Agile Project Estimation

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MS thesis Computer Science
Research Problem

• INVEST model
• Prioritize user stories
• Evaluate risk and value
• User story estimation
Agile Development

WE'RE GOING TO TRY SOMETHING CALLED AGILE PROGRAMMING.

THAT MEANS NO MORE PLANNING AND NO MORE DOCUMENTATION. JUST START WRITING CODE AND COMPLAINING.

I'M GLAD IT HAS A NAME. THAT WAS YOUR TRAINING.
# Scrum

<table>
<thead>
<tr>
<th><strong>Scrum asks...</strong></th>
<th><strong>Fundamental Project Management issue</strong></th>
</tr>
</thead>
<tbody>
<tr>
<td>What have you done during the last 24 hours?</td>
<td>This is progress, it’s work completed to date</td>
</tr>
<tr>
<td>What do you plan to do in the next 24 hours?</td>
<td>This is forward planning, it is work you are about to do</td>
</tr>
<tr>
<td>What’s stopping you getting on with the work in the next 24 hours?</td>
<td>These are your impediments or obstructions, it might be things you need in order to work... more forward planning. It’s also identification of immediate risks.</td>
</tr>
</tbody>
</table>
Why Scrum?

• It facilitates changing customer requirements.
• The system of sprints encourages regular feedback, as each sprint is followed by a review.
• Clear and open lines of communication between the developers, the client and other stakeholders.
User Story

User stories describe the benefits of products delivered by the project in a simple format.
User Story

As a visitor of the website
I want submit my email address
In order to receive the newsletter.
INVEST (Bill Wake, 2003)

- I – Independent
- N – Negotiable
- V – Valuable
- E – Estimable
- S – Small
- T – Testable
Bad User Story

- User story is only a wrapper
- User story is too small
- User story is too big
- User story does not describe a feature
- User story focuses on wrong user
- Platinum plate
- Customer can not prioritize
- Thinking too far ahead
# Prioritizing User Story

<table>
<thead>
<tr>
<th>Metrics</th>
<th>Answer</th>
</tr>
</thead>
<tbody>
<tr>
<td>Is it really important that these stakeholders (users) are able to do this?</td>
<td>YES / NO</td>
</tr>
<tr>
<td>Is it actually possible for us to support this activity currently?</td>
<td>YES / NO</td>
</tr>
<tr>
<td>Is it important enough to us that we should consider infrastructure / policy changes?</td>
<td>YES / NO</td>
</tr>
<tr>
<td>Can we meet these goals only in this way?</td>
<td>YES / NO</td>
</tr>
<tr>
<td>Do we need to meet these goals now?</td>
<td>YES / NO</td>
</tr>
<tr>
<td>Is this a long term project goal?</td>
<td>YES / NO</td>
</tr>
</tbody>
</table>
Risk and Value

- **Risk** – consider the team’s inexperience with developing this story.

- **Value** – implemented story’s importance to the customer.
Prioritizing User Story ...

- **High priority**
  - High value
  - High risk
  - Check again if it's really needed

- **Low priority**
  - Low value
  - High risk

- **Medium priority**
  - High value
  - Low risk

- **High priority**
  - Low value
  - Low risk
Velocity

Velocity is an Agile (Scrum) term, and is a metric to estimate the productivity of the project team based on their previous work such as previous iteration. Team velocity could be calculated as:

\[ V_{t_1} = \frac{CSP}{I_{\text{length}}} \]

*Where:*

- \( V_{t_1} \) – Velocity of the Team (\( t_1 \) stands for team 1)
- \( CSP \) – Completed Story Points
- \( I_{\text{length}} \) – Iteration length in days usually is 2 – 4 weeks
Velocity fluctuations

• Team changes
• New tools
• Vendor defects
• Responsibilities outside of the project
• Personal issues
• Unclear requirements
• Relocation
Estimating User Story

Story Points are not a measurement of duration, but rather a measurement of size / complexity.

- Pure measure of size and complexity
- Relative; longer shelf life
- Independent of the estimator
- Typically faster
- Easier to work with
- Studies show we are better at relative estimating
Planning Poker

User story: As a hotel employee I want to create report of all reservation

Product Owner

Scrum Master / Moderator

Developer A

Tester

QA

Developer B
Five Steps

1. Moderator Reads Story Description
2. Ask Moderator Questions
3. Estimate Cards (Fingers)
4. Discuss Low / High Estimates
5. Consensus or Pessimist Wins
   - Take the average
   - Accept the most pessimistic estimate
   - Defer discussion to a separate meeting
Why Planning Poker

- Planning poker brings together multiple expert opinions to do the estimating
- Averaging individual estimates leads to better results
- Finally, planning poker works because it’s fun.
Agile Estimation

Desired Features → Estimate Size → Derive Duration → Schedule

Size (i.e. 300 Story Points) → Calculation (i.e. Velocity = 50) → Duration (i.e. 300 / 50 = 6 iterations)
Workflow

User Stories → Planning Poker → Story Points

Re-estimation → Velocity → Product Backlog
Successful Estimation

• Involve the whole team
• Plan at different levels
• Re–estimate after each iteration
• Track and communicate progress
• Prioritize features
• Leave some slack
Future work

• Case Study
• Craft the model in a tool
Questions
THANK YOU