



#11 Project  
RISK

PMBOK 5 Ed. – DEI-



Every project is  
risky, meaning there  
is a chance things  
won't turn out  
exactly as planned.



**55%**

**percent of runaway  
projects**

**“ Did no risk management at all 38 percent did some, and 7 percent were not sure whether they did risk management or not” (KPMG,1995)**



# Project Risk

Identifying, analyzing, and responding to risk throughout the life of a project and in the best interests of meeting project objectives.

# Project Risk Objective

Increase or decrease  
the probability and impact of



# Terms & Concept

- **Uncertainty:** a lack of knowledge about an event that reduces confidence
- **Risk adverse:** someone who **does not want to take risks.**
- **Risk tolerances:** **area of risk** that are **acceptable/unacceptable.**
- **Risk thresholds:** **the point** at which a risk become **unacceptable**



- Remember that in this area there is no activity in executing process group



# The Advantages of Project Risk Management

Better Scope







**Better Project  
Selection**

# Better Schedulling



# Realistic Cost Budgeting



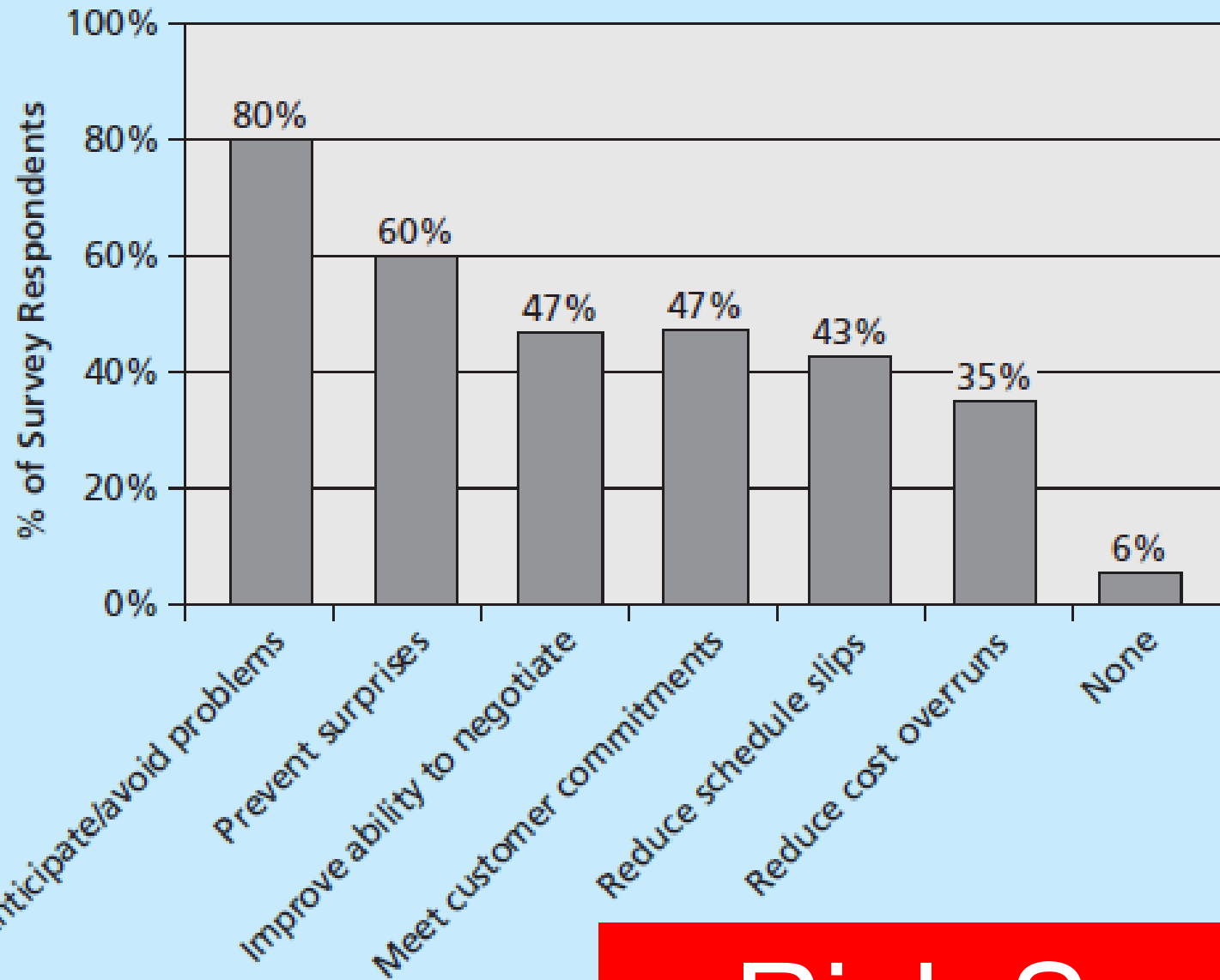
# Project Management Maturity by industry group

KEY: 1 = Lowest Maturity Rating, 5 = Highest Maturity Rating

Knowledge Area	Engineering/ Construction	Telecommunications	Information Systems	Hi-Tech Manufacturing
<i>Scope</i>	3.52	3.45	3.25	3.37
<i>Time</i>	3.55	3.41	3.03	3.50
<i>Cost</i>	3.74	3.22	3.20	3.97
<i>Quality</i>	2.91	3.22	2.88	3.26
<i>Human resources</i>	3.18	3.20	2.93	3.18
<i>Communications</i>	3.53	3.53	3.21	3.48
<i>Risk</i>	2.93	2.87	2.75	2.76
<i>Procurement</i>	3.33	3.01	2.91	3.33

Source: Ibbs and

**Risk is not big attention among industrial group**



# Risk Survey

# Project Risk

A Newton's cradle is shown with a red ball on the left side, swinging towards the right. On the right side, there are several yellow boxes containing text, representing the steps of project risk management. The background is a light gray gradient.

**Plan Risk**

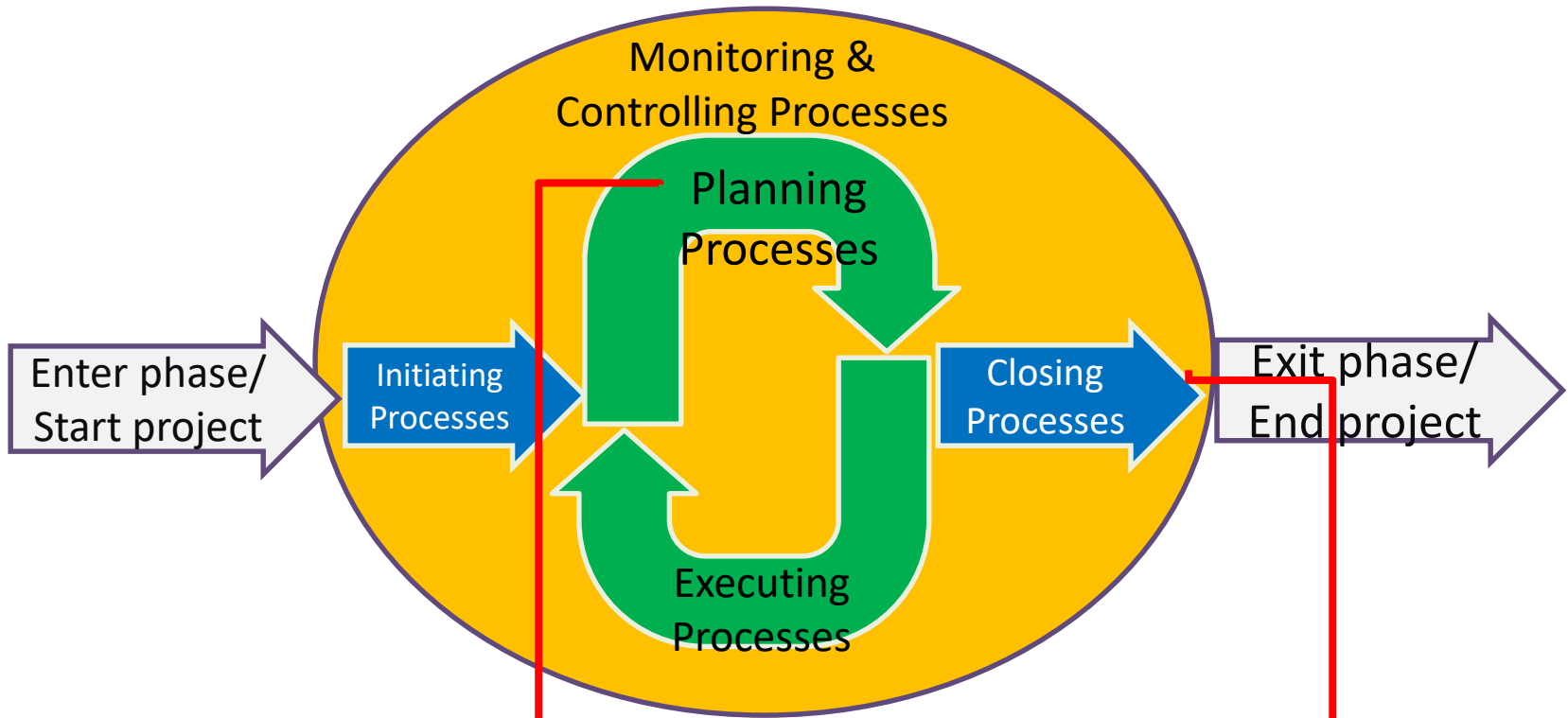
**Identify Risk**

**Perform Qualitative Risk analysis**

**Perform Quantitative Risk analysis**

**Plan Risk Response**

**Monitor and Control Risk**



Knowledge Area	Process				
	Initiating	Planning	Executing	Monitoring & Control	Closing
Scope		Plan Risk Management Identify Risk Perform Qualitative Risk Analysis Perform Quantitative Risk Analysis Plan Risk Response		<b>Monitor Control Risk</b>	

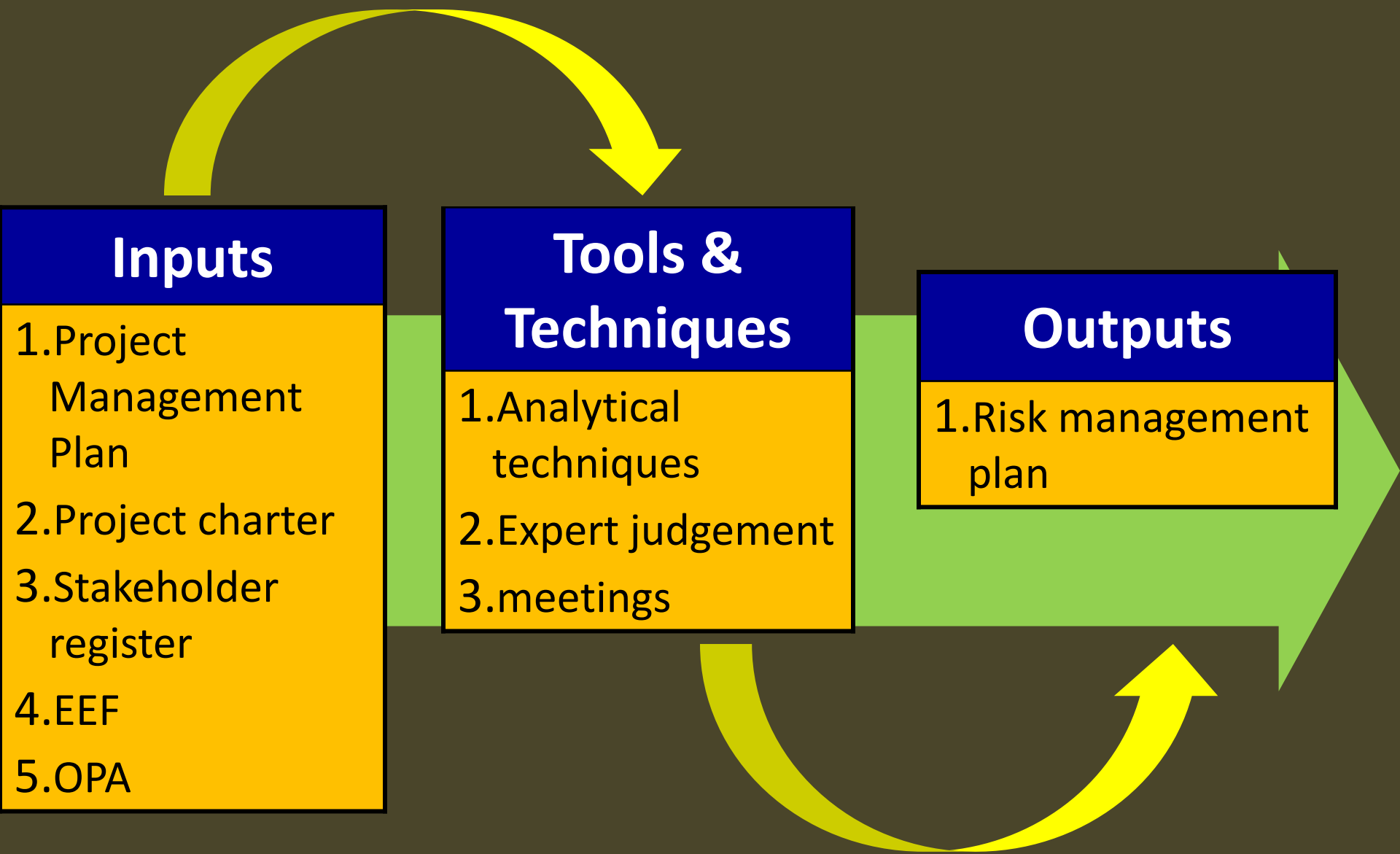


# Plan Risk

The process of defining how to conduct risk management activities for a project.







## Inputs

1. Project Management Plan
2. Project charter
3. Stakeholder register
4. EEF
5. OPA

## Tools & Techniques

1. Analytical techniques
2. Expert judgement
3. meetings

## Outputs

1. Risk management plan



# Plan Risk

- **Source of risk is RISK CATEGORY**
  - **A standard list of risk categories** can help to make sure areas of risk are not forgotten.
  - Companies and PMO should **have standard list of risk categories** to help identify risk.
  - Resource Breakdown Structure=RISK Category

# Risk Management

## Risk Identification

### External Unpredictable

- Regulatory
- Natural Hazards
- Postulated Events
- Side Effects
- Completion
- Energy shortage
- War
- Terrorist Act
- Monetary Crisis

### External Predictable

- Market Risks
- Operational
- Environmental Impacts
- Social Impacts
- Inflation
- Demonstration/ People Claim
- Financial Uncertainty
- Failure of Payment
- Government Act and Regulation (Tax Ratio and Permits)
- Uncertainty in Equipment (Availability)
- Delay of Site Access (Permits)
- Currency Fluctuation/changes
- Limited Number of Sub Con
- NSC (Nominated Sub Contractor)

### Internal Non Technical

- Management
- Schedule
- Cost
- Cash Flow
- Loss of Potential
- Uncertainty in Labor (Availability, Skill)
- Uncertainty in Material
- Coordination Failure
- Project Delay
- Labor Importation Cost
- Work Accident C

### Technical

### Legal

- Licences
- Patent Rights
- Contractual
- Outsider Suit
- Force Majeure
- Government Act and Regulation
- Construction Permits

### Financial


- Unpaid Project
- Wrong in Making Cash Flow Prediction

# Risk Category

# 2 main type of risk



**Business**  
**Risk of gain Loss**



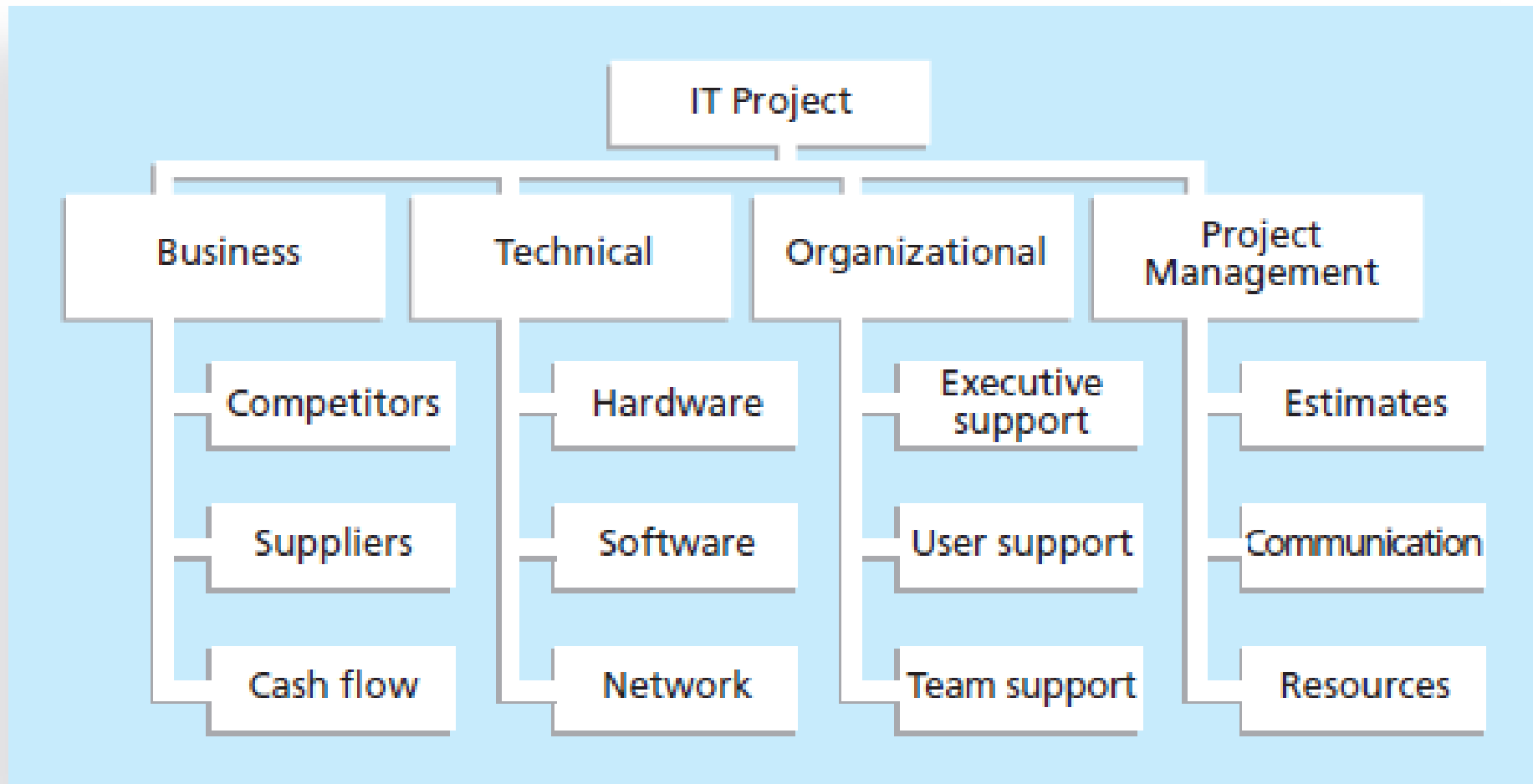
**Pure (insurable)  
risk – Only a risk of  
loss (i.e. fire, theft,  
personal injury,  
etc)**



# Risk Management Plan

- ✓ Methodology
- ✓ Roles & responsibilities
- ✓ Budgeting
- ✓ Timing
- ✓ Risk categories.
- ✓ Definition of probability and impact
- ✓ Stakeholder tolerances
- ✓ Reporting formats
- ✓ Tracking
- ✓ Probability and impact matrix

# Example of RBS



A close-up photograph of a person's hands gripping the silver metal frame of a walker. The person is wearing a light-colored shirt with a small blue floral pattern. A prominent red rounded rectangle is overlaid in the center of the image, containing white text. The background is a plain, light-colored wall.

**THE POTENTIAL RISK  
IN KNOWLEDGE AREA**

# INTEGRATION

A 3D rendered metal chain is shown breaking apart in the center. The broken pieces are flying outwards. In the top left, there is a red rounded rectangle containing the word 'INTEGRATION' in white, bold, sans-serif font. In the bottom right, there is a yellow rounded rectangle containing text in black, bold, sans-serif font. The background is white.

**Inadequate planning, poor resource  
allocation, poor integration  
Management, lack of post-project  
review**



# SCOPE



**Poor definition of scope or work packages;  
incomplete definition**

A black and white photograph of a woman with dark hair looking upwards with an expression of surprise or interest. She is looking at a hand holding a black bag with white polka dots. The background is blurred, showing other people in a crowd.

**COST**

**Estimating errors; inadequate productivity, cost, change, or contingency**

**QUALITY**

**B**

**A**

**D**

**Poor attitude toward quality  
substandard design, materials, and  
Workmanship, inadequate quality assurance  
program**

# COMMUNICATION



**Carelessness in planning or communicating**



# HUMAN RESOURCE

**Poor conflict management; poor project organization and definition of responsibilities; absence of leadership**



**RISK**

**Ignoring risk; unclear analysis of risk; poor insurance management**

# PROCUREMENT

T

**CONT**

**TRACT**

**Unenforceable conditions or contract clauses; adversarial relations**

# STAKEHOLDER

A grayscale background image of a business meeting. In the foreground, a woman in a dark sleeveless top is holding a large sheet of paper with text. To her left, a man in a dark suit and white shirt is partially visible, looking towards the paper. The background is slightly blurred, showing other people and documents on a table.

**Lack of consultation with  
key stakeholder**





# Identify Risk

- The process of **determining which risks may affect the project** and documenting their characteristics.

## Inputs

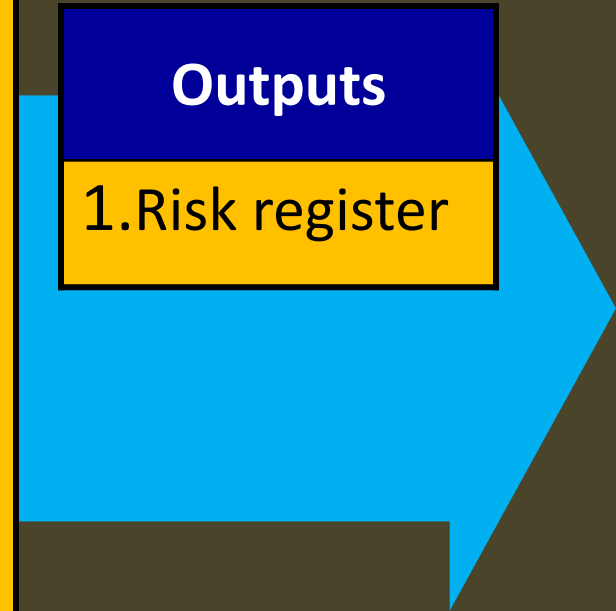
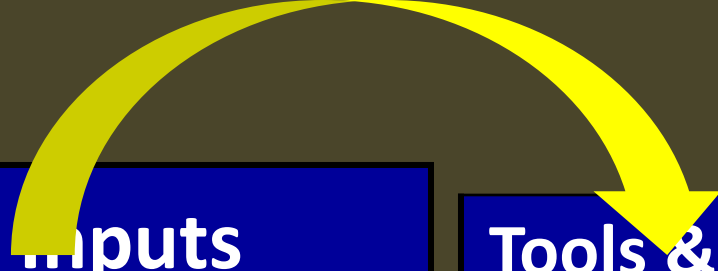
1. Risk, Cost, Shcedule, Quality, HR, management plan
2. Scope baseline
3. Activity cost estimates
4. Activity duration estimates
5. Stakeholder register
6. Project documents
7. Procurement documents
8. EEF
9. OPA

## Tools & Techniques

- 1.Documentation reviews
- 2.Information gathering techniques
- 3.Checklist analysis
- 4.Assumptions analysis
- 5.Diagramming techniques
- 6.SWOT analysis
- 7.Expert iudgment

## Outputs

- 1.Risk register



# Identify Risk

- Risk should be continually reassessed (**iterative**) such as in **integrated change control** activity
- **Information gathering techniques**
  - **Brainstorming**
  - **Delphi technique**
  - **Interviewing:**
  - **Root cause analysis**
  - **SWOT**



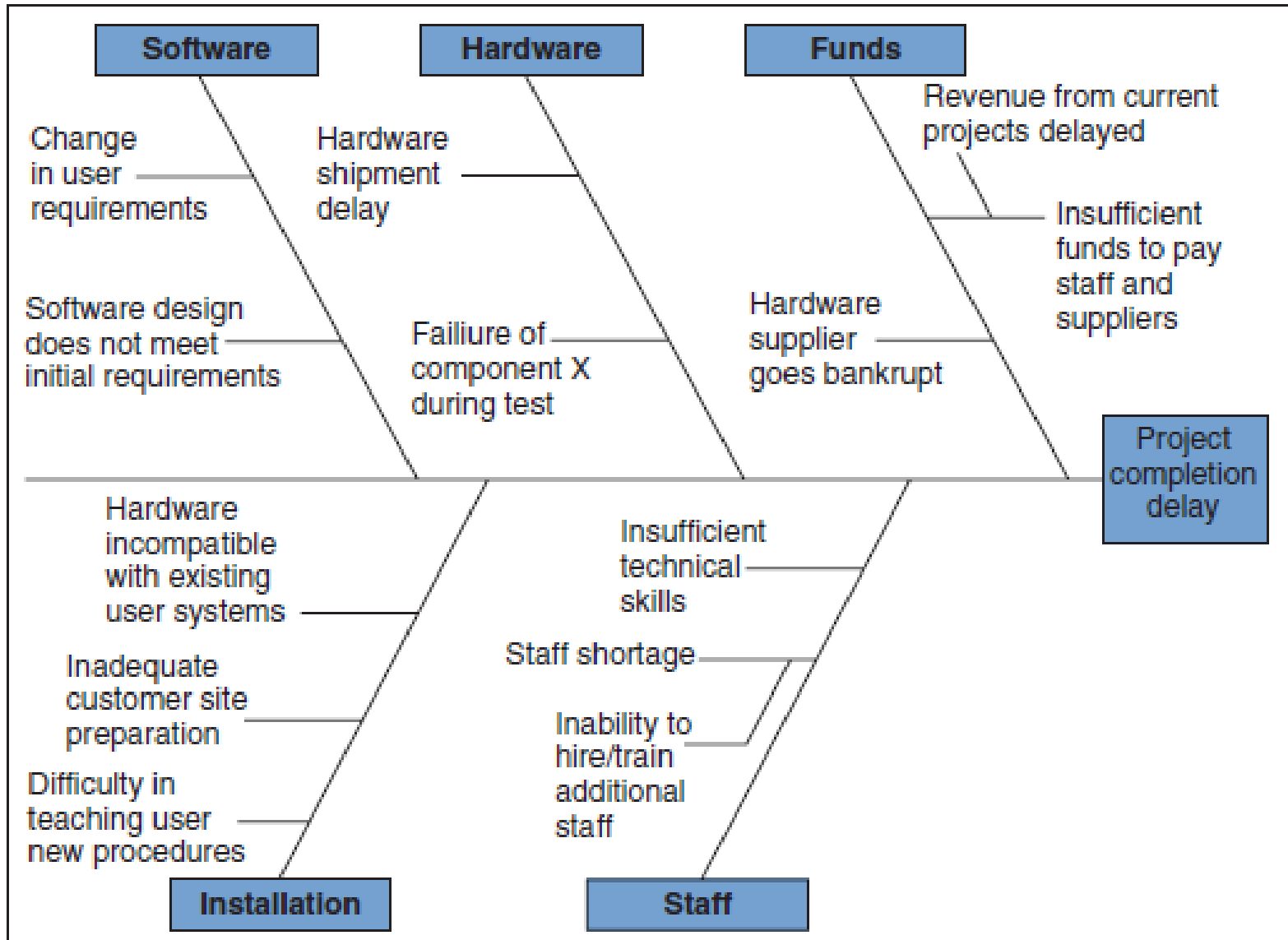
# SWOT Strengths, Weaknesses, Opportunities, Threats

## Opportunities



**Threats**

# Cause & effect diagram



# Risk Register

No.	Rank	Risk Description	Category	Root Cause	Triggers
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R44	1				
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R21	2				
-----	---	--	--	--	--

R7	3				
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Potential Responses	Risk Owner	Probability	Impact	Status
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# Risk Register

## MONTHLY RANKING

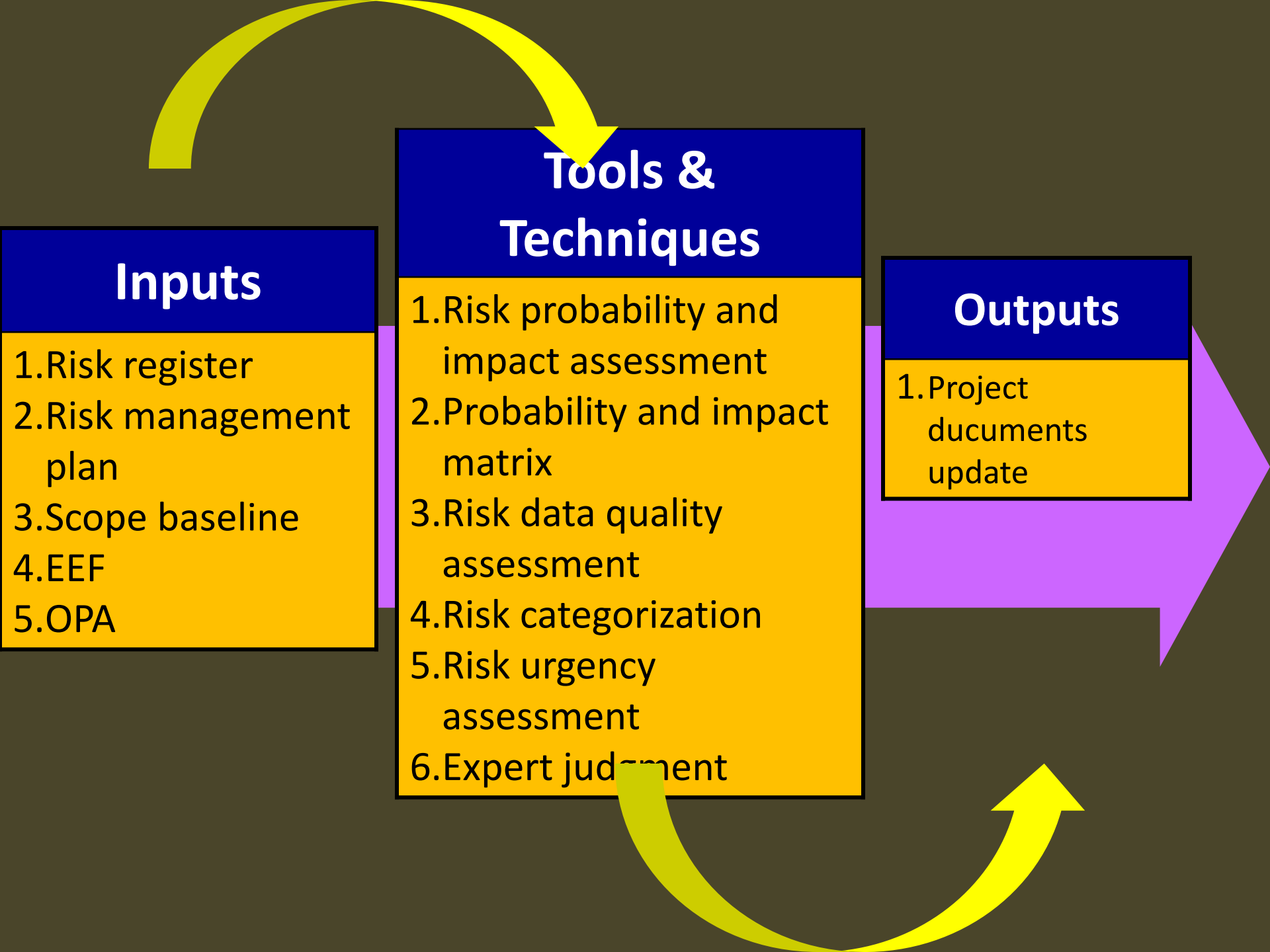
Risk Event	Rank This Month	Rank Last Month	Number of Months in Top Ten	Risk Resolution Progress
Inadequate planning	1	2	4	Working on revising the entire project management plan
Poor definition	2	3	3	Holding meetings with project customer and sponsor to clarify scope
Absence of leadership	3	1	2	After previous project manager quit, assigned a new one to lead the project
Poor cost estimates	4	4	3	Revising cost estimates
Poor time estimates	5	5	3	Revising schedule estimates

A black and white photograph of a young girl with a joyful expression, smiling broadly. She is holding a spoon with a dollop of ice cream, ready to take a bite. In front of her is a large ice cream cone with several scoops of different flavors, including what appears to be chocolate chip and vanilla. The background is softly blurred, suggesting an outdoor setting like a park or a fair. The overall mood is happy and carefree.

## Perform qualitative risk analysis

- **Prioritizing risks action by assessing and combining their probability of occurrence and impact.**





# Qualitative risk

NOW   
LATER



- Help to focus on ***high priority risks***
- A ***subjective analysis***
- Can be also used to:
  - Compare risk to the **overall risk of other projects**
  - **selected, continued or terminated?**
  - Proceed to **Perform Quantitative Risk Analysis?**

# Probability Impact Matrix

- Different matrices can be used for **cost, time, scope**
- It helps guide **risk responses** (priority action & response strategies)

No	Category	Description of Risk	IMPACT	PROBA BILITY	RISK LEVEL
1	Resource	Testing environment not available	4	B	ORANGE
2	Schedule	Documentation approval took longer time	4	A	RED

Likelihood	Consequence				
	1 Insignificant	2 Minor	3 Moderate	4 Major	5 Catastrophic
A Almost Certain	11	16	20	23	25
B Likely	7	12	17	21	24
C Possible	4	8	13	18	22
D Unlikely	2	5	9	14	19
E Rare	1	3	6	10	15

Colors shows level of importance



# Perform quantitative risk analysis

- **Numerically** analyzing the effect of identified risks on overall project objectives.

## Inputs

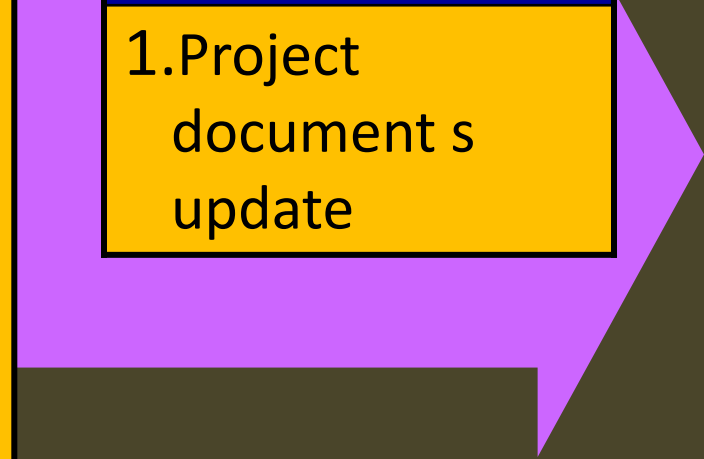
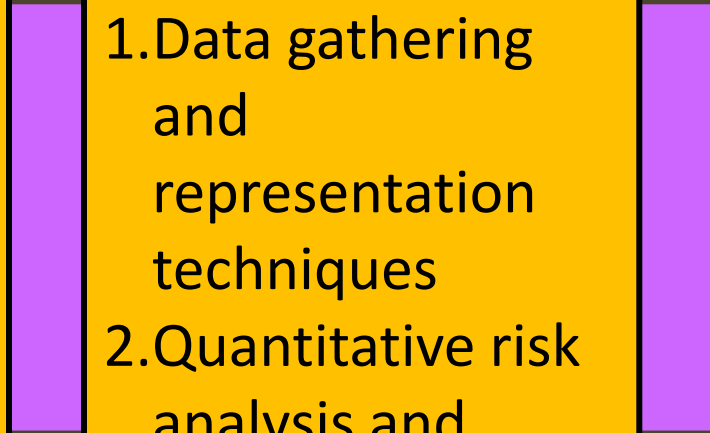
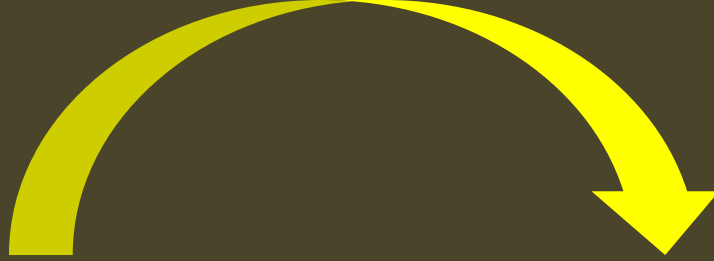
1. Risk register
2. Risk, Cost, Schedule management plan
3. Project scope statement
4. OPA

## Tools & Techniques

1. Data gathering and representation techniques
2. Quantitative risk analysis and modeling techniques
3. Expert judgment

## Outputs

1. Project documents update



# Quantitative Risk



- A numerical evaluation  
**(more objective)**
- This process may be skipped.

**Create realistic and achievable cost, schedule, or scope targets.**

# Quantitative Risk T&T

- Sensitivity analysis – tornado diagram
- Expected monetary value (EMV) analysis
- Decision tree
- Monte Carlo analysis (simulation)
- PERT

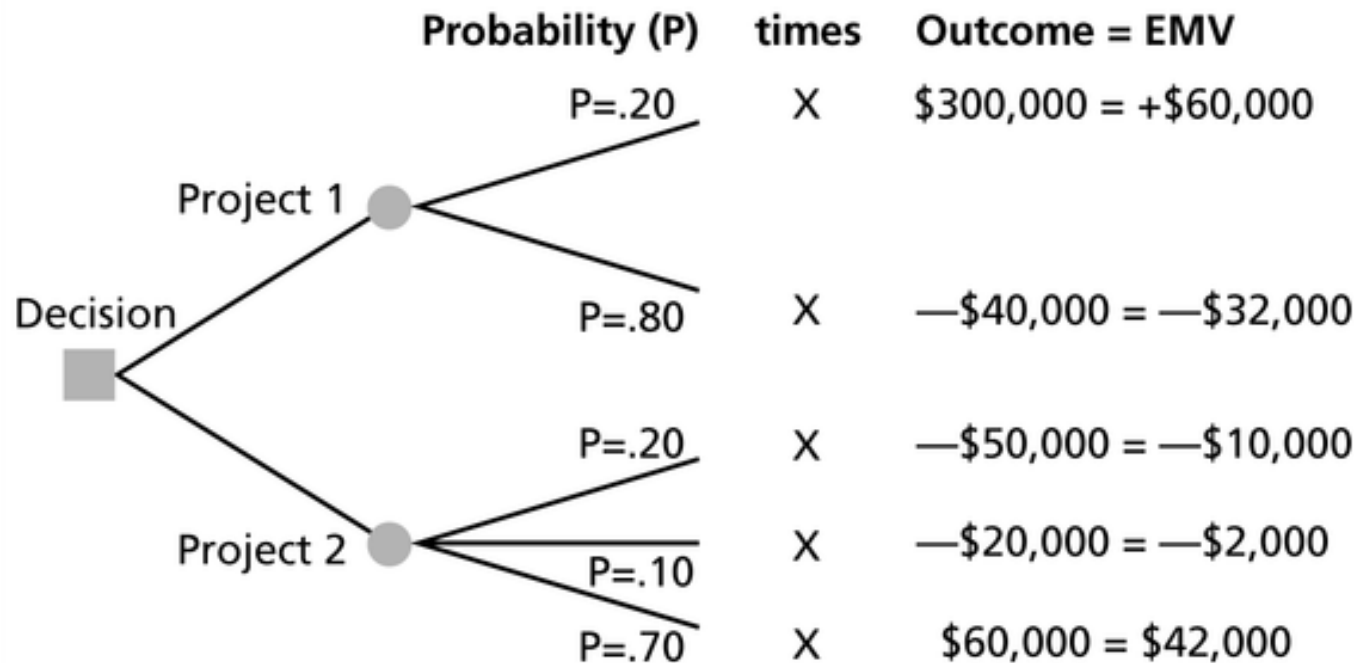


# Expected monetary value

$$EMV = \sum [(Probability) \times (Impact)]$$

- **EMV (expected monetary value) used with Decision Tree to choose between many alternative which take into account the future event**

- **Example:**

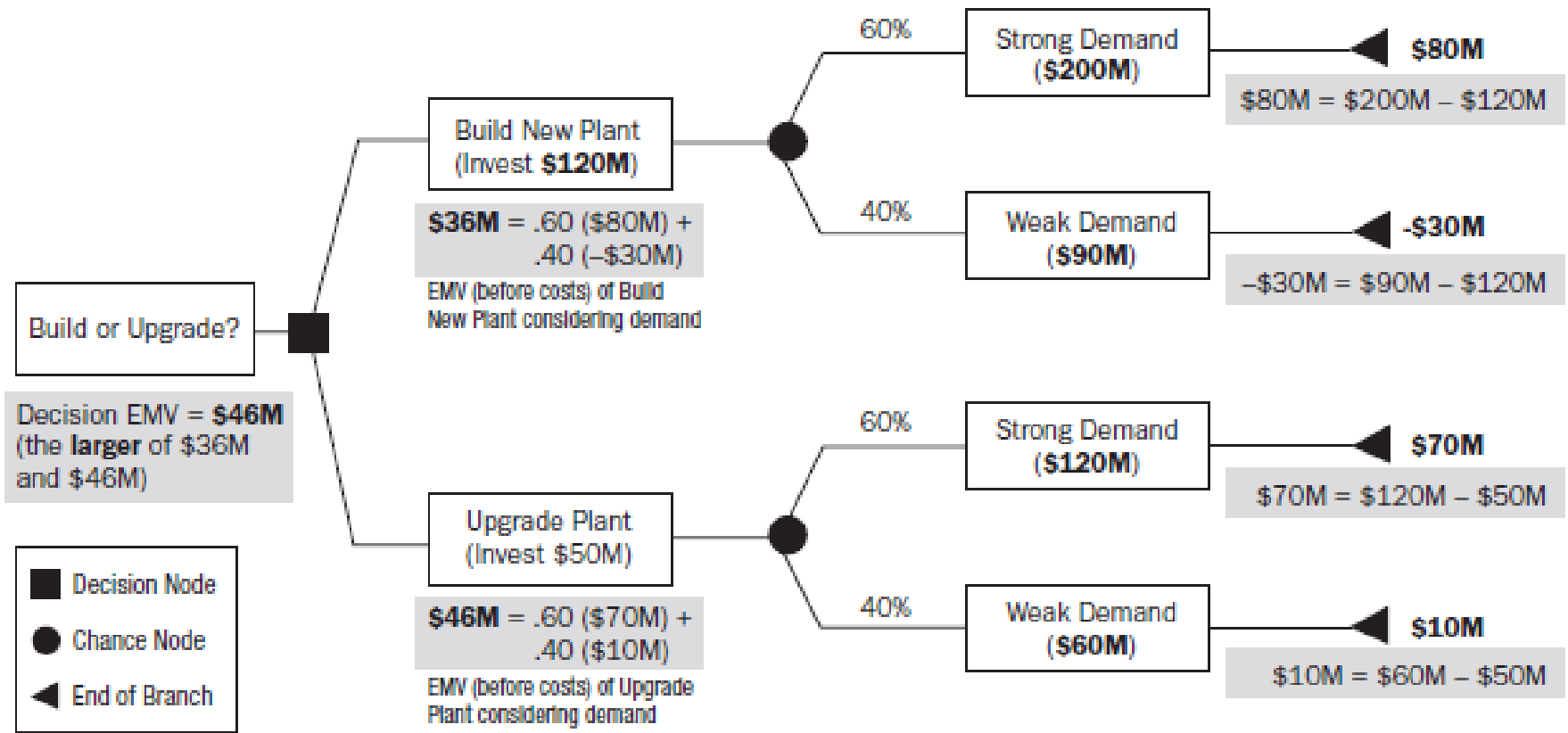


Project 1's EMV = \$60,000 —32,000 = \$28,000

Project 2's EMV = —\$10,000 —2,000 + 42,000 = \$30,000

# Decision Tree / EMV

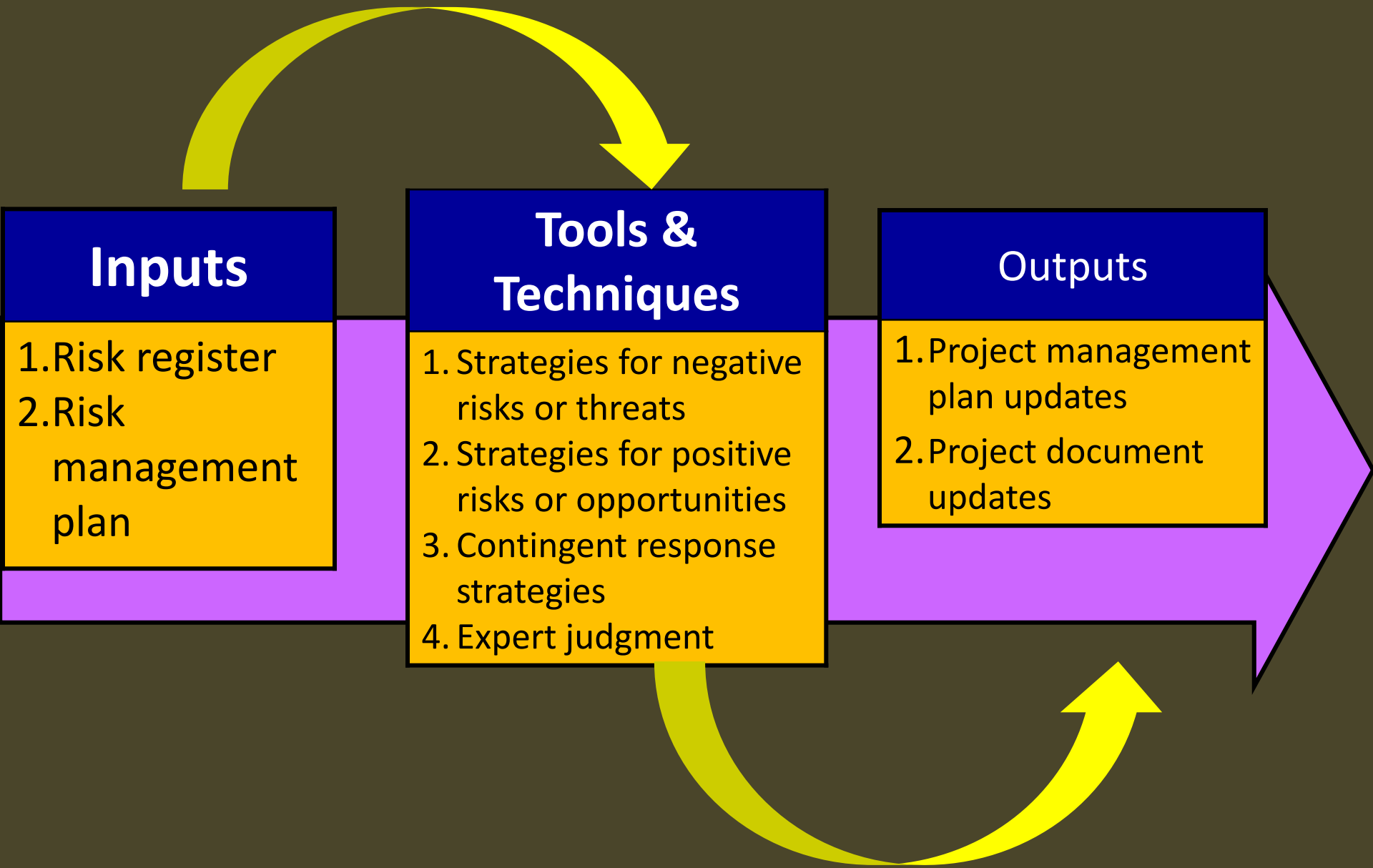
Decision Definition	Decision Node	Chance Node	Net Path Value
Decision to be Made	<b>Input:</b> Cost of Each Decision <b>Output:</b> Decision Made	<b>Input:</b> Scenario Probability, Reward if it Occurs <b>Output:</b> Expected Monetary Value (EMV)	<b>Computed:</b> Payoffs minus Costs along Path



# Plan Risk Response



**Developing option and action to enhance opportunities and to reduce threats to project objectives.**



STRATEGY

FOR  
THREAT





ACCEPT

***Deal with the risks***

Project management plan is not changed

AVOID

Eliminate the threat entirely  
Isolate project objectives from  
the risk's impact



# TRANSFER

Shift some or all the negative impact of a threat to a third party  
e.g insurance, outsourcing







## MITIGATE

Implies a reduction in the probability and/or impact of an adverse risk event to be within acceptable threshold limits

# STRATEGY



EXPLOI

SHARE

ENHANC

ACCEP

# EXPLOIT

Seek to ensure the opportunities definitely happen



# ENHANCE

Increase the probability and/or the positive impacts of an opportunity.



ACCEPT



Not actively pursuing an opportunity

Share



Sharing the opportunity to another party

# Monitoring & Controlling Risk

- The process of ..
  - **implementing** risk response plans
  - **tracking** identified risks,
  - **monitoring** residual risks,
  - **identifying** new risks, and
  - **evaluating** risk process effectiveness throughout the project.



## Inputs

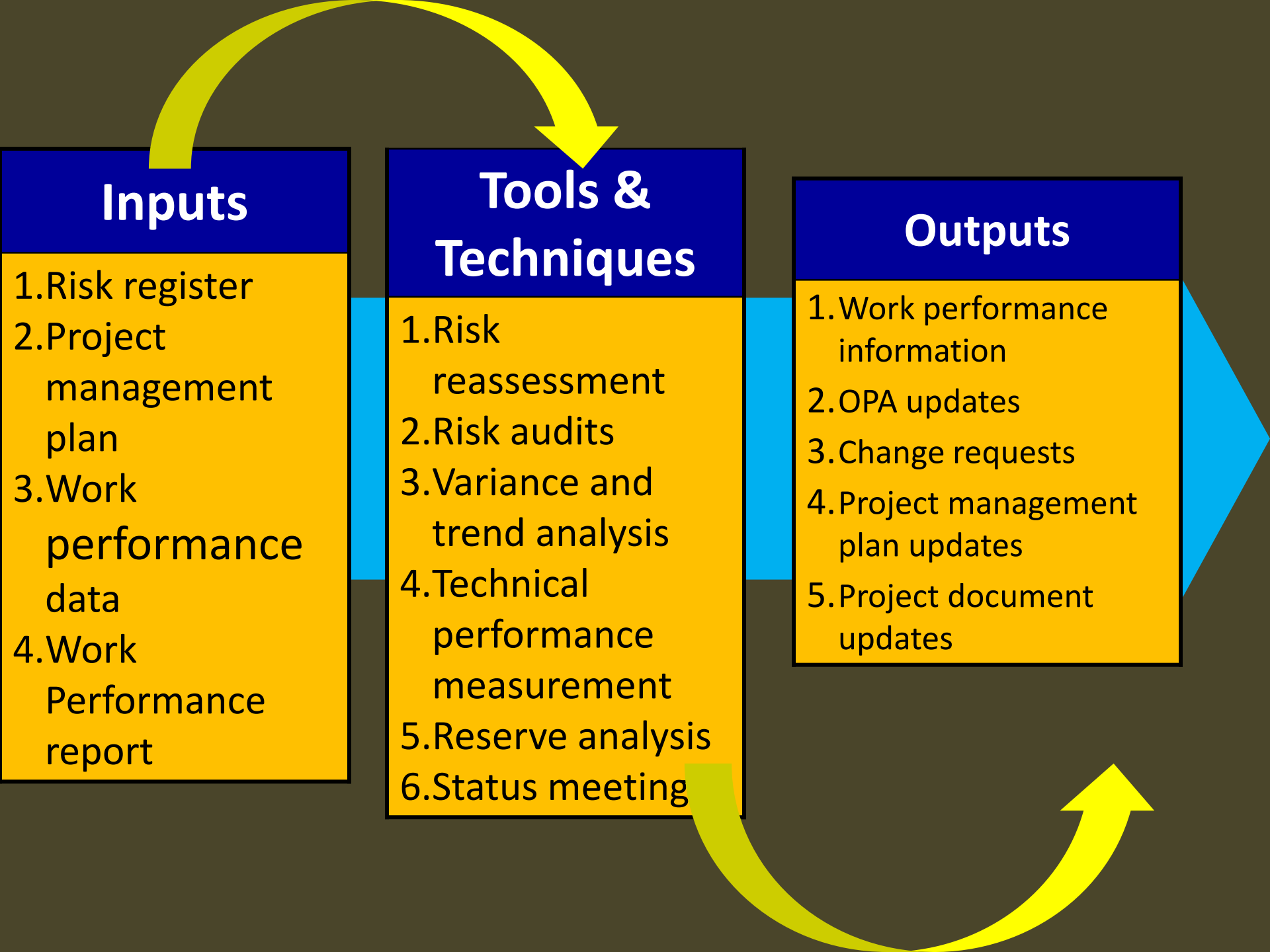
1. Risk register
2. Project management plan
3. Work performance data
4. Work Performance report

## Tools & Techniques

1. Risk reassessment
2. Risk audits
3. Variance and trend analysis
4. Technical performance measurement
5. Reserve analysis
6. Status meeting

## Outputs

1. Work performance information
2. OPA updates
3. Change requests
4. Project management plan updates
5. Project document updates





# Risk Monitoring & Controlling

- Other purposes are to determine if
  - Project assumptions are still valid
  - Risk has changed or can be retired
  - Risk management policy & procedure are being followed
  - Align contingency reserves with current risk assessment

# Example: Definition of Risk Probability and Impact

- This should be defined in Risk Management Plan

S

## Defined Conditions for Impact Scales of a Risk on Major Project Objectives

(Examples are shown for negative impacts only)

Relative or numerical scales are shown

Project Objective	Very low /.05	Low /.10	Moderate /.20	High /.40	Very high /.80
<b>Cost</b>	Insignificant cost increase	<10% cost increase	10-20% cost increase	20-40% cost increase	>40% cost increase
<b>Time</b>	Insignificant time increase	<5% time increase	5-10% time increase	10-20% time increase	>20% time increase
<b>Scope</b>	Scope decrease barely noticeable	Minor areas of scope affected	Major areas of scope affected	Scope reduction unacceptable to sponsor	Project end item is effectively useless
<b>Quality</b>	Quality degradation barely noticeable	Only very demanding applications are affected	Quality reduction requires sponsor approval	Quality reduction unacceptable to sponsor	Project end item is effectively useless

This table presents examples of risk impact definitions for four different project objectives. They should be tailored in the Risk Management Planning process to the individual project and to the organization's risk thresholds. Impact definitions can be developed for opportunities in a similar way.

# Example: Influence Diagram

- Diagramming technique used when Identify Risk

