APPLICATION OF PROJECT MANAGEMENT BEST PRACTICES, TOOLS AND TECHNIQUES TO A "BID & PROPOSAL" PROCESS: MOVING FROM THEORY TO PRACTICE

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Introduction and Contents

- **Problem Statement**: Can P.M. tools effectively help Construction Companies in increasing their business?
- **General Approach**: Can we define an overall flowchart to describe in general terms a "Bid & Proposal" Process?
- **Process Tailoring**: Should we always follow a default pattern in order to fulfil the "Best Efficiency and Effectiveness" goal?
- **A Case Study**: Is it possible to put this awesome theory into practice?
- **Lessons Learned**: What should we remember about this slideshow?

Something about myself…
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Problem Statement (1/1)

Modern organizations, especially in the civil construction branch, use to look at the P.M. Best Practices as an additional burden, mainly responsible of costs increasing and delay of the core business activities. The purpose of the present slideshow is to prove that a careful tailoring of the general P.M. practices can add efficiency and effectiveness to Company business and, if properly applied, P.M. tools can add an incremental value to competitiveness in Bid & Proposal processes.

"There is nothing so practical as a good theory"

Kurt Zadek Lewin (1890 – 1947)

"Those who are in love with practice without knowledge are like the sailor who gets into a ship without rudder or compass and who never can be certain whether he is going. Practice must always be founded on sound theory, and to this Perspective is the guide and the gateway; and without this nothing can be done well in the matter of drawing"

Leonardo da Vinci (1452 – 1519)

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General Approach (1/4): Definitions

CALL FOR INTEREST

A **call for interest** is an invitation to all potential suppliers to show their interest in a particular project (this is often applied for very large and important projects). Ensuing calls for tenders will then in general only be sent to those companies which have registered their interest and have proven their capabilities where so requested.

CALL FOR TENDER or REQUEST FOR BID

A **call for tender** is an invitation to all potential suppliers to submit their best competitive tender for a specific requirement (a tender being the written commitment of the tenderer in response to a call for tenders). The tender involves mainly **economic aspects**.

REQUEST FOR PROPOSAL (Bid & Proposal)

A **request for proposal** is an invitation to all potential suppliers to submit not only their best competitive bid, but to develop a complete execution plan, in order to prove the affordability of the offer. The tender involves **economic, technic, time schedule and sometimes contractual aspects**.

In a "Bid & Proposal" process, as it is obvious, complexity increases. In a complex scenery, a great planning effort is needed in the beginning and the need for Tools and Techniques that can help the work stream flow becomes absolutely essential.

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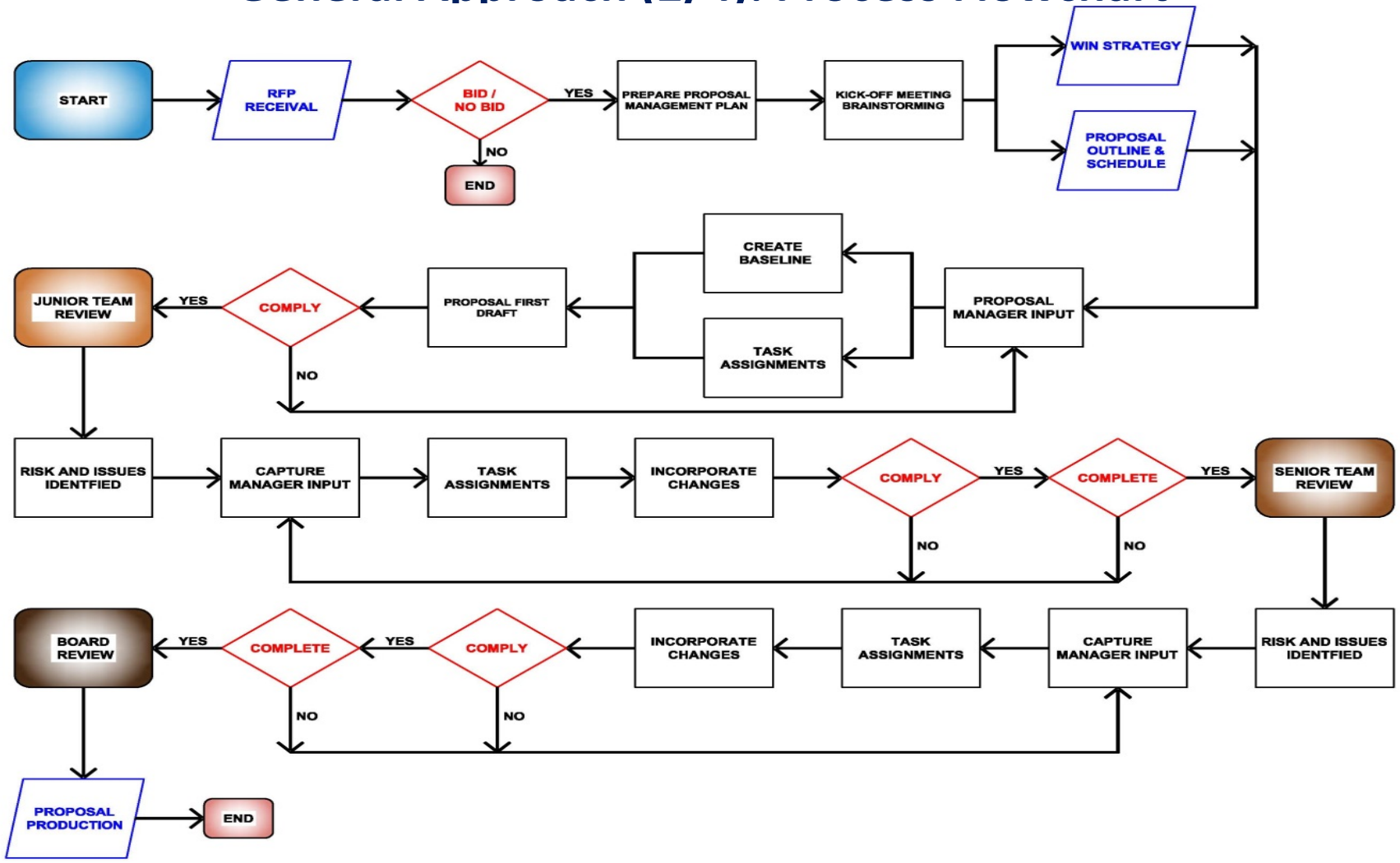
General Approach (2/4): Process Flowchart



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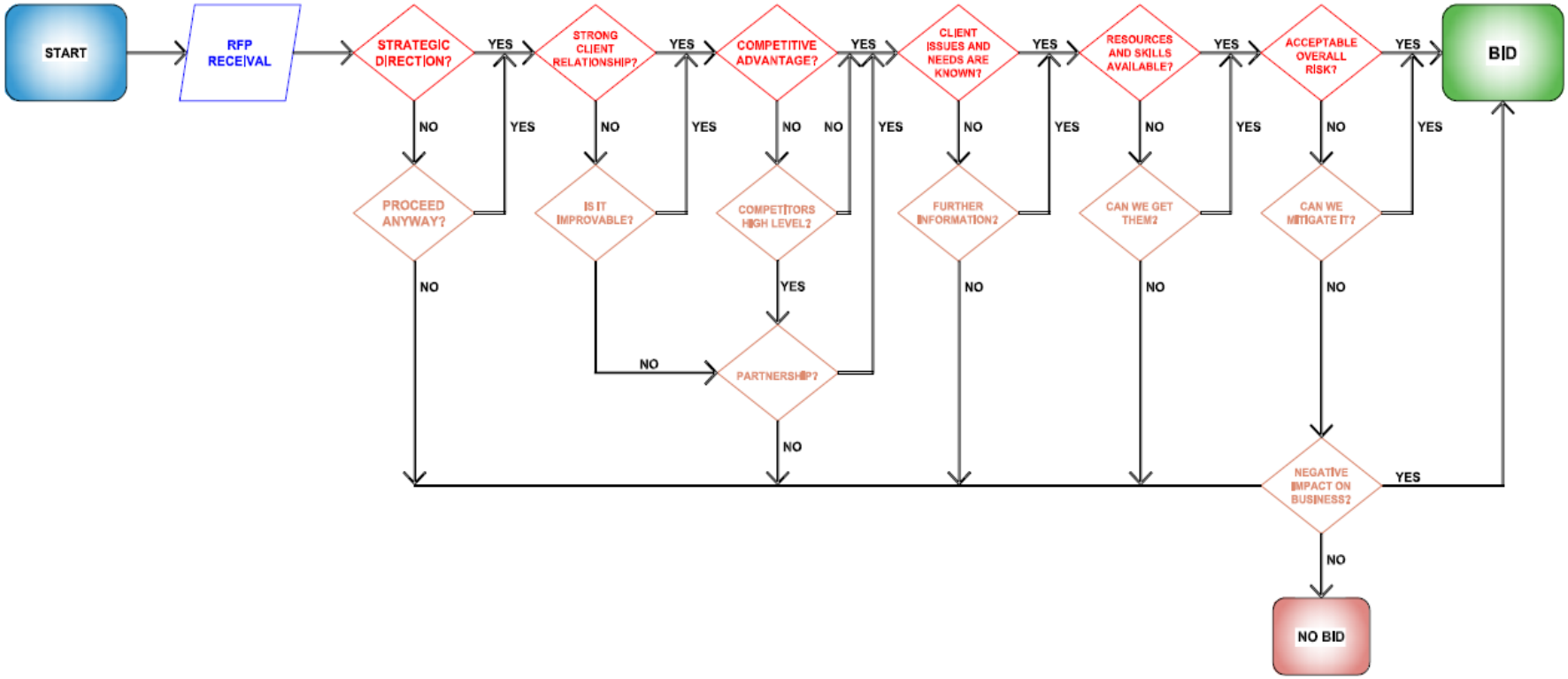
General Approach (3/4): Comment on the Process Flowchart

The flow sequence can be described as follows:

- A Request For Proposal (RFP) is received by the Company;
- Top Management evaluates the RFP and decides whether take part to the tender procedure or not;
- If the Top Management chooses to bid, the Sponsor issues a Project Charter and a P.M. is identified;
- The Project Manager, together with the Proposal Manager and the Capture Manager, defines the Project Team and the deliverables to be produced;
- The Project Team develops a first draft of the deliverables;
- The Junior Team analyzes independently the first draft, proposes possible changes and develops the Risk Analysis;
- The Senior Team evaluates the second draft of the deliverables, sets the Risk & Profit thresholds that believe could be profitable for the Company;
- The final review of the Bid & Proposal deliverables are sent to the Sponsor for the final approval and the presentation to the Client.

General Approach (4/4): Bid / No Bid Sub-Process Flowchart



Six Factors can be considered in the final decision about participation to the Tender.

A very important role is played by the evaluation of the strategic opportunity and the level of knowledge of Client Issues and Needs.

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Process Tailoring (1/3): Some Considerations

Should we always follow a default pattern in order to fulfil the "Best Efficiency and Effectiveness" goal?

The answer is "NO".

Project Management is not only a "Discipline", rather a "Culture", that should be innate in Company values and organization.

A "Mature Organization" recognizes the effective role of Project Management and is able to choose every time the suit that fits to the effective needs of every procedure.

A couple of examples:

- Is not essential to have always a "Project First Draft Team", a "Junior Team" and a "Senior Team": sometimes, for instance, the Sponsor can act as the Senior Team and take alone the final decisions about the contents of the Bid & Proposal;
- Is not essential that the organizational (Project Manager), operative (Proposal Manager) and strategic (Capture Manager) functions should be assigned to 3 different subjects: sometimes, for instance, an High Level Manager could act as Capture Manager and Senior Team or, as often happens, the Project Manager could perform as Proposal Manager too.

Process Tailoring (2/3): Some Considerations

Can the same approach be used to the choice of the P.M. Tools to be applied during a tender procedure?

The answer is "YES".

The most important tools that can be implemented during a Bid & Proposal process are:

- A "Due Diligence" to evaluate the strategic position compared to the other competitors;
- A "Make or Buy Analysis" to evaluate the convenience of "In House" realization vs. "Sub-Contracting" opportunity;
- A "Monte Carlo Simulation" in order to develop Risk Analysis;
- A "Legal Detailed Study" in order to verify the impact that the Terms and Conditions of the contract have on the expected cash flow;
- A "PERT Analysis" in order to set the expected duration of works;
- A "Tender Simulation", if the tender procedure consider quantitative criteria (score).

A "Mature Organization" doesn't pursue the idea that all that tools should be applied to every procedure, but is rather aware about the opportunities that every tool offers in the investigation of tender's threats and opportunities.

Process Tailoring (3/3): Practice Suggest

How can a Company choose what are the most efficient tools to implement in a specific tender procedure?

Every Project Management Tool have a specific goal. And every business has specific threats and, on the other hand, opportunities. The answer can not be univocal: an expert Project Manager can recognize threats and direct the process towards the most effective direction.

Tool	Useful	Useless
Due Diligence	Nearly always in Private Tenders	Mainly in Public Tenders
Make or Buy Analysis	When highly specific competences are required	When there is a solid internal Know How about the works
Monte Carlo Simulation	When the Risk conditions seem to be very different from usual sceneries	When Risk conditions seem to be standard
Legal Detailed Study	When the Contract form is open	When contract rules are set in the RFP
PERT Analysis	Nearly always	When Time is not a main requirement for the Client
Tender Simulation	When the tender procedure is based on quantitative scores	In private tenders, where the Client is free to select the desired Contractor

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A Case Study (1/16): Requalification of a former Klinik

SCOPE: A **General Contractor** receives a Request for Proposal by a **Client**, in order to submit a bid (proposed cost ⇒ economic aspects) and proposal (firm's plan ⇒ technical-organizational aspects) for an EPC Contract, concerning the reconversion of an existing clinic complex into a 5-star-Health Resort in Germany.

The scope of the RFP is completely "Open", as the Client has given the opportunity to the Company to develop a contractual – organizational – technique proposal that, together with the economic bid, could be competitive according to the Client business model.

In this context, the application of adequate forecasting models for both the "work-site production" (Gantt Diagram, Make or Buy analysis, cost variability simulation, Monte Carlo analysis) and the definition of contract terms (due diligence, cash flow analysis, change management, choice of contractual form) brings an added value to the General Contractor bid and proposal, that could really prove decisive in awarding the contract under advantageous conditions.

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A Case Study (2/16): Due Diligence

A **Due diligence** is an investigation of a business prior to signing a contract.
It is in the nature of the economic organizations to replicate well-known and affordable schemes in order to respond to repetitive issues and requests. In the same way, companies tend to apply repetitive schemes to face singular requests, such as a RFP by a Client.
Some questions should be always asked:

- Why has the Client thought to our Company? What does he expect as an outcome? Economic competitiveness? Or a technical innovation?
- Has the Client special needs? Is there some specific aspect that has an added value according to Client's ideas?
- Are the other competitors known? What is our position, if compared to the other competitors? Do we have competitive advantage factors to push in our proposal?

Two Golden Rules never to be forgotten

Customers, not competitors, determine who wins the war [P. Kotler]

There is only one boss: The Customer. And he can fire everybody in the company from the chairman on down, simply by spending his money somewhere else [S. Walton]

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A Case Study (3/16): Contractual Aspects

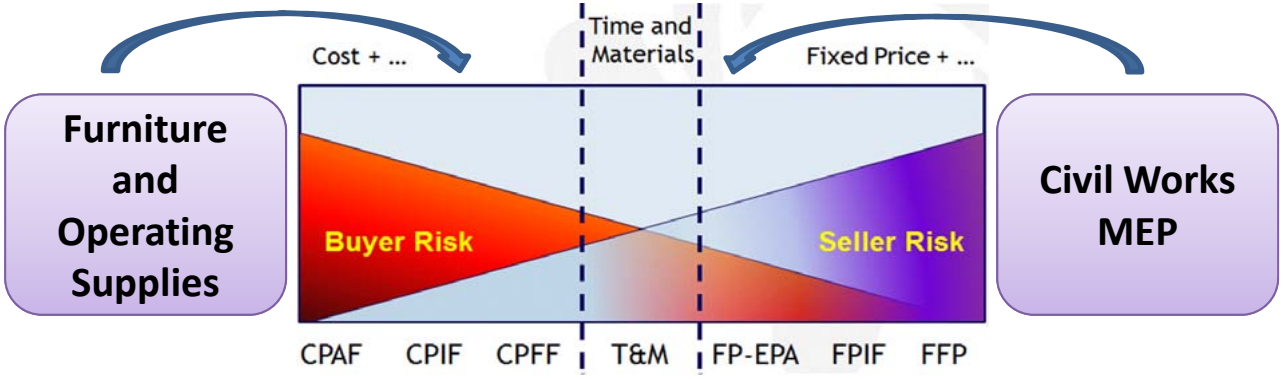
Usually, the main contractual aspects are set in the RFP and are the same for all the Competitors.
Sometimes, anyway, the Client is open to proposal that could enhance its business.
A typical question in the beginning phases of the proposal process is the "Make or Buy" analysis: should we act as a "Construction Company" (MAKE) and directly execute parts of the work or is it more desirable for the client a "General Contractor" approach (BUY)?
Which is the better solution balancing Client satisfaction and company business needs?

Pursuing Client Satisfaction doesn't mean always increasing Company Risk

«Construction Company» Approach	Make	Analysis Higher Effort Assume Higher Risks	Higher Degree of Competitivness
«General Contractor» Approach	Buy	Analysis Lower Effort Assume Lower Risks	Lower Degree of Competitivness

In the case study, for instance, the «Best Efficiency» solution selected is a mix between the two approaches:

- Subcontracting of the civil works (Buy);
- "In House" execution of the most complex activities (Make);
- Firm fixed price for civil works and MEP;
- Open-Book contract for Furniture and Operating Supplies.



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A Case Study (4/16): Bid Development

The better way to develop an economic offer is always to set up a WBS and an analytic estimation

WBS	Costs (analytic)	Buy-Out	Expected Optimization	Expected Costs
Dismantling and Demolition	€ 192.902,65	0,0%	0,0%	€ 192.902,65
Earth Works	€ 129.823,48	0,0%	0,0%	€ 129.823,48
Structural Works – New Buildings	€ 766.002,91	3,0%	5,0%	€ 704.722,68
Structural Works – Existing Buildings	€ 252.399,61	0,0%	2,5%	€ 246.089,62
Special Structures	€ 239.408,00	3,0%	2,5%	€ 226.240,56
Civil Works – New Buildings	€ 163.369,25	3,0%	2,5%	€ 154.383,94
Civil Works – Existing Buildings	€ 483.087,65	2,0%	2,5%	€ 461.348,70
Waterproofing and Insulations	€ 86.972,86	2,0%	2,5%	€ 83.059,08
Fire Protection – Civil Works	€ 142.585,15	3,0%	5,0%	€ 131.178,34
MEP – HVAC	€ 1.642.238,89	6,0%	6,0%	€ 1.445.170,22
MEP – Electric and Data Systems	€ 1.155.674,75	6,0%	7,5%	€ 999.658,66
MEP – Special Systems	€ 52.258,10	4,0%	6,0%	€ 47.032,29
MEP – Civil Works	€ 98.997,64	0,0%	1,5%	€ 97.512,67
MEP – External Works	€ 136.746,76	0,0%	6,0%	€ 128.541,95
MEP - Lights	€ 482.427,92	10,0%	6,0%	€ 405.239,45
MEP – Toilet Furniture and Fittings	€ 577.378,85	10,0%	4,0%	€ 496.545,81
Custom Made Furniture	€ 1.024.521,78	8,0%	0,0%	€ 942.560,04
Other Furniture	€ 1.371.459,90	10,0%	0,0%	€ 1.234.313,91
Handling Services	€ 137.534,57	0,0%	0,0%	€ 137.534,57
Landscaping	€ 864.209,27	0,0%	2,5%	€ 842.604,04
Total Costs *	**€ 10.000.000,00**			**€ 9.106.462,68**

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A Case Study (5/16): Risk Analysis – General Principles

Performing a Risk Analysis can be done considering different dimensions for Risk

	Tangible	Intangible
Controllable	**Tangible and Controllable:** - Easy to handle for the PM; - Easy to foresee during Bid process; - Breakdown and assess impact and risk thresholds. i.e. change of construction costs due to poor engineering, poor procurement, etc.	**Intangible and Controllable:** - Hard to handle for the PM; - Difficult to foresee during Bid process; - Provide adequate contingencies, related to risk thresholds. i.e. problems not correctly addressed during design, Client unsatisfaction, sub-contractor issues, etc.
Un-controllable	**Tangible and Un-Controllable:** - Due to external reasons; - Hard to handle for the PM; - Impossible to foresee during Bid process; - Provide adequate contingencies. i.e. raw material prices cost fluctuation, oil price fluctuation, etc.	**Intangible and Un-Controllable:** - Impossible to handle for the PM; - Impossible to foresee during Bid process; - Useless to provide contingencies; - Define clauses in contract terms and conditions. i.e. earthquakes, tsunami, civil riots, etc.

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A Case Study (6/16): Risk Analysis – Risk Breakdown

A Risk Breakdown is the easier way to focus on the effective risk profile of our job

EPC Risk Breakdown (Tangible)								
Risk Source	**Critical**	**Engineering**	**Procurement**	**Construction & Testing**	**Transportation and Installation**	**Commissioning**	**Risk Rate**	**Reliability Index**
Range	**1-5**	**1-5**	**1-5**	**1-5**	**1-5**	**1-5**	**Weighed**	
Influence Rate	**40%**	**10%**	**5%**	**30%**	**10%**	**5%**		
Dismantling and Demolition	2	5	1	1	1	3	38%	89,55%
Earth Works	1	5	1	1	1	1	28%	94,83%
Structural Works – New Buildings	5	4	1	2	2	2	67%	74,23%
Structural Works – Existing Buildings	2	4	1	4	3	1	56%	80,04%
Special Structures	3	2	3	2	1	1	46%	85,32%
Civil Works – New Buildings	3	2	1	2	1	2	45%	85,85%
Civil Works – Existing Buildings	2	3	1	4	3	1	54%	81,09%
Waterproofing and Insulations	1	1	1	3	2	1	34%	91,66%
Fire Protection – Civil Works	1	4	1	2	1	1	32%	92,72%
MEP – HVAC	4	3	3	4	3	4	75%	70,00%
MEP – Electric and Data Systems	4	1	2	2	2	4	56%	80,04%
MEP – Special Systems	1	1	3	1	1	4	25%	96,42%
MEP – Civil Works	2	2	1	2	1	1	36%	90,60%
MEP – External Works	1	2	1	1	1	1	22%	98,00%
MEP - Lights	2	1	4	1	1	2	32%	92,72%
MEP – Toilet Furniture and Fittings	2	1	4	1	1	1	31%	93,25%
Custom Made Furniture	5	2	5	2	3	3	70%	72,64%
Other Furniture	5	3	5	1	3	3	66%	74,75%
Handling Services	1	1	1	1	2	1	22%	98,00%
Landscaping	1	2	1	2	2	2	31%	93,25%

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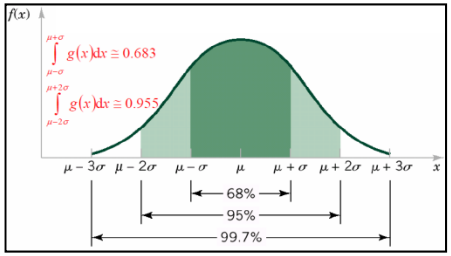
A Case Study (7/16): Risk Analysis – Probabilistic Models

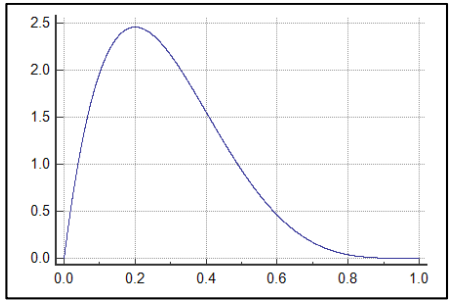
To perform a Montecarlo Simulation we need to choose a probabilistic model

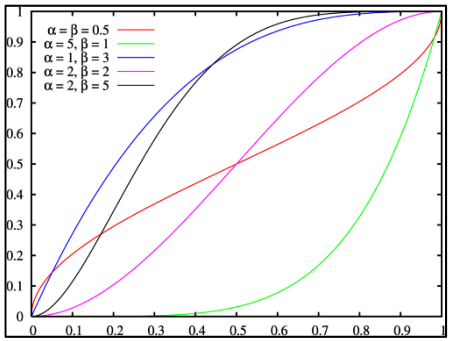
WBS	Expected Costs *	Reliability Index	Standard Deviation *
Dismantling and Demolition	€ 192.902,65	89,55%	€ 10.081,89
Earth Works	€ 129.823,48	94,83%	€ 3.355,81
Structural Works – New Buildings	€ 704.722,68	74,23%	€ 90.816,15
Structural Works – Existing Buildings	€ 246.089,62	80,04%	€ 24.562,53
Structural Works – New Wooden Foyer	€ 226.240,56	85,32%	€ 16.605,20
Civil Works – New Buildings	€ 154.383,94	85,85%	€ 10.923,39
Civil Works – Existing Buildings	€ 461.348,70	81,09%	€ 43.610,51
Waterproofing and Insulations	€ 83.059,08	91,66%	€ 3.463,41
Fire Protection – Civil Works	€ 131.178,34	92,72%	€ 4.776,87
MEP – HVAC	€ 1.445.170,22	70,00%	€ 216.775,53
MEP – Electric and Data Systems	€ 999.658,66	80,04%	€ 99.777,25
MEP – Special Systems	€ 47.032,29	96,42%	€ 843,03
MEP – Civil Works	€ 97.512,67	90,60%	€ 4.581,26
MEP – External Works	€ 128.541,95	98,00%	€ 1.285,42
MEP - Lights	€ 405.239,45	92,72%	€ 14.756,83
MEP – Toilet Furniture and Fittings	€ 496.545,81	93,25%	€ 16.770,13
Custom Made Furniture	€ 942.560,04	72,64%	€ 128.935,10
Other Furniture	€ 1.234.313,91	74,75%	€ 155.803,02
Handling Services	€ 137.534,57	98,00%	€ 1.375,35
Landscaping	€ 842.604,04	93,25%	€ 28.457,76
Total Costs *	**€ 9.106.462,68**		σ = EC * (1 – RI) / 2

Gauss Distribution



Beta Distribution





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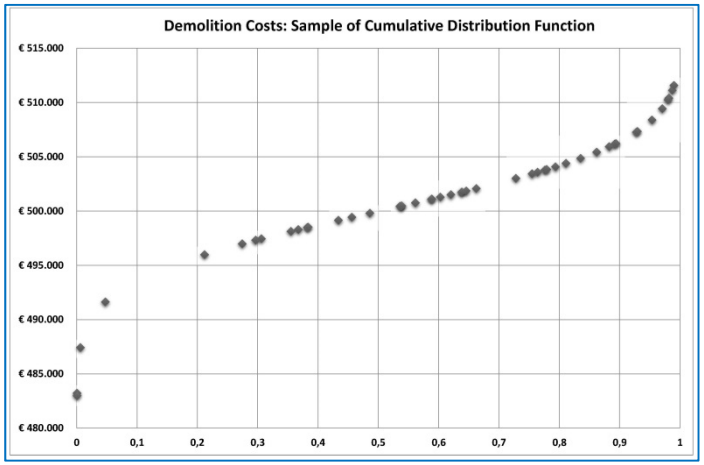
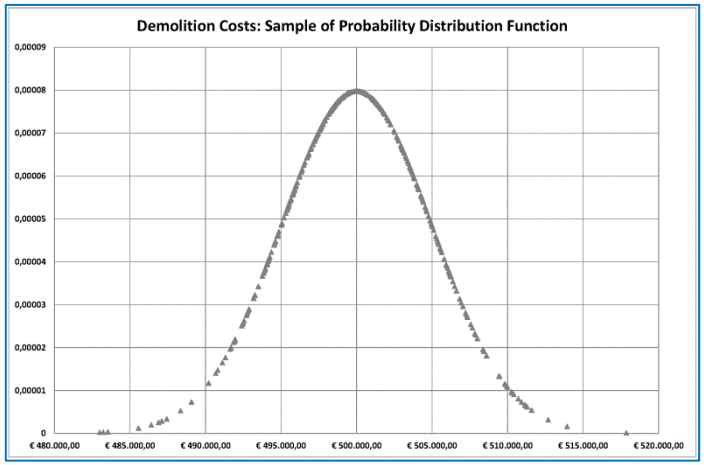
A Case Study (8/16): Risk Analysis – Gauss Distribution

The Gauss distribution is a first approach that could be implemented to perform a Risk Analysis.
The first step is to define the Expected Costs (EC) and the Reliability Index (RI) for every element of the WBS.
The Reliability Index defines the width of the Bell-Shaped Gauss curve and is defined in the case study considering a +/-30% fluctuation of costs if compared to the Expected Value.
In the fluctuation model the only effective variable is the Standard Deviation σ.
Considering $2\ \sigma$ = EC * (1 – RI) means that the Effective Costs in the Montecarlo Simulation will be in 96% of cases between the value EC +/- 30%.
The Gauss curve assumes a symmetrical fluctuation of costs.
A Montecarlo simulation could be easily performed using EXCEL statistical functions.

Model «A» Gauss Distribution





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A Case Study (9/16): Risk Analysis – Beta Distribution

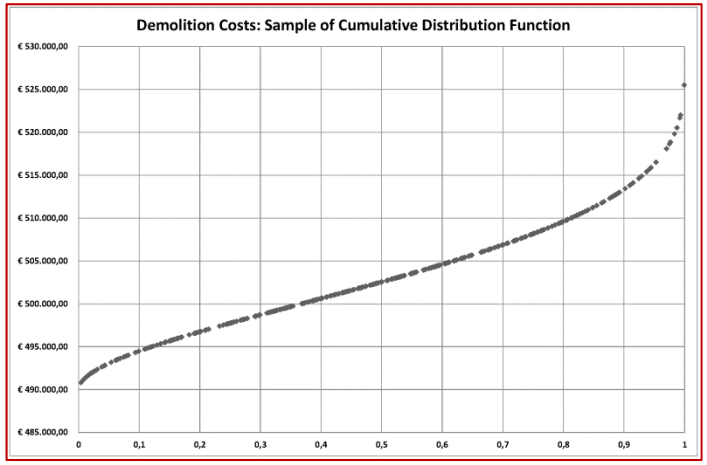
The Gauss distribution approach has a basic restriction: effective costs fluctuation has not a symmetrical distribution!

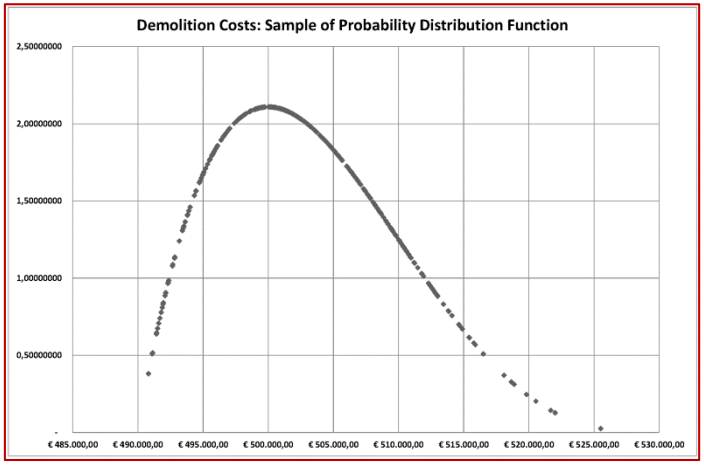
Usually in EPC Contracts the effective borne costs can vary from -10% to +30% if compared to the Expected Costs (see literature references reported in the last slide). This situation can be properly modeled using a Beta Distribution probability curve.

The parameters that describe a "Beta Curve" can be set so that every fluctuation curve describes effectively the expected variation of costs within our model.

For instance, if a specific Work Breakdown Element is expected to have an "almost fixed" cost with low fluctuations, it is possible to arrange the Beta Curve coefficients in order to reduce the variability range of costs [e.g. from -10/+30% to -5%/+10%].

Model «B» Beta Distribution





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A Case Study (10/16): Risk Analysis – Beta Distribution Application

In the following spreadsheet an applicative example of Beta Distribution parameters set up for the case study is shown.

WBS	Expected Costs*	R.I.	Maximum Expected Cost*	Distribution Parameter*	Distribution Parameter	Distribution Parameter	Mean	Mode
	[b]		[c]	[μ]	[α]	[β]	[α/(α+β)]	[(α-1)/(α+β-2)]
Dismantling and Demolition	€192.902,65	89,55%	€253.394,01	€199.623,91	2,000	4,000	0,333	0,250
Earth Works	€129.823,48	94,83%	€146.602,56	€131.277,67	2,297	3,703	0,383	0,324
Structural Works – New Buildings	€704.722,68	74,23%	€1.249.619,58	€771.321,19	1,842	4,158	0,307	0,211
Structural Works – Existing Buildings	€246.089,62	80,04%	€422.939,84	€264.920,90	2,061	3,939	0,344	0,265
Special structural Works	€226.240,56	85,32%	€319.229,71	€236.757,19	1,973	4,027	0,329	0,243
Civil Works – New Buildings	€154.383,94	85,85%	€219.924,30	€161.666,21	2,000	4,000	0,333	0,250
Civil Works – Existing Buildings	€461.348,70	81,09%	€723.011,76	€490.422,37	2,000	4,000	0,333	0,250
Waterproofing and Insulations	€83.059,08	91,66%	€103.839,52	€85.368,02	2,000	4,000	0,333	0,250
Fire Protection – Civil Works	€131.178,34	92,72%	€159.839,57	€134.362,92	2,000	4,000	0,333	0,250
MEP – HVAC	€1.445.170,22	70,00%	€2.138.851,93	€1.502.977,03	2,333	3,667	0,389	0,333
MEP – Electric and Data Systems	€999.658,66	80,04%	€1.398.767,67	€1.036.243,65	2,241	3,759	0,374	0,310
MEP – Special Systems	€47.032,29	96,42%	€50.404,42	€47.313,30	2,333	3,667	0,389	0,333
MEP – Civil Works	€97.512,67	90,60%	€115.837,70	€99.039,76	2,333	3,667	0,389	0,333
MEP – External Works	€128.541,95	98,00%	€137.539,89	€129.677,41	1,782	4,218	0,297	0,195
MEP - Lights	€405.239,45	92,72%	€456.888,37	€408.928,66	2,455	3,545	0,409	0,364
MEP – Toilet Furniture and Fittings	€496.545,81	93,25%	€563.626,34	€502.135,85	2,333	3,667	0,389	0,333
Custom Made Furniture	€942.560,04	72,64%	€1.587.235,54	€1.007.027,59	2,143	3,857	0,357	0,286
Other Furniture	€1.234.313,91	74,75%	€2.169.132,03	€1.338.182,59	2,000	4,000	0,333	0,250
Handling Services	€137.534,57	98,00%	€145.786,65	€138.451,47	2,000	4,000	0,333	0,250
Landscaping	€842.604,04	93,25%	€984.892,83	€856.832,91	2,143	3,857	0,357	0,286
Total Costs*	€9.106.462,68							

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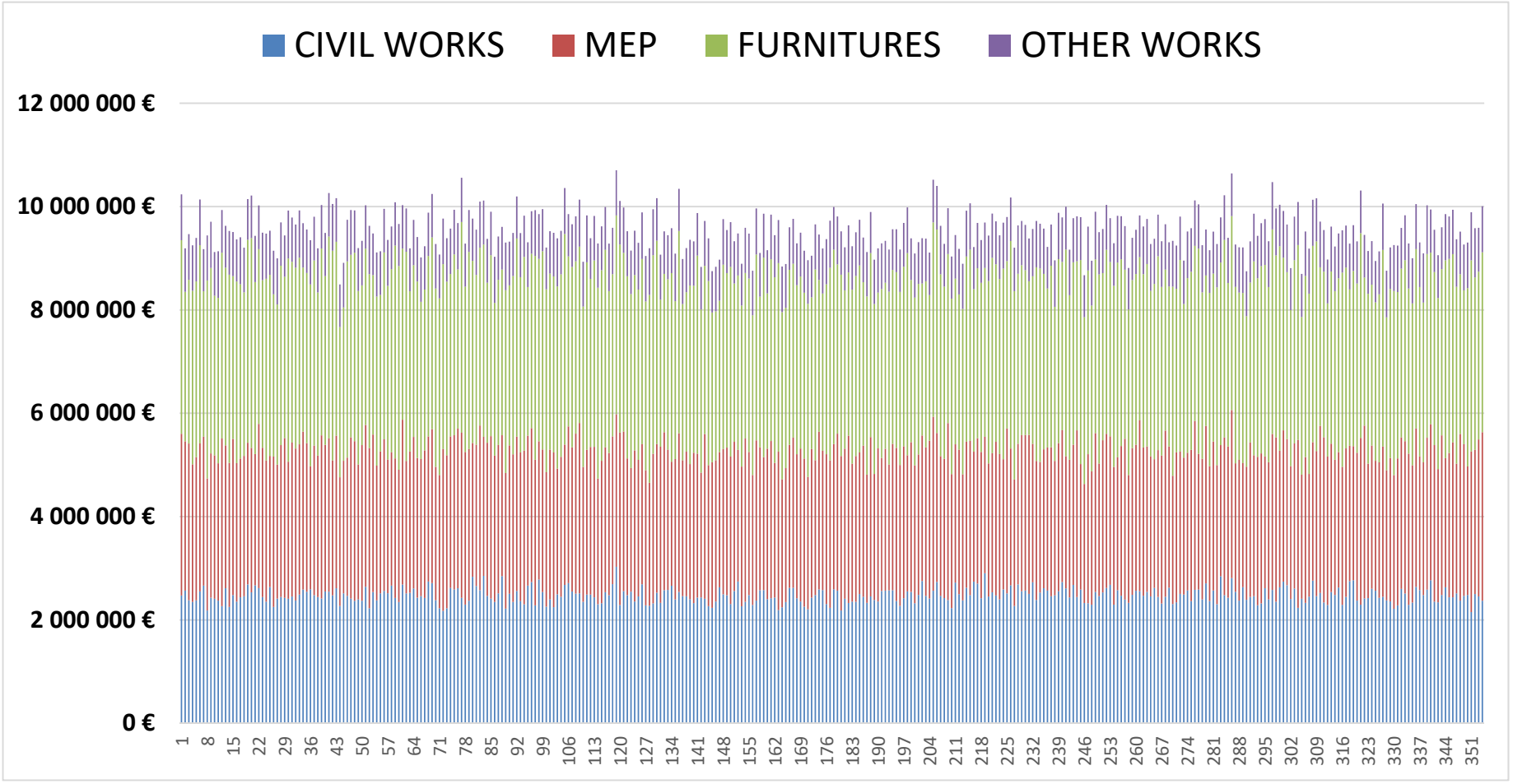
A Case Study (11/16): Risk Analysis – Beta Distribution Application

Once the model is calibrated, a Montecarlo Simulation can be run (350 attempts).



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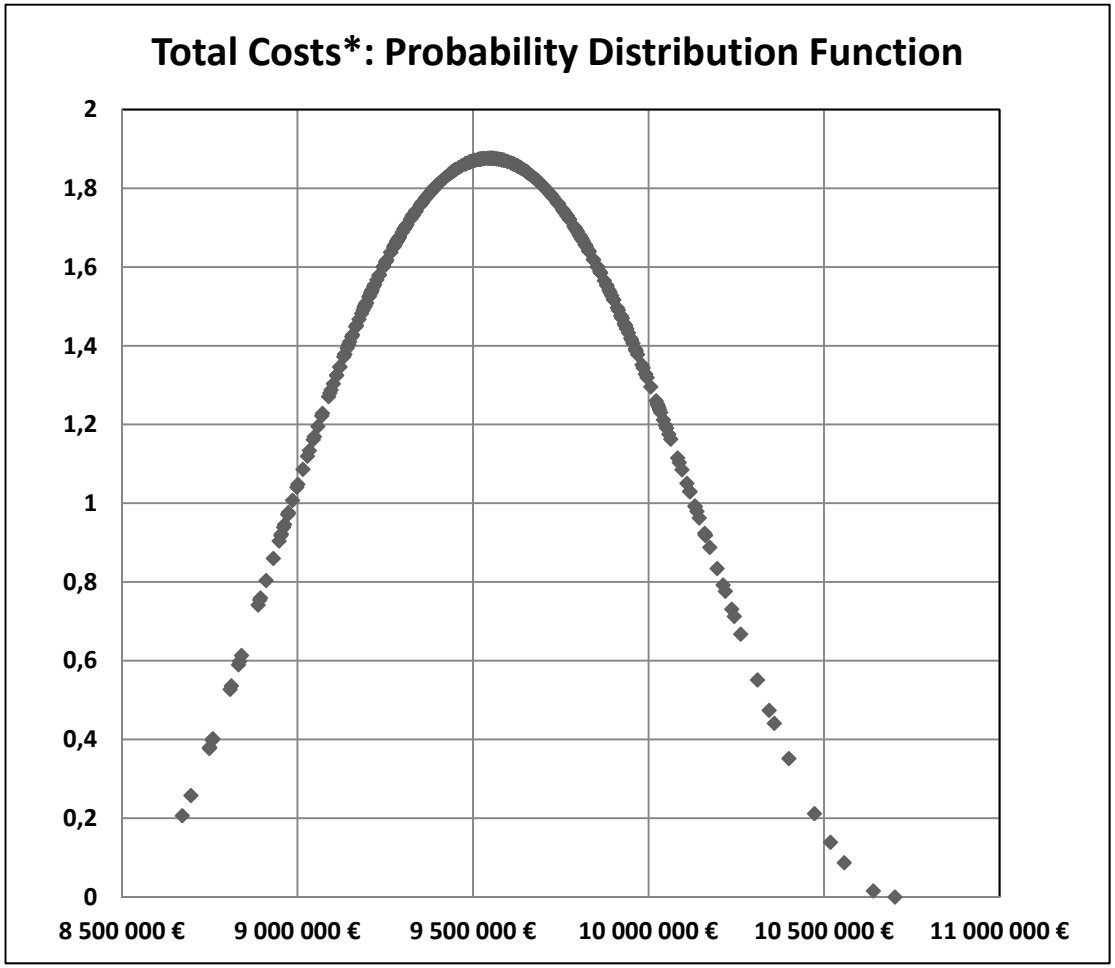
A Case Study (12/16): Risk Analysis – Beta Distribution Application

Montecarlo Simulation scenery – final results and percentile distribution



Total Costs*: Average Value	€9.509.399,04
Maximum Cost*	€10.726.831,64
Minimum Cost*	€8.579.463,85
α - Total Cost Distribution	3,268
β - Total Cost Distribution	2,732
95th Percentile*	€10.393.765,42
70th Percentile*	€9.992.083,54
60th Percentile*	€9.874.253,54
50th Percentile*	€9.760.289,61
35th Percentile*	€9.584.388,94
20th Percentile*	€9.380.796,62
10th Percentile*	€9.199.018,37
5th Percentile*	€9.065.263,35

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A Case Study (13/16): A Challenge – Make tangibles the intangibles

The result of the first step of the Montecarlo Simulation are summed up in the spreadsheet: each percentile corresponds with an expected amount.
The capture manager has a powerful instrument to decide how the company can be aggressive and to know how huge the financial exposure is.
Evaluate tangible risks – anyway – is pretty easy. More difficult is to provide an evaluation about the impact on the EPC job of the intangible risks.
By their very nature, intangible risks should be impossible to evaluate. But for every Company the real challenge is to turn intangible risks in tangible ones.
A viable option is to allocate in the Contract Proposal a Provisional Sum in order to face intangible risks that should occur during the works, from the Engineering first phase until the commissioning of the job.
But the real trouble is: what is a reasonable percentage to set aside in order to cover intangible threats and – at the same time – not to burden unacceptably Client's budget?
P.M. tools can provide an answer. And the answer is still the same: first of all, provide a Risk Breakdown and then analyze single Risk sources.
In this case, the experience gained in the specific sector shows that Intangible Risks can have huge impacts, according to an exponential degree of variability. A breakdown and analysis example is shown in the following slide.

A Case Study (14/16): Risk Analysis – Evaluation of Intangible Risks

Risk Source (Intangibles)	Possibility	Max Cost Impact	Max Schedule Impact	Normal Cost Expected*	Max Cost Expected*	λ	Exp. Value	P_{25}	P_{50}	P_{75}	P_{95}
Re-work due to poor quality engineering	10,00%	0,50%	5,00%	€5.000,00	€50.000,00	10	0,10	1.438,41 €	3.465,74 €	6.931,47 €	14.978,66 €
Non availability of external resources	2,00%	6,00%	16,00%	€12.000,00	€600.000,00	50	0,02	3.452,18 €	8.317,77 €	16.635,53 €	35.948,79 €
Non availability of raw materials, other logistic issues	5,00%	2,50%	5,00%	€12.500,00	€250.000,00	20	0,05	3.596,03 €	8.664,34 €	17.328,68 €	37.446,65 €
Client's unsatisfied minor category	5,00%	0,10%	0,00%	€500,00	€10.000,00	20	0,05	143,84 €	346,57 €	693,15 €	1.497,87 €
Client's unsatisfied major category	0,50%	15,00%	2,00%	€7.500,00	€1.500.000,00	200	0,01	2.157,62 €	5.198,60 €	10.397,21 €	22.467,99 €
Unexpected expediting escalation	2,00%	5,00%	5,00%	€10.000,00	€500.000,00	50	0,02	2.876,82 €	6.931,47 €	13.862,94 €	29.957,32 €
Subcontracor issues	10,00%	5,00%	10,00%	€50.000,00	€500.000,00	10	0,10	14.384,10 €	34.657,36 €	69.314,72 €	149.786,61 €
HSE issues major	0,10%	7,50%	20,00%	€750,00	€750.000,00	1000	0,00	215,76 €	519,86 €	1.039,72 €	2.246,80 €
HSE issues minor	5,00%	1,00%	5,00%	€5.000,00	€100.000,00	20	0,05	1.438,41 €	3.465,74 €	6.931,47 €	14.978,66 €
Improper planning (high importance items)	2,00%	5,00%	10,00%	€10.000,00	€500.000,00	50	0,02	2.876,82 €	6.931,47 €	13.862,94 €	29.957,32 €
Improper planning (low importance items)	10,00%	0,10%	1,00%	€1.000,00	€10.000,00	10	0,10	287,68 €	693,15 €	1.386,29 €	2.995,73 €
Constructability issues: Major & Critical	5,00%	4,00%	5,00%	€20.000,00	€400.000,00	20	0,05	5.753,64 €	13.862,94 €	27.725,89 €	59.914,65 €
Constructability issues: Minor & Non-Critical	10,00%	1,00%	1,00%	€10.000,00	€100.000,00	10	0,10	2.876,82 €	6.931,47 €	13.862,94 €	29.957,32 €
Local population unrest / riots	0,10%	1,00%	10,00%	€100,00	€100.000,00	1000	0,00	28,77 €	69,31 €	138,63 €	299,57 €
	Total*			**€144.350,00**				**€41.526,91**	**€100.055,80**	**€200.111,59**	**€432.433,95**
								0,42%	**1,00%**	**2,00%**	**4,32%**

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A Case Study (15/16): Bid & Proposal Summary

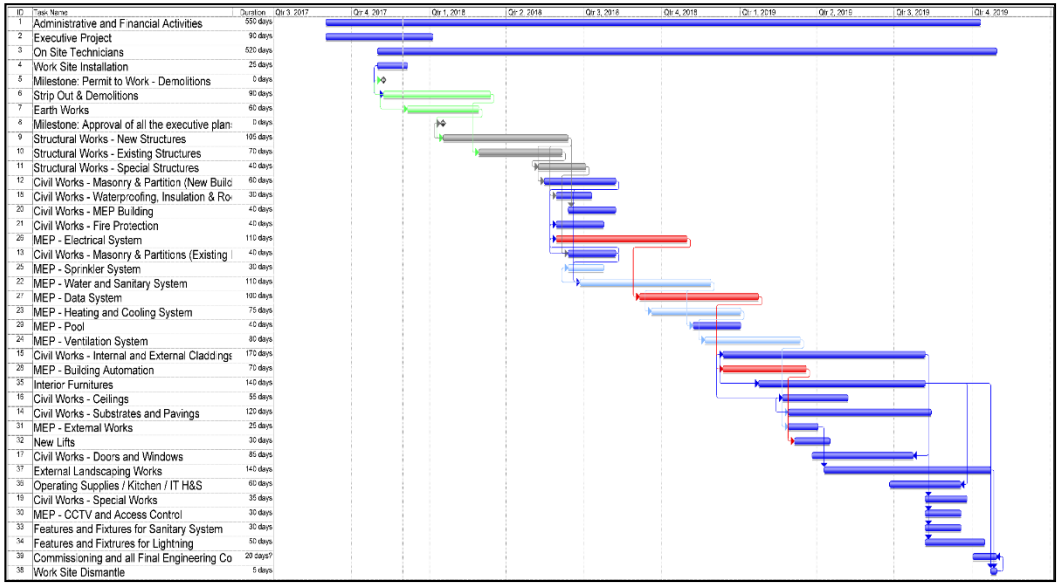
At the end of the process a bid & proposal can be prepared and presented to the Client.

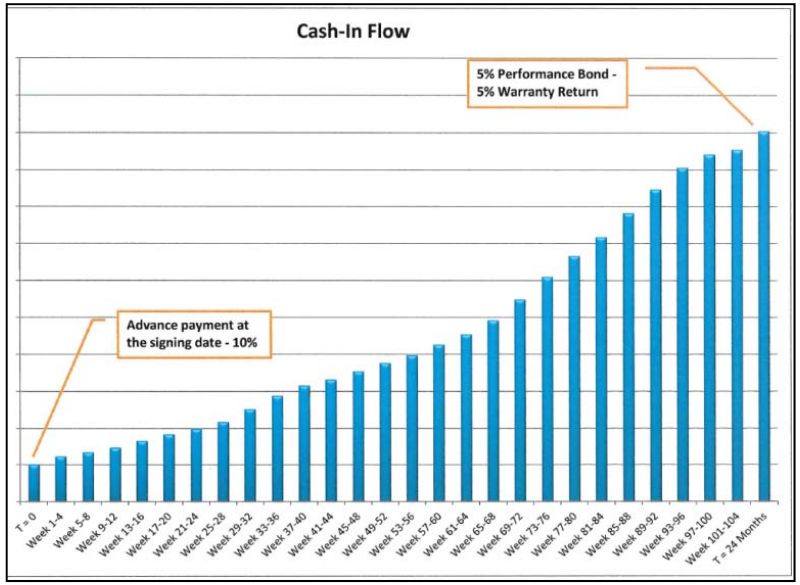
Bid (see also the following slide)

Tangible risk are evaluated as an increase of Direct Costs and not explicitly shown to the Client.
Intangible risks are included in the Bid Summary as an external Provisional Sum.

Proposal (see graphics below)

The execution idea is presented to the client with the help of graphic summaries, such as a Gantt Chart, a P.E.R.T. Chart, a Cash-In and Cash-Out Flow Chart.





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A Case Study (16/16): Bid & Proposal Summary

DIN276 Code	Text der Kostengruppe		Price*
300	**BAUWERK - BAUKONSTRUKTIONEN**	**STRUCTURE - CONSTRUCTION WORKS**	**€9.036.896,42**
310	Baugrube	Excavation	€134.079,92
320	Gründung	Foundations	€235.399,15
330	Außenwände	External Walls	€1.455.025,46
340	Innenwände	Internal Walls	€3.377.418,43
340 (fp)	Innenwände (Brandschutz)	Internal Walls (fire protection)	€203.957,08
350	Decken	Floors and Ceilings	€2.191.128,75
360	Dächer	Roofs	€472.787,21
370	Baukonstruktive Einbauten	Structural Fitments	€58.208,97
391	Baustelleneinrichtungen	Site Equipment	€279.824,96
392	Gerüste	Scaffolding	€45.906,79
393	Sicherungsmaßnahmen	Safety Measures	€22.858,16
394	Abbruchmaßnahmen	Demolition Works	€394.046,42
396	Materialentsorgung	Final Disposal of Materials	€166.255,13
400	**BAUWERK - TECHNISCHE ANLAGEN**	**STRUCTURE - SERVICES**	**€5.642.228,59**
410	Abwasser-, Wasse-, Gasanlagen	Sewerage, water and gas systems	€1.234.983,21
420	Wärmeversorgungsanlagen	Heat supply systems	€387.035,81
430	Lufttechnische Anlagen	Air treatment systems	€754.693,06
440	Starkstromanlagen	Power installations	€2.215.857,14
450	Fernmelde- und informationst. Anlagen	Telecommunications and other systems	€463.154,08
456	Gefahrmelde- und Alarmanlagen	Security systems	€39.858,91
461	Aufzugsanlagen	Lifts	€84.458,60
475	Feuerlöschanlagen	Fire-Fighting installations	€95.511,77
476	Schwimmbadtechnik und Aussenbecken	Swimming baths equipment	€164.287,70
480	Gebäudeautomation	Building Automation	€202.388,32

DIN276 Code	Text der Kostengruppe		Price*
700	**BAUNEBENKOSTEN**	**INCIDENTAL BUILDING COSTS**	**€1.010.610,67**
736	Planung der technischen Ausrüstung	Planning of technical equipment	€131.344,40
739	Architekten- u. Ingenieurleistungen	Services of architects and engineers, other items	€807.834,54
790	Sonstige Baunebenkosten	Other incidental building costs	€71.431,73
TOTAL			**€15.689.735,69**
770	Allgemeine Baunebenkosten	Incidental Building Cost	€315.352,70
500	Aussenanlagen	External Works	€622.406,64
PROVISIONAL SUMS			**€937.759,34**
600	Ausstattung und Kunstwerke	Furnishings, furniture and artistic appointments	€2.661.088,80
471	Küchentechnische Anlagen	Kitchen Fitments	€396.265,56
611	Allgemeine Ausstattung	General Furnishing and Furnitures	€215.767,63
TOTAL FURNITURES & OS&E (OPEN BOOK)			**3M < COST < 4M**
489	Sonstige Maßnahmen für techn. Anlagen (IT)	Building Automation, other items (IT)	€985.809,13

Bid Resume *

Total Bid *	20.1-21.1 M€	Contract Form
Civil Works	**9.0 M€**	Fixed Price
MEP	**5.6 M€**	Fixed Price
Furniture (without OS)	**3.0-4.0 M€**	Cost Reimbursable (Open Book)
External Works / OS	-	Excluded
Incidental Costs	**2.5 M€**	Provisional Sum

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Lessons Learned, closing remarks and final comments (1/2)

a) PM Techniques can be the successful key-factor in a tender procedure, if properly applied;
b) PM Techniques offer a fully 360-degree approach to the project, that can be more efficient as it forces the Company to take a look to all the factors involved in the main process;
c) The more the tender is an “open procedure”, the more the detailed understanding of Client needs and issues becomes a key-factor;
d) A «bid & proposal» process is deeply different from a Bid Request, a Call for Tender or a Price Enquiry, as it gives the Company the chance to consider alternative options and a complex range of opportunities;
e) On the other hand, a «bid & proposal» process involves high overall risks and a Risk Evaluation becomes central in the whole process;
f) The Contract Form, in a high overall risk scenery, is a key-factor, as it has a deep impact on costs variability and risk threshold;
g) In a complex project environment, the rule of the PM is more effective, as his mastery on all the activities involved in the whole process is strong.

Lessons Learned, closing remarks and final comments (2/2)

At the end, I would like to focus attention about 3 remarkable aspects:

- The Client is the North Pole of the bidding process: we should not blindly follow his desires, but his issues and needs shall guide our choices;
- P.M. Tools alone are never an answer; rather, a mature application of the P.M. tools can be a precious key to success;
- Mature organizations learn to evaluate risks in a global meaning of threat (negative impact) and opportunities (positive impact); a successful market strategy in EPC Contracts depends on the ability of recognize and address risks.

There are several routes to successfully complete a job, but the choice of the best one depends on the ability of quickly and exactly understand where do we want to get.

Alice: "Would you tell me, please, which way I ought to go from here?"
The Cheshire Cat: "That depends a good deal on where you want to get to".
[Lewis Carroll – Alice in Wonderland]

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Literature

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