

Determining the Mathematical ROI of a Project Management Office Implementation

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Imagine hearing this

Our project
office estimates
a **result** of

\$2.512.244,15

With a
ROI of

90,68%

ROI Calculation Process

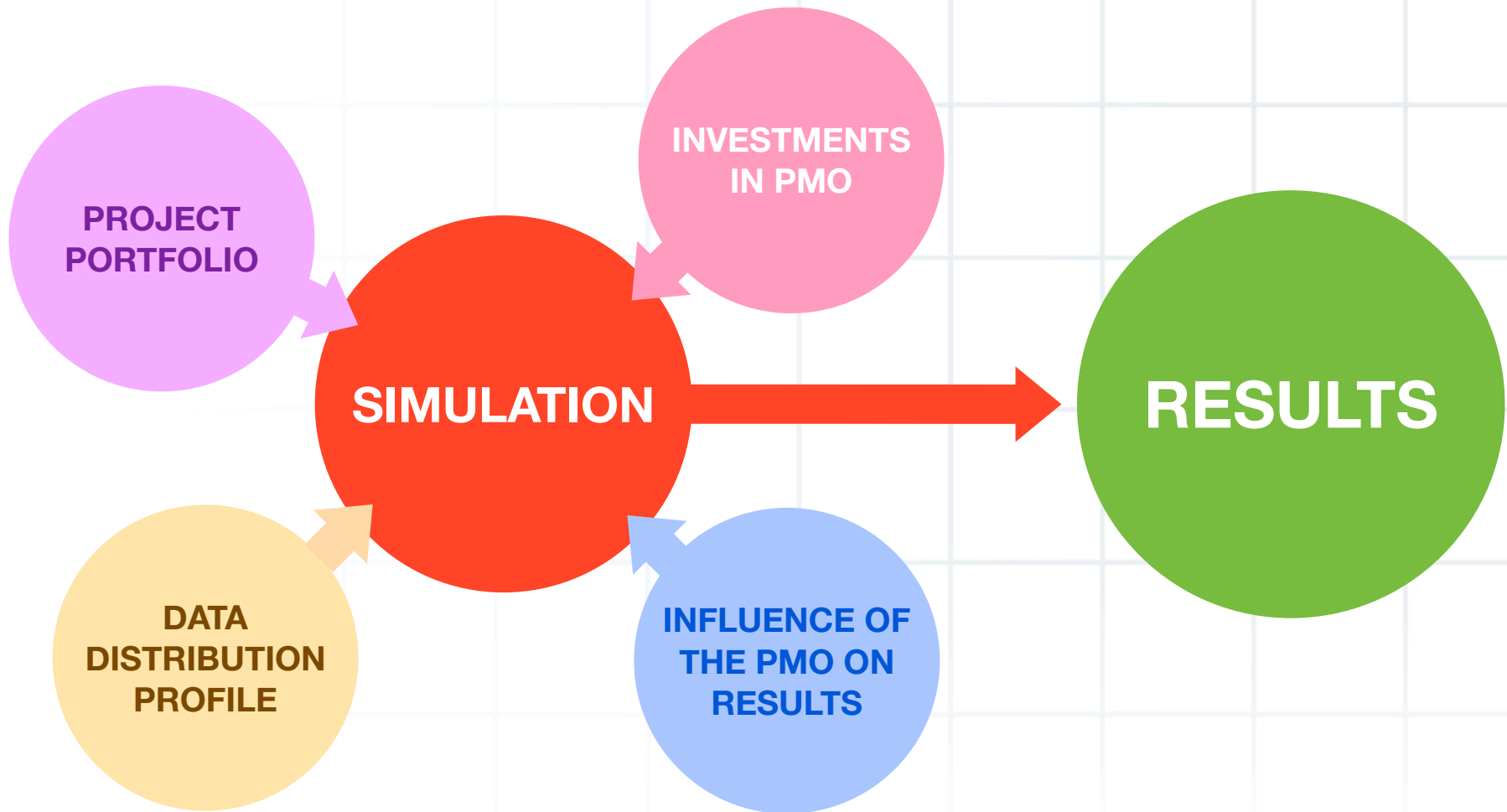
ROI - Key benefits of a numerical calculation

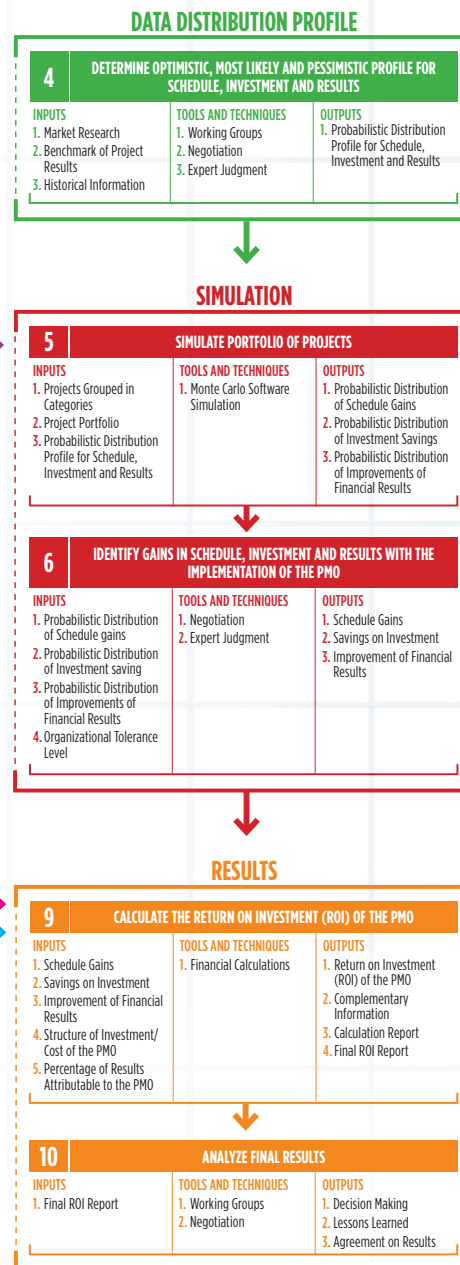
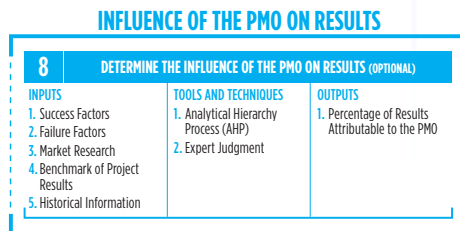
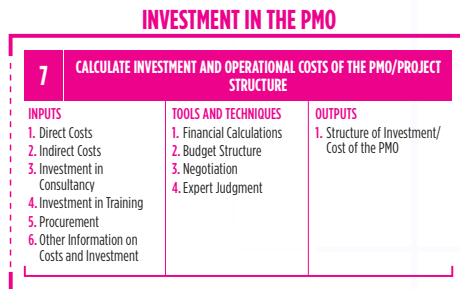
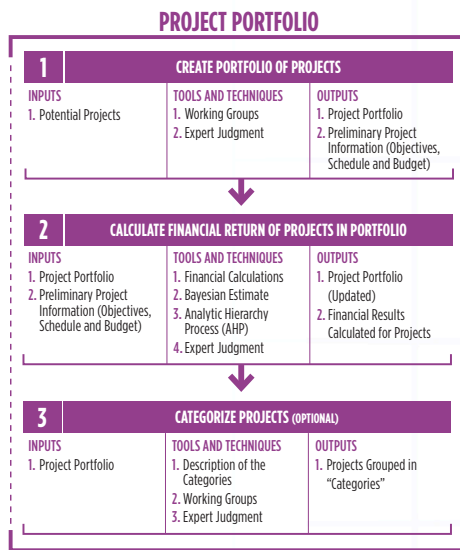
- Price is a proxy for value.
- Makes it easier to align and integrate with financial systems performance.
- Supports the identification of critical sources of value.
- Promotes communication and makes results quantitatively tangible.

What about the Challenges?

- It is a simplification of the possible scenarios.
- Plenty of cultural, social and moral aspects.
- Benefits can be questionable since the perceptions of value can be different.

Process Overview





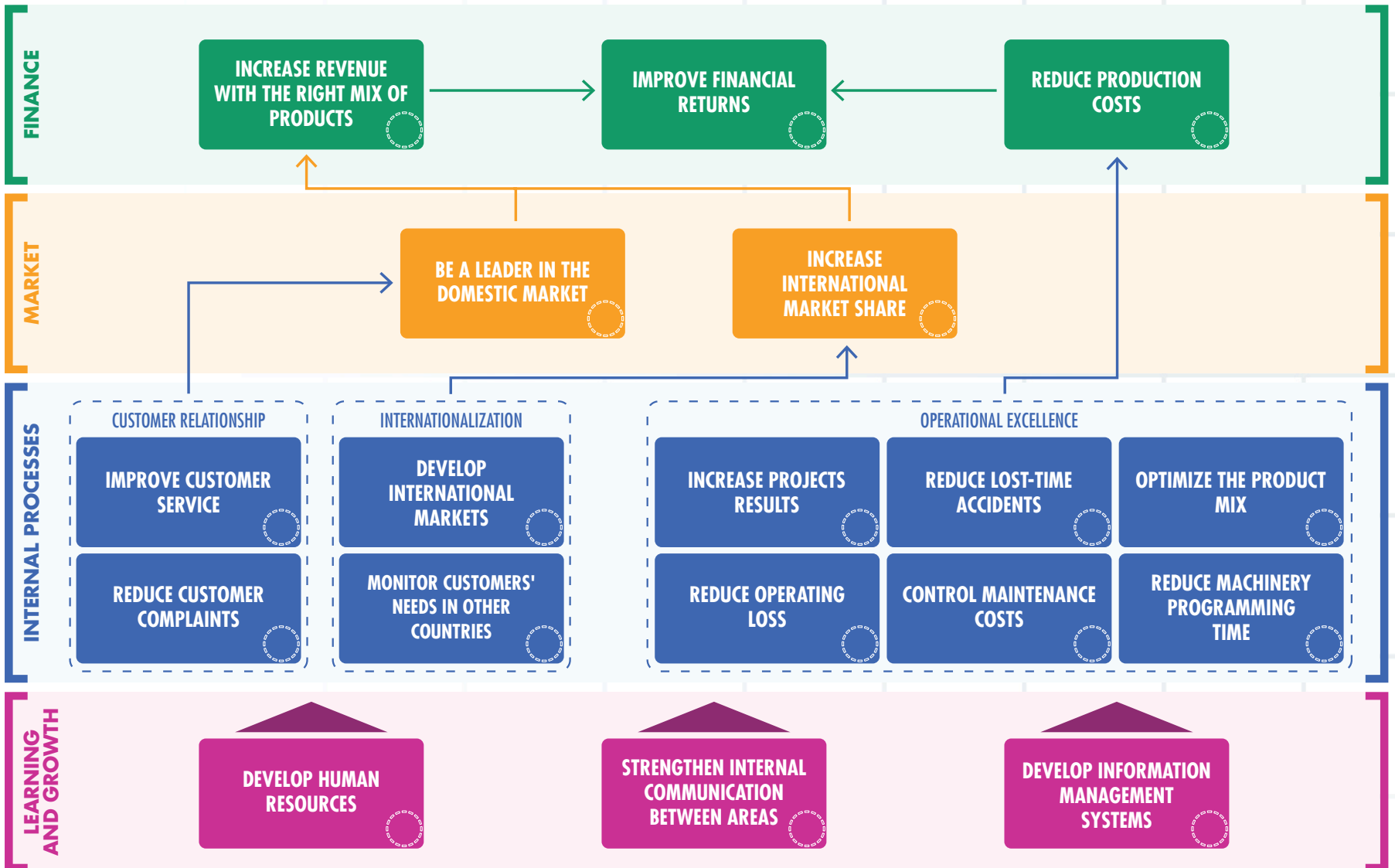
Process Flow

Step by Step Process: Tiger Screws Case

Tiger Screws Company



- Founded in 1961
- Third largest screw manufacturer in the country
- Produces 4200 tons per month
- 12,000 products comprising 280 different lines
- Revenues of \$48,000,000.00 last year



Project Portfolio

1

CREATE PORTFOLIO OF PROJECTS

INPUTS

1. Potential Projects

TOOLS AND TECHNIQUES

1. Working Groups
2. Expert Judgment

OUTPUTS

1. Project Portfolio
2. Preliminary Project Information (Objectives, Schedule and Budget)

Tiger Screws' Project List

Review of Product Mix

Zero Accidents

Internationalization of Production Units

Modernization of the Instrumentation System

E-commerce

Corporate Office Projects

New Markets

University Tiger Screws

New Line for the Oil Industry

Import Finished Products

Opening of Capital

Social Media

ERP System

New Maintenance Policy

Example of Preliminary Information

8 AREA HUMAN RESOURCES



UNIVERSITY TIGER SCREWS

DESCRIPTION

It is a project for establishing an internal technical training center, aimed at qualifying workers for industrial jobs.

STRATEGIC MAP OBJECTIVES THAT ARE SUPPORTED BY THIS PROJECT

1. Improve customer service
2. Reduce lost-time accidents
3. Develop human resources

BASIC DATA

Begin	Mar-12
End	Sep-12
Duration	7 months
Budget (\$)	350,000

WORK BREAKDOWN STRUCTURE - WBS



Tiger Screws Portfolio Consolidated Information

ID	PROJECT	DURATION	BUDGET
1	Review of Product Mix	6	460,000
2	Zero Accidents	12	300,000
3	Internationalization of Production Units	23	6,350,000
4	Modernization of the Instrumentation System	8	2,420,000
5	E-commerce	4	350,000
6	Corporate Office Projects	7	450,000
7	New Markets	13	360,000
8	University Tiger Screws	7	350,000

Tiger Screws Portfolio Consolidated Information

ID	PROJECT	DURATION	BUDGET
9	New Line for the Oil Industry	18	2,850,000
11	Import Finished Products	22	2,080,000
12	Opening of Capital	24	1,200,000
13	Social Media	5	225,000
14	ERP System	9	1,240,000
15	New Maintenance Policy	17	680,000
Total		194	22,915,000

Tiger Screws Portfolio Consolidated Information

ID	PROJECT	AREA	RISK	COMPLEXITY
1	Review of Product Mix	Marketing and Sales	High	High
2	Zero Accidents	Industrial	Low	Medium
3	Internationalization of Production Units	Planning	Very High	High
4	Modernization of the Instrumentation System	Industrial	Medium	Medium
5	E-commerce	Information Technology	Medium	Medium
6	Corporate Office Projects	Planning	Low	Low
7	New Markets	Marketing and Sales	High	High

Tiger Screws Portfolio Consolidated Information

ID	PROJECT	AREA	RISK	COMPLEXITY
8	University Tiger Screws	Human Resources	Low	Low
9	New Line for the Oil Industry	Research and Development	High	High
11	Import Finished Products	Marketing and Sales	Very High	High
12	Opening of Capital	Financial	High	High
13	Social Media	Marketing and Sales	Very Low	None
14	ERP System	Information Technology	High	High
15	New Maintenance Policy	Industrial	Medium	Medium

2

CALCULATE FINANCIAL RETURN OF PROJECTS IN PORTFOLIO

INPUTS

1. Project Portfolio
2. Preliminary Project Information (Objectives, Schedule and Budget)

TOOLS AND TECHNIQUES

1. Financial Calculations
2. Bayesian Estimate
3. Analytic Hierarchy Process (AHP)
4. Expert Judgment

OUTPUTS

1. Project Portfolio (Updated)
2. Financial Results Calculated for Projects

Monetizing Intangibles

Questions designed to make the results tangible:

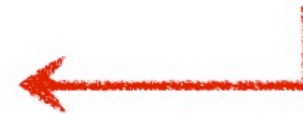
Why should this project be done?



Process covered with preconceptions and moralism that must be addressed.



Until a financial rationality appears



Example: Corporate University

- **Q: Why is there interest in the implementation of the Corporate University?**
 - A: So that we can prepare new talents
- **Q: Why is there interest in preparing new talents?**
 - A: To have in the future a greater allegiance in our executive level professionals.

Example: Corporate University

- **Q: Why do you want higher allegiance in the future?**
 - A: To lessen the turnover that generates additional costs

Then it can be concluded that one of the main objectives of the Corporate University is to reduce additional costs of hiring.

Imagine that the Tiger Screws' cost of hiring is \$8,716,704 over the next 5 years and that there is a likelihood that they are reduced in the coming years because of the corporate university.

AHP and Bayesian Estimate: University Tiger Screws

% Economy in the hiring process in the next 5 years	IMPACT	NAME OF THE GROUP TO BE EVALUATED				
		1	2	3	4	5
		10% ECONOMY	7% ECONOMY	5% ECONOMY	2% ECONOMY	NO ECONOMY
10% ECONOMY	USD 871,670.43	1	is just as likely	is most likely	is much more likely	is much more likely
7% ECONOMY	USD 610,169.30	2		is just as likely	is most likely	is much more likely
5% ECONOMY	USD 435,835.22	3			is just as likely	is most likely
2% ECONOMY	USD 174,334.09	4				is just as likely
NO ECONOMY	USD -	5				
EXPECTED VALUE		1	2	3	4	5
USD 608,110.28		10% ECONOMY	7% ECONOMY	5% ECONOMY	2% ECONOMY	NO ECONOMY
PROBABILITY		39.75%	28.43%	16.57%	9.16%	6.10%
INCONSISTENCY INDEX						5.4%

Example of Results University Tiger Screws

- Result: **\$608,110.28**
- Investment: **\$350,000.00**
- Benefit: **258,110.28**
- **Project ROI: 74%**

NOTE: Assuming the values are already brought to their present values.

Tiger Screws Portfolio Consolidated Information

ID	PROJECT	DURATION	BUDGET	FIN. RESUL. (\$)	ROI
1	Review of Product Mix	6	460,000	128,800	28%
2	Zero Accidents	12	300,000	123,000	41%
3	Internationalization of Production Units	23	6,350,000	11,430,000	180%
4	Modernization of the Instrumentation System	8	2,420,000	1,573,000	65%
5	E-commerce	4	350,000	126,000	36%
6	Corporate Office Projects	7	450,000	364,500	81%
7	New Markets	13	360,000	248,400	69%
8	University Tiger Screws	7	350,000	258,110	74%

Tiger Screws Portfolio Consolidated Information

ID	PROJECT	DURATION	BUDGET	FIN. RESUL. (\$)	ROI
9	New Line for the Oil Industry	18	2,850,000	598,500	21%
11	Import Finished Products	22	2,080,000	4,430,400	213%
12	Opening of Capital	24	1,200,000	660,000	55%
13	Social Media	5	225,000	41,116	18%
14	ERP System	9	1,240,000	347,200	28%
15	New Maintenance Policy	17	680,000	95,200	14%
Total		194	22,915,000	22,548,226	

The Total duration is used only to determine the approximate total workload in projects. The term may be replaced by man/hour or other measures of effort.

Tiger Screws Portfolio Consolidated Information

ID	PROJECT	DURATION	BUDGET	FIN. RESUL. (\$)	ROI	AREA	RISK	COMPLEXITY
1	Review of Product Mix	6	460,000	128,800	28%	Marketing and Sales	High	High
2	Zero Accidents	12	300,000	123,000	41%	Industrial	Low	Medium
3	Internationalization of Production Units	23	6,350,000	11,430,000	180%	Planning	Very High	High
4	Modernization of the Instrumentation System	8	2,420,000	1,573,000	65%	Industrial	Medium	Medium
5	E-commerce	4	350,000	126,000	36%	Information Technology	Medium	Medium
6	Corporate Office Projects	7	450,000	364,500	81%	Planning	Low	Low
7	New Markets	13	360,000	248,400	69%	Marketing and Sales	High	High
8	University Tiger Screws	7	350,000	258,110	74%	Human Resources	Low	Low
9	New Line for the Oil Industry	18	2,850,000	598,500	21%	Research and Development	High	High
11	Import Finished Products	22	2,080,000	4,430,400	213%	Marketing and Sales	Very High	High
12	Opening of Capital	24	1,200,000	660,000	55%	Financial	High	High
13	Social Media	5	225,000	41,116	18%	Marketing and Sales	Very Low	None
14	ERP System	9	1,240,000	347,200	28%	Information Technology	High	High
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Total		194	22,915,000	22,548,226				

3

CATEGORIZE PROJECTS (OPTIONAL)

INPUTS

1. Project Portfolio

TOOLS AND TECHNIQUES

1. Description of the Categories
2. Working Groups
3. Expert Judgment

OUTPUTS

1. Projects Grouped in “Categories”

PORTFOLIO BY AREAS

	PROJECTS	TOTAL DURATION	TOTAL BUDGET	TOTAL FINANCIAL RESULT
Financial	1	24.00	1,200,000.00	660,000.00
Industrial	3	37.00	3,400,000.00	1,791,200.00
Logistics	1	19.00	3,600,000.00	2,124,000.00
Marketing and Sales	4	46.00	3,125,000.00	4,848,715.95
Research and Development	1	18.00	2,850,000.00	598,500.00
Planning	2	30.00	6,800,000.00	11,794,500.00
Human Resources	1	7.00	350,000.00	258,110.00
Information Technology	2	13.00	1,590,000.00	473,200.00
Total	15	194.00	22,915,000.00	22,548,225.95

PORTFOLIO BY RISKS

	PROJECTS	TOTAL DURATION	TOTAL BUDGET	TOTAL FINANCIAL RESULT
High	5	70.00	6,110,000.00	1,982,900.00
Medium	3	29.00	3,450,000.00	1,794,200.00
Low	3	26.00	1,100,000.00	745,610.00
Very High	3	64.00	12,030,000.00	17,984,400.00
Very Low	1	5.00	225,000.00	41,115.95
Total	15	194.00	22,915,000.00	22,548,225.95

PORTFOLIO BY COMPLEXITY

	PROJECTS	TOTAL DURATION	TOTAL BUDGET	TOTAL FINANCIAL RESULT
High	8	134.00	18,140,000.00	19,967,300.00
Medium	4	41.00	3,750,000.00	1,917,200.00
Low	2	14.00	800,000.00	622,610.00
None	1	5.00	225,000.00	41,115.95
Total	15	194.00	22,915,000.00	22,548,225.95

In order to exemplify, the **Portfolio by Complexity** will be used in the next steps.

Data Distribution Profile

4

DETERMINE OPTIMISTIC, MOST LIKELY AND PESSIMISTIC PROFILE FOR SCHEDULE, INVESTMENT AND RESULTS

INPUTS

1. Market Research
2. Benchmark of Project Results
3. Historical Information

TOOLS AND TECHNIQUES

1. Working Groups
2. Negotiation
3. Expert Judgment

OUTPUTS

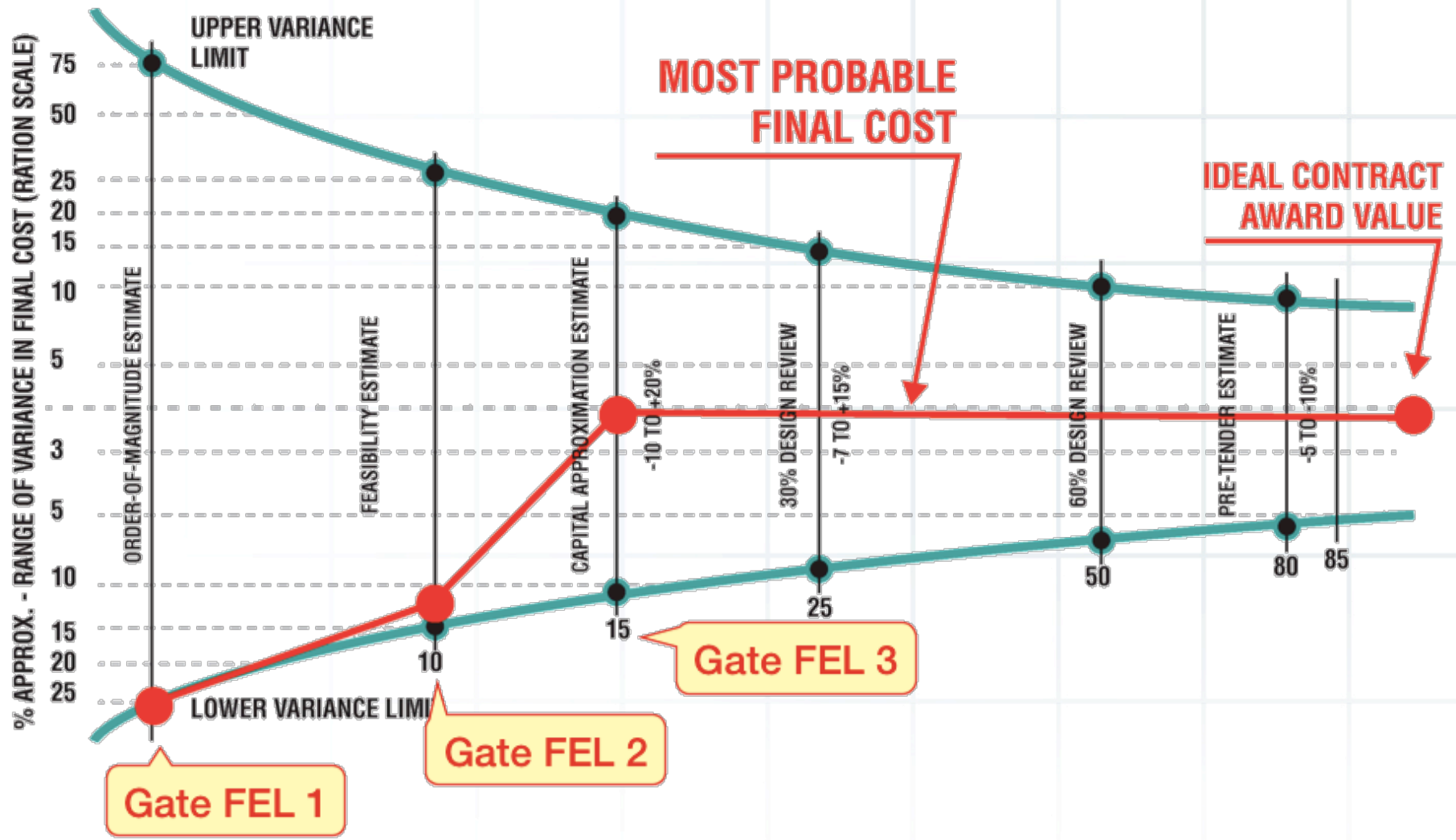
1. Probabilistic Distribution Profile for Schedule, Investment and Results

Standish Group Report

OVERRUN ON TIME	
Below 20%	13,9%
21-50%	18,3%
51-100%	20,0%
101-200%	35,5%
201-400%	11,2%
Above 400%	1,1%

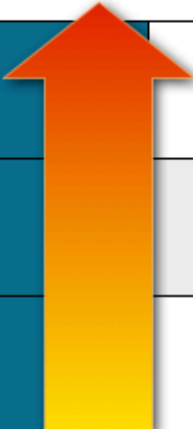
OVERRUN ON BUDGET	
Below 20%	15,5%
21-50%	31,5%
51-100%	29,6%
101-200%	10,2%
201-400%	8,8%
Above 400%	4,4%

FEL and Investment Projects



PMI Pulse Report 2012

Reported Organizational Project Management Maturity Level		% of on-time projects	% of on-budget projects	% of projects meeting original goals and business intent
	HIGH	67%	68%	73%
	MEDIUM	55%	58%	67%
	LOW	39%	44%	53%



PwC Report

Only 2.5% of the companies managed to complete 100% of their projects on time, within budget, according to scope and realizing the right business benefits

Boosting Business Performance through Programme and Project Management. PwC, 2004.

Chosen Profile: Tiger Screws - Conservative

COMPLEXITY	Without PMO			With PMO		
	OPTIMISTIC	MOST LIKELY	PESSIMISTIC	OPTIMISTIC	MOST LIKELY	PESSIMISTIC
High Complexity	+25%	+50%	+75%	+0%	+5%	+15%
Medium Complexity	+25%	+50%	+75%	+0%	+5%	+15%
Low Complexity	+15%	+30%	+45%	+0%	+5%	+15%
No Complexity	+10%	+20%	+30%	+0%	+5%	+15%

Simulation

5

SIMULATE PORTFOLIO OF PROJECTS

INPUTS

1. Projects Grouped in Categories
2. Project Portfolio
3. Probabilistic Distribution Profile for Schedule, Investment and Results

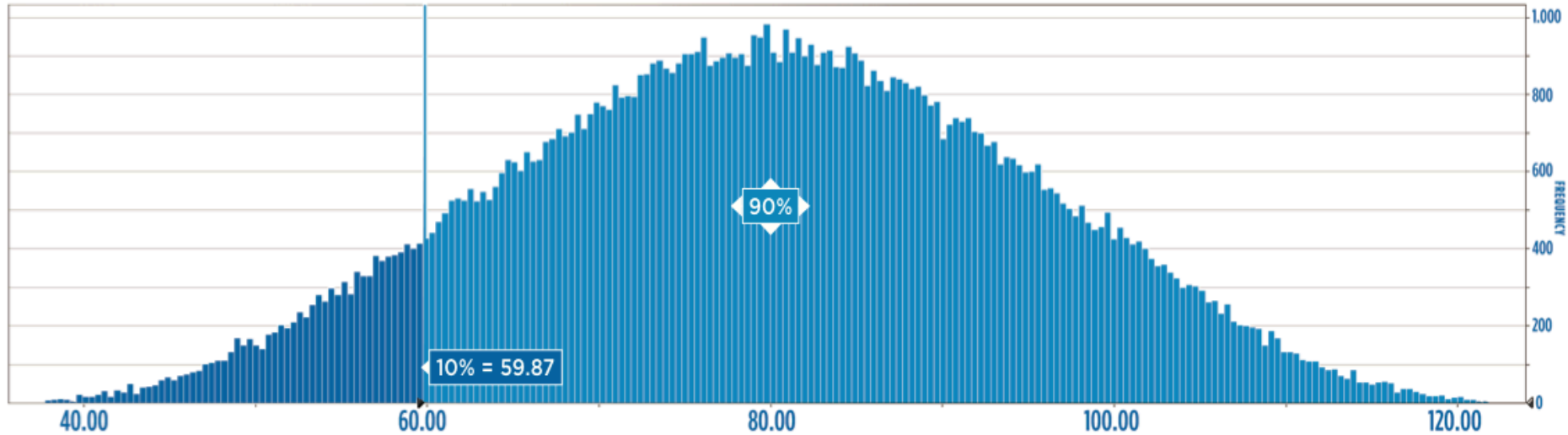
TOOLS AND TECHNIQUES

1. Monte Carlo Software Simulation

OUTPUTS

1. Probabilistic Distribution of Schedule Gains
2. Probabilistic Distribution of Investment Savings
3. Probabilistic Distribution of Improvements of Financial Results

IMPROVEMENT IN TIME



STATISTICS

Trials	100,000
Mean	79.77
Median	79.78
Standard Deviation	15.02

PERCENTILE

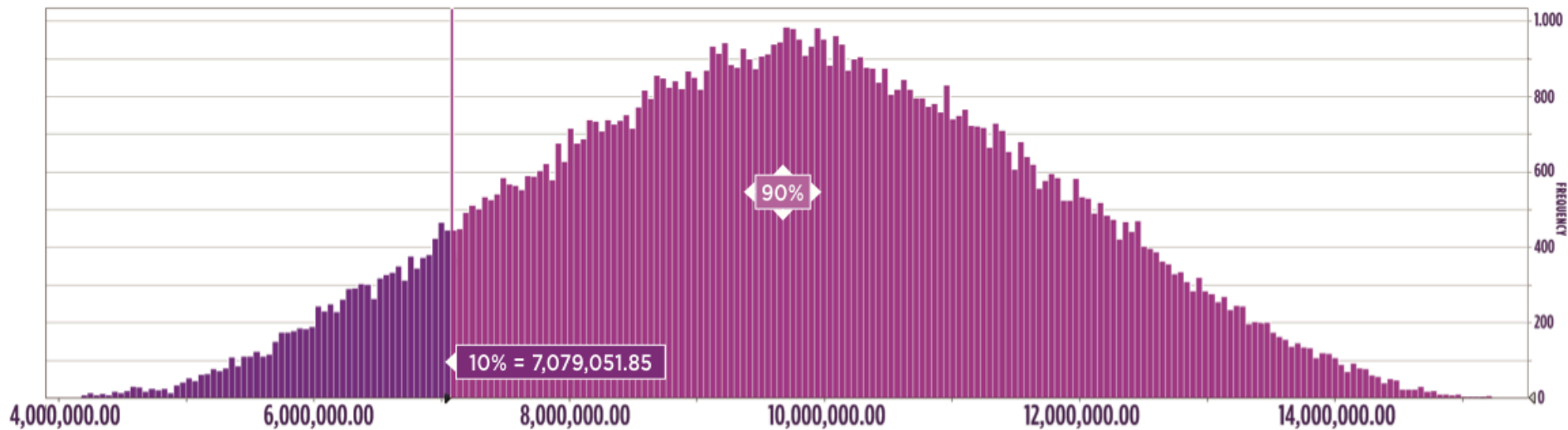
0%	31.29	60%	83.80
10%	59.87	70%	88.08
20%	66.53	80%	93.03
30%	71.52	90%	99.69
40%	75.77	100%	126.78
50%	79.78		

CONCLUSION

There is a 90% probability that the time gain using the PMO will be a minimum of **59.87 months**.

Please note that the objective of time gain is to evaluate the reduction in the projects' workload and not necessarily a faster completion of work.

GAIN IN BUDGETS



STATISTICS

Trials	100,000
Mean	9,702,355.47
Median	9,710,732.45
Standard Deviation	1,974,491.61

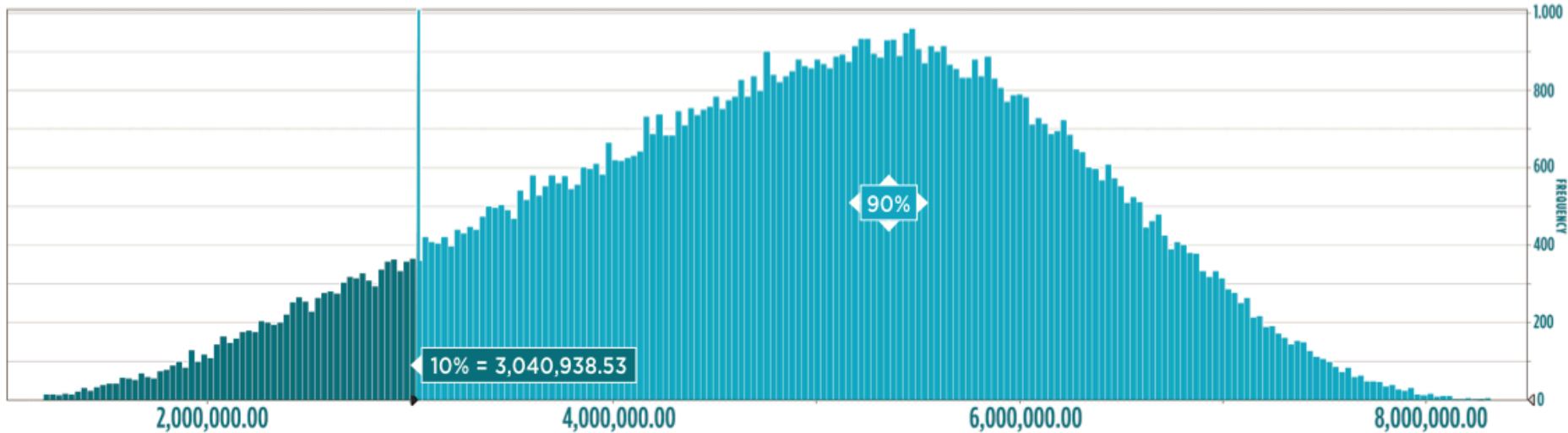
PERCENTILE

0%	3,606,978.10	60%	10,226,382.08
10%	7,079,051.85	70%	10,798,999.79
20%	7,949,33.15	80%	11,453,496.87
30%	8,615,088.26	90%	12,322,497.62
40%	9,182,361.04	100%	15,765,007.69
50%	9,710,723.29		

CONCLUSION

There is a 90% probability that **savings in financial investments** (budgets) using the PMO will be at least **\$7,079,051.85**.

GAINS IN FINANCIAL RESULTS



STATISTICS

Trials	100,000
Mean	4,885,464.95
Median	4,990,530.57
Standard Deviation	1,318,293.80

PERCENTILE

0%	658,194.03	60%	5,338,818.99
10%	3,040,938.53	70%	5,679,229.44
20%	3,697,475.40	80%	6,058,075.00
30%	4,204,554.59	90%	6,544,955.20
40%	4,622,957.56	100%	8,315,454.74
50%	4,990,451.82		

CONCLUSION

There is a 90% probability that **the gains in financial results** with the use of the PMO will be at least **\$3,040,938.53**.

6

IDENTIFY GAINS IN SCHEDULE, INVESTMENT AND RESULTS WITH THE IMPLEMENTATION OF THE PMO

INPUTS

1. Probabilistic Distribution of Schedule gains
2. Probabilistic Distribution of Investment saving
3. Probabilistic Distribution of Improvements of Financial Results
4. Organizational Tolerance Level

TOOLS AND TECHNIQUES

1. Negotiation
2. Expert Judgment

OUTPUTS

1. Schedule Gains
2. Savings on Investment
3. Improvement of Financial Results

GAINS IN FINANCIAL RESULTS (\$)

Resulting from budget reduction and an improvement in the financial results.

10,119,990.38

FINANCIAL GAINS / PORTFOLIO VALUE (%)

44.16%

IMPROVEMENT IN TIME / EFFORT

RELIABILITY OF 90%

59.87 months

Investments in PMO

7

CALCULATE INVESTMENT AND OPERATIONAL COSTS OF THE PMO/PROJECT STRUCTURE

INPUTS

1. Direct Costs
2. Indirect Costs
3. Investment in Consultancy
4. Investment in Training
5. Procurement
6. Other Information on Costs and Investment

TOOLS AND TECHNIQUES

1. Financial Calculations
2. Budget Structure
3. Negotiation
4. Expert Judgment

OUTPUTS

1. Structure of Investment/
Cost of the PMO

PMO Tiger Screws

PMO Investments

	YEAR 1	YEAR 2	YEAR 3	YEAR 4	YEAR 5	TOTAL	TOTAL PV
Infrastructure	50.000	50.00	20.000	30.000	50.000	200.000	161.368,16
Consulting	800.000					800.000	800.000,00
Personal	420.000	420.000	420.000	420.000	420.000	2.100.000	1.669.277,96
Equipment	100.000					100.000	100.000,00
Other	10.000	10.000	10.000	10.000	10.000	50.000	39.744,71
Total	1.380.000	480.000	450.000	460.000	480.000	3.250.000	2.770.390,83

Influence of the PMO on Results

8

DETERMINE THE INFLUENCE OF THE PMO ON RESULTS (OPTIONAL)

INPUTS

1. Success Factors
2. Failure Factors
3. Market Research
4. Benchmark of Project Results
5. Historical Information

TOOLS AND TECHNIQUES

1. Analytical Hierarchy Process (AHP)
2. Expert Judgment

OUTPUTS

1. Percentage of Results Attributable to the PMO

		1	2	3	4	5		
		MARKET CHANGES	LEGISLATION	PROJECT MANAGEMENT (PMO)	LOW TECHNICAL SKILLS	OTHERS		
MARKET CHANGES	1		Likely	Less likely	Very likely	Likely	1	
LEGISLATION	2			Very unlikely	Very likely	As likely as	2	
PROJECT MANAGEMENT (PMO)	3				Highly likely	Very likely	3	
LOW TECHNICAL SKILLS	4					Less likely	4	
OTHERS	5						5	
		1	2	3	4	5		
INCONSISTENCY INDEX: 6,8%		MARKET CHANGES	LEGISLATION	PROJECT MANAGEMENT (PMO)	LOW TECHNICAL SKILLS	OTHERS		
PROBABILITY		23,36%	11,61%	52,20%	3,63%	9,21%		

Results

9 CALCULATE THE RETURN ON INVESTMENT (ROI) OF THE PMO

INPUTS

1. Schedule Gains
2. Savings on Investment
3. Improvement of Financial Results
4. Structure of Investment/
Cost of the PMO
5. Percentage of Results
Attributable to the PMO

TOOLS AND TECHNIQUES

1. Financial Calculations

OUTPUTS

1. Return on Investment
(ROI) of the PMO
2. Complementary
Information
3. Calculation Report
4. Final ROI Report

Tiger Screws PMO ROI Calculation

GAINS IN FINANCIAL RESULTS (\$)

Resulting from budget reduction and an improvement in the financial results.

10,119,990.38

FINANCIAL GAINS / PORTFOLIO VALUE (%)

44.16%

IMPROVEMENT IN TIME / EFFORT

RELIABILITY OF 90%

59.87 months

Tiger Screws

PMO ROI Calculation

IMPORTANCE OF THE PMO ON RESULTS (%)

52.20%

FINANCIAL GAINS ADJUSTED FOR
IMPORTANCE OF THE PMO ON RESULTS (\$)

5,282,634.98

PMO INVESTMENT (\$)

2,770,390.83

Tiger Screws

PMO ROI Calculation

PMO RETURN ON INVESTMENT (\$)

2,512,244.15

PMO RETURN ON INVESTMENT (%)

90.68%

10

ANALYZE FINAL RESULTS

INPUTS

1. Final ROI Report

TOOLS AND TECHNIQUES

1. Working Groups
2. Negotiation

OUTPUTS

1. Decision Making
2. Lessons Learned
3. Agreement on Results

Key Points and Conclusions

- The model is a "**master line**" of the value calculation and can thus be customized.
- The entire process is to be **performed in teams**.
- Any mathematical model is a *simplification* of the real process.
- The result of the PMO is achieved by simulating imagined future scenarios (a risk inherent to the process).

Ace in the hole

2

CALCULATE FINANCIAL RETURN OF PROJECTS IN PORTFOLIO

INPUTS

1. Project Portfolio
2. Preliminary Project Information (Objectives, Schedule and Budget)

TOOLS AND TECHNIQUES

1. Financial Calculations
2. Bayesian Estimate
3. Analytic Hierarchy Process (AHP)
4. Expert Judgment

OUTPUTS

1. Project Portfolio (Updated)
2. Financial Results Calculated for Projects

4

DETERMINE OPTIMISTIC, MOST LIKELY AND PESSIMISTIC PROFILE FOR SCHEDULE, INVESTMENT AND RESULTS

INPUTS

1. Market Research
2. Benchmark of Project Results
3. Historical Information

TOOLS AND TECHNIQUES

1. Working Groups
2. Negotiation
3. Expert Judgment

OUTPUTS

1. Probabilistic Distribution Profile for Schedule, Investment and Results

8

DETERMINE THE INFLUENCE OF THE PMO ON RESULTS (OPTIONAL)

INPUTS

1. Success Factors
2. Failure Factors
3. Market Research
4. Benchmark of Project Results
5. Historical Information

TOOLS AND TECHNIQUES

1. Analytical Hierarchy Process (AHP)
2. Expert Judgment

OUTPUTS

1. Percentage of Results Attributable to the PMO

Conclusions

- It is impossible to determine ROI without knowing which projects are selected and the strategy that goes behind them.
- If the PMO will manage projects with no calculable benefits (*mathematically intangible*), it is essential that the calculation process (step 2) is carried out with great care and attention.
- This is a laborious process but much more effective to determine/prove the value of the PMO.

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