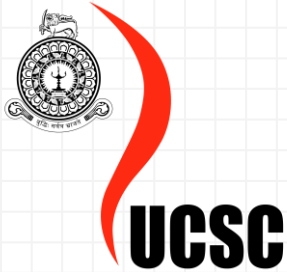
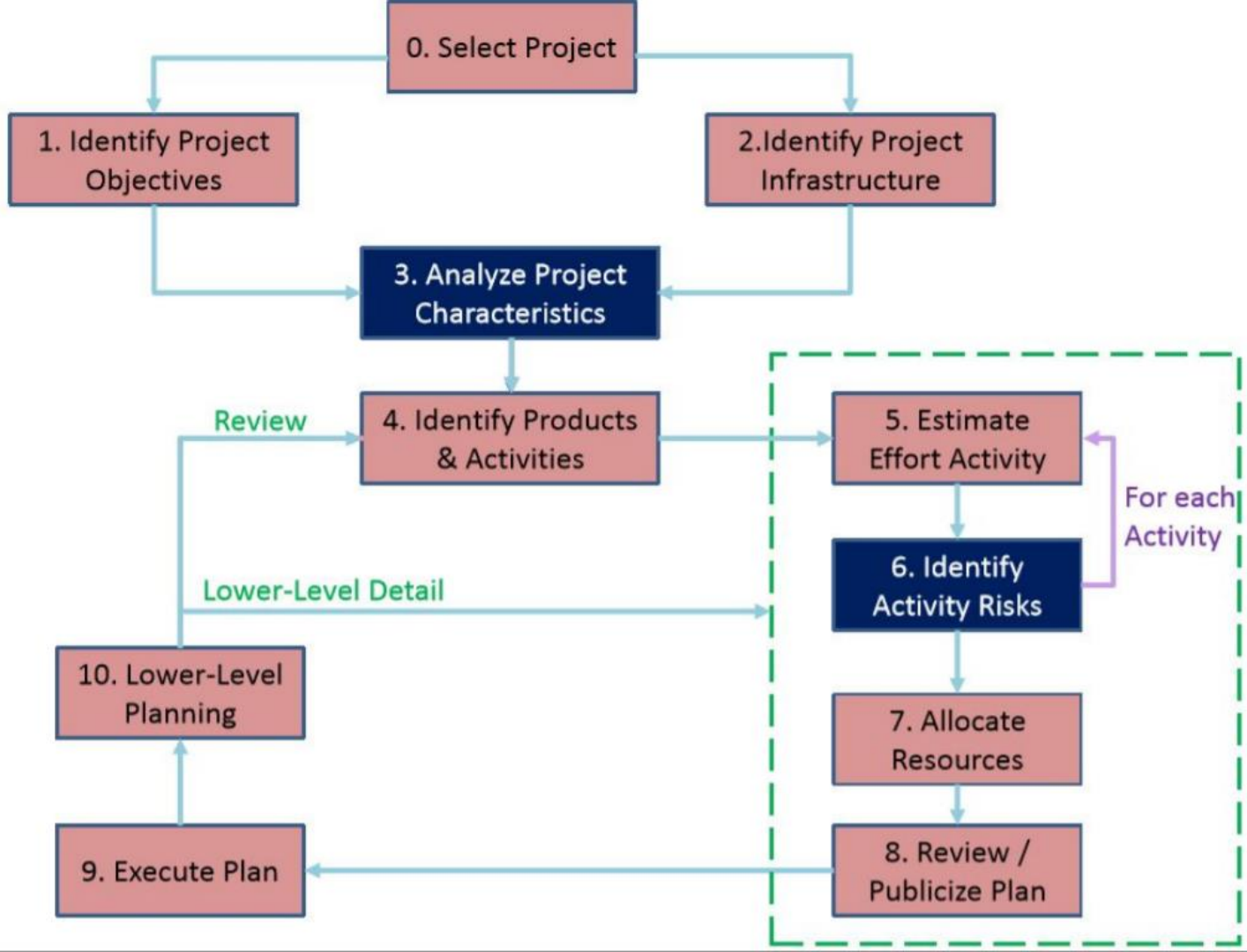



IS 2108 – IT Project Management
Lecture 06

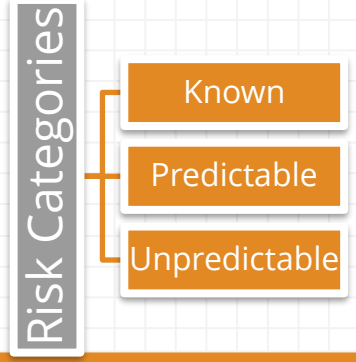
# *Risk Management*

Sanduni Thrimahavithana

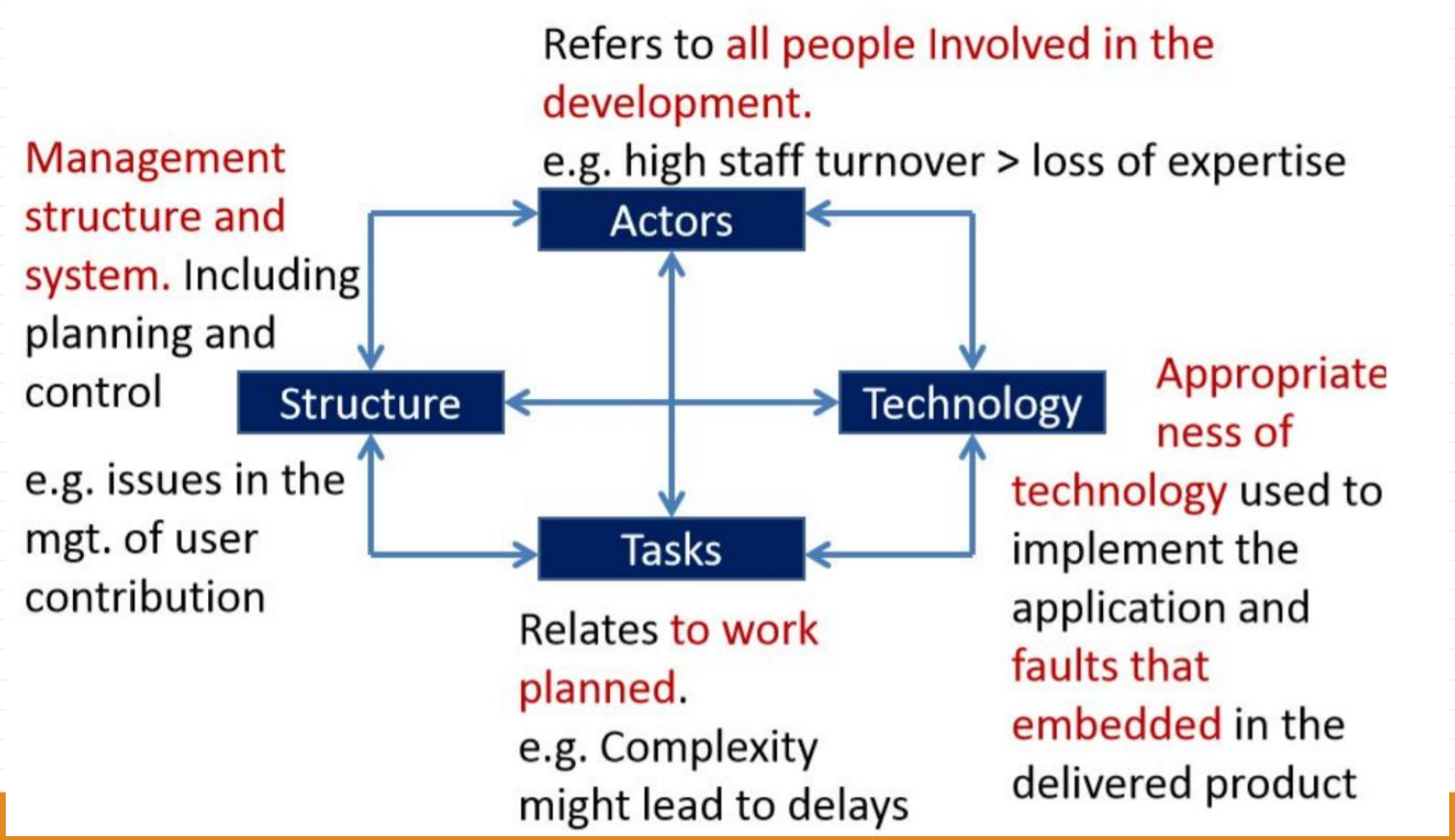

0. Select Project
1. Identify Project Objectives
2.Identify Project Infrastructure
3. Analyze Project Characteristics
4. Identify Products & Activities
Review
5. Estimate Effort Activity
For each Activity
6. Identify Activity Risks
Lower-Level Detail
10. Lower-Level Planning
7. Allocate Resources
9. Execute Plan
8. Review / Publicize Plan

# WHAT IS A *RISK?*

- An **uncertain event or condition** that has a negative effect on the project objectives.
- An unforeseen event that can **adversely impact on the project's cost, schedule, or quality.**
- Relates to the **future**
- **Measured in terms of probability of occurrence** (High-Low) and **consequences** (Loss: High-Low)
- Involves **cause and effect**

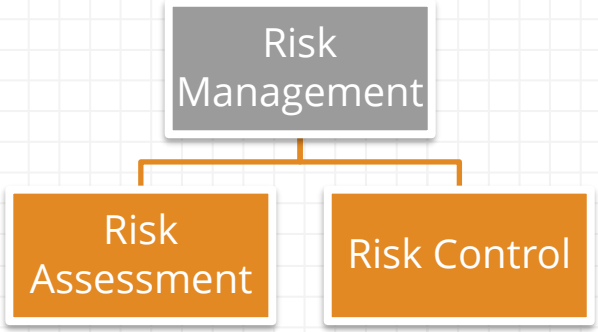



# CATEGORIZING *RISKS*



# RISK *MANAGEMENT (RM)*

- An attempt to minimize the chances of failure caused by unplanned events/risks.
- Aim to **identify, quantify and take actions** to minimize the effect of risks on the project.
- Risk management involves additional costs.
  - **RM is cost effective only if the cost of RM is considerably less than the loss incurred.**
- It is not easy to measure the value of RM.
- Involves two key components:



# A FRAMEWORK FOR *DEALING WITH RISKS*

# RISK IDENTIFICATION - *TYPES OF RISKS*

- **Estimation Errors**
  - Some tasks are harder to estimate due to;
    - Lack of experience
    - Unique nature of the task
  - E.g.
    - Producing a user manual – Straightforward & no risks involved
    - Program testing & debugging – High risk in estimating time/duration
  - Estimations can be improved by analyzing historical data

# RISK *IDENTIFICATION*

- **Application Factors**
  - Projects with Safety Critical Factors may have risks
  - Remote transactions
- **Staff Factors**
  - Issues related to experienced and skilled staff
- **Project Factors**
  - Problems in defining project objectives etc.
- **Project Methods**
  - Problems that occur if well specified and structured methods are not used

# RISK *IDENTIFICATION*


- **Hardware/Software Factors**
  - Projects that require new hardware may have higher risks
- **Changeover Factors**
  - Risks in projects such as parallel or incremental change over to a new system
- **Supplier Factors**
  - Risks involved depending on external organizations
- **Environment Factors**
  - Changes in environment (e.g. change of government tax policy)
- **Health and Safety Factors**
  - Health and safety of project participants

# PRIORITIZING *RISKS*

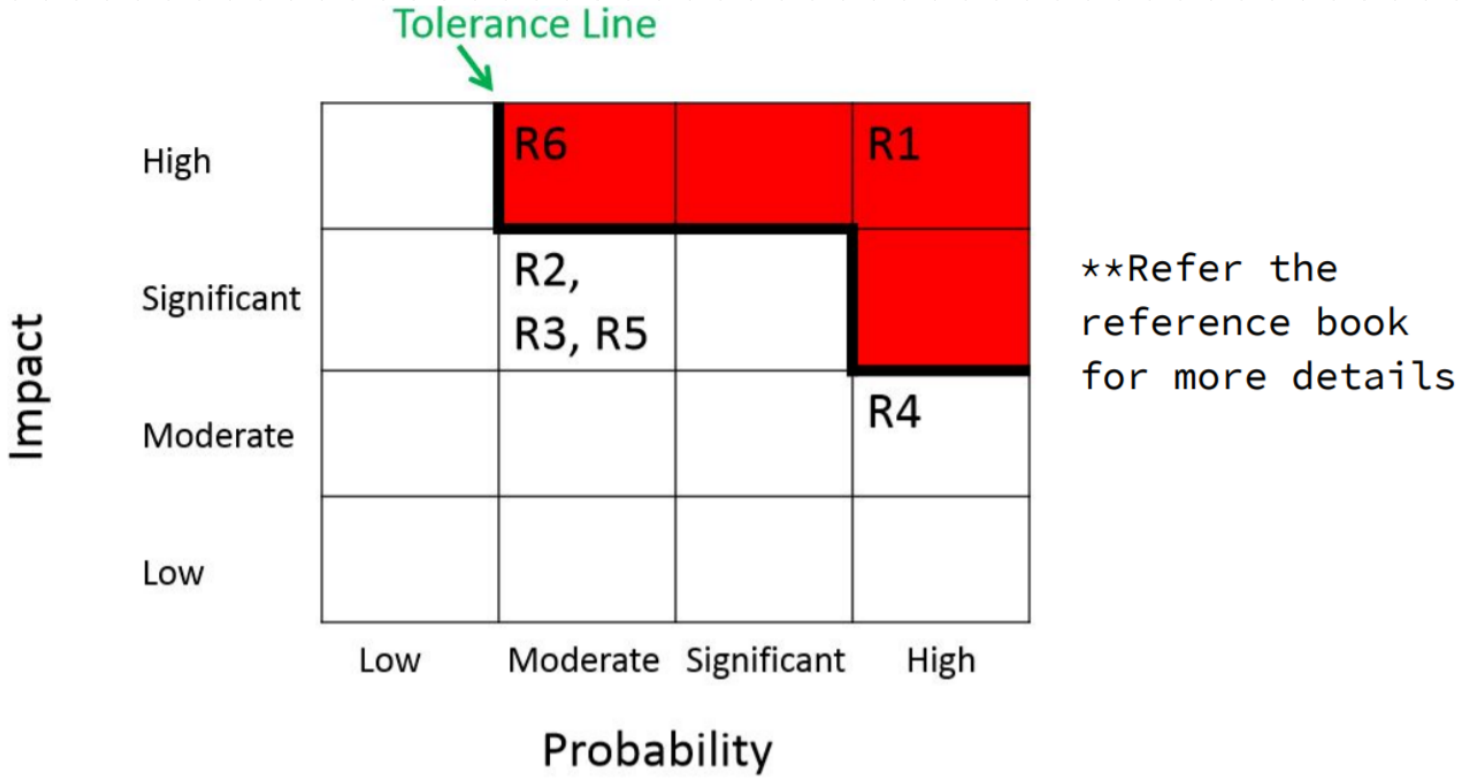
- Reducing Risk Exposure by reducing Likelihood and Impact

- Confidence of Risk Assessment
  - Some risk assessments are very poor

- Compound Risks
  - Some risks depend on others

- The Number of Risks

# A PROBABILITY - *IMPACT MATRIX*




**Refer the reference book for more details

# RISK *ESTIMATION*

- Risk Exposure: **Expected Value** of the loss for the risk

**Risk Exposure = Risk Likelihood x Risk Impact**

**RE(R) = Prob(R) x Loss(R)**

- Risk Likelihood: The probability of a risk.
- Risk Impact: The total loss incurred if the risk happens.

# RISK *ESTIMATION*

A project depends on a data center which is vulnerable to fire. It is estimated that there is a 1 in 1000 chance fire actually happening. If a fire occurred a new computer configuration should be established for Rs.500,000. Find the risk exposure.

*RE= Rs.500,000x1/1000 =Rs.500*

*This is the minimum sum an insurance company would require as a premium*

# QUALITATIVE *DESCRIPTIONS*

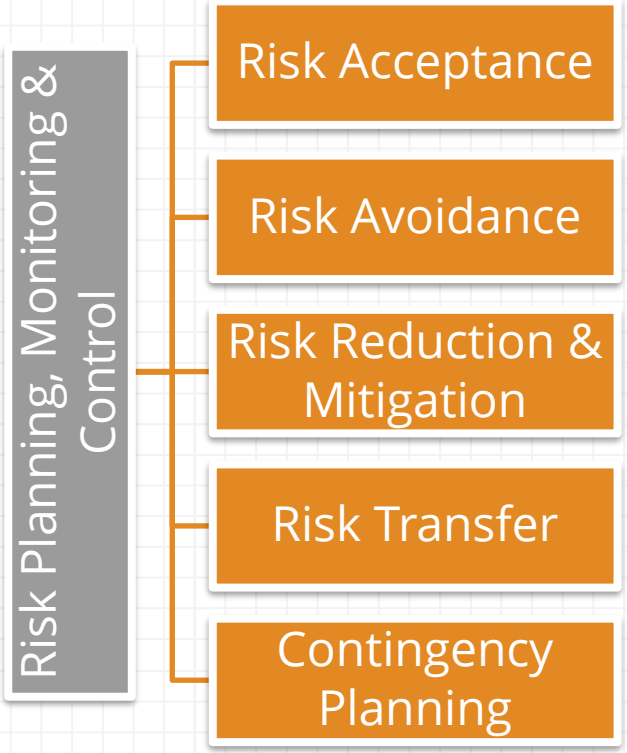
| Probability | Range |
|---|---|
| High | Greater than 50% chance of happening |
| Significant | 30-50% chance of happening |
| Moderate | 10-29% chance of happening |
| Low | Less than 10% chance of happening |

*Qualitative description of risk probability and associated range values*

| Impact Level | Range |
|---|---|
| High | More than 30% above budget expenditure |
| Significant | 20-29% above budget expenditure |
| Moderate | 10-19%above budget expenditure |
| Low | Within 10 % of budget expenditure |

*Qualitative descriptors of impact on cost and associated range values*

# RISK PLANNING, *MONITORING & CONTROL*



# RISK PLANNING & *CONTROL Cont...*

- **Risk Acceptance (Tolerate)**
  - Do-nothing
  - Approval of operations under exposure to the risk, according to the organizations policies and criteria for risk acceptance
  - Should also involve provision for recovery under business continuity management

# RISK PLANNING & *CONTROL Cont…*

- **Risk Avoidance (Terminate)**
  - Changing or re-engineering the business process
  - Terminate the activity giving rise to risk

# RISK PLANNING & *CONTROL Cont...*

- **Risk Reduction (Treat)**
  - Reduction
    - Attempts to reduce the likelihood of the risk occurring
    - Application of security controls
    - Treat risk with appropriate control measures and mechanisms
  - Mitigation
    - Takes actions to ensure that the impact of the risk is lessened when it occurs.

# RISK PLANNING & *CONTROL Cont...*

- **Risk Transfer**
  - Transfer the risk to another party
    - Partners, suppliers or business process outsourcing
    - You can transfer the risk, but not the responsibility
  - Insurance or Outsourcing
    - Provision of financial coverage for potential losses incurred

# RISK PLANNING & *CONTROL Cont…*

- **Risk Control : Application of Controls**
  - Introduce controls **to reduce or remove** the likelihood or impact
  - Different actions of controls
    - Avoid , Communicate, Correct, Detect, Deter, Monitor, Prevent, Recover, Reduce
  - Different categories of controls
    - Technical, Procedural, Educational
    - Will have different Effects, Constraints, Implications
    - May have very different cost

# RISK PLANNING & *CONTROL Cont...*

- **Risk Control : Implementation Constraints**
  - **Time**
    - Implementation deadlines due to legal , regulatory, contractual, business or management requirements
    - Requirements for short, medium and long term solutions
  - **Money**
    - Cost of control compared to benefits
    - Budget for implementation, operational and maintenance cost
  - **Technical**
    - Capabilities of internal/ external staff
    - Compatibility with existing technology

# RISK PLANNING & *CONTROL Cont...*

- **Risk Control : Implementation Constraints**
  - **Cultural**
    - Compliance of internal/ external staff
  - **Environmental**
    - Space availability and other characteristics of the specific location
  - **Legal**
    - IT related legislations and regulations
    - Other legislations and regulations (Labor Laws, Fire Protection, etc.)

# RISK *ACTIONS*

- Some risks can be avoided or reduced immediately.
- For others;
  - Cost vs. Benefits
- Cost effectiveness of a risk reduction can be evaluated by;
  - **Risk Reduction Leverage**
  - Calculates a value for the return on investment
  - Simple calculation that gives a numeric value to a countermeasure, enabling different countermeasures to be compared.

$$RRL = \frac{RE\ before - RE\ after}{Risk\ Reduction\ Cost}$$

- If the value is greater than 1, it is good.

# EVALUATE THE EFFECTS OF *UNCERTAINTY*

- Uncertainty surrounding estimates of task durations
- Most Likely Time (m) –The time we would expect the task to take under normal circumstance
- Optimistic Time (a) –The Shortest Time
- Pessimistic Time (b) –The Worst Possible Time

# EVALUATE THE EFFECTS OF *UNCERTAINTY*

- Expected Duration (te)

**te = (a + 4m + b)/6**

- Activity Standard Deviation (s)

**s = (b –a)/6**

**s ∝ (b-a)** is used to rank the measure of degree of uncertainty or risk of activity

# *EXAMPLE*

**te = (a + 4m + b)/6**

**s = (b –a)/6**

| Activity | Optimistic (a) | Most Likely (weeks) (m) | Pessimistic (b) | $t_e$ (wk) | s (wk) |
|---|---|---|---|---|---|
| A | 5 | 6 | 8 | | |
| B | 3 | 4 | 5 | | |
| C | 2 | 3 | 3 | | |
| D | 3.5 | 4 | 5 | | |
| E | 1 | 3 | 4 | | |
| F | 8 | 10 | 15 | | |
| G | 2 | 3 | 4 | | |
| H | 2 | 2 | 2.5 | | |

# *EXAMPLE*

**te = (a + 4m + b)/6**

**s = (b –a)/6**

| Activity | Optimistic (a) | Most Likely (weeks) (m) | Pessimistic (b) | $t_e$ (wk) | s (wk) |
|---|---|---|---|---|---|
| A | 5 | 6 | 8 | 6.17 | 0.50 |
| B | 3 | 4 | 5 | 4.00 | 0.33 |
| C | 2 | 3 | 3 | 2.83 | 0.17 |
| D | 3.5 | 4 | 5 | 4.08 | 0.25 |
| E | 1 | 3 | 4 | 2.83 | 0.50 |
| F | 8 | 10 | 15 | 10.50 | 1.17 |
| G | 2 | 3 | 4 | 3.00 | 0.33 |
| H | 2 | 2 | 2.5 | 2.08 | 0.08 |

# THANKS!

Do you have any questions?
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