, viz.:

1. Arranging the Expression of Interest
2. Evaluation of Subcontractor
3. Issuance of Pre-Qualification form
4. Response from Engg Subcontractors
5. Implementing a Screening Questionnaire
6. Sub-contractor listing

Once the steps are broken into tasks like finalization of the prequalification scoring matrix, subcontracting activities, activities efforts, etc. This subcontractor selection becomes challenging.

One of the ways is to plan for collecting the data required for the activities, one of the approaches could be to issue the following requirement format:

Extract from the requirement List

Sr. No.	Discipline	Activity	Reference: Tools & Softwares	A	B
1	Structural	Structural Design Drawings / Calculations: Piling / Concrete / Steel (with 3D modeling)	1. StaadPro		
			2. Risa		
			3. S3D, E3D		
			4. MS office		
			5. Adobe Acrobat		
21	Architectural	Building Functional Datasheet	1. MS office		
25	Piping	3-D modeling and design	1. S3D / E3D		
			2. SPR / Navisworks		
38	Mechanical	Vessel data sheets	Excel/ AutoCAD		
57	Electrical	Earthing & Lightning Protection Plan (Non-Plant Building)	1. AutoCAD / MicroStation		
			2. MS office		
			4. MS office		
62	CS	SIL Assessment & Report	1. ExSILentia		
			2. MS office		
67	HSE	HAZOP & Report (PHA3)	1. PHA S/W		
			2. MS office		
81	Process	Flare system	MS Office, Flarenet		

**A:** Contractor to Confirm Execution Experience (Y/N)

**B:** Provide recent Project Experience of the last 5 years

The goal is to select based on the assessment of the following requirements:

REF	QUESTION ON
IA	COMPANY
IB	ACTIVITIES
IC	FINANCIAL STATUS
ID	EMPLOYEES
IE	QUALITY ASSURANCE/CONTROL
IF	HSE
IG	BUSINESS CONDUCT & ETHICS
IIA	DETAILS OF ACTIVITIES
IIB	EMPLOYEES
IIC	INSPECTION AGENCY
IID	PRODUCT INFORMATION
IIE	REFERENCE LIST
IIF	SHOP/YARD LOCATION - CAPACITY
IIG	LIFTING CAPACITY
IIIA	CATEGORY OF WORK TURNOVER (REVENUE)
IIIB	CATEGORY OF WORK QUALIFICATIONS & LICENSES
IIIC	JOINT VENTURE
IIID	PAYROLL PERSONNEL SPECIFICATION
IIIE	SUPPLEMENTARY SOURCES FOR ADDITIONAL PERSONNEL
IIIF	PERSONNEL ON LOAN TO OTHERS
IIIG	TRADE ASSOCIATIONS
IIIH	REFERENCE LIST
IVA	KNOWLEDGE AND EXPERIENCE
IVB	QUALIFIED PERSONNEL
IVC	SUPPLEMENTARY SOURCES FOR ADDITIONAL PERSONNEL
IVD	REFERENCE LIST
VA	INTEREST AND CAPABILITY TO PERFORM WORK
VB	AVAILABLE MANPOWER
VC	SHOP CAPACITY FOR THIS PROJECT
VD	MANPOWER RESOURCES
VE	PRESENT WORKLOAD
VF	COMMITTED FUTURE WORKLOAD

REF	QUESTION ON
VG	PERFORMANCE GUARANTEE
VH	MINIMUM BIDDING TIME REQUIRED

Queries and proformas will give you the data. The question is, how are you assessing them regarding their respective requirements?

Assigning weightages is one of the techniques, this helps in screening. Deciding at Level 01 and flowing to Level 2 to refine the decision is a well-known philosophy of screening. Here also the screening level 01 meanings assigning weightages for the commercial and technical qualification. We may go for 50:50, or 40:60, or any other distribution followed at your end. However, we recommend qualifying the commercial qualification rather than scoring with weightages governance.

Commercial qualification means, accepted or not. This needs to be evaluated on the following strengths:

1. Financial Strength
2. Knowledge & Experience
3. Qualified Personnel

This is then followed with Specific Technical questionnaires, as stated earlier, there is no hard and fast rule, and the need is the mother of all criteria. Sometimes we see the following weightages, however, these are again dependent on need and risk (we will discuss risk some other time):

Weightages Item	Score
Financial Strength	15%
Knowledge & Experience	25%
Qualified Personnel	25%
Specific Questionnaire	35%
<b>Total</b>	<b>100%</b>

Once technical screening starts, we see certain formats.

Sr. No.	Discipline	Activity	Analysis	1	2	3	4	5	6	7	8	TOTAL	Remarks
				10	15	10	15	10	15	0	15		
1	Structural	Structural Design Drawings / Calculations: Piling / Concrete / Steel (with 3D modeling)	1. Availability of required Software and proficiency: StaadPro, Risa, SAP 2000, Lpile - 10% 2. Experience with applicable codes and standards - 15% 3. Dynamic analysis experience - 10% 4. Relevant Industry experience - 15% 5. Modularization Experience - 10 % 6. Steel Connection design and detailing experience - 15% 7. Seismic Detailing experience (Steel / Concrete) - 10% 8. 3D modeling experience: Tools S3D, E3D etc. - 15 %	10	15	10	15	10	15	0	15	90	No experience in seismic detailing

If you observe the assessment sample above, the analysis column has relative sub weightages to arrive at the selection. This is one of the techniques.

The commercials come to Yes/No. This is attached to assessing the financial risk, one of the examples is:

Weighted Score	Weightage	A	B	C
Financial Strength	100%	90.0	90.0	20.0
Financial Due Diligence		LOW	MEDIUM	MEDIUM
Does Subcontracting		No	No	Yes

Due Diligence comes from Risk Rating. Another template with weightage criteria having financial passing as the base is:

Weighted Score	Weightage
Financial Strength	100%
Financial Due Diligence	Low/Medium/High

Weighted Score	Weightage
Does Subcontracting	Yes/No
After Financial Pass	Yes
Ethics	5%
Knowledge & Experience	20%
Qualified Personnel	30%
Specific Questionnaire	45%
<b>Total</b>	<b>100%</b>

Generally, both the above approaches are followed; however, our preference is for the second one. It is always preferred to clear the selection criteria on financial strength with Yes/No rather than assigning weightage. We may term this a GATE approach to qualify.

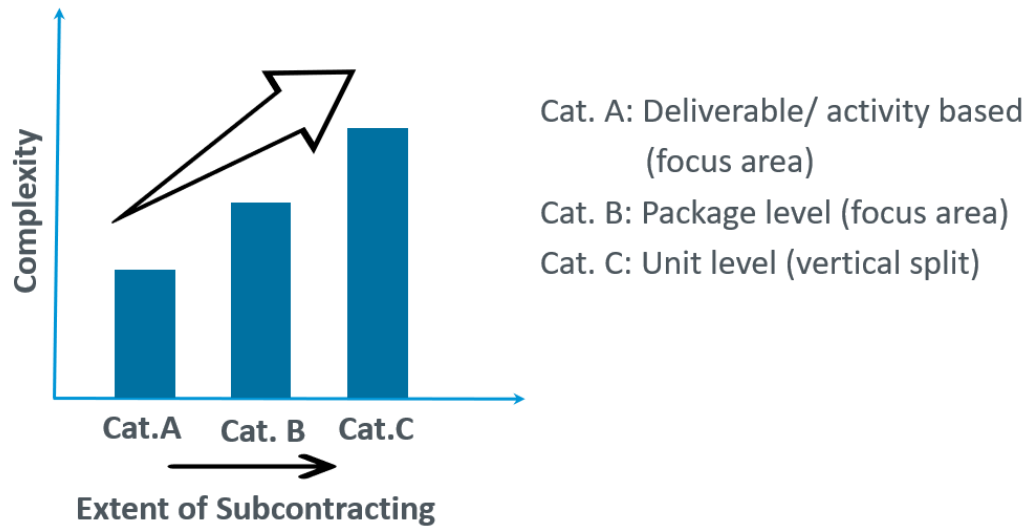
### Conclusion

The subcontractor selection, if done effectively, adds benefits to managing the project cost and technicalities. The potential to subcontract engineering activities will provide commensurate relief in the Company’s sell rate, help in better management of backlog volatility, and stabilize the company’s core strength/ capabilities Effectiveness efficiency comes from:

- ▶ Creating a Flexible execution model – Activity identification based on Project /Client /Contract /Location
- ▶ Having a Sub-contract activity matrix to minimize/streamline interfaces between key entities
- ▶ Having a Structured framework with skill mapping to sub-contractor capability/capacity / periodic evaluation
- ▶ Mapping opportunity to optimize schedule through effective workload distribution.

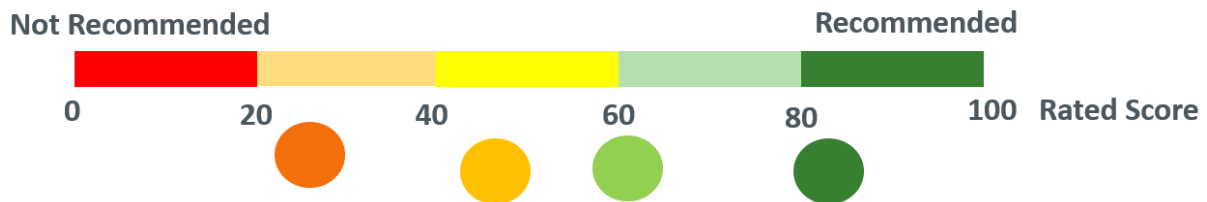
Running a Cost-benefit analysis sensitive to volume and supervision is also recommended. The sensitivity of the analysis can be referred from the following chart:





This means a vertical split with the subcontractor; herein independent management of activities by the sub-contractor is seen as high on complexity. High because flawless monitoring and change management are needed to avoid awkward claims.

If we can leverage qualified engineering sub-contract capabilities/capacities locally, then this cost-competitive Plug and Play” execution model with building blocks is suitable for today’s competitive execution.



And the subcontractors must be rated periodically on RCP: Reliability, Commitment, and Performance by the technical and financial team and shared. As we all say, continual improvement is the key to success.

*Let us remember then that we were made to do hard things, not easy, for if we do nothing but what is easy we will not go forward; then, as there is no standing still in the universe, we will degenerate, so that by doing something a little harder each time we prepare ourselves against something really hard.*

~The Agricultural Journal (British Columbia), 1921

If you find yourself stuck in a selection dilemma, you can reach out to us via [anil.seth@fluor.com](mailto:anil.seth@fluor.com) or [anilshivani99@gmail.com](mailto:anilshivani99@gmail.com).

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## About the Author



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**Mr. Anil Seth** is working as Project Manager in Fluor's India office at Gurugram. Fluor Daniel India Private Limited (Fluor India) provides a full range of engineering, design, procurement, and construction management services to Indian and overseas Clients. Fluor India is an established quality provider of engineering, procurement, construction management (EPC) and project management services for Fluor's energy and chemicals, power, mining, and industrial projects, and is a key support office for Fluor facilities located in North America, Africa, the Middle East, Europe, and Asia Pacific

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