Release planning using a great extension of Little's Law (found during reading the Scrumban Revolution)

ontheagilepath.net/2015/08/release-planning-using-a-great-extension-of-littles-law-found-during-reading-the-scrumban-revolution.html

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I'm currently reading the advanced ScrumBan book Scrumban [R]Evolution – Getting the most out of Agile, Scrum and Lean, Kanban by Ajay Reddy and found a nice extension of Little's Law that I would like to share with this post.

A short recap on Little's Law

Formula 1 average output (per time period) = average inventory of work (per time period) average lead time of work (per time period)
The average inventory of work is the average number of user stories between the starting and end points for a given period of time (WIP).

The average lead time is the average amount of time it takes for a work item to move from the first stage of a production process to the end of that process.

And the extension for release planning with Little's Law

Based on Project Planning Using Little's Law by dimitar.bakardzhiev the formula can be extend to:
Formula 2

Average WIP (The amount of developers,resources,… needed) = Average Lead Time
number of user stories Total project time

Formula 3

(Project/Release) lead time = number of user stories Average Throughput
test

Let's consider the following example… Given:

- each team member averaging 2 items of work in progress at any point in time
- a teams average completion rate of 28 user stories per 2 weeks iteration (14 stories per week)
- an average lead time of 0.9 weeks per user story
- the release backlog with 675 user stories

and we search for the optimal staffing to complete the project within 26 weeks – by applying Formula 2:

Average WIP = 0.9 675 26 = 23.36

This means you'll need 24/2 (average WIP of every team member) = 12 team members to accomplish the project within 26 weeks.

And what happens if you have to finish it in 18 weeks?

Average WIP = 0.9 675 18 = 33.75

This means you'll need 34/2 = 17 team members to accomplish the project within 18 weeks.

Now let's fix the number of people to 12 (2 teams with 6 team members each) and we need to forecast the project duration.

Duration = number of stories average lead time average WIP

Duration = 675 0.9 24(12 people x 2 items each) = 25.3weeks

What a nice extension for release planning.

In addition we need to consider that work delivery rates in projects are not uniform but tend to follow a fairly predictable S-Curve (with delays in the beginning and at the end of a project).

Little's Law can therefore be applied with high confidence to only the middle portion of most projects (approximately 60% of total project duration).

For the remaining 40% of the project we need to work with a project buffer that can be calculated using the formula I'll describe in my next post (just subscribe to receive your weekly updates right in your inbox ;-).

Further readings

Use the release burn down chart to forecast your release date
Scrumban [R]Evolution – Getting the most out of Agile, Scrum and Lean, Kanban
Actionable Agile Metrics for Predictability
Project Planning Using Little's Law by dimitar.bakardzhiev

Add on 2015-10-25: