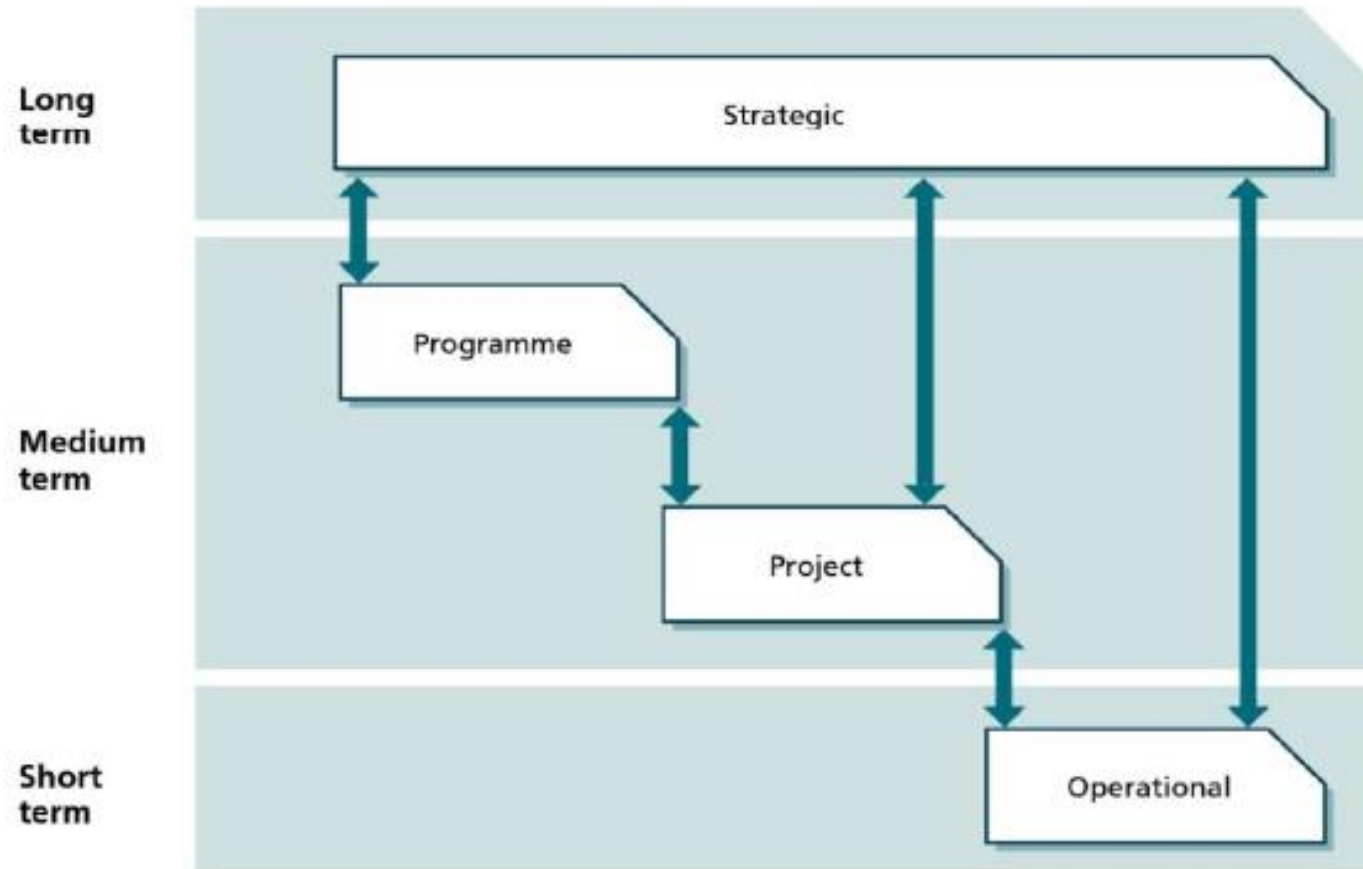




MTC Risk Management Guidance

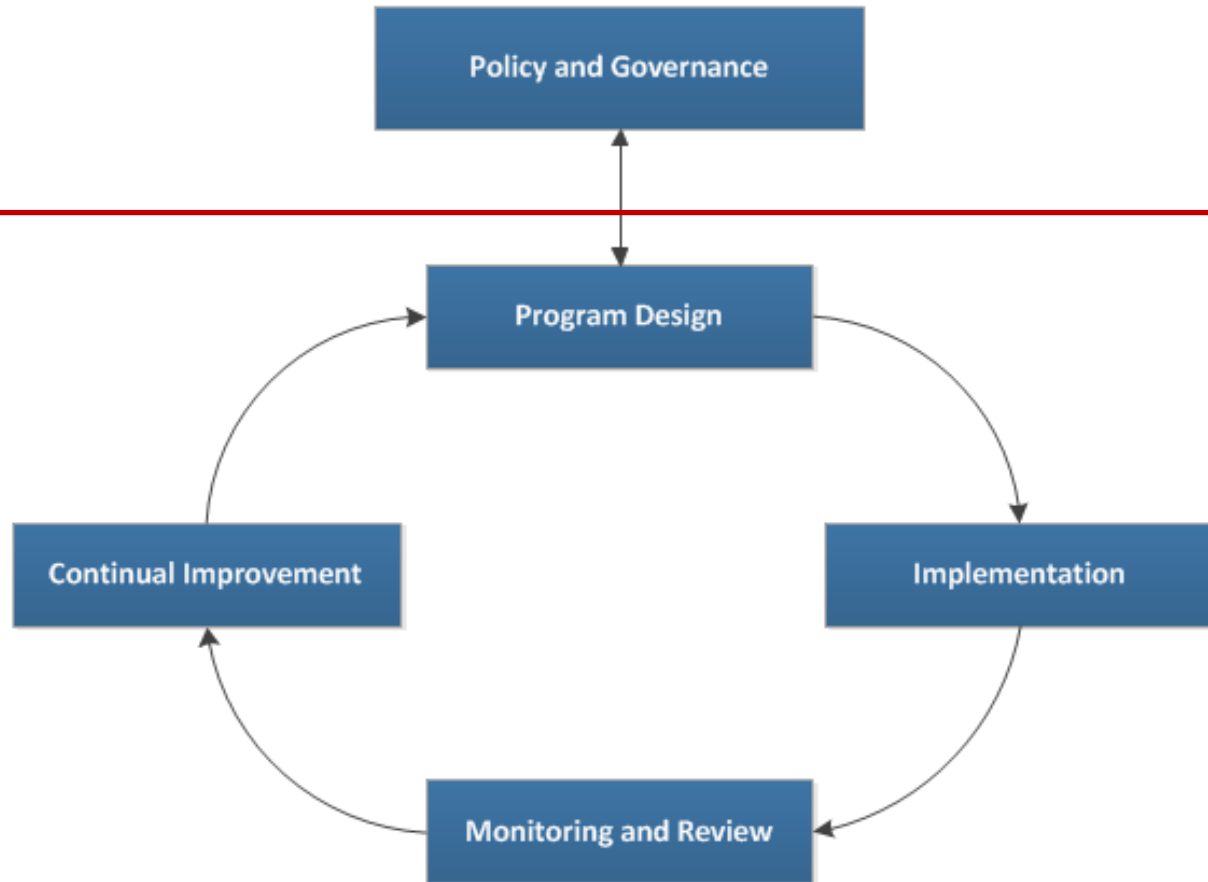
Prepared by: Yasser Soliman
yasser.soliman@cappross.com

Organizational perspectives



Risk Management – The Basics of ISO 31000

Framework



Process



The Five Process Groups

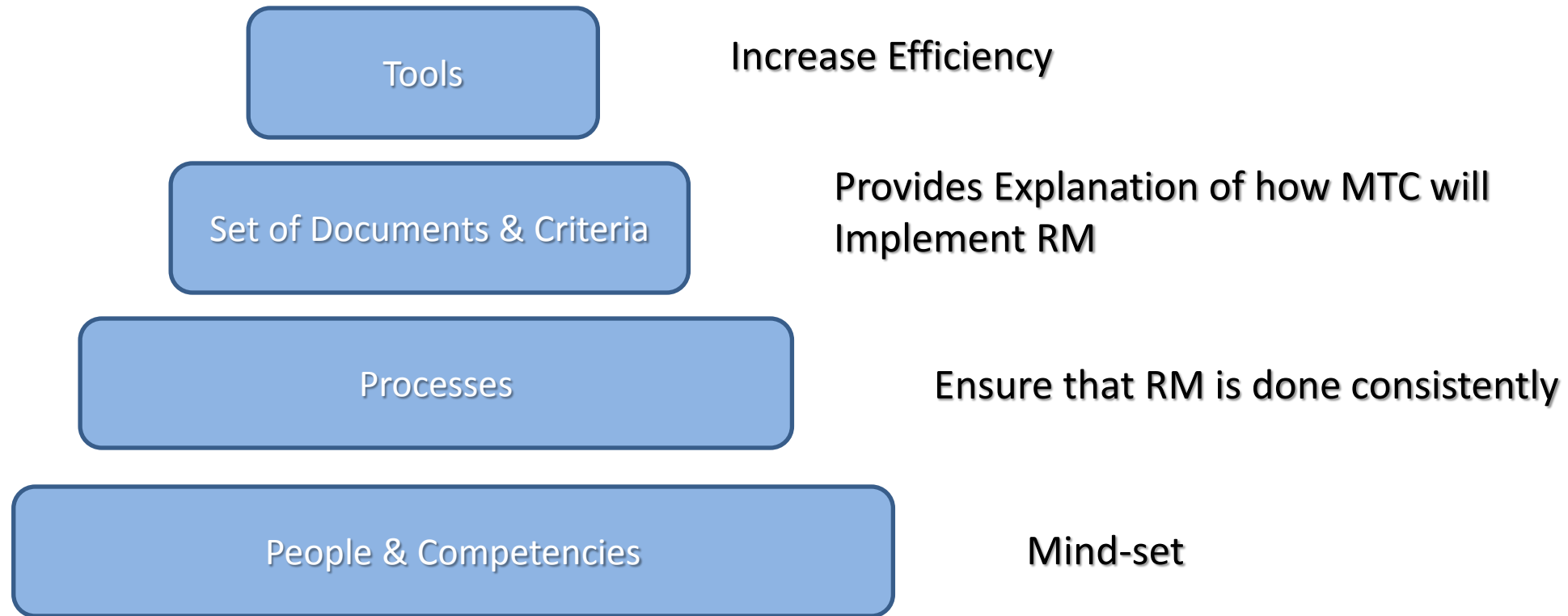
A Process is a "set of interrelated actions and activities performed to achieve a pre-specified product, result or service"



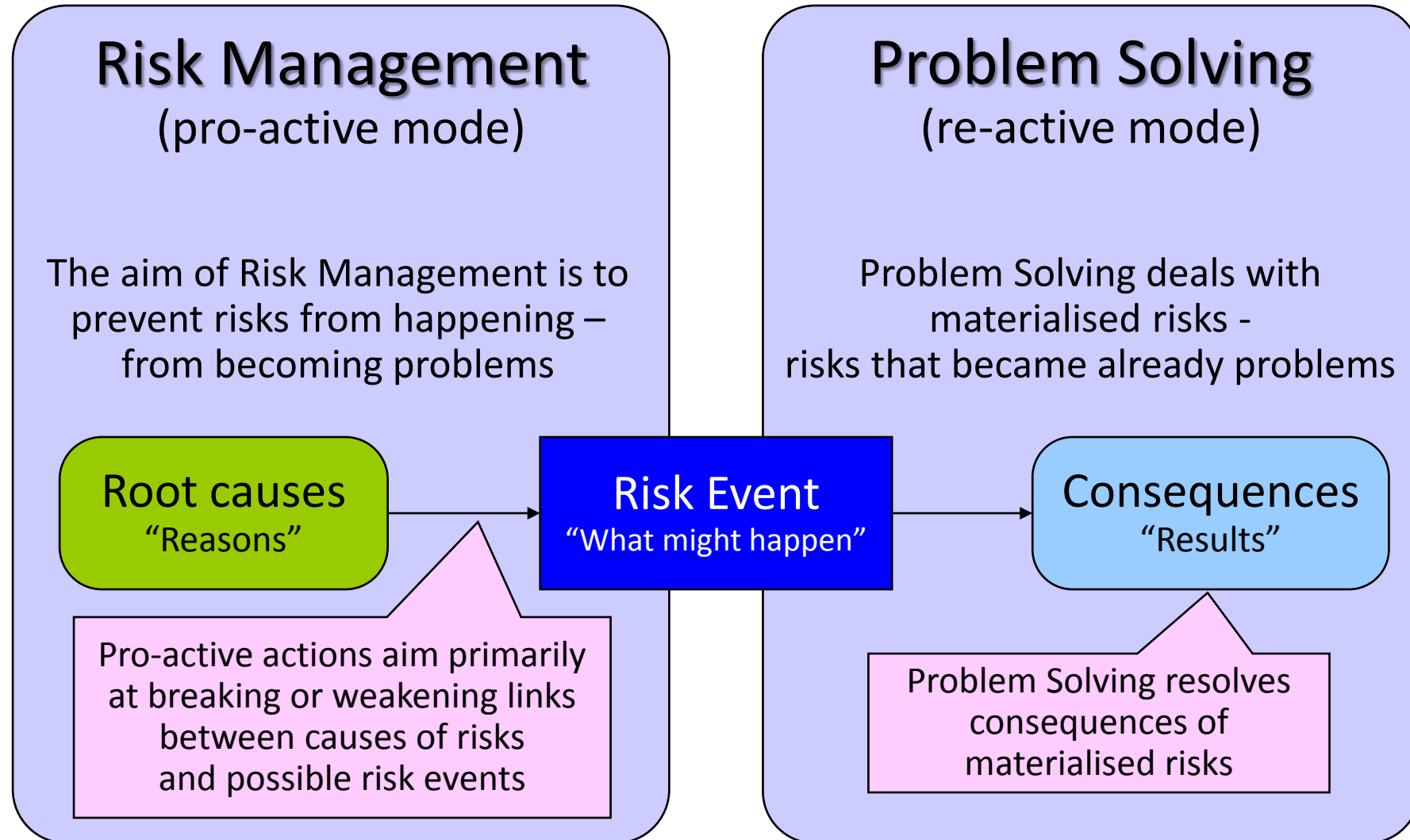
		Project Management Process Groups				
		Initiating	Planning	Executing	Monitoring & Controlling	Closing
Knowledge Areas	Project Integration Management	4.1 Develop Project Charter	4.2 Develop Project Management Plan	4.3 Direct and Manage Project Work 4.4 Manage Project Knowledge	4.5 Monitor and Control Project Work 4.6 Perform Integrated Change Control	4.7 Close Project or Phase
	Project Scope Management		5.1 Plan Scope Management 5.2 Collect Requirements 5.3 Define Scope 5.4 Create WBS		5.5 Validate Scope 5.6 Control Scope	
	Project Schedule Management		6.1 Plan Schedule Management 6.2 Define Activities 6.3 Sequence Activities 6.4 Estimate Activity Durations 6.5 Develop Schedule		6.6 Control Schedule	
	Project Cost Management		7.1 Plan Cost Management 7.2 Estimate Costs 7.3 Determine Budget		7.4 Control Costs	
	Project Quality Management		8.1 Plan Quality Management	8.2 Manage Quality	8.3 Control Quality	

Project Management Process Groups						
		Initiating	Planning	Executing	Monitoring & Controlling	Closing
Know	Project Resource Management		9.1 Plan Resource Management 9.2 Estimate Activity Resources	9.3 Acquire Resources 9.4 Develop Team 9.5 Manage Team	9.6 Control Resources	
	Project Communications Management		10.1 Plan Communications Management	10.2 Manage Communications	10.3 Monitor Communications	
	Project Risk Management		11.1 Plan Risk Management 11.2 Identify Risks 11.3 Perform Qualitative Risk Analysis 11.4 Perform Quantitative Risk Analysis 11.5 Plan Risk Responses	11.6 Implement Risk Responses	11.7 Monitor Risks	
	Project Procurement Management		12.1 Plan Procurement Management	12.2 Conduct Procurements	12.3 Control Procurements	
	Project Stakeholder Management	13.1 Identify Stakeholders	13.2 Plan Stakeholder Engagement	13.3 Manage Stakeholder Engagement	13.4 Monitor Stakeholder Engagement	

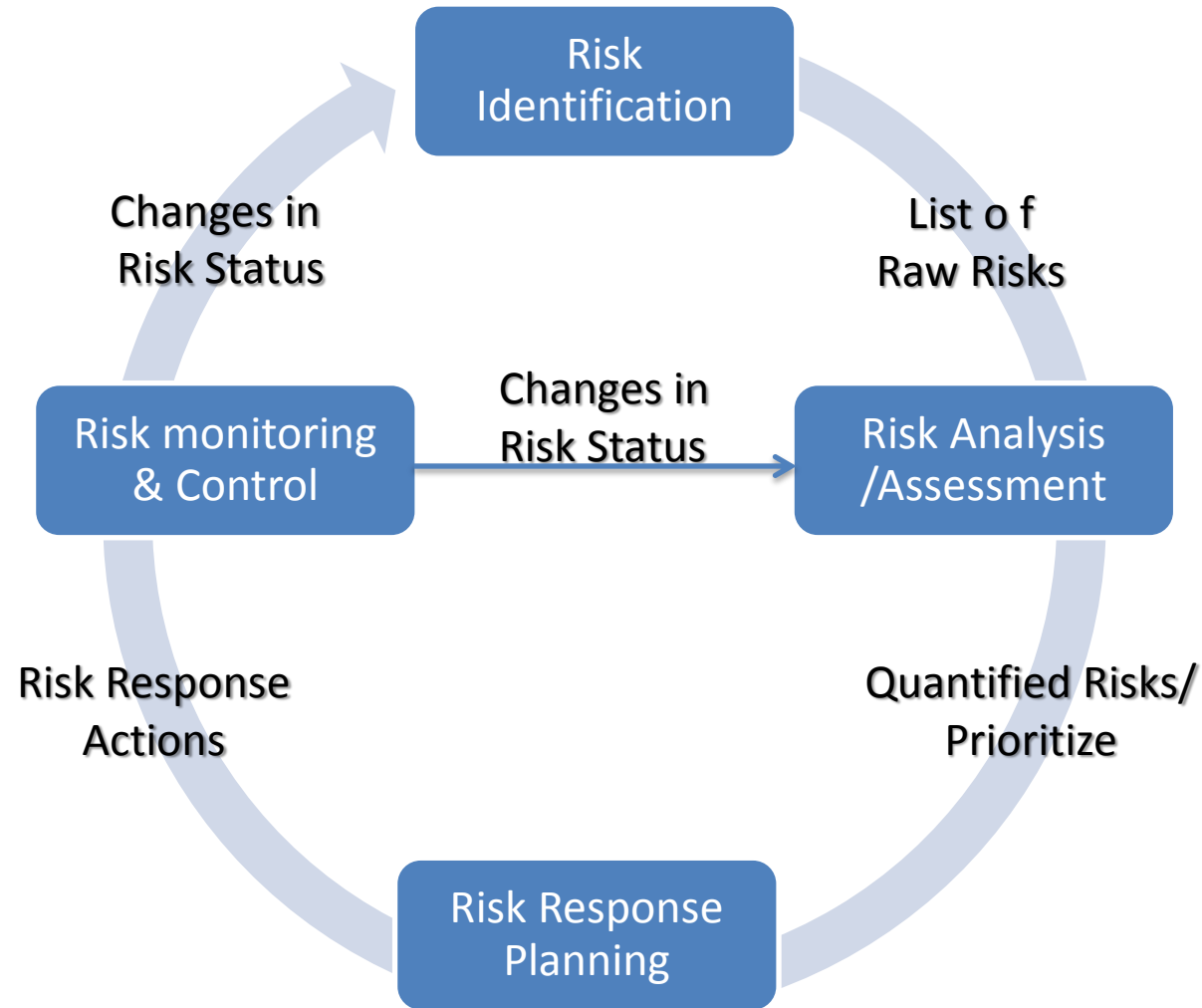
Risk Management System



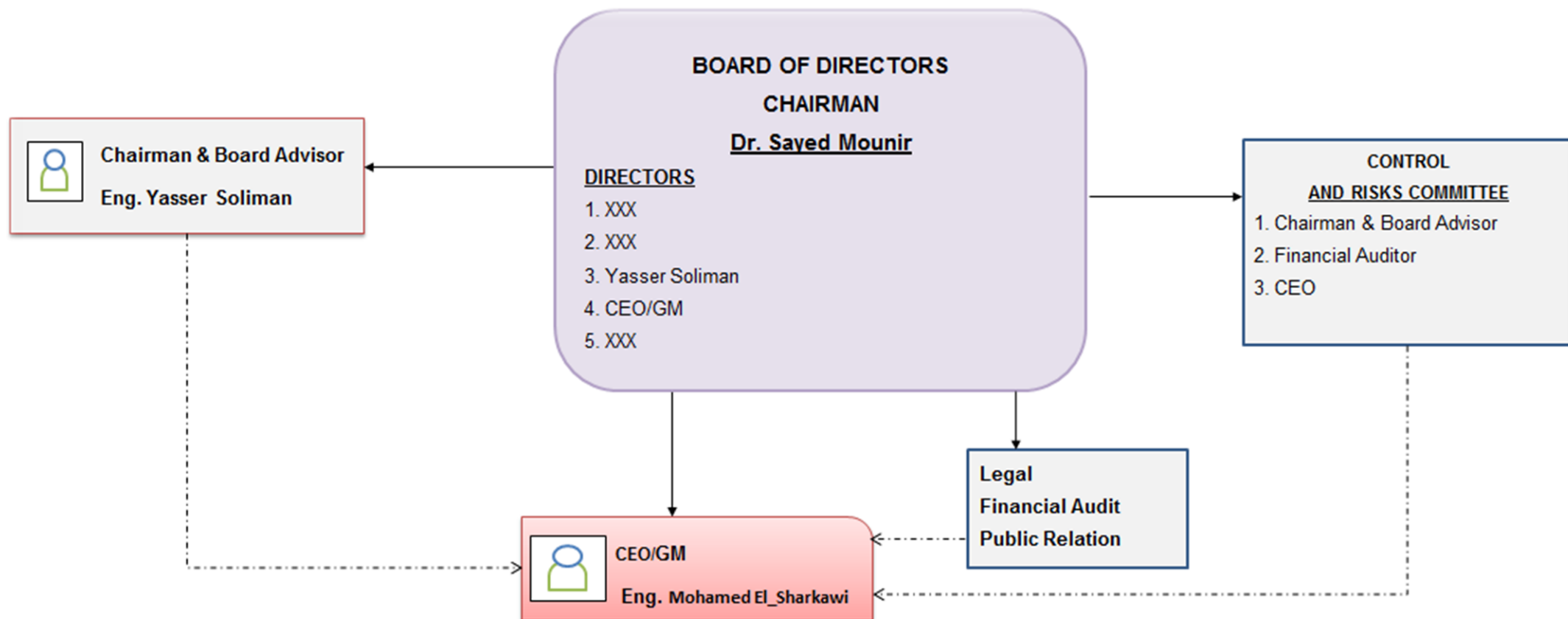
Risk Response and Contingency



Risk Management Process



MTC RM Embedded in the Organizational Structure



Project Management Plan

- ☐ Scope mgmt plan
- ☐ Schedule mgmt plan
- ☐ Cost mgmt plan
- ☐ Quality mgmt plan
- ☐ Process improvement plan
- ☐ Staffing mgmt plan
- ☐ Communication mgmt plan
- ☐ Risk mgmt plan
- ☐ Procurement mgmt plan





Risk Identification

Risk Category

Customer/Supplier Risk

Market or Political Risk

Product Release Risk

Project Logistics Risk

Project Execution Risk

Contractual (T&C) / Legal Risk

Financial Risk

Other Risks/Opportunity



Volume Loss or Shift

Product Excess Cost

Operative Excess Cost

Penalties

Price Erosion

AR Delay

Bond

Warranty

Termination

Inflation

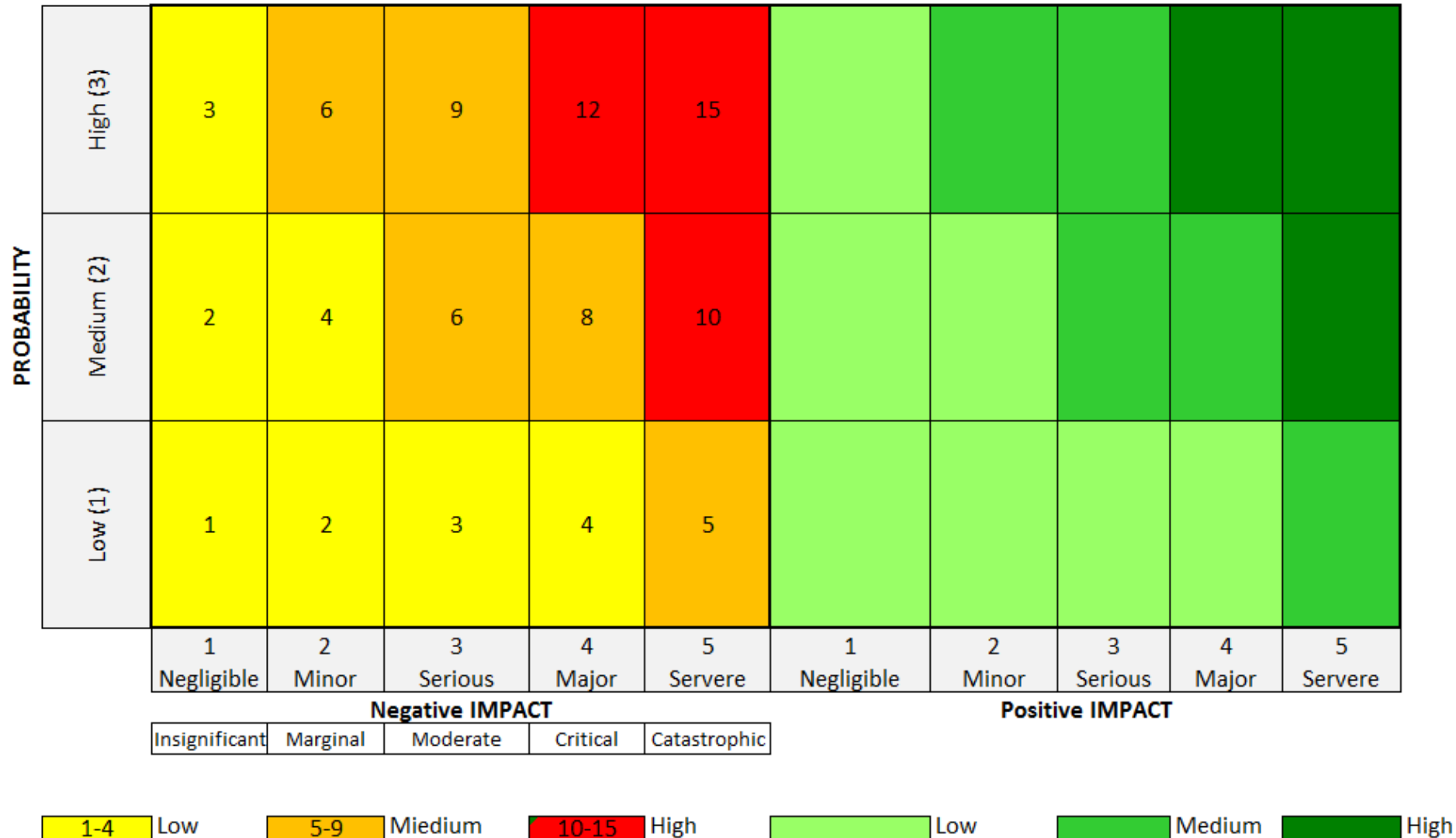
Currency Hedging

Risk (Event) Type



Initial Risk Assessment

Qualitative Approach – *Heat Map*



Risk Assessment – Qualitative Approach

Probability Impact Grid

Probability	Low	Medium	High		
VH (0.9)	4.5%	9%	18%	36%	72%
H (0.7)	3.5%	7%	14%	28%	56%
M (0.5)	2.5%	5%	10%	20%	40%
L (0.3)	1.5%	3%	6%	12%	24%
VL (0.1)	0.5%	1%	2%	4%	8%
	VL (0.05)	L (0.1)	M (0.2)	H (0.4)	VH (0.8)
	Impact				

In this example, probability is evaluated on a "0 to 1" scale and impact on a "1 to 5" scale

Risk ID	Risk	Probability	Impact	Risk Score
1	Poor weather conditions	.3	4	1.2
2	Low morale of team members	.4	2	.8
3	Poor cost estimates	.8	3	2.4
4	Lack of technical equipment	.6	5	3
			Total Avg	7.4 1.85

Another common method uses ranges

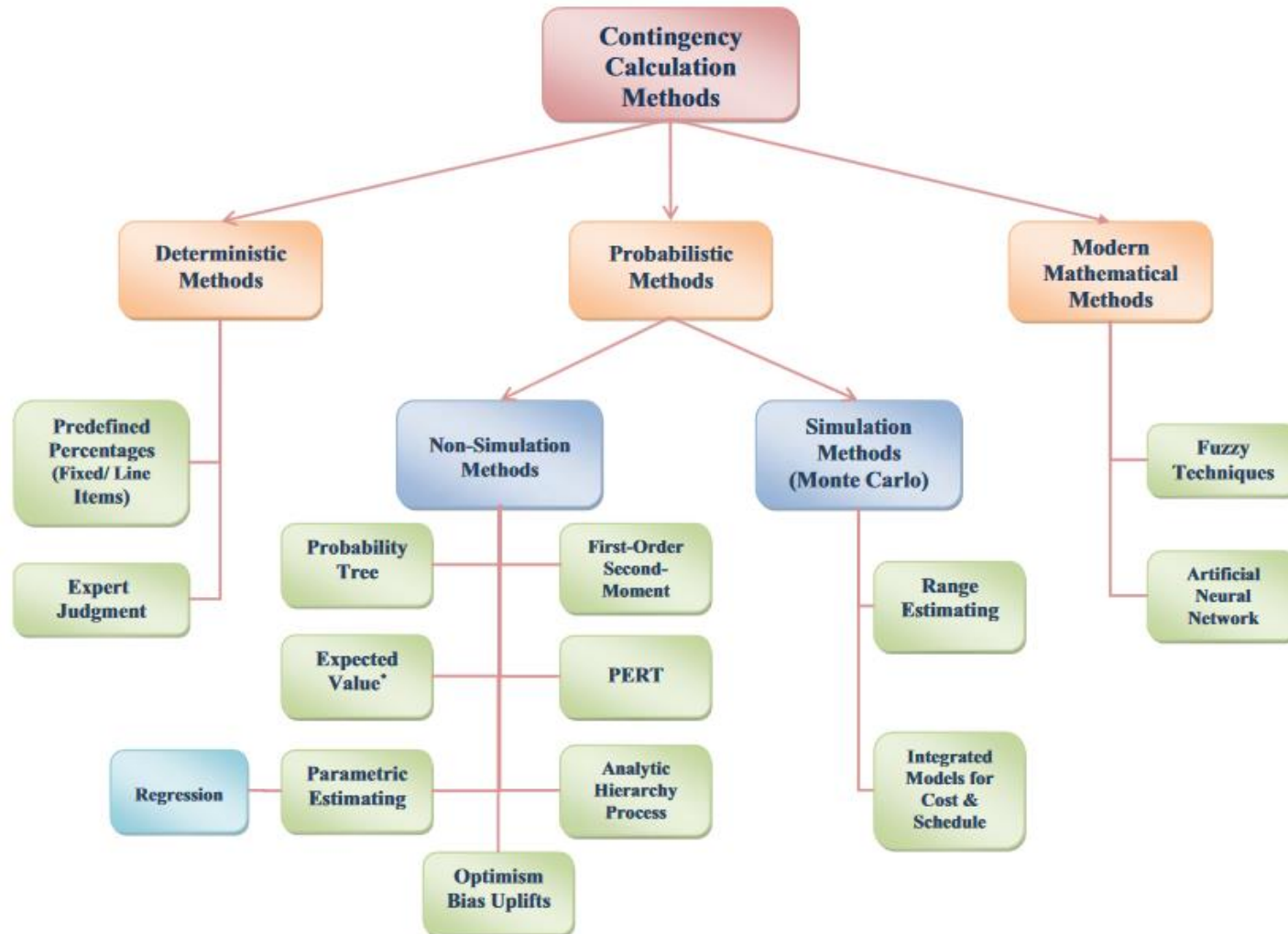
- Probability
 - High - 50% or higher (likely)
 - Medium - Between 10%-50% (unlikely)
 - Low - 10% or lower (very unlikely)
- Impact
 - High - Project objective is at risk (mandatory change to one or more constraints: scope, schedule, or resources/cost)
 - Medium - Project objectives can be met, but significant re-planning is required
 - Low - No major plan changes; the risk is an inconvenience or it will be handled through overtime or other minor adjustments

Risk Assessment – Quantitative Approach

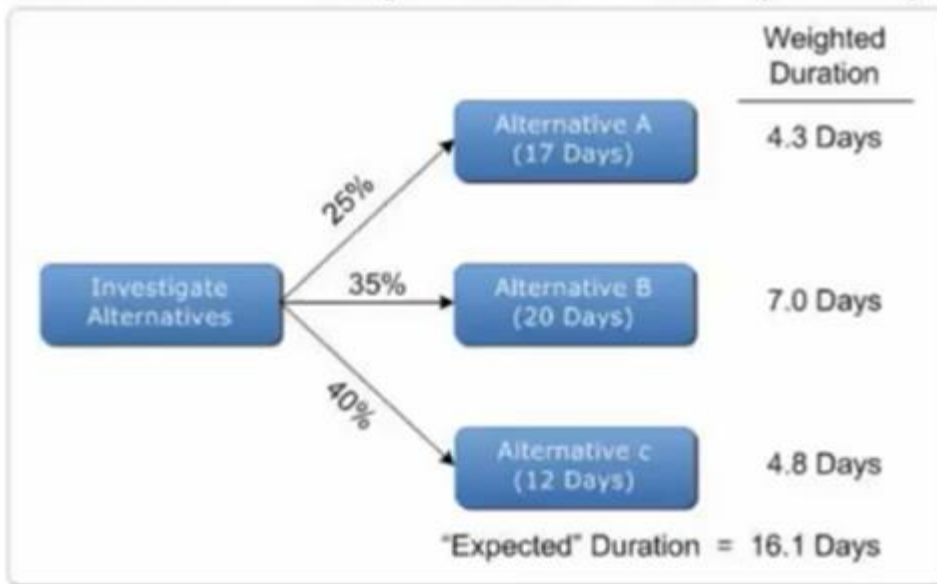
- ❑ Determine the probabilistic estimates of Time & Cost
- ❑ Identify risks with greatest impact (Ex. Project)
- ❑ Tools & Techniques :
 - Decision Tree & Expected Value (EV)
 - Monte Carlo Simulation
 - Sensitivity Analysis
 - Fault Tree Analysis

Risk Response Planning

Contingency Reserve



Risk Assessment – Quantitative Approach



3-Point Estimate

Activity	a	m	b	Expected time (t_e) $= \frac{a + 4m + b}{6}$
A	5	7	9	7
B	6	7	8	7
C	1	2	3	2
D	3	6	9	6
E	4	8	12	8
F	4	5	6	5
G	5	7	9	7
H	6	8	10	8
I	2	4	6	4

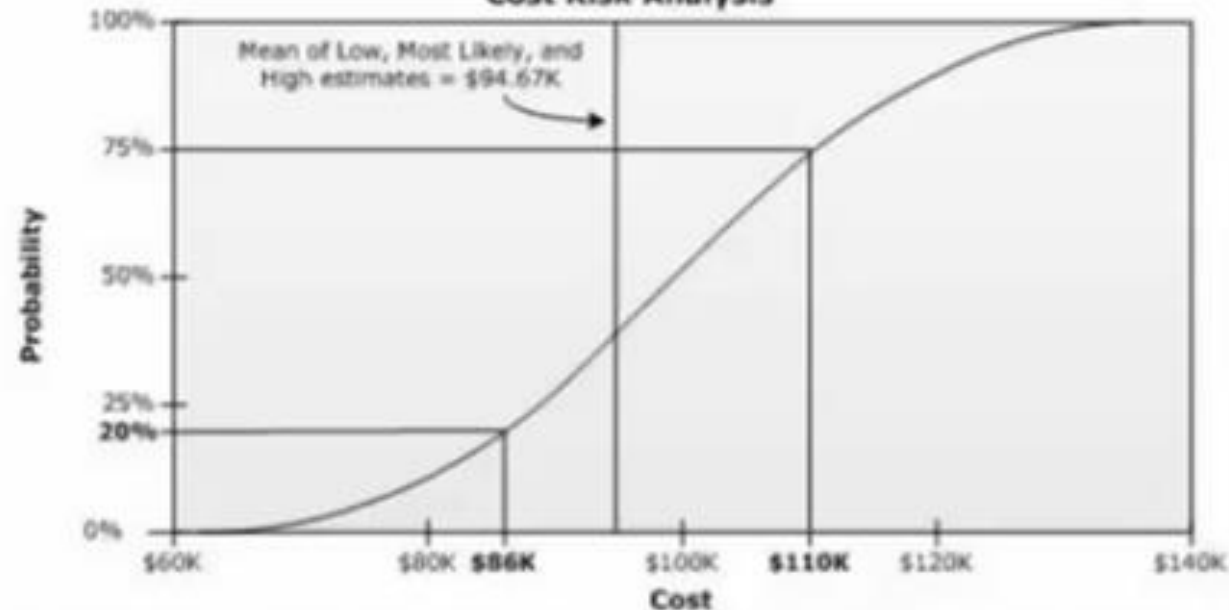
Risk Assessment – Quantitative Approach

Range of Project Cost Estimates

WBS Element	Low	Most Likely	High
Design	\$8,000	\$14,000	\$20,000
Build	\$32,000	\$40,000	\$70,000
Test	\$22,000	\$32,000	\$46,000
Total Project	\$62,000	\$86,000	\$136,000

Interviewing relevant stakeholders helps determine three-point estimates for each WBS element. These estimates can be input into simulation software for a **cost risk analysis** as seen below.

Cost Risk Analysis

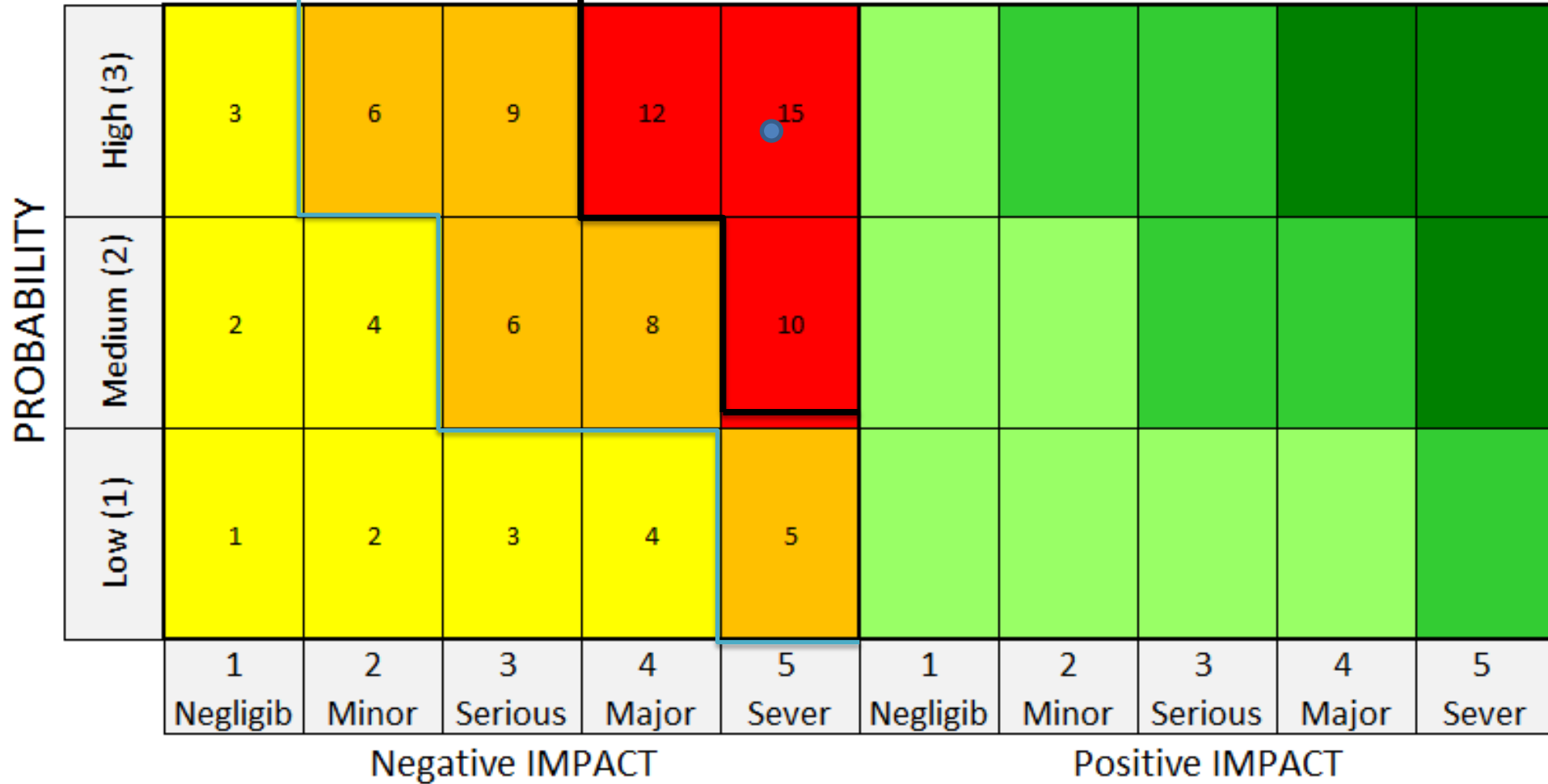




Risk Assessment – Quantitative Approach

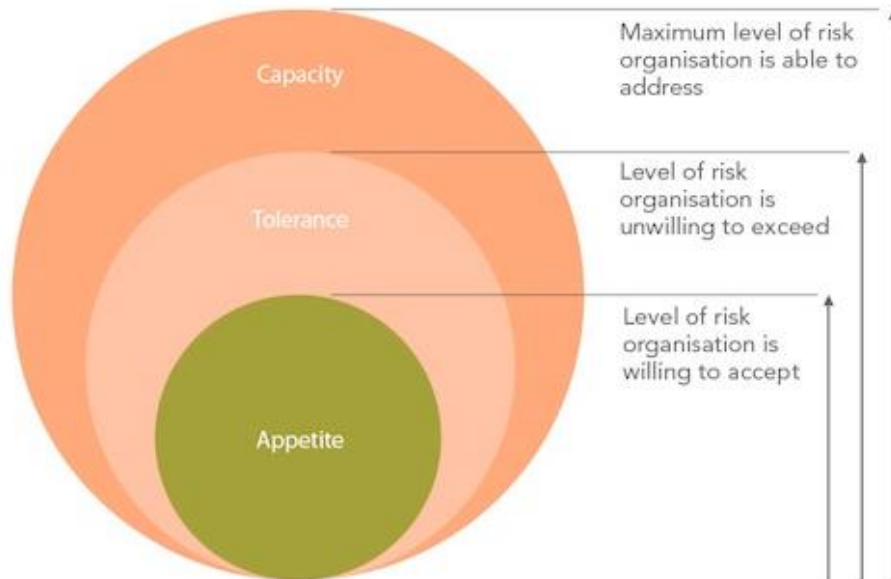
Appetite Line

Threshold Line



Risk Assessment – Quantitative Approach

1	2	3	4	5
Negligible	Minor	Serious	Major	Severe
< 1,976	1,976 - 5,926	> 5,926 - 15,801	> 15,801 - 27,651	> 27,651 - 39,501



Expected Value Status		Severity Level		GP Loss %	New GM%
●	1	Negligible	< 1,976	5%	28.5%
●	2	Minor	1,976 - 5,926	15%	25.5%
●	3	Serious	> 5,926 - 15,801	40%	18.0%
●	4	Major	> 15,801 - 27,651	70%	9.0%
●	5	Severe	> 27,651 - 39,501	100%	0.0%

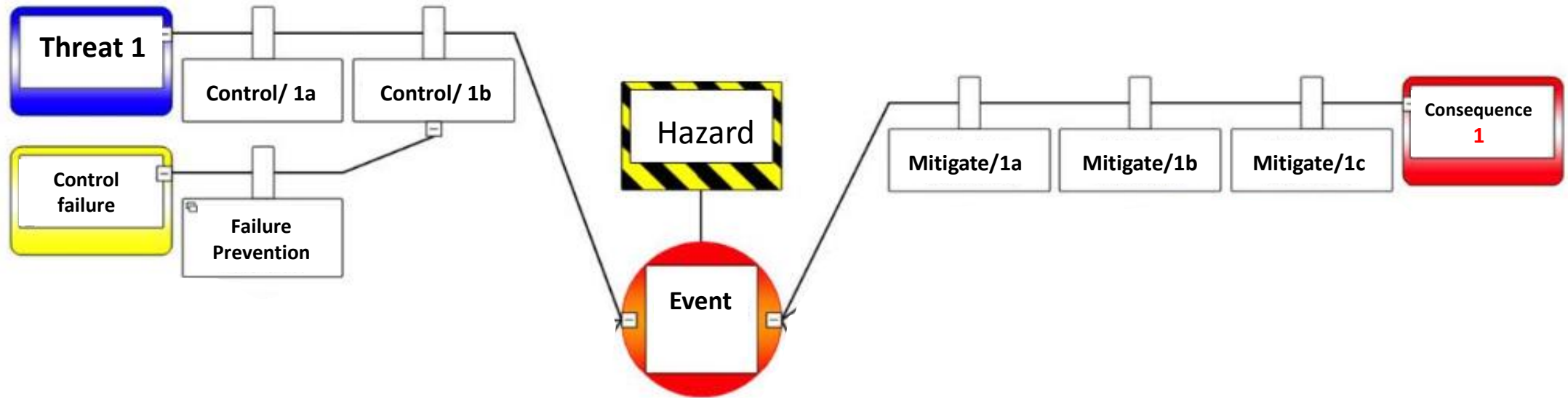
Risk Response Planning

Remedy/Strategy/Impact/Action

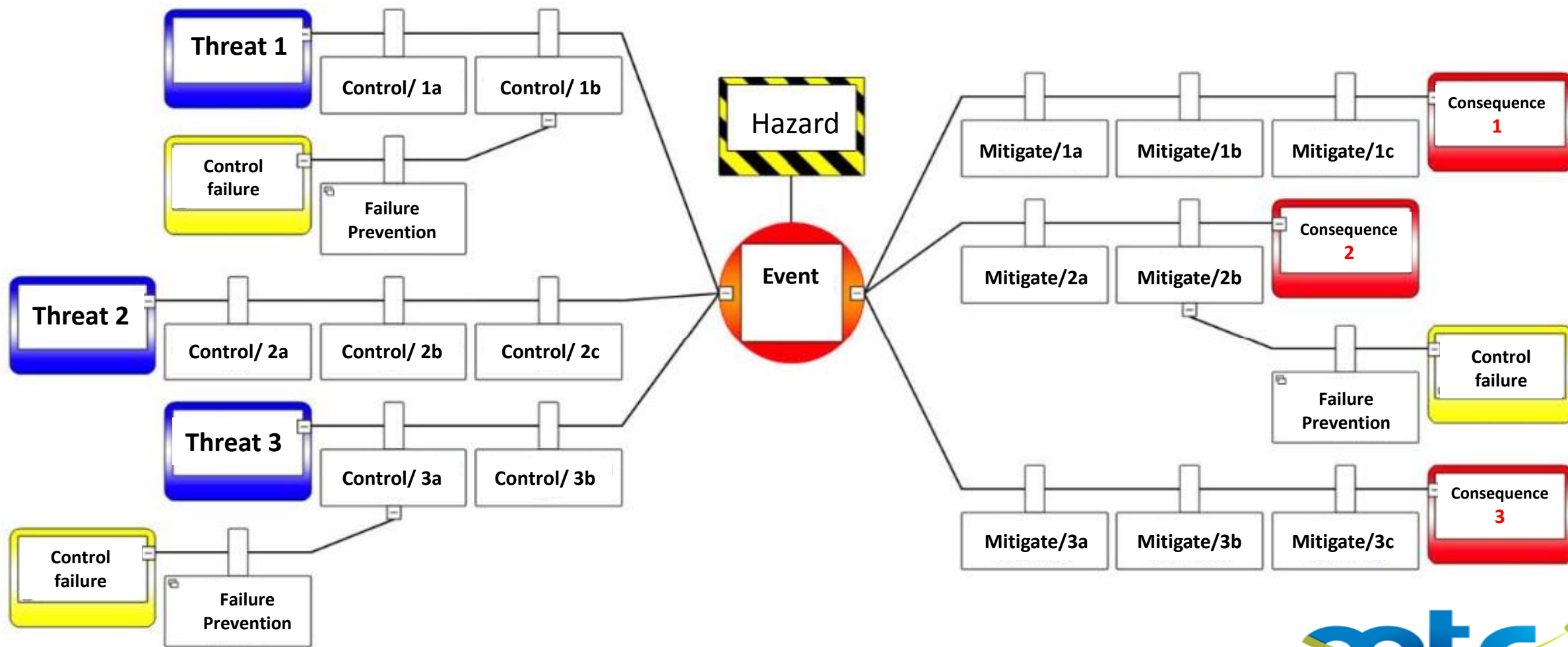
Risk Category	Risk Type	Remedy	Response Strategy	Response Impact	Response Action Summary
Contractual/Legal	Termination	Pro-active	Avoid	Management	Supplier/Sub-contractor Credit Rating
			Mitigate	Add. Cost	Highly Skilled PM (Monitor, Control, PIP)
			Mitigate	Management	Well Defined Triggers of Breaching Clauses
			Mitigate	Management	Well Defined Responsibility Matrix (RACI) - SoR
			Mitigate	Management	Avoid penalty/termination in Contract Clauses
			Mitigate	Management	Bundled Offers
		Reactive	Transfer	Management	Back to Back agreement with 3rd party
			Mitigate	Management	Lock_In period
			Mitigate	Management	Termination Fee
			Mitigate	Management	Notice Period
			Mitigate	Management	Limit Penalty amount in contract clauses
			Mitigate	Management	Secure Customer Outstanding payment after termination
			Accept	Committed Cost	Contingent Plan



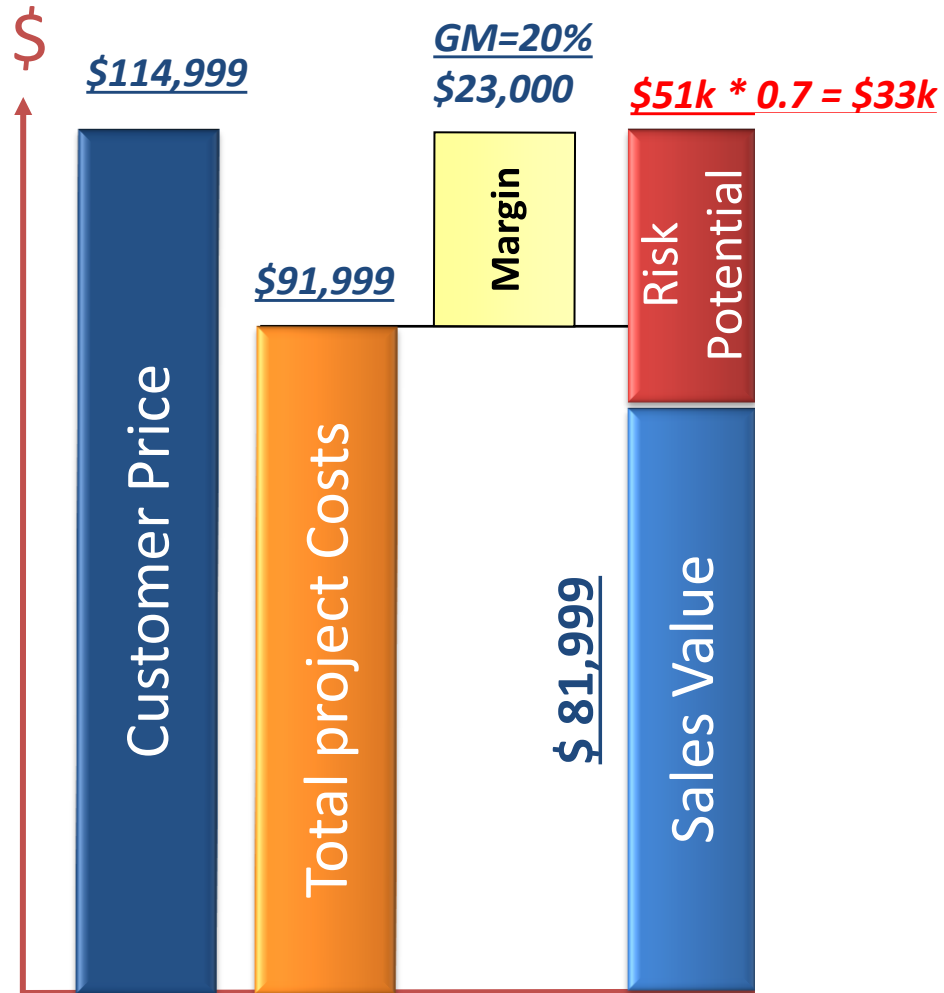
Risk Response Planning



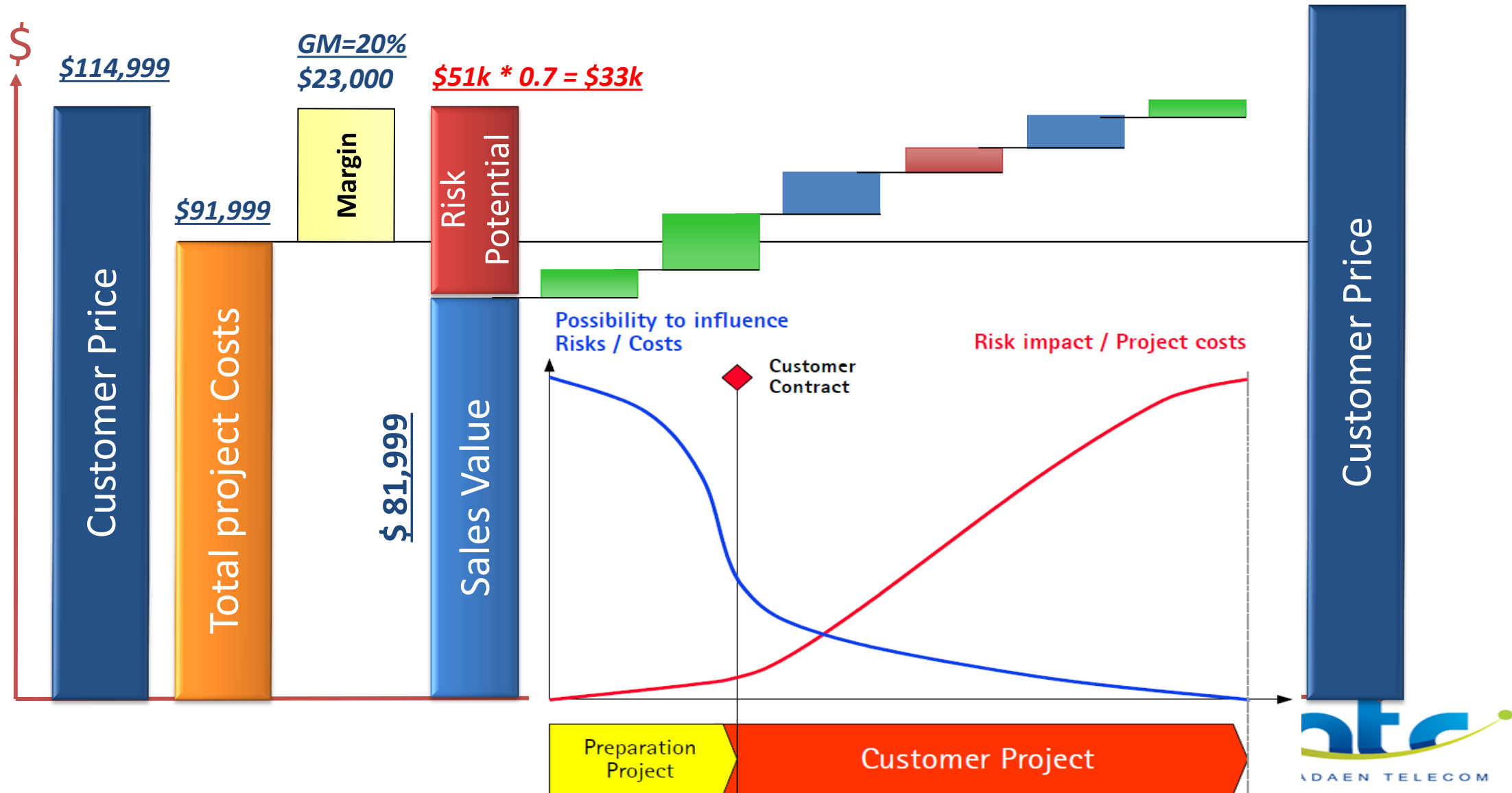
Risk Response Planning



Risk Response – Importance of Pre-Contract Activities

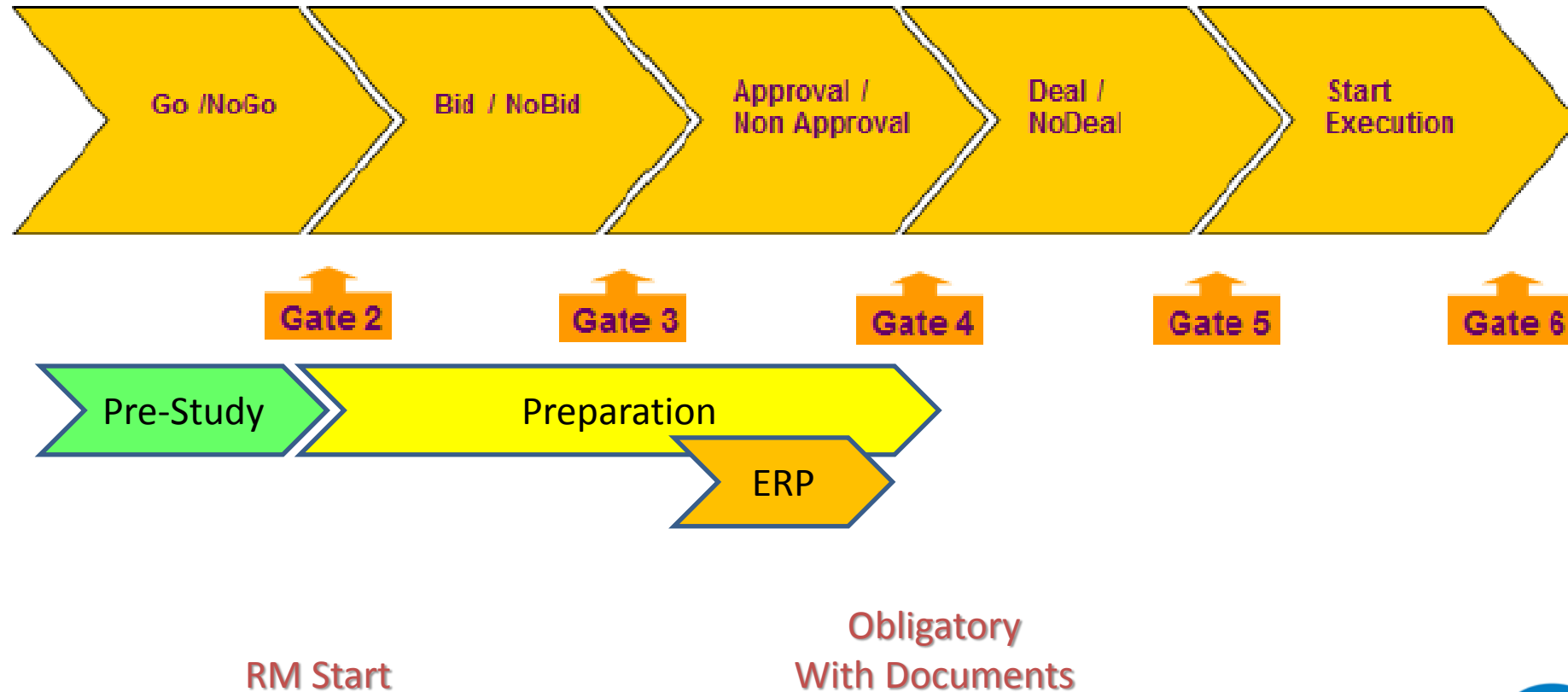







Risk Response – Importance of Pre-Contract Activities






































Risk Response – Example of Pre-Contract Activities





Risk Management in Bid Process



Expected Value Status		Severity Level		GP Loss %	New GM%
	1	Negligible	< 1,976	5%	28.5%
	2	Minor	1,976 - 5,926	15%	25.5%
	3	Serious	> 5,926 - 15,801	40%	18.0%
	4	Major	> 15,801 - 27,651	70%	9.0%
	5	Severe	> 27,651 - 39,501	100%	0.0%

Risk Exposure

						Threat after Control		Threat after Control + Cont.						
OPT./Min. Impact	TYPICAL Impact	PESS./Max. Impact	Estimated Prob. Of Occurrence	Mean Impact (PERT/Triang/Beta)	likelihood of this Impact	Estimated Impact	Initial EV	Residual EV	Cost of Control (CoC)	Contingency Reserve	Management Reserve	Residual NEV	Risk Cost	Risk Budget
						-		-					-	-
						-		-					-	-
						-		-					-	-
						-		-					-	-
						-		-					-	-
						-		-					-	-
						-		-					-	-
						-		-					-	-
						-		-					-	-
						-		-					-	-
						-		-					-	-
						-		-					-	-
						-		-					-	-
15,000.0	25,000.0	28,000.0	40%	23,833	50%	23,833	 9,533	 9,533		7,000	1,000	 1,533	7,000	8,000
15,000.0	25,000.0	28,000.0	40%	23,833	80%	25,657	 10,263	 4,004	6,000	2,000	1,000	 1,004	8,000	9,000
15,000.0	25,000.0	28,000.0	40%	23,833	80%	25,657	 10,263	 9,533	-	3,000	4,000	 2,533	3,000	7,000

Initial EV	Residual EV	Cost of Control (CoC)	Contingency Reserve	Management Reserve	Residual NEV	Risk Cost	Risk Budget
 30,059	 23,071	 6,000	12,000	6,000	 5,071	18,000	24,000

Profitability Estimation

Total Price calculation		Before Mitigation	After Mitigation
		Total	Total
Initial Solution Cost		91,999	91,999
Initial Sales Price		131,500	131,500
Risk - Initial EV		30,059	30,059
Risk - Residual NEV		● 30,059	● 5,071
Risk Cost (Excluding Contract Penalties)			18,000
Sales Price (Initial Sales + Risk Cost)		131,500	149,500
Cost Baseline (Sol. Cost+Risk Cost)		91,999	109,999
<u>GM%</u>		<u>30.0%</u>	● <u>26.4%</u>

Profitability Estimation

Penalty Calculation			
		Total	Total
Cost Baseline (Sol. Cost+Risk Cost)		91,999	109,999
Sales Price		131,500	149,500
Penalty %	0%		
Penalty Probability	0%		
Penalty EV = Penalty * Probability		-	-

Final Price = Sales Price + Penalties			
Final Sales Price (Init. Sales + Risk + Penalties)		131,500	149,500
Total Cost (Sol. Cost+Risk Cost)		91,999	109,999
Penalties		-	-
Total Cost (Sol. Cost+Risk Cost+ Penalty)		91,999	109,999
<u>GM (Risk Cost + Penalty)</u>		30.0%	 26.4%
<u>GP</u>		39,501	39,501

Risk Register

Risk Category		Risk Type	Remedy	Response Strategy	Response Impact	Response Action Summary									
Contractural/Legal		Termination	Pro-active	Avoid	Management	Supplier/Sub-contractor Credit Rating									
Threat after Control															
Threat after Control + Cont.															
OPT./Min. Impact	TYPICAL Impact	PESS./Max. Impact	Estimated Prob. Of Occurrence	Mean Impact (PERT/Triang/Beta)	likelihood of this Impact	Estimated Impact	Initial EV	Residual EV	Cost of Control (CoC)	Contingency Reserve	Management Reserve	Residual NEV	Risk Cost	Risk Budget	
						-	●	-	●	-			●	-	-
						-	●	-	●	-			●	-	-
						-	●	-	●	-			●	-	-
						-	●	-	●	-			●	-	-
						-	●	-	●	-			●	-	-
						-	●	-	●	-			●	-	-
						-	●	-	●	-			●	-	-
						-	●	-	●	-			●	-	-
						-	●	-	●	-			●	-	-
						-	●	-	●	-			●	-	-
						-	●	-	●	-			●	-	-
15,000.0	25,000.0	28,000.0	40%	23,833	50%	23,833	● 9,533	● 9,533		7,000	1,000	● 1,533	7,000	8,000	
15,000.0	25,000.0	28,000.0	40%	23,833	80%	25,657	● 10,263	● 4,004	6,000	2,000	1,000	● 1,004	8,000	9,000	
15,000.0	25,000.0	28,000.0	40%	23,833	80%	25,657	● 10,263	● 9,533	-	3,000	4,000	● 2,533	3,000	7,000	
							Initial EV	Residual EV	Cost of Control (CoC)	Contingency Reserve	Management Reserve	Residual NEV	Risk Cost	Risk Budget	
							● 30,059	● 23,071	● 6,000	12,000	6,000	● 5,071	18,000	24,000	

MTC Risk Management Cycle

Periodic RM Process

- ☐ Monthly sales & rolling forecast
- ☐ Quarterly STP for each BU (Telecom, IT/HIT, App.)
- ☐ Yearly long term planning for MTC Strategy

Case Driven RM Process

- ☐ New/Modified/Obsolescence Products, Complex Solution, Bids, Major Investment
- ☐ MTC Financing; Overdue, DSO, 3rd Party Guarantees, Bonds
- ☐ Contractual/Legal; Partner's Agreements
- ☐ BCM; IT solutions for operational efficiency

Example of Risk Identification & Assessment

Risk Identification & Assessment

Gross Expected Value

Risk Category/Type	Risk Event	Root Cause	Consequences	Risk Impact	Risk Probability	Proactive Action (Lowering Probability) Reactive Action (Lowering Impact)
Contractual/Termination	** Project Shutdown (Value = EGP 900K)	** Customer Own Interest (No reason) OR ** Customer request due to contract breach:	** Sales volume drop by 50% and GM by 20% ** Shutdown cost - Dismissal of Employee - Redeployment of assets ** Uncovered Sunk Cost ** Loss of Anticipated Profit ** Brand/Reputation Damage	EGP 450k (4, Major)	30% (2, Medium)	
		- Scope is too big to be completed on time - Lack of customer/3rd party cooperation and knowledge transfer - MTC team lack of resources or inexperienced team				

Risk Identification & Assessment

Gross Expected
Value

Risk Category/Type	Risk Event	Root Cause	Consequences	Risk Impact	Risk Probability	Proactive Action (Lowering Probability) Reactive Action (Lowering Impact)
Contractual/Termination	** Project Shutdown (Value = EGP 900K)	** Customer Own Interest (No reason) OR ** Customer request due to contract breach:	** Sales volume drop by 50% and GM by 20% ** Shutdown cost - Dismissal of Employee - Redeployment of assets ** Uncovered Sunk Cost ** Loss of Anticipated Profit ** Brand/Reputation Damage	EGP 450k (4, Major)	30% (2, Medium)	Proactive: ** Customer Credit Rating ** Highly Skilled PM (Project monitor & control, PIP) ** Well Defined Triggers for breaching clauses ** Well Define Responsibility Matrix (RACI) with customer/3rd party ** Avoid Penalty in contract clauses ** Bundled Offers
		- Scope is too big to be completed on time - Lack of customer/3rd party cooperation and knowledge transfer - MTC team lack of resources or inexperienced team				Reactive: ** Back to Back agreement with 3rd party ** Lock-In period ** Termination Fee ** Notice Period ** Limit Penalty Amount in contract clauses ** Secure Customer outstanding payment after contract termination

