A Model to Develop and Use Risk Contingency Reserve

Agenda

1. Your Expectations from this Presentation
2. Introduction – Myself
3. Model to Develop and Use Risk Contingency Reserve
   a. Background/Overview of Risk Management
   b. What is a Contingency Reserve?
   c. Using Expected Monetary Value to calculate Contingency Reserve
   d. Communicating the Contingency Reserve
   e. Using the Contingency Reserve
   f. Limitations of the Model
4. Q & A
Session Objectives

1. Learn a very simple way to calculate contingency reserve using Expected Monetary Value
2. Learn ways to communicate the contingency reserve to stakeholders
3. Understand how to use the contingency reserve to respond to risks as they are realized

Your Expectations

What are your expectations from this presentation?

Why are you here today?
A Model to Develop and Use Risk Contingency Reserve

- Overview of Risk Management
- What is a Contingency Reserve?
- Using Expected Monetary Value (EMV) to calculate contingency reserve
- Communicating Contingency Reserve
- Using Contingency Reserve
**What is a Project Risk?**

**Project risk is an uncertain event or condition that, if it occurs, has a positive or a negative effect on a project's objectives.**

- From PMI's Practice Standard for Project Risk Management – Chapter 2, Page 9

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**Risks Vs Issues**

<table>
<thead>
<tr>
<th>Risks</th>
<th>Issues</th>
</tr>
</thead>
<tbody>
<tr>
<td>A future event</td>
<td>An event of past or present</td>
</tr>
<tr>
<td>It has not occurred yet but there are chances that it may occur</td>
<td>It has already occurred or occurring right now, there is no doubt</td>
</tr>
<tr>
<td>– there is uncertainty</td>
<td>whether it'll happen or not – no uncertainty</td>
</tr>
<tr>
<td>The probability of occurrence can range from 0 to 1 but it is</td>
<td>Probability is 1 since it already occurred</td>
</tr>
<tr>
<td>neither 0 or 1 (greater than 0 but less than 1)</td>
<td>– The language to describe an issue uses present to past tense</td>
</tr>
<tr>
<td>The language to describe a risk uses future tense</td>
<td>Need a resolution plan with action items to resolve an issue</td>
</tr>
<tr>
<td>A response plan is needed in case risk event occurred</td>
<td>Issue log is used for issues</td>
</tr>
<tr>
<td>Risk Register is used for risks</td>
<td></td>
</tr>
</tbody>
</table>
Risk Management Processes

Plan Risk Management
  → Identify Risks
  → Perform Qualitative Risk Analysis
  → Perform Quantitative Risk Analysis
  → Plan Risk Responses
  → Monitor and Control Risks

Adapted from PMI's Practice Standard for Project Risk Management

Risk Management Processes

Plan Risk Management
  → Identify Risks
  → Perform Qualitative Risk Analysis
  → Perform Quantitative Risk Analysis
  → Plan Risk Responses
  → Monitor and Control Risks

- Risk Mgmt Plan
- Tailored Process
- Risk Thresholds
- Roles/Responsibilities
- Risk Register Template

Adapted from PMI's Practice Standard for Project Risk Management
Risk Management Processes

1. Plan Risk Management
2. Identify Risks
3. Perform Qualitative Risk Analysis
4. Perform Quantitative Risk Analysis
5. Plan Risk Responses
6. Monitor and Control Risks

- Risk Register
- List of risks
- Risk Owners

Updated Risk Register
Probability & Impact
Root Causes
Prioritized List of Risks
Watch List

Adapted from PMI’s Practice Standard for Project Risk Management

www.RefineM.com
Risk Management Processes

Plan Risk Management

Identify Risks

Perform Qualitative Risk Analysis

Perform Quantitative Risk Analysis

Plan Risk Responses

Monitor and Control Risks

• Updated Risk Register
• Numerical models
• Sensitivity analysis (Monte Carlo Simulation)
• Re-prioritized list

Adapted from PMI’s ‘Practice Standard for Project Risk Management’

Risk Management Processes

Plan Risk Management

Identify Risks

Perform Qualitative Risk Analysis

Perform Quantitative Risk Analysis

Plan Risk Responses

Monitor and Control Risks

• Updated Risk Register
• Strategies/Responses
• Actions/Action Owners
• Contingency Reserves

Adapted from PMI’s ‘Practice Standard for Project Risk Management’
Risk Management Processes

Plan Risk Management
Identify Risks
Perform Qualitative Risk Analysis
Perform Quantitative Risk Analysis
Plan Risk Responses

Monitor & Control Risks

- Updated Risk Register
- Variance Analysis
- Risk Audit
- Trends in risk exposure

Adapted from PMI's Practice Standard for Project Risk Management

Contingency Reserve

* Time or cost set aside to manage identified risks

* Contingency Reserve covers “known unknowns”

* Management Reserve covers “unknown unknowns”

Contingency Reserve is a CRITICAL part of Risk Management

Cost Budget
Management Reserves
Cost Baseline
Contingency Reserves
Project Estimates
Control Acct. Estimates
Work Packages
Activity Estimates
How It Is Used

* Communicating risks
* Responding to risks
* Making project outcome more predictable

How to Develop

* What is needed?
  * Risk Register
  * Quantitative Analysis Technique
    * Such as Expected Monetary Value (EMV)
Expected Monetary Value

- Expected Monetary Value (EMV) of a Risk
- Probability x Impact
  - Probability of the risk occurring (percentage)
  - Impact, if the risk occurred (time or cost measure)

There is a 70 percent chance that computers needed for the project team will not be available on time, causing a delay of 5 days.

What is the EMV for this Risk?

EMV (probability x impact)
= 0.7 x 5 days
= 3.5 days
There is a 50 percent chance that a critical piece of equipment will fail during the project and will cost $10,000 to replace.

What is the EMV of this Risk?

EMV (probability x impact)

\[ = 0.5 \times 10000 \]

\[ = 5000 \]

**EMV Example #2**

**Communicating Schedule**

Schedule baseline = Estimated finish date + contingency reserve (time/schedule aspect)

- Example: Estimated Finish date is in 10 weeks, with contingency reserve of 4 weeks. What is the schedule baseline?
  - Schedule Baseline is 14 weeks.

“No Later Than” date
* Cost baseline = Estimated costs + contingency reserve

- Example: Project budget is $1,000,000, contingency reserve is $250,000. What is the cost baseline?
  - Cost baseline is $1,250,000.

"Not to Exceed" budget

Project Finish
Using the Reserve

* When risk occurs:
  - Actual impact is added to cost/schedule
  - Estimated budget/schedule is updated
  - Contingency reserve decreases
  - **Baseline is NOT updated**

If risk does not occur, contingency not spent

Project finishes before time, under budget

Cost Baseline

<table>
<thead>
<tr>
<th>Month</th>
<th>Project Estimates</th>
<th>Remaining Contingency Reserve</th>
</tr>
</thead>
<tbody>
<tr>
<td>Jan-14</td>
<td>$10,000</td>
<td>$2,000</td>
</tr>
<tr>
<td>Feb-14</td>
<td>$10,500</td>
<td></td>
</tr>
<tr>
<td>Mar-14</td>
<td>$11,000</td>
<td></td>
</tr>
</tbody>
</table>
**Risks With EMV**

<table>
<thead>
<tr>
<th>ID</th>
<th>Risk Description</th>
<th>Event Date</th>
<th>Probability</th>
<th>Impact (Days)</th>
<th>EMV</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Performance issues are not addressed before testing, causing delays.</td>
<td>Sep-14</td>
<td>H</td>
<td>M</td>
<td>15</td>
</tr>
<tr>
<td>2</td>
<td>Server performance issues may occur during testing, causing delays.</td>
<td>Aug-14</td>
<td>L</td>
<td>M</td>
<td>10</td>
</tr>
<tr>
<td>3</td>
<td>Unanticipated changes occur after code complete, causing errors.</td>
<td>Aug-14</td>
<td>L</td>
<td>L</td>
<td>5</td>
</tr>
<tr>
<td>4</td>
<td>Testing environment may interfere with other high-priority projects, causing conflicts.</td>
<td>Jul-14</td>
<td>L</td>
<td>M</td>
<td>10</td>
</tr>
<tr>
<td>5</td>
<td>Implementation priority may change, causing massive delays.</td>
<td>Jul-14</td>
<td>L</td>
<td>M</td>
<td>40</td>
</tr>
<tr>
<td>6</td>
<td>Impact analysis may cause additional change requests.</td>
<td>Jul-14</td>
<td>L</td>
<td>M</td>
<td>15</td>
</tr>
<tr>
<td>7</td>
<td>Code Complete may be delayed due to developer resources allocation to other projects.</td>
<td>Jun-14</td>
<td>L</td>
<td>M</td>
<td>20</td>
</tr>
<tr>
<td>8</td>
<td>Testing may be delayed due to differences in rating between test projects.</td>
<td>May-14</td>
<td>L</td>
<td>M</td>
<td>15</td>
</tr>
<tr>
<td>9</td>
<td>Production problems may interrupt developers working on this project.</td>
<td>Anytime</td>
<td>L</td>
<td>M</td>
<td>10</td>
</tr>
<tr>
<td>10</td>
<td>Other new projects may take away resources.</td>
<td>Anytime</td>
<td>L</td>
<td>M</td>
<td>45</td>
</tr>
</tbody>
</table>

| Total EMV | 79.75 |

**Magnitude Over Time**

![Magnitude Over Time Graph](https://www.refinem.com)
### Risk Duration

<table>
<thead>
<tr>
<th>ID</th>
<th>Task Name</th>
<th>Duration</th>
<th>% Complete</th>
<th>Start</th>
<th>Finish</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>SBR for 1st State (IOWA) - with Risks</td>
<td>39.25 days</td>
<td>0%</td>
<td>Mon 8/5/09</td>
<td>Wed 1/19/11</td>
</tr>
<tr>
<td>2</td>
<td>Risk Reserve for Unmitigated Risks</td>
<td>66 wks</td>
<td>41%</td>
<td>Mon 8/3/09</td>
<td>Thu 11/18/10</td>
</tr>
<tr>
<td>3</td>
<td>Project Tasks</td>
<td>0 days</td>
<td>100%</td>
<td>Fri 11/10/09</td>
<td>Fri 11/10/09</td>
</tr>
<tr>
<td>4</td>
<td>SBR in Production - 1st State (IOWA)</td>
<td>0 wks</td>
<td>30%</td>
<td>Wed 11/14/09</td>
<td>Mon 2/1/10</td>
</tr>
<tr>
<td>5</td>
<td>Identify the first state - IOWA</td>
<td>1.8 wks</td>
<td>60%</td>
<td>Mon 1/18/10</td>
<td>Fri 5/28/10</td>
</tr>
<tr>
<td>6</td>
<td>Mainframe Tasks Group1</td>
<td>19 wks</td>
<td>99%</td>
<td>Mon 1/18/10</td>
<td>Fri 5/28/10</td>
</tr>
<tr>
<td>7</td>
<td>Mainframe Tasks Group2</td>
<td>19.2 wks</td>
<td>75%</td>
<td>Mon 2/8/10</td>
<td>Tue 6/22/10</td>
</tr>
<tr>
<td>8</td>
<td>Mainframe Tasks Group3</td>
<td>12.6 wks</td>
<td>67%</td>
<td>Mon 3/24/10</td>
<td>Mon 6/21/10</td>
</tr>
<tr>
<td>9</td>
<td>Mainframe Tasks Group4</td>
<td>20.8 wks</td>
<td>59%</td>
<td>Fri 1/22/10</td>
<td>Thu 6/17/10</td>
</tr>
<tr>
<td>10</td>
<td>Mainframe Tasks Group5</td>
<td>4.6 wks</td>
<td>15%</td>
<td>Mon 5/10/10</td>
<td>Thu 6/10/10</td>
</tr>
<tr>
<td>11</td>
<td>PARA/PC Tasks</td>
<td>39.8 wks</td>
<td>65%</td>
<td>Thu 10/15/09</td>
<td>Thu 7/29/10</td>
</tr>
<tr>
<td>12</td>
<td>Rating Related Tasks</td>
<td>43 wks</td>
<td>61%</td>
<td>Mon 8/3/09</td>
<td>Thu 6/8/10</td>
</tr>
<tr>
<td>13</td>
<td>HSM for IOWA</td>
<td>0 wks</td>
<td>0%</td>
<td>Fri 8/8/10</td>
<td>Fri 8/8/10</td>
</tr>
<tr>
<td>14</td>
<td>Testing</td>
<td>19.2 wks</td>
<td>0%</td>
<td>Wed 6/23/10</td>
<td>Fri 11/15/10</td>
</tr>
<tr>
<td>15</td>
<td>Initial Implementation</td>
<td>15 wks</td>
<td>0%</td>
<td>Thu 8/5/10</td>
<td>Thu 11/18/10</td>
</tr>
</tbody>
</table>

### Charting Estimates

- Show periodic expenditure for each risk that occurs
  - Monthwise or otherwise
- For each risk:
  - Remaining contingency reserve goes down
  - Cost / Schedule Estimate goes up
  - Cost Baseline remains the same
Estimates Over Time

Limitations of the Model

* This Model is NOT as useful when:
  ✓ Only few risks have been identified
  ✓ All risks have high probability

Either of these could produce erroneous results
**Too Few Risks**

* If risks are too few, “insurance pool” not large enough
  - Need to find more risks
  - Consider a Risk Breakdown Structure (RBS)

**Too High Probability**

* Look into strategies other than risk contingency reserve
  - Avoid
  - Mitigate
  - Transfer
  - Accept
Summary

Contingency reserve is:
- Critical in risk management
- Included in baselines (schedule and cost)
- An effective communication tool for risks
- A way to make project outcomes more predictable

Start using Contingency Reserve today!
EMV is a simple way to get started

Questions?

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