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How to leverage different Agile Estimation Techniques to Avoid Uncertainties in a Project
Advisory
by Gopinath Venu

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Gopinath Venu

Introduction

In any project, uncertainties are more during the beginning of the project . As the project moves along, there is more information that is available and we adjust the estimation as and when new information is available. This process is called **Progressive elaboration**. Even Though we make adjustments on a regular basis , why do some projects cause inevitable delays, compromise on product qualities and incur costs.

There are three most important categories in understanding what we know and what we don't know in a project at the initial stages.

- **What We Know**. - We already have all the information that is necessary to estimate, and we are more comfortable and confident in the estimations.
- **Known-Unknowns**. - We know about a large beast of work that is incoming, but we don't know how that is going to disseminate. If that happens, we don't know how to estimate but we know something is going to come into the project in the foreseeable future.
- **Unknown-Unknown**s. - We cannot predict or prepare for the things that derail the project because we don't know what is coming.

Some of the Projects in real world that led to cost overrun are:

- **The Boeing 787 Dreamliner**

The Boeing 787 Dreamliner is a commercial airliner that was first introduced in 2011. The development of the Dreamliner was plagued by delays and cost overruns. One of the main reasons for the delays was that Boeing underestimated the complexity of the project. The Dreamliner is the first commercial airliner to be made with a large amount of

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composite materials. These materials are more difficult to work with than traditional aluminum materials, which led to delays in the manufacturing process.

The Dreamliner project also incurred cost overruns due to a number of factors, such as the discovery of defects in the aircraft's electrical system. These defects required Boeing to redesign and recertify the aircraft, which added to the project's cost.
As a result of these factors, the Boeing 787 Dreamliner project was delayed by several years and incurred cost overruns of over $2 billion.

■   **The London 2012 Olympic Games**

The London 2012 Olympic Games were originally scheduled to cost $2.4 billion. However, the actual cost of the games was over $12 billion. This was due in part to inefficient project estimation. The original estimate for the games was based on outdated data and did not take into account the increasing cost of construction. As a result, the actual cost of the games far exceeded the original estimate.

Now, before getting into the different nuances in Agile Estimation techniques, let's revisit some of the basics of Estimations.

Let me give you a practical example here. Let's consider that you want to travel from Point A to Point B. <u>The only information that you know at that particular moment is the distance and the legally allowed speed limit from Point A to B.</u>

- ■   Distance = 120 Miles
- ■   Speed= 65 mph

Can you estimate the time it takes to travel from Point A to Point B.?

We know the formula **Time = Distance /Speed**. Therefore, substituting the numbers in the formula results in Time T = 120/65 which is 1.85 hours ~ = 2 Hours.

Do you conclude that you can reach it in approximately 2 hours? The Answer is probably …No.

So, what are some of the factors that we need to consider along with the above estimation.

- ●   Traffic

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- Time of the day of Travel
- Medium of Transportation
- Any Local Events resulting in detour
- Drivers Calibre
- CarPool/Using Tolls for faster & Efficient route

All these above factors/constraints are mostly inter-related to each other. The time of the day you chose dictates if you will encounter traffic on the way. Also, what kind of Vehicle that you are going to drive. If you have an Electric Car, you will probably have to make a pit stop which has a charging station. If you are an Experienced Driver who doesn't require a break in between or if you have a co-passenger, you might go in a carpool lane to beat the traffic, or you could have a toll pass which will enable you to take a more efficient route then the estimation changes. If there are any localized events that take place, there might be a temporary detour which will add up more distance before you reach Point B. There could be unexpected accidents on the way that may result in delays. In Summary, we have to consider all these factors to efficiently estimate and have a near-accurate estimation.

Projects are no different as we are constantly encountering roadblocks on our project journey. It's important to brainstorm all the different issues/obstacles and bring in those factors to estimate better.

Agile Estimation Techniques

Agile estimation is the process of estimating the effort required to complete a task or deliverable in an agile project. This is done to help teams plan their work and make informed decisions about how to allocate resources.

Different Techniques

There are a number of different agile estimation techniques that can be used. Some of the most common techniques include:

- **Three-point estimation:** This technique involves estimating the task or deliverable three times, using different estimates (usually optimistic, pessimistic, and most likely). The average of these three estimates is then used as the final estimate.

Example: - We can use a formula → **(O+P+M)/3.**

Here **O** stands for **Optimistic** Estimate;

  P stands for **Pessimistic** Estimate and

  M stands for **Most Likely** Estimate.

  Hence, we add up all the 3 range estimates and have an average out of these three estimates.

- **Weighted Average**: For the same above formula we pad up the 'Most Likely' Estimate with 4 times. Therefore, the **formula is (O+P+4M)/3.**

- **Planning poker:** This technique involves using a deck of cards with numbered values (usually Fibonacci numbers) to estimate the task or deliverable. Team members vote anonymously for their estimate, and the group then discusses the estimates until there is a consensus.

- **Affinity grouping**: This technique involves grouping similar tasks or deliverables together based on their size or complexity. This can help teams to identify tasks that are similar in terms of effort, which can make it easier to estimate them.

- **T-shirt sizes:** This technique involves estimating the task or deliverable using T-shirt sizes (e.g., small, medium, large, extra-large). This can be a quick and easy way to estimate tasks, but it is important to note that it is not as precise as other techniques.

- **Story points:** This technique is commonly used in Scrum teams. Story points are a relative unit of measurement that is used to estimate the size of a user story. They are not based on any specific time or effort, but rather on the team's collective experience and judgment.

Choosing the Right Technique

The best agile estimation technique for a particular project will depend on a number of factors, such as the size and complexity of the project, the experience of the team, and the availability of resources. In general, it is important to choose a technique that is

appropriate for the specific project and that will help the team to make informed decisions about how to allocate resources.

Tips for Agile Estimation

Here are a few tips for agile estimation:

- **Involve the entire team:** It is important to involve the entire team in the estimation process. This will help to ensure that everyone has a shared understanding of the work involved and that the estimates are accurate.
- **Use historical data:** If possible, use historical data from previous projects to help with estimating. This can provide a good starting point for estimating new tasks or deliverables.
- **Be realistic:** It is important to be realistic when estimating tasks or deliverables. It is better to underestimate than to overestimate, as this can lead to scope creep and missed deadlines.
- **Be flexible**: Things change, so it is important to be flexible with your estimates. Be prepared to adjust your estimates as needed throughout the project.

Applying Agile Estimation Techniques to Scrum Teams

Scrum teams typically use story points to estimate the size of user stories. Story points are a relative unit of measurement, so they are not directly comparable to hours or days. However, they can be used to compare the size of different user stories and to estimate how long it will take to complete a sprint.

When estimating story points, it is important to involve the entire scrum team. This includes the product owner, the development team, and the scrum master. The product owner can provide information about the business value of the user story, the development team can provide information about the technical complexity of the user story, and the scrum master can help to facilitate the estimation process.

Once the team has estimated the size of all of the user stories in the sprint backlog, they can use this information to estimate how long the sprint will take. The team can then adjust their estimates as needed throughout the sprint.

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Applying Re-estimation Techniques for Spilled over tasks/User Stories:

When a User Story or a task spills over to the next sprint with the leftover work, oftentimes, the team ends up using the same estimation techniques to re-estimate, which is ok but what if we use a different estimation technique like "Fist of Five" which brings in team collaboration in re-estimating effort rather the same Planning Poker technique. Let me explain with an example:

Let's say there is a User Story which has 8 points and the story spills over to the next sprint. If that person re-estimates this User Story with the left over work then the re-estimate is based on what this particular person believes, but when the entire team is involved in re-estimating based on the left over work with a different estimation technique like "Fist of Five" the re-estimation is based on the entire team's perspective which will be the near perfect re-estimate.

Conclusion

Agile estimation is an important part of agile project management. By using the right techniques and following some simple tips, we can improve the accuracy of project estimates and make better decisions about how to allocate resources. This can help to ensure that projects are successful.

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Gopinath Venu has about 19 Years of experience in the IT Industry. He is certified in PMP, PMI-ACP from Project Management Institute (PMI), SAFe Advanced Scrum Master Certification from Scaled Agile Institute. He also holds a certification in AWS as a Certified Practitioner and Azure Certified from Microsoft. He has done multiple roles such as Project Manager, QA Manager, Scrum Master in his career. He is an active member of International Toastmasters. He has presented papers in PM conferences organized by local chapters of PMI. He presented a paper on Agile in the 15th Annual PMI Symposium organized by PMI Dallas and The University of Texas at Dallas. He also contributes to articles and discussions on www.projectmanagement.com.