



Agile Project Estimation

Audrius Grinys

Supervisors: Helgi Þorbergsson, Hjálmtýr Hafsteinsson
Master's thesis in Computer Science submitted May 2012

Introduction

Agile software development offers many benefits compared with more traditional development approaches. Estimating in traditional project management is usually task-based. In agile environments, every iteration is an opportunity to reconsider the plan and adjust to reality for the next iteration. It's the realization of the famous aphorism that "a good plan now is better than a perfect plan tomorrow." The central reason why it is important that agile planning be done at the feature level rather than the task level is that stakeholders and sponsors don't care about tasks and often don't understand what they mean.

User Stories

User stories describe the benefits of products delivered by the project in a simple format. User Stories are great for Development Teams and Product Managers as they are easy to understand, discuss and prioritize – they are more commonly used at sprint – level. User story should have the following INVEST features.

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

Prioritizing User Stories

Prioritizing user stories is one of most important tasks for the team leader (i.e. scrum master). Because we have to have working code that represents a business value to the customer after each iteration, we have very carefully prioritized user stories. Some questions that we have to be able to answer before prioritizing (Table 1) are:

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

Table 1. Metrics for the prioritizing user stories.

Basically from the experience if we can answer with YES more than three answers then we should implement user story otherwise re – think / re – design, suspend to the next iteration or even remove from the product backlog considered as wrong user story.

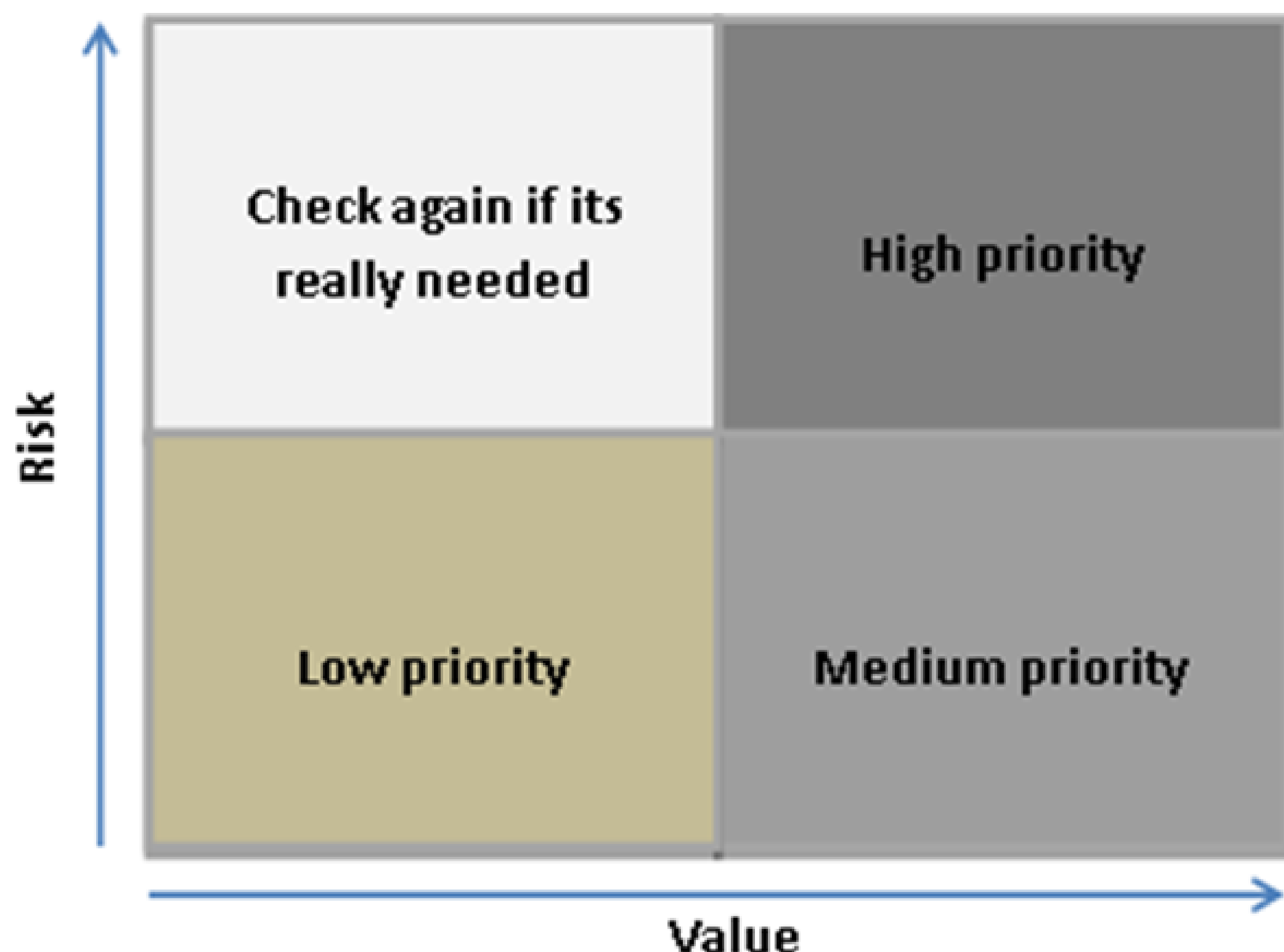


Figure 1. Quadrants for prioritizing user stories.

Calculating User Story's Changeability Rate

Defining changeability rate of a user story is very important in the estimating process. Looking at the story's changeability rate, it's only needed to concentrate on the coming changes of the requirements from the customer. It does not include any changes of the features in testing phase or any fixes.

$$ChR = \left(\frac{R}{R_{Max}} + \frac{V}{V_{Max}} + \left(\frac{INVEST_{Max} - INVEST}{INVEST_{Max}} \right) \right) \times 0.25$$

$$ChR' = \left(\left(\frac{R}{R_{Max}} + \frac{V}{V_{Max}} \right) \div 2 \right) \times 0.25 + \left(\frac{INVEST_{Max} - INVEST}{INVEST_{Max}} \right)$$

Agile Estimation

Most agile project estimation models use a story point as a primary input parameter. The velocity is measured per iteration to track the project's progress.

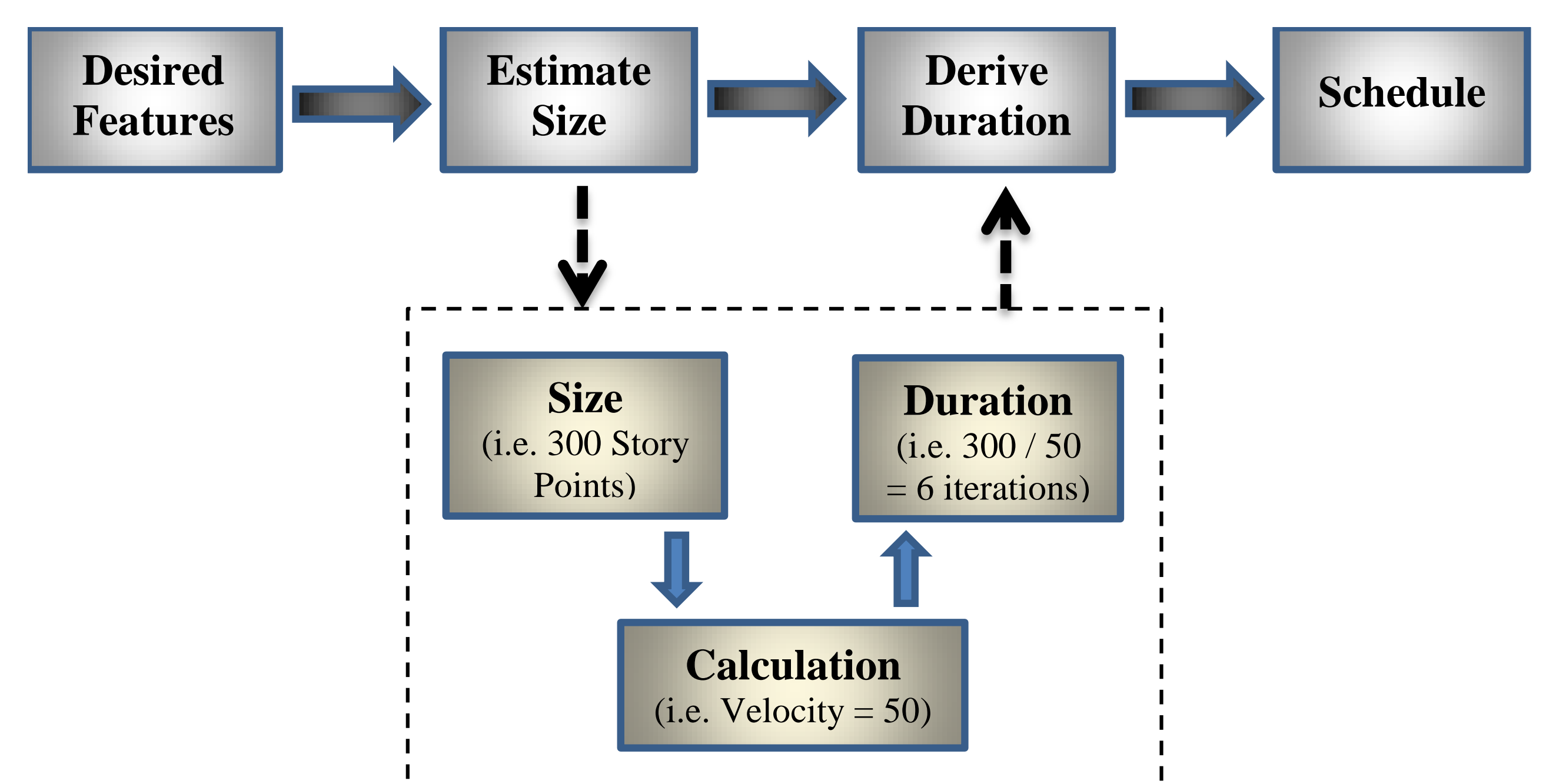


Figure 2. Agile estimation overview.

Desired Features – collect user requirements and convert them into user stories;
Estimate Size – estimate size of the user stories, i.e. planning poker;
Derive Duration – calculate duration of the implementation of the user stories based on the team velocity into iterations;
Schedule – schedule entire project implementation.

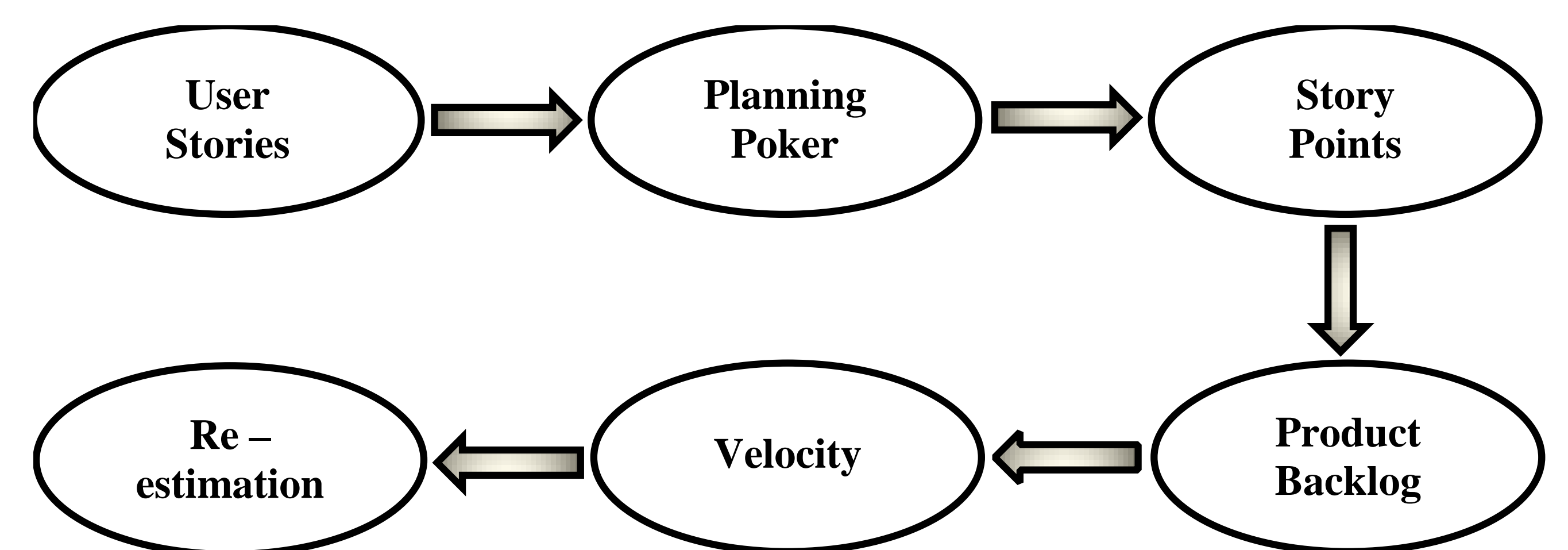


Figure 3. Agile estimating workflow.

In a complex environment with frequent changes that cannot be anticipated, estimation must be done in an incremental and adaptive way. It can no longer be done in a sophisticated, big-upfront approach by highly skilled estimators at the beginning of the project. Agile approaches to estimation look extremely simple, but they work quite well.

Conclusions

Agile development is more a way of thinking more than a pre-defined process. Flexibility, low cost, fast response of agile methods make most development teams realize that they should take agile thinking to respond to the fierce market competition actively in their later development project. Now a days in the software development field, agile methods are probably one of the most popular methodology.

The aim of this thesis is to investigate how project estimation can be predicted based on given estimation from the team of developers by user stories and to make it closer to actual time as possible using risk and value quadrants for the prioritizing the features, applying changeability rate for the user story and using story points for planning poker estimation technique.