

Task 1 – Planning

a) What is the role of a process model in planning ? Exemplify

When you start a project or an application, the main objective of process model is to describe how you

gonna lead this project/application, describe as much as you can, like how you gonna work with you team, there is some need for a process model, all the people of your team must work in the same direction, so everyone know "where they going". There will not be (at least not too much) misunderstanding about what the project is about. For example we want to develop a web site where you can sell shoes. You and your team will be agree on the direction of the project, "ok it should be a web site, we know that we will sell products". Have a big vue of this project. Define roles, activities, factors who can cause problem

Also what we going to implement must be controllable, it means that even before starting the project the team project know already that there will be some change (because it always happen in real life) and must be prepare to those changes, be able to have control about what you're doing, trying to be one step ahead the client and adapt his demand to your implentation, a project is never the same as the start and as the end, so we must have control on it, being able to adapt, adaptation is the key. I mean for example when you define the requirement with your client, like if he told you that he wants a green background , what you team must do is not to create a green background (at least not at the start) but just have a function where you can choose the color of the background and we do this because we know that the client can change his mind easily, and it will be really easy to adapt this.

Also the process model must be repeatable, it means that even if it's not the same final end product or same project, the step are, not exactly but almost the same, for example we know that we going to start with a meeting, then step 1 to divide the task, planning the task, etc. It's like the process model is a template where you must be able to adapt this template to any project. The structure of the process planning can be the same.

b) Describe and exemplify three planning related risks that iterative and incremental planning mitigate.

Task 2 – Process models

a) Compare SCRUM and Open UP. Use roles, artifacts, and activities for your comparison.

Roles :

Well comparing the roles, we can see that Open UP is a lot more specific about roles than SCRUM. But still we can easy mapping some roles : Product owner correspond to the Analyst Worker Set (not exactly but almost), Scrum master correspond to the Manager Worker Set and Development team correspond to the Developper and Tester Worker Set and Additionnal Worker Set. For the roles Open UP is more detailed.

Artifacts :

Here we can see differences between those two process model, SCRUM work as iteration like Open UP but in term of planning SCRUM will plan at each end of the current iteration (sprint) contrary to Open UP who will plan all his iteration in the Software Development Plan. Again here the artifacts of Open UP is well more detailed than SCRUM.

Activites :

Well as I said both of those process use the iterative approach, but where we can see difference is how they execute their activites, first one small difference is that Open UP introduce the notion of micro-increments, also SCRUM used their iteration as “sprint”, the development team implement something then every day a meeting comes so they can have frequend feedback instead of the Open UP where you get a feedback at the end, when it the transition phase. For example Open UP first do Requirements then Analysis then design/implementation ... , well at contrary SCRUM will to those steps each iteration (Miles-Stones for Open UP vs Evolutionary for SCRUM).

SCRUM is extremly good for small project, because it permit to have a constant feedback and permit to improve what you implemented with the meetings to discuss about what you implemented. At contrary, Open UP is better for large and complexe project.

b) Most process models are generic require some tailoring/configuration for the project context. Exemplify and discuss some project specifics that would require you to tailor your process model.

Well this question can be related with the previous one, as I said some process models will be preferable for a “small” project like SCRUM, Open UP will be preferable for large project. For example a project during one month with 5 people working on it will not need the same requirement than a project during a year with 50 people. So it depends on how much people, how long the project will be.

Indeed, some process model maybe need to be tailor depending on the project, a (stupid) example is for example if some company ask you to build a function to their website or some small application. Will you add a full project plan, and all the artifacts and roles of an Open UP process, of course not, you need to take in consideration what the company wants and to adjust/tailor and trying to not spend unsued time. It will be different every time and you need to have the best efficiency for you project.

It's all about how much the process model will tell you to do, how much information you will get and you must adapt it to your case. Before starting a project, you should ask :

What's gonna be the size of this project, how much longer (and discuss with your team because they know better their job than you do and they will be able to tell you how much longer it will take).

What resource do I need, what people do I need, for example I have in my team a java programmer, and the project must be develop in python well I don't need him.

Also the nature of the project, if I'm building a control system for a bank, maybe I need to tailor the process and put more effort on verification and validation.

Another example is if you don't really understand or know the problem, in that specific case you must use the “Evolutionary” method, system evolves as developers understand the problem domain.

In conclusion, I will say that it's all depend of the resource of the project, the time, the budget, the nature of the project, the people involve in the project, there some works needed to be done before starting the planning, sometimes called guidelines who will help you to define what you really need for this software.

Task 3 – Requirements

a) Use-case modeling is widely-used for modeling functional requirements. Describe how you work when you model use-cases. Use an example!

When I want make a use-cases, there is few questions I need to ask to myself, like what I'm going to design, what I want to reprensent with this use case model. The use case model is here to describe which actors will be interact with your systems, what they can do, the relationship they can have with the system. Then come

a use case to a specific action, I'm telling to myself that when it will be ended it should be first understandable by everyone, and describe all the step to realise this action. It should be like the “requirement” of the action, and everyone of my team member should be able to refer to this document if they don't understand what I'm implementing. It will also permit to have the point of view of the user like I'm asking myself what I would like to have if I had this application and this is really important because when you implementing something you never (or almost never) think about the point of view of the client. What's gonna trigger this action, the preconditions, the different scenario, what should be the input and output.

For example, I'm dealing with the case where user purchase a clothe. So what I'm thinking is first, the user should be able to purchase an item, look at the clothes, the action will be triggered when user click on purchase, the item should be in stock and updated when the user bought the item. Also cover all the possibilities of this action like if he didn't have an account then create one, if the user doesn't have enough money, user receive an email of confirmation when he bought something.

b) Non-functional or quality requirements are different the functional requirements. Discuss three differences. How would you model quality requirements if you model with use-cases?

Functional requirements are like what the system should do, what kind of service that the system should provide, it correspond to the basic flow of events in the use case, how the system react to a special action.

Non functional requirements, contrary to functional requirements are how the system will do, it's more focused about constraints on the service provide by the system.

As I said functional requirements focused on what the system should provide (in my previous example an email when item bought), and non functional requirements will focus on the constraints of this service, (HOW the email will be sent add more conditions, constraints, like the speed of the delivery of the email.).

Also non functional requirements must be more critical than functional requirements in the way that the functional requirement provide only what the system will do and didn't say how it will work, in that way non functional requirement are a “level ahead”.

How would you model quality requirements if you model with use-cases?

If I model with use-cases, first they will be no actor because quality requirements requirements focus on how the system work.

Task 4 – Testing

a) Write a set of test-cases for the sortBillItems method/function. Explain your reasoning and motivate your test-effort. You do NOT have to implement the method/ function itself.

Test case : < sortBillItem >

Test case ID	ID01	ID02	ID03	ID04
Test scenario	Sort an empty array	Sort an array already sorted	Sort an array who aren't already sort.	Sort an array where there is number converted in string
Test Case Description	I gonna try to sort an empty array	I gonna try to sort an array which is already sorted	I gonna try to sort an array which isn't already sorted	I gonna try to sort an array where it's number converted to string
Test Steps	1. Check if the array	1. Check if the array is	1. Check if the array is	1. Check if the array is

	is empty 2. If the array is empty just return the array	empty 2. Foreach the array and check every character with others to sort it.	empty 2. Foreach the array and check every character with others to sort it.	empty 2. Foreach the array and check every character with others to sort it.
Prerequisite	Array is empty	Array is sorted	Array isn't sorted.	Array contain number converted to string
Test Data	ToBeSorted = []	ToBeSorted = ["a","b","c"]	ToBeSorted = ["c","a","b"]	ToBeSorted = ["42","24","72"]
Expected Result	ToBeSorted = []	ToBeSorted = ["a","b","c"]	ToBeSorted = ["a","b","c"]	ToBeSorted = ["24","42","72"]
Actual Result	ToBeSorted = []	ToBeSorted = ["a","b","c"]	ToBeSorted = ["a","b","c"]	If I handle the case, (should product an error).

Test case is a very powerful tool and need to be used before starting implements, it permit you to know which case you should also handle, for example here the case where an array is empty, it's useless to go into the for-loop if there is not any string to compare, also I didn't put it in the test case, but if there is only one string like ToBeSorted=["a"], is it interesting to go into the for-loop ? No it's not so before going into the for loop who will compare every string, we should test the size of the array if it's 0 or 1 just return the array directly. And there is always some case like this you should handle. Again in our test we can also check the size of the array, it should be the same before and after the function, (toBeSorted.size.begin == toBeSorted.size.end).

Finally, test case is here to cover all possibilities of your function, and it will help you during the implementation like "ok I know that I should handle this case so it's better to implement it like this or like that".

b) Describe and explain the test-automation, motivate its usage and non-usage.

Test-automation is a tool where test will be running automatically, it can be very helpful for large project because you don't have to re-write the test every time, it's often (and used in the library book) that we implemented for API testing, those test will run every time to test that the API of our software is correct. Test automation is often basic test without specific case (specific test is more for manual testing).

So why it's good to have test automation, well there is multiple good usage, you can run test quickly and effectively, and as I said you don't have to write every time those test, those test will be global, that's why we often use it for API testing. It also can help you to discover error faster, who will save you time and then money. Test-automation is also a good tool to see the result with your team, instead of manual testing, when you using test-automation all of your team can see the result, because those test will always be the same, it's continuous testing and that's very powerful when you're develop and application.

The biggest "problem" of test-automation is that it take a lot of time doing them, and that's why it's preferable to use test-automation when you're doing a large project, indeed there is no interest doing test-automation when you're project take only couple of days, in that case manual testing if preferable. As I said test-automation is often global, but it didn't cover all the test, and as the definition say it's automatic and don't act like a real user.

Finally I would say that test-automation taking time of course, at least to implement them but can be really useful for a large project during long time, it will save a lot of time. The best combinaison is to used both test-automation and manual testing so you can cover all the possibilites of your project.