Managing Risk in Agile Development: It Isn’t Magic

DCG Software Value
Risk

Risk is any uncertain event that can have an impact on the success of a project.
Risk and Uncertainty

Risk is the direct result of uncertainty. If there is no uncertainty, it is not a risk – it is a certainty.
A Second-Class Citizen?

• There are too many other things to do directly related to delivering functionality.

• Risk management processes are driven by a need for an external certification.

• Common risks are continually identified and nothing is done about those risks.
Classic Risk Management

• With risk management, we attempt to identify the things we don’t know (the uncertainties) and quantify them so that they can be managed.
  – Identify
  – Evaluate
  – Categorize
  – Prioritize
  – Plan Mitigation
  – Implement Mitigation
Basis for Conversation: Agile

• A basic tenet of Agile methods is that teams produce a continuous series of usable software builds in very short cycles called sprints.

• Each build is assessed, issues identified and the backlog of tasks is reviewed and prioritized, and the most important tasks are scheduled for the next sprint.
Controllable Risk Contributors

• **Complexity** in any problem is a reflection of the number of parts to the problem, how those parts interact and the level of intellectual difficulty.

• **Size** of project or release influences the overall variability.

• **Ad hoc or uncontrolled processes** can’t deliver a consistent output.

• **People** are chaotic by nature.
Another View of Risks

- Tom DeMarco and Tim Lister identify five risk areas found in most projects in their book, *Waltzing with Bears*:
  - Intrinsic Schedule Flaw
  - Specification Breakdown
  - Scope Creep
  - Personnel Loss
  - Productivity Variance
A Common Agile Risk Taxonomy

• **Business Risk** – Adapting to business change.

• **Technical Risk** – Fitting within technology environment.

• **DevOps/Operational Risk** – Fitting within the organization’s operational environment.

• **Process Risk** – Fitting of techniques for delivering value.

• **Organizational/People Risk** – Impact of an environment populated by people.
## Agile Puts Basic Risks at Risk

<table>
<thead>
<tr>
<th>Risk</th>
<th>Agile Approach</th>
</tr>
</thead>
<tbody>
<tr>
<td>Mitigating Schedule Flaw</td>
<td>Scrum provides feedback loops to mitigate invalid estimates. Teams update the release plan at the end of every sprint.</td>
</tr>
<tr>
<td>Mitigating Specification Breakdown</td>
<td>A scrum delivery team will work collaboratively with the product owner to ensure alignment between what is requested and how it can be delivered.</td>
</tr>
<tr>
<td>Mitigating Scope Creep</td>
<td>The product owner will evaluate the new backlog items and decide what action to take: Add, delete, trade-out in priority with other product backlog items.</td>
</tr>
<tr>
<td>Mitigating Personnel Loss</td>
<td>Self-organizing teams focus on problems impacting work resulting in higher morale.</td>
</tr>
<tr>
<td>Mitigating Productivity Variation</td>
<td>Agile teams address the performance at the end of every sprint as part of the retrospective.</td>
</tr>
</tbody>
</table>
Managing Risk in Agile is Different

A great deal of explicit risk management becomes unnecessary when a project uses an Agile approach.

Mike Cohn, Mountain Goat Software
# Managing Risk in Agile is Different

<table>
<thead>
<tr>
<th>Traditional</th>
<th>Scrum</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Risk Management</strong>: PM works with management and stakeholders to determine what the risk management approach will be for the project.</td>
<td><strong>Risk Management</strong>: Team works with the product owner, delivery team, and scrum master to determine what the risk management approach will be.</td>
</tr>
<tr>
<td><em>formal documentation</em></td>
<td><em>no or informal documentation</em></td>
</tr>
<tr>
<td><strong>Risk Identification</strong>: Identify all risks upfront at project initiation and planning.</td>
<td><strong>Risk Identification</strong>: Identify risk on multiple levels: Vision, roadmap, release planning, sprint planning &amp; daily standup.</td>
</tr>
<tr>
<td>Risk identification is “Big planning up front.” <em>(BPUF)</em></td>
<td>Risk is identified and mitigated daily and at planning exercises.</td>
</tr>
<tr>
<td><em>the project manager creates this deliverable</em></td>
<td><em>whole team is involved in scrum ceremonies and transparency</em></td>
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### Managing Risk in Agile is Different

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<tr>
<td><strong>Risk Analysis</strong></td>
<td>Review all of the risks identified during the identification meeting and perform quantitative and qualitative analysis.</td>
<td>Agile projects generally focus on qualitative risk analysis because of the sprint time-boxes and constant feedback loops provided in scrum or xP.</td>
</tr>
<tr>
<td></td>
<td>Prioritize risks by performing an exercise of possibility and probability, scoring every risk.</td>
<td>Prioritization exercise for most likely risks.</td>
</tr>
<tr>
<td><em>the project manager scores and determines which risks to mitigate</em></td>
<td></td>
<td>*scrum master facilitates seeing the risks and determining what to do next</td>
</tr>
<tr>
<td><strong>Risk Response Planning</strong></td>
<td>Develop options and actions for the risks creating the biggest threats.</td>
<td><strong>Risk Response Planning</strong> Happens in real-time as risk is identified.</td>
</tr>
<tr>
<td><em>the project manager</em></td>
<td></td>
<td>*whole team</td>
</tr>
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# Managing Risk in Agile is Different

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<td><strong>Risk Monitoring and Controlling</strong>: Status meetings are the forum to discuss new risks and updates to the risk identification list.</td>
<td><strong>Risk Monitoring and Controlling</strong>: Transparency of the delivery team’s work via task boards, burndowns, daily standups, and end-of-sprint reviews provide information and forums for continuously monitoring risk.</td>
</tr>
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</table>

  *the project manager facilitates the status meeting, which is usually weekly or monthly  

  *whole team is involved in risk monitoring through their contributions to the data and feedback loops in scrum*
Recognizing Risks

- Carve out time when you are developing the backlog and ask as diverse a group as possible to identify the potential problems.
- Form a small team (consider the Three Amigos) to interview stakeholders that were not part of the planning exercise.
- Gather risk data though surveys when the program stakeholders are geographically diverse.
- Interview customers or potential customers.
- Periodically ask about risks either as an agenda item or as a follow-on to standard meetings.
Agile Framework

- Identify knowable risks. Identify the knowable risks when generating the initial backlog.
- Build mitigation for common risks into the definition of done.
- Generate stories for less common risks and add them to the project’s backlog.
- Review risks when grooming stories
- Carve out time during planning to identify emerging risks.
Agile Risk Management: Approach 2

1. Light Approach Influenced by Michael Lant
   1. Identification: SWOT Analysis (Initially during project chartering, refresh at each planning exercise)
   2. Classify: At a story or defect level using a simple taxonomy
   3. Quantify: Performed by the respective SME, not PM
      • Impact: Measure of effect on a simple 1 – 5 (High) scale (I reflect value or days)
      • Probability: Likelihood on a simple 1 – 5 (High) scale
### Agile Risk Management: Approach 2

4. **Rate: Matrix: 5 x 5**

<table>
<thead>
<tr>
<th>Probability</th>
<th>Impact</th>
<th>1</th>
<th>2</th>
<th>3</th>
<th>4</th>
<th>5</th>
<th>10</th>
<th>15</th>
<th>20</th>
<th>25</th>
</tr>
</thead>
<tbody>
<tr>
<td>5</td>
<td></td>
<td>5</td>
<td>5</td>
<td>10</td>
<td>15</td>
<td>20</td>
<td>25</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>4</td>
<td></td>
<td>4</td>
<td>4</td>
<td>8</td>
<td>12</td>
<td>16</td>
<td>20</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>3</td>
<td></td>
<td>3</td>
<td>3</td>
<td>6</td>
<td>9</td>
<td>12</td>
<td>15</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>2</td>
<td></td>
<td>2</td>
<td>2</td>
<td>4</td>
<td>6</td>
<td>8</td>
<td>10</td>
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<tr>
<td>1</td>
<td></td>
<td>1</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**Critical (25)**
- Requires urgent action
- Requires notification of responsible executive and senior executives
- Tracked as soon as identified (add story to backlog)

**Serious (15 - 20)**
- Requires notification of all senior stakeholders
- Monitored and reviewed during planning sessions
- (add story to backlog)

**Moderate (6 - 12)**
- Requires notification of senior manager
- Monitored and reviewed during release planning sessions
- (add story to backlog)

**Moderate (1 - 5)**
- Reviewed Quarterly
- Add story to backlog (low priority)

5. **ACT!**

6. **Repeat**
Agile Risk Management: Approach 3

- Risk Census (Adapted from Mike Cohn)
  - Develop a census that describes each risk (add each risk to the product backlog)
  - Estimate of how likely the risk is to occur
  - Estimate the impact if the risk did occur
  - Calculate the expected exposure to the risk, which is the probability multiplied by the impact
- When
  - Create the risk census during project chartering (Iteration Zero)
  - Update it quickly during subsequent planning meetings
### Risk Census Example

<table>
<thead>
<tr>
<th>Risk</th>
<th>Probability of Risk</th>
<th>Size of Loss (Days)</th>
<th>Risk Exposure</th>
</tr>
</thead>
<tbody>
<tr>
<td>Communications through human capital continue to be slow</td>
<td>20%</td>
<td>15</td>
<td>3</td>
</tr>
<tr>
<td>Historical data access and quality of data</td>
<td>30%</td>
<td>20</td>
<td>6</td>
</tr>
<tr>
<td>Data: Tool availability and work arounds</td>
<td>70%</td>
<td>2</td>
<td>1.4</td>
</tr>
<tr>
<td>Funding issues (once we set goals, we won’t change them until we have a chance to report on accurate data)</td>
<td>10%</td>
<td>15</td>
<td>1.5</td>
</tr>
<tr>
<td>Forced mandates cause ineffective communications and inability to use pilot data for lessons learned</td>
<td>20%</td>
<td>30</td>
<td>6</td>
</tr>
<tr>
<td>Misalignment of function point team (time difference)</td>
<td>40%</td>
<td>5</td>
<td>2</td>
</tr>
<tr>
<td><strong>Total Exposure</strong></td>
<td></td>
<td></td>
<td><strong>19.9</strong></td>
</tr>
</tbody>
</table>
Risk Burn-Down Chart

- The risk burn-down chart is then created by plotting the sum of the risk exposure values from the census.
## Description
An evaluation of the cost impact of risks that have not been un-remediated.

## Purpose
Facilitate the management of the impact of probability weighted net present value of un-remediated risk through transparency and monitoring.

## Utilization
The impact value of risk is monitored at specific points of the program lifecycle. Where the cost impact of risk is above program risk tolerance specific remediation, plans will be established to reduce the estimated risk impact.

## Data Required
\[ \sum (\text{Net Present Value of Un-remediated Risk}) \]

## Risk Tolerance

<table>
<thead>
<tr>
<th>Iterations</th>
<th>Value At Risk</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>200000</td>
</tr>
<tr>
<td>2</td>
<td>400000</td>
</tr>
<tr>
<td>3</td>
<td>600000</td>
</tr>
<tr>
<td>4</td>
<td>800000</td>
</tr>
<tr>
<td>5</td>
<td>1000000</td>
</tr>
</tbody>
</table>

## Calculation
Value at Risk = Probability Weighted Net Present Value of Estimated Cost Impact of Un-remediated Risk

## Timing
Work Unit Completion – Specific Points

## Baseline
Not Applicable

## Industry Data
None
ROAMing Risks

- **Resolved:** The risk has been answered and avoided or eliminated.
- **Owned:** Someone has accepted the responsibility for doing something about the risk.
- **Accepted:** The risk has been understood and the team has agreed that nothing will be done about it.
- **Mitigated:** Something has been done so that the probability or potential impact is reduced.
Risks Are Managed Collaboratively
Risk Questions I Am Often Asked

• Is there still a perception from business that Agile is riskier than the familiar ways of doing things?
• Agile can be a random walk. How can projects work without an effective classic requirements management?
• Contracting for Agile?
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