

Introduction

Delivery of Software projects, to plan and to budget, is always a challenge! Fortunately, even in an Agile environment, keeping the business and stakeholders up to date with progress on a weekly basis, while delivering the project in an efficient and flexible manner AND following the core Agile principles is entirely achievable.

One of the key responsibilities of the Project Manager is to have; an accurate view on the status of the project, a clear view of the tasks (ahead and behind schedule), and to produce accurate weekly reports so that the business knows the true status of the project. This applies whether the project is Agile or a traditional model, the measure of a project manager is the ability to keep the business informed on the status of the project and to deliver the project within the planned boundaries.

The approach described in this white paper details an approach that has been successfully implemented in Agile (SCRUM, DSDM, ICONIX) environments over the last 20 years.

Benefits

So what are the benefits of planning and tracking:

The team gets a better understanding of the stories / requirements to be delivered, so rework time late on in the project, can be reduced or avoided.

It builds confidence if you can report on a weekly basis that the project has delivered 120 man days of progress against the planned 115 man days of progress: The management team have confidence that you are in control of the project.

Tracking will show up slips early in the project. Without tracking, if the project is 2 months long and, on a weekly basis, the delivery is slipping by 2 days elapsed, then a 16 day slip on the estimated delivery will have accumulated by the time the project finishes. With accurate tracking in place, this 2 day slip is identified in the first week and a mitigation plan can be determined and the project brought back on schedule.

This approach helps as a motivator, as the team have a clear vision of what they need to do and management are shown graphically exactly what progress is being made; past, present and predicted.

Costs

Typically a 3 months project will take key team members about a week to estimate and the tracking activity during the project is about 1.5 hours a week for the team leads/ scrum masters. A project manager has a bit more involvement and their up front planning would take a couple of days , then tracking and reporting about a 1/2 day a week.

So the cost overhead is minimal; The benefits far out weigh the cost.

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This document references the Task Estimating Spreadsheet which can be found at <http://www.processmashup.com>

Benefits of Good Planning / Tracking

FIND SLIPS FAST

GAIN AND RETAIN THE CONFIDENCE OF THE BUSINESS

PREDICT PROJECT DELIVERY

KNOW HOW MUCH PROJECTS WILL COST

WORKS FOR ALL AGILE PROCESS MODELS

PROVEN IN REAL LIFE

WORKS FOR OUTSOURCED AND INSOURCED PROJECTS

CONFIRMS IF PROJECTS ARE DELIVERING TO PLAN

Fundamentals of Agile Planning

Planning projects hinges on building a good project plan describing what activities need to be completed to deliver the project, the effectiveness of people assigned, and how the work is split up for the delivery.

Sprint / Iteration

A Cycle of development and release. A period of software development and testing activity that leads to a release of the software developed.

Activities

Activities are discreet tasks that need to be completed for the project to progress.

Activities that deliver functionality need to be about 5 days long at most, so that the progress can be tracked on a weekly basis. Its difficult to estimate beyond a week, bigger tasks are harder to visualise and estimating becomes less accurate as the task gets bigger.

Effort Estimates

Estimates for planning should be provided by the team delivering the work and should be based on the time to complete the activities in a perfect working day, with no adjustments for availability or experience (this aspect is covered by utilisation levels, described in [Availability and Effectiveness](#) below)

People Assigned

In order to deliver a project then people need to be assigned to activities to deliver them. However, the people assigned could be individuals or could be teams, it really doesn't matter, as long as the tasks are estimated and allocated to the plans appropriately. Using teams is a good approach as the team then has the flexibility to move tasks around as circumstances change and to fix slips etc.

Utilization (or Availability and Effectiveness)

Utilization is a percentage measure of how much work can be completed in a day, by the person / team assigned to the task (assignee).

The standard utilization level is 80%, for an assignee that is available full time 5 days a week and who is competent in the tasks being delivered. This means that in a working week the assignee is only expected to produce 4 days worth of work, this allows for tea / coffee breaks, meetings, chats with team members etc.

So if the assignee, at 80% utilization, is assigned a task that requires 5 days, so the tasks will take 6.25 days duration to deliver.

If the assignee is only available 4 days a week then the utilisation level will be reduced to 60% and the duration to complete a 5 day effort task will be 8.3 days.

The other purpose for utilization is to adjust the assignee's effectiveness. If the assignee is learning about a new technology or is new to a project then they won't be as effective as someone familiar with the technologies. So the assignee's utilization level can be adjusted to compensate for this difference. If the assignee is 50% as effective as a normal team member then their utilization will be set at 40%.

The reason for the utilization level is so the effort estimates can be consistent, the differences in performance and availability are adjusted by changes the assignee's utilization level.

Estimating Activities

The first stage of project planning is estimating and preparing to build the plan. This stage is the process of working out what needs to be delivered and how long it will take to deliver it. The primary goal of estimating is to understand the details of implementation, the actual estimation activity is small once the details of implementation have been identified.

It is never feasible to estimate the delivery of a large project in one go, the delivery is most effective being broken into phases, iterations or sprints depending on the profile of the project model being used for the work.

The first stage is the gathering and elaboration of the requirements/stories for the first sprint / iteration,. This should be time boxed. So, once the stories are elaborated and there is a good description of the functionality to be delivered, the estimating can commence.

If there are a lot of requirements/stories for the first iteration/sprint then it might be worth estimating and planning the requirements elaboration and estimating. If the requirements/stories can be elaborated in less than two weeks then there is no need for a plan for them, however if the requirements gathering and estimating is more than a couple of weeks then real benefits will be achieved by putting a plan in place, covering what needs to be completed to complete the requirements.

Requirement/Story Elaboration

Elaboration is a maturing of the stories / requirements to be delivered in the upcoming iteration / sprint, to the point where the delivery team have a good understanding of what is to be delivered and the ambiguity in requirements is removed.

Goals of Elaboration :

1. Have a clear vision of the customers requirements.
2. User experience is designed and agreed.
3. Understand how the requirements will be implemented.
4. Have the ability to pass requirements to any team member (with the appropriate skills) to deliver.
5. Ensure the delivery team have reviewed and confirmed that requirements/stories are deliverable.
6. Agree what will be delivered with the customer (Product Owner/ Customer Representative).

The next stage is to create a list of tasks that will allow the team to achieve these stories/requirements. Creating the list of tasks needs to be done by the delivery team, with the PM ; You are asking people to commit to tasks, so they need to define them and estimate them.

Workshops are quite a good way of progressing this, send the stories for the next iteration/sprint to be estimated to the team that will be performing the delivery and then arrange a session and sit down with them and brainstorm on the tasks needed to deliver the stories /requirements.

The task list is important regardless of whether a plan is needed or not, the task list is a confirmation of the delivery tasks that are needed. Without a reviewed list of activities, quite often items are missed , such as developer testing, bug fixing, bug fixing from previous sprint, support QA team during test cycle, pre deployment testing and bug fixing, deployments etc. On reviewing a task list for stories the PM will identify some of the missing tasks, the Scrum Master will find others and the person responsible for the development will find others.

Once we have the task list, the next stage is estimating and then the planning.

During the estimating, the planning should not impede the delivery of the requirements / stories. There is also a benefit for starting development during the planning as an opportunity to validate the estimates during the planning phase.

Estimating Activities cont.....

Here is a sample task list from a Scrum project with a good level of story break down.

Story 1412 : Add customer account

- CRM— develop backend
- CRM— define API 's
- Java - interface to CRM - dependent on CRM API definition
- Java— define API for UI.
- Java— develop interface to CRM / FLEX
- Flex - Develop UI - dependent on java API definition
- Flex—Review with product owner
- QA - Develop story tests
- QA - Test story

Story 1414 : Update customer account

- CRM— develop backend
- CRM— define API 's
- Java - interface to CRM - dependent on CRM API definition
- Java— define API for UI.
- Java— develop interface to CRM / FLEX
- Flex - Develop UI - dependent on java API definition
- Flex—Review with product owner
- QA - Develop story tests
- QA - Test story

TIP : bring multiple stories together for delivery and therefore speed up the project. In this example, instead of defining the API's on a per story level, create a super story to define and develop the API's for all the stories in the iteration / sprint, this approach will help to identify issues early and means that the API's can be delivered ahead of being needed by the API consumer stories.

Now that we have a task list we need to start putting estimated work days against each task. So, now the team members to set an estimate against each task.

The following are definitions of terms used in planning and estimating:

What is an Ideal Day ?

An Ideal day is a working day where there are no disturbances breaks or a day where you just get on doing the jobs and nothing else.

All task estimating should be done in ideal days, because in creating the plan the developer's utilization level is used to adjust the ideal day to a realistic day in respect of the elapsed time to deliver the task.

What is a Realistic Day ?

A realistic day is the amount of work that the person assigned to a task can complete against the ideal day estimate. The realistic day is a product of utilization level of the person/team assigned to the task and the ideal day estimate.

So if the utilization level of the assignee to the task is 50% then the realistic day estimate is 2* the ideal day estimate.

What is the confidence level ?

Estimates always have a level of risk against them, the person who estimates needs to communicate this risk level out, so the confidence level is used to adjust the ideal day estimate, the actual adjustment can be refined over time based on the accuracy of the estimator, but the adjustments to the right are recommended to start with :-

Confidence Level Adjustments	
Confidence level	Estimate adjustment, add
90%	Ideal day + 0
80%	20%
50%	30%
20%	50%
10%	100%

Estimating Activities cont. ...

Estimating tasks sheet to be completed by the delivery team :

Task name	Story Reference	Owner	Allocation to task	Dependencies	Ideal Day Estimate (man days)	Utilization	Confidence
	name of the use this is related to	Team member proposed for task	People allocated to the task.	What does the task deliver	Number of days task will take if you work on it full time.	effectiveness on tasks	(100% if there is no doubt the estimate is correct, 0% estimate could be doubled or halved)
Define API	1412	CRM	1.00		3	80.0%	80.00%
Develop backend	1414	CRM	1.00		4	80.0%	30.00%
Define API	1412	CRM	1.00		3	80.0%	80.00%
Develop backend	1414	CRM	1.00		4	80.0%	80.00%
Interface to CRM	1412	Java	2.00	Dependent on CRM API definition	3	160.0%	80.00%
Define API for UI.	1412	Java	1.00		2	80.0%	80.00%
Develop interface to CRM / FLEX	1412	Java	1.00		2	80.0%	80.00%
Develop UI	1412	FLEX	1.00	Dependent on Java API definition	5	80.0%	80.00%
Review with product owner	1412	FLEX	1.00		5	80.0%	80.00%
Develop story tests	1412	QA	1.00		2	80.0%	80.00%
Test story	1412	QA	1.00		5	80.0%	80.00%

The above is an example from the ProcessMashup estimating spread sheet (see website), the key fields are described [on the previous page](#). NB. The "Allocation of Task", "Ideal Day Estimate", and "Confidence" figures are the base information from which the others are worked out.

Tasks need to be at most 5days, if a task is longer than 5 days it needs to be broken down into smaller chunks. If a task is less than 2 days, then bundle them together to achieve as close to 5 days as possible. The Owner is set by the team, and is chosen based on skills, could be a team / sub team task, or if a task can only be executed by one person then this person needs to be named as the owner.

The example in this white paper will use the concept of team assignments rather than individuals, as this is a most appropriate.

The sample data from the estimating spread sheet has more data in it than is seen here. The information above is mainly the critical information to be provided by the team with respect to the estimates for the tasks.

The Confidence level field is used to calculate the working estimate that will be used to build the plan from: The confidence percentage is applied to the ideal day estimate. This will give an estimate range, the mid point of this is used as the working estimate.

The estimate used is the project managers decisions, however, it should be based on the views provided by the team.

The next stage is creating the project plan.

Estimating Activities cont. ...

Ideal Day Estimate (man days)	Utilization	Confidence	Estimate From (man days)	Estimate To (man days)	Working Estimate
Number of days task will take if you work on it full time.	effectiveness on tasks	(100% if there is no doubt the estimate is correct, 0% estimate could be doubled or halved)	Calculated lower range of your effort estimate.	Calculated upper range of your effort estimate	This is a mid point of the estimate ranges the most expected estimate
3	80.0%	80.00%	2.4	3.6	3.3
4	80.0%	30.00%	1.2	6.8	5.4
3	80.0%	80.00%	2.4	3.6	3.3
4	80.0%	80.00%	3.2	4.8	4.4
3	160.0%	80.00%	2.4	3.6	3.3
2	80.0%	80.00%	1.6	2.4	2.2
2	80.0%	80.00%	1.6	2.4	2.2
5	80.0%	80.00%	4	6	5.5
5	80.0%	80.00%	4	6	5.5
2	80.0%	80.00%	1.6	2.4	2.2
5	80.0%	80.00%	4	6	5.5

Illustration of the calculation of “Working estimate” used for the planning; from the ideal day estimate and the estimated confidence level.

Creating the Project Plan

Planning

Once the task list has been created the planning can commence. Planning is critical to the whole tracking mechanics, its the project plan that allows you to measure the progress against activities, it enables the project manager to understand the load against the resources on the project, and accurately estimates delivery timelines and milestones.

Creating the Plan

Once the estimates are gathered then each task can be added to the plan. Using MS project 2010, you can leave the organization of the tasks to project, unless there is a dependency explicitly stated in the estimating sheet.

See the following project plan illustration containing the previously defined tasks. Note that each task needs to have an assigned resource. For simplicity, we have only assigned individuals to tasks, later we will be looking at how to assign teams.

- Make sure task start dates are realistic.
- The realistic day estimates from the task list are entered into the Work field. Let Project calculate the duration.
- Set the resource on the tasks as per the owner field on the task sheet and allocate

Creating the Project Plan

Add all the tasks identified by the team to the project plan using the working estimate as the value for the Working Estimate column of the plan. As you are adding the tasks, set the named resource (individual or team) and set the utilization level for the resource against the tasks. When planning I normally set the utilization level for each task at 80% but set the resources utilization level based on the size of the team, so, MS Project will then handle the levelling of the plan: so, two people in the CRM team full time, means a 160% capacity. So, if each task is allocated at 80% then two tasks can be done in parallel - where there is only 1.5 people (120%) then project will split tasks to compensate for the resource shortfall. Obviously, if the task needs more than one person, then the task utilization level will be set at the appropriate percentage.

Milestones

Milestones should be put into plans to show where major project activities start and complete. They are a useful method of giving the business dates during the delivery of the project that can visibly show the project is progressing.



Plan based on the estimates identified above.

Utilization Level Other Uses

Changing utilization levels can have many benefits in managing and tracking projects. The first as described above, when you have skills shortages or people are not available full time. But in addition, utilization levels can be adjusted to reflect how people work. If someone is working on 2 tasks then reducing the utilization to 40% on each task allows the two tasks to run in parallel, or someone is fixing bugs 1 day a week at 16% utilization and continuing development in another area at 64% utilization.

The idea behind planning is to make the plan match reality, and changing utilization level can make putting a realistic plan together a lot simpler.

Creating the Project Plan cont.....

Sanity Checking The Plan

This is a key phase; firstly the creator of the plan does this then gets the estimators and the people who will be delivering the tasks to review. So, lets look at the tasks:

- ⇒ Are there tasks that cannot be started until another task has completed? If so, put a dependency into the plan.
- ⇒ Are any tasks missing?
- ⇒ Does the duration match the work days, do the delivery timelines look sensible?
- ⇒ Where staff are not fulltime check with them that the estimate will not increase due to extra effort needed to prepare before starting work.
- ⇒ Ensure go live process is incorporated.
- ⇒ The tasks can be picked up by the team in any order they want, and the PM does not need to be notified, if the tasks do not need to be executed in a specific order where there is a physical need.
- ⇒ Does plan include hand over to support ?
- ⇒ Is there enough contingency, these are put in as tasks with no resources allocated that just move the milestone dates out, the number of days contingency is normally about 20% of the elapsed time but for high risk process 50%-80% would not be unreasonable.
- ⇒ Is everything covered that is needed for a release ?

Now review the plan with the team, best approach is in a workshop style, projecting the plan and working through it with the team by assigned team member, and get their input. This stage is critical as you are getting the teams buy in to the plan, if they don't feel represented then you cannot expect them to take it seriously.

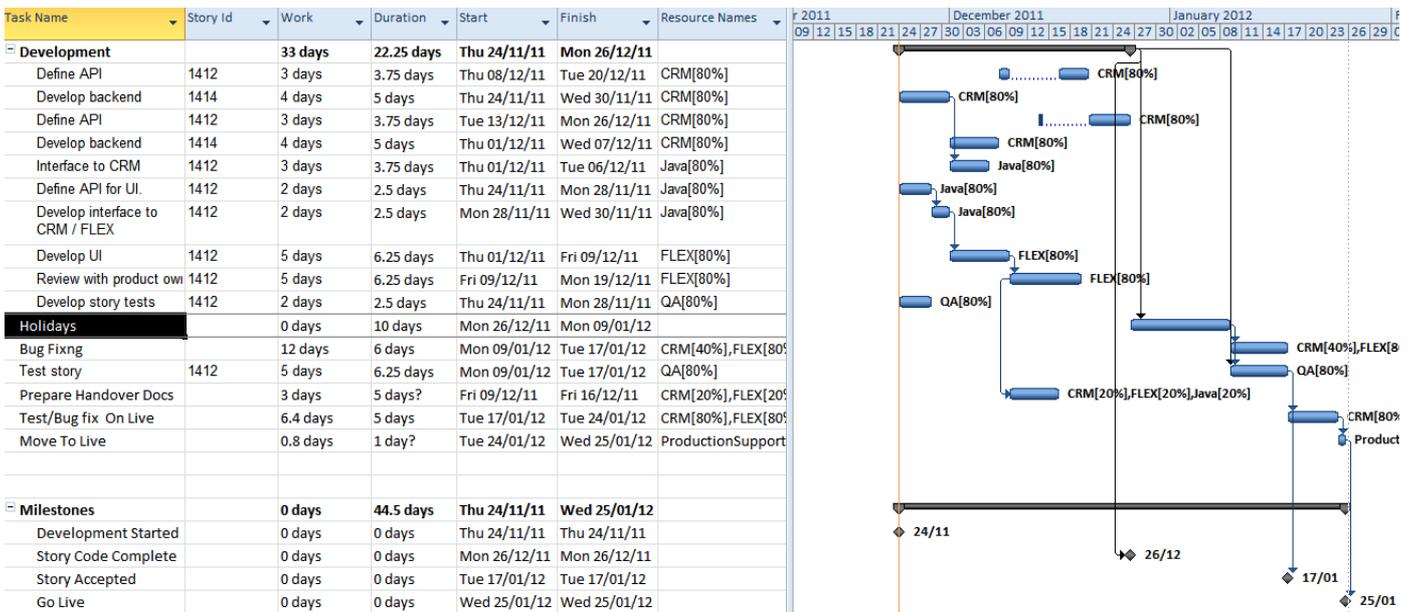
Gotcha's

- If the team are not in a position to estimate for a piece of work then don't give estimates for the work. Instead, estimate / plan for what the team need to complete to be able to complete the estimating; So you are providing a date for when you will have a plan.
- Always estimate pessimistically, you will get better and more accurate over time; Make sure you plan to get ahead of the plan early, build up a bit of contingency early in the delivery phase. This builds business confidence and motivates the team.
- Contingency in plans is important, this is time allocated in case things go wrong and more time is needed than expected. You can put tasks in the plan labelled contingency with all the available resources as in the example above. An effective way of building in contingency is to put the contingency before milestones; so making a milestone 5 days long, gives the team an extra 5 days to deliver, while teams tasks stay the same length, so the team are focussed on an earlier date than the business is expecting.
- Sometimes it is wise not to add explicit contingency; you can reduce utilization levels on key resources to achieve the same effect.
- Make sure that if you have critical path Items that there is a plan to cover key people if they are off sick etc.
- Plan for holidays, add a task with all team members against it for the average duration of the holidays the team is expected to take.
- After every change to the plan, level the plan from the resource menu and sanity check it.

Creating the Project Plan cont.

Below, you can see the updated plan after review and the sanity check; the dates have moved significantly, so a good job I did the sanity check! Plans bring realism into project delivery, changes may look small and able to be delivered fast, but put them in a plan and you see very quickly that this is not always the case.

The story accepted date has moved from 27 December to 17th January and there is now a go live date of the 25th January, so we now can set realistic expectations in the business.



Tracking the Project

The project has been running for one week and it is reporting day. The customer who is paying for the work has been hassling you, trying to get a good indication of whether the project will deliver as expected.

The team realised after you issued the plan to the customer that some tasks in the plan were in the wrong order, and a team member started a task that was not due to start until week 3. So none of the tasks you planned to complete this week have been started, what are you going to do ?

Well, not a problem that is what BelieveIT's white papers are all about. The order tasks are completed in is not a problem, the planning and tracking mechanisms will handle this. See the Tracking Projects guide on [ProcessMashup's website](http://www.processmashup.com)