Software Engineering
Prof. Rajib Mall
Department of Computer Science and Engineering
Indian Institute of Technology, Kharagpur

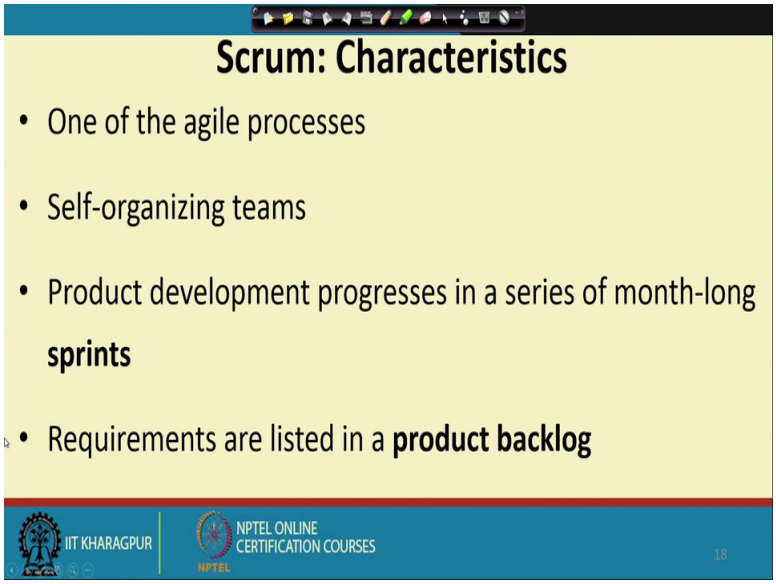
Lecture – 14
Scrum

Welcome to this lecture. Till now we had looked at some introductory topics and then we had looked at life cycle models. And, then you said that for last 2 decades or so, the agile models have become very important. They are being used extensively in the industry and the main reason for that is that the project characteristics have changed. In the old times, all programs a developed from scratch and they were multiyear projects.

And, that is the reason the waterfall based models were very popular, but then slowly the project characteristics have changes and of let the service oriented projects have become prevalent, and that is one of the reason that the agile modes are being extensively used. And, we had discussed that agile is actually an umbrella term which denotes some characteristics of the life cycle, but then there are several life cycle models, which satisfies this criteria. And, last lecture we are looked at extreme programming and we are just starting to discuss about the scrum, scrum is a very popular agile model which is being used.

Let us start with scrum today.

(Refer Slide Time: 02:01)

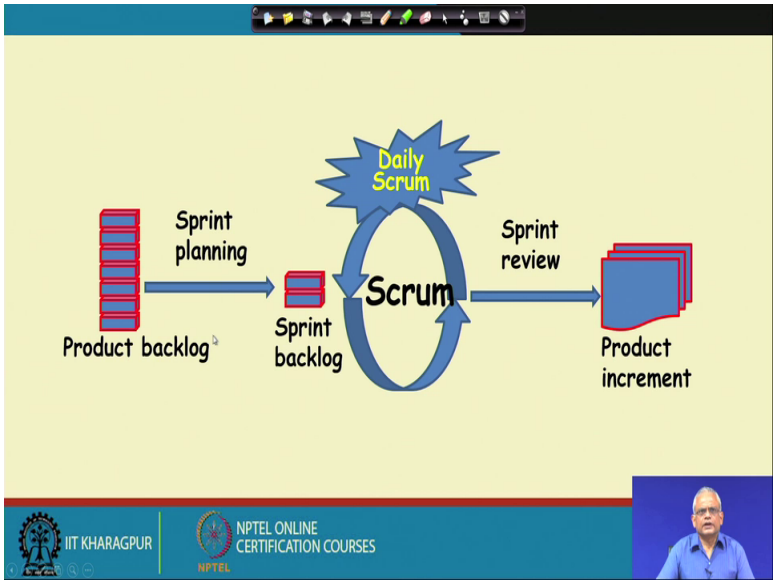


Scrum consists of small teams which are self-organizing; by self-organizing we mean that the team members by themselves choose their own roles activities. There is no chief programmer or somebody who assigns them activities, but they self-organized themselves and decide who will do which one best.

There are several technical terms here and also concepts just let look at that. One of the main principle is the sprint, a sprint is something like an iteration or a time box in as used in other agile models like extreme programming. The development work is done over several sprints each sprint is typically about a month long. And, as the software gets developed the requirement get build starting with some initial requirements.

The initial requirements are refined more requirements are added and this is listed in something called as a product backlog. Typically an excel file where the requirements are kept track of the requirements are actually called as user stories as you know other agile models, which are simpler form of functional requirements.

(Refer Slide Time: 03:55)

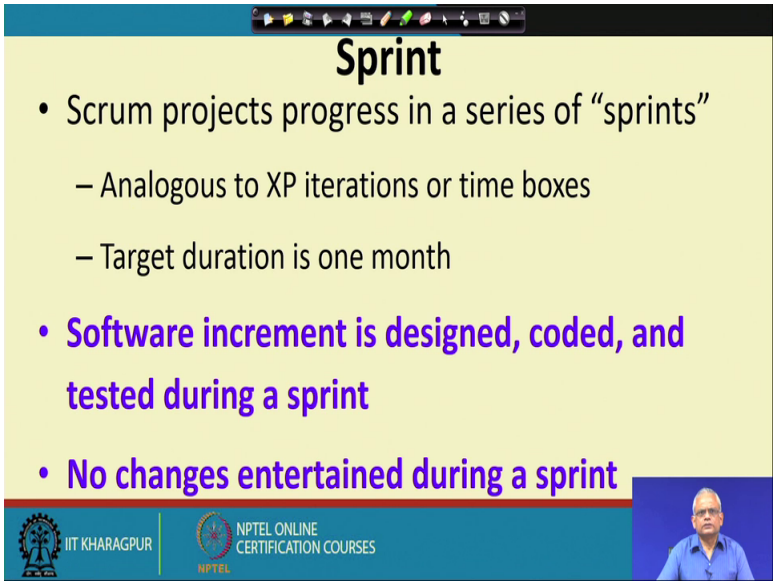


This diagram characterizes, the main principles in the scrum, the product backlog is all the requirements these are maintained in a excel file and each requirement is called as a user story. And, as you are saying that user story is a informal description of a requirement. There is a sprint planning meeting which decides, which backlogs, which product backlog, which stories to take up next and those selected user stories are taken up in the next sprint.

The selected user stories are kept in the sprint backlog and the scrum is a month long about 3 to 4 weeks. And, every day the team members work towards completing the sprint backlog and they meet every day, which is called as the daily scrum meeting, in the daily scrum meeting they discuss what they achieved yesterday, and what they will do today, and is there any difficulties that they affection.

And, at the end of the scrum the spring backlog would have got exhausted and an increment of the software would have got built. And, this is reviewed in a sprint review meeting and the product increment that gets approved in the spring review meeting each installed at the client side. And, this cycle continuous until all the product backlog gets exhausted. And, please understand that the product backlog is dynamic nature as the work progresses more users to this are put into the product backlog and some user stories may get deleted, because of requirements change.

(Refer Slide Time: 06:21)

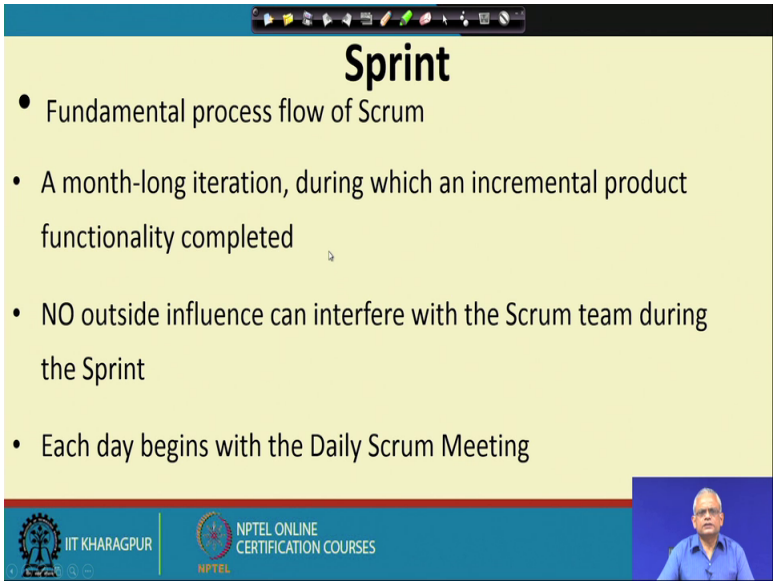


As, we discussed in the schematic representation of the scrum sprint is the one of the main technicalities in the scrum.

It is analogous to an XP iteration or a time box usually one month in one sprint software increment is designed coded and tested and no changers entertained during a sprint. So, once the product backlog items that is user stories have been selected that development starts and the main idea here is that once the development stats the developer should not be disturbed, because otherwise it will never converge. And therefore, as a role once the

features that are most accepted or stable have been selected these are developed during a sprint.

(Refer Slide Time: 07:33)



The, sprint as I was saying is the possibly the most fundamental process flow. It is a month long at the end of the sprint some working software comes out, which is the incremental product functionality. During the sprint no outside influence is allowed; that means, the scrum backlog which contains the user stories to be completed during the sprint, I will frozen. And, during the sprint each day starts with a daily scrum meeting, where a review is done about what was achieved yesterday and what to do today and are there any obstacles that any team member is facing.

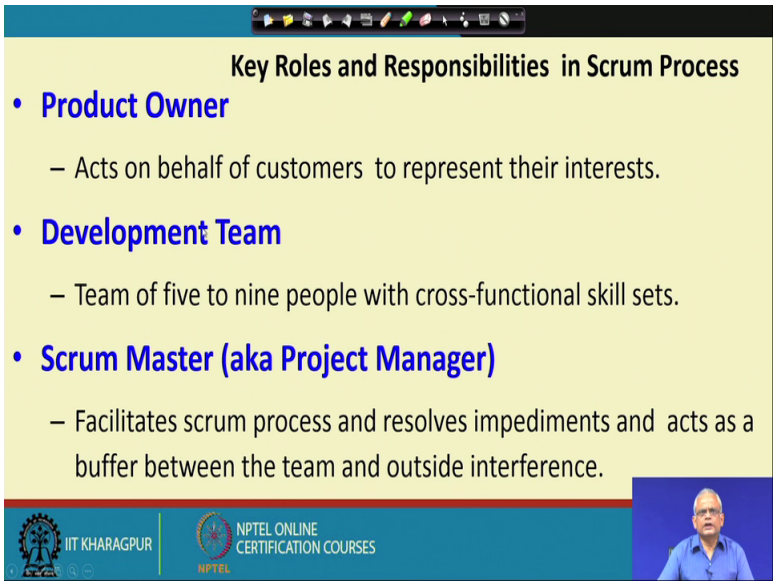
(Refer Slide Time: 08:30)

These are some of the terminologies in the scrum framework the roles that is the team members they assume some rolls, one of the team member is the product owner. Another, team member is the scrum master and then there is the team members, we will see what these roles mean and what are their responsibilities?

And, then there are the scrum ceremonies one is the sprint planning ceremony. In the sprint planning ceremony the user stories to be taken up for the next sprint from the product backlog is decided. Sprint review ceremony is done after a sprint is complete to review that the incremental software that has got developed is it alright. The sprint retrospective and the daily scrum meeting, the daily scrum meeting we said that it is a done a daily meeting in the morning, the team members just check what was done yesterday and what will be done today and are there any obstacles.

These are the artifacts that are maintained one is the product backlog which contains the user stories. The sprint backlog that these are the selected user stories from the product backlog that will be completed during the sprint. And, then there are various types of burn down charts which are useful in a monitoring the progress of the developed.

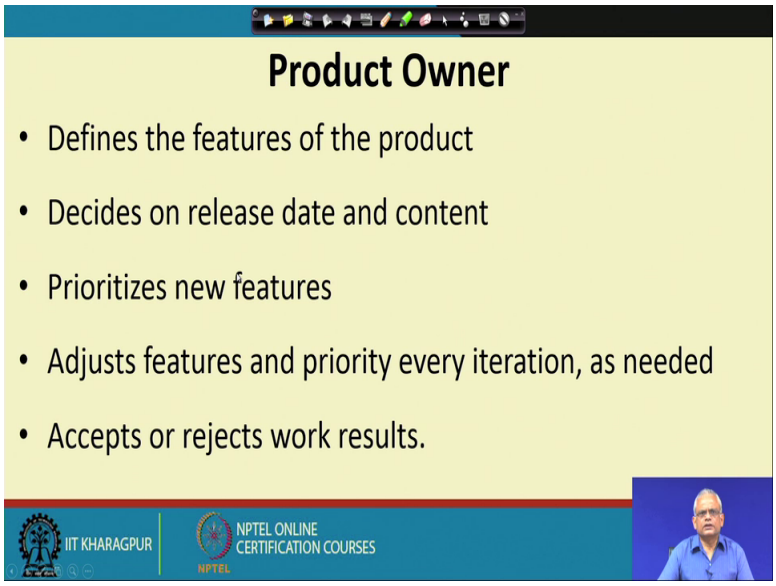
(Refer Slide Time: 10:24)



Now, let us look at the different roles of the team member; one is product owner. So, very important role, the product owner has the customer perspective and represents customer interest you can be a member is a part of the customer, organization, understands the customer requirements well interacts with the customer. And, then there are the development team members which are 5 to 9 people with cross functional skills, like coding design testing quality assurance and so on. And, then one of the team member is scrum master the scrum master is also known as the project manager.

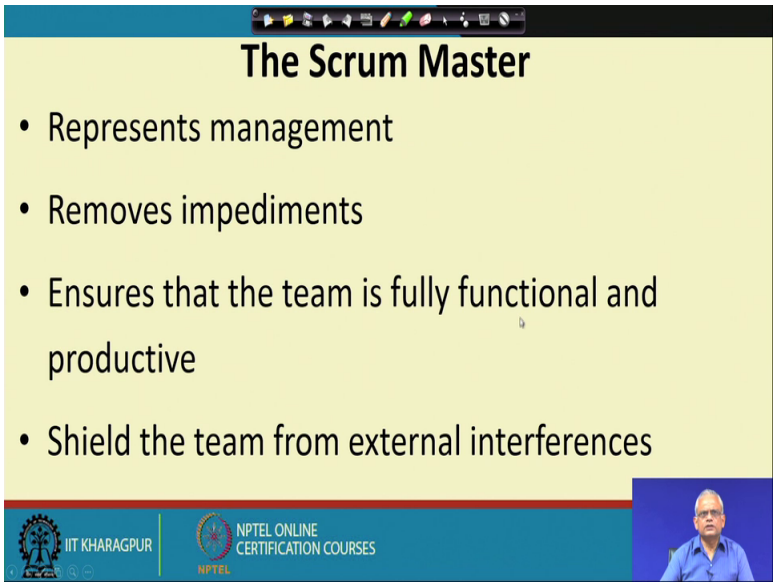
The scrum master is the management representative in the team, the role as the responsibility of facilitating development any obstacles that are faced, talk to the management facilitate. And, also is a buffer between the team and outside in influence.

(Refer Slide Time: 11:54)



Now, let us look at the responsibilities of the different roles, the product owner is the customer prospective may be a employee of the customer organization. And, understands the software well defines the features of the product, decides on the release date prioritize new features, adjust features and priority in every iteration, and accepts or rejects the work result.

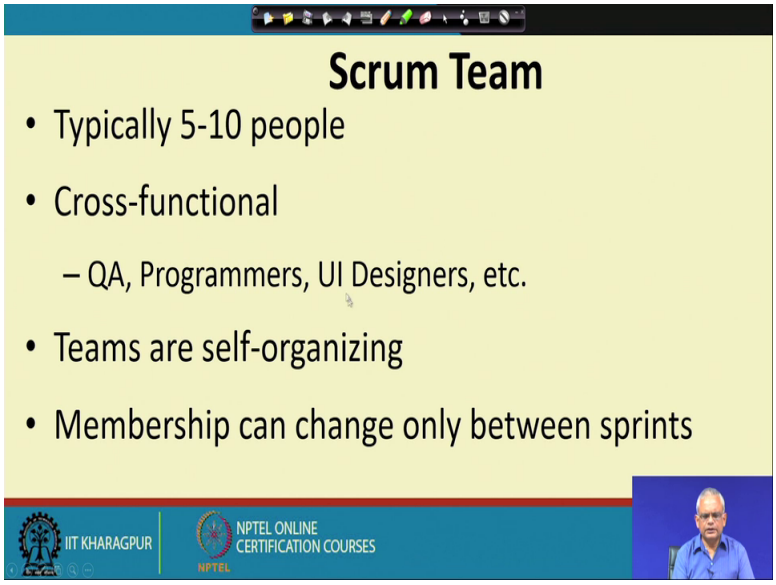
(Refer Slide Time: 12:39)



So, during the sprint review meeting the scrum master as you said is not project manager is the management representative in the team, removes an your obstacle that the team

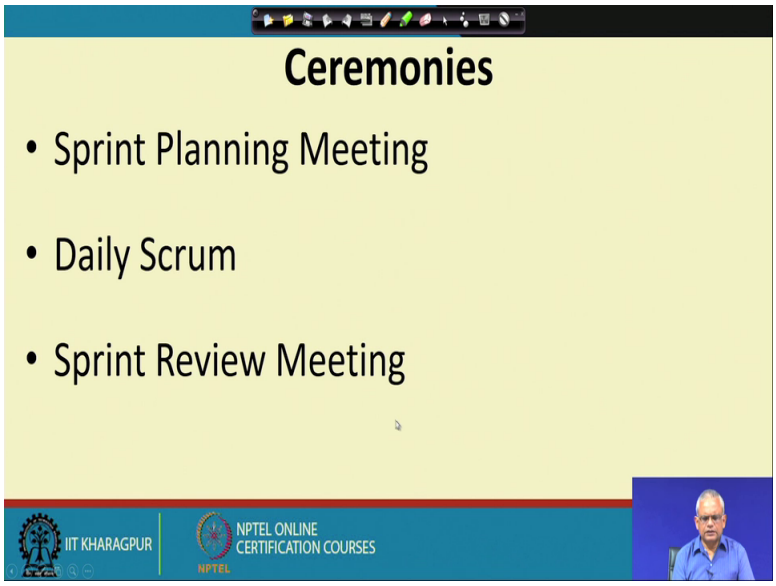
facing hardware not working network issues etcetera etcetera ensures that the team is fully functional and productive shields the team from external interference lesions between the management and the team and also with the customer.

(Refer Slide Time: 13:15)



The scrum team typically 5 to 10 people they have expertise in various areas like quality assurance programming user interface design testing and so on. The teams member are self-organizing they select their own roles the one that they can do best the scrum team sometimes members may leave or new members may join, but it is ensured that when the sprint is in progress membership change is not allowed, otherwise the development work will get hampered.

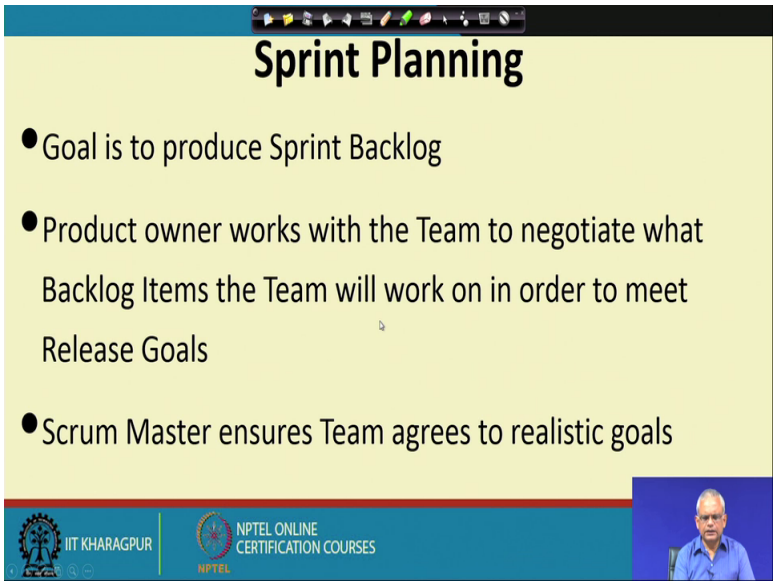
(Refer Slide Time: 13:55)



There are 3 main ceremonies, the sprint planning meeting, where the spring backlog is selected from the product backlog, the daily scrum it is a daily meeting the team members meet to review what each member did previous day? And, what we will be achieved today and any obstacles that they are fetching?

The sprint review meeting is conducted at the end of the sprint to check whether the developed increment is alright.

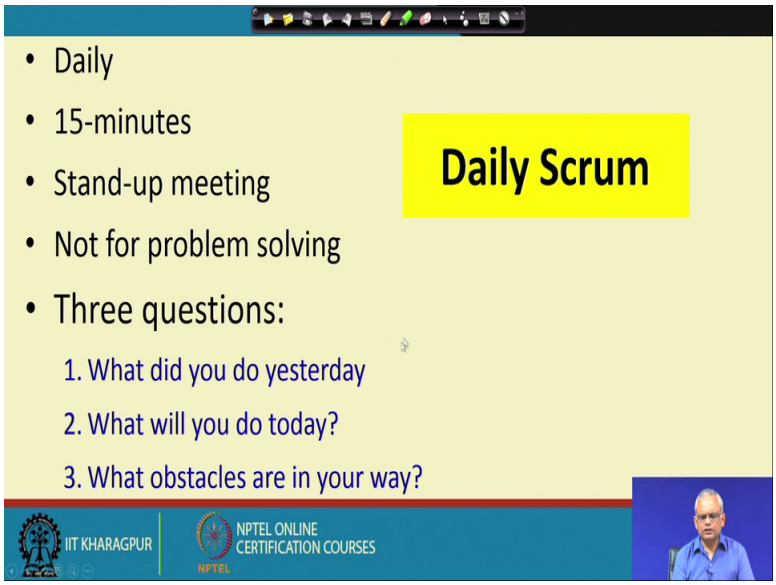
(Refer Slide Time: 14:31)



The sprint planning produces the sprint backlog from the product backlog, here the product owner who understands the customer requirement well and the team member they decide which user story to take up next.

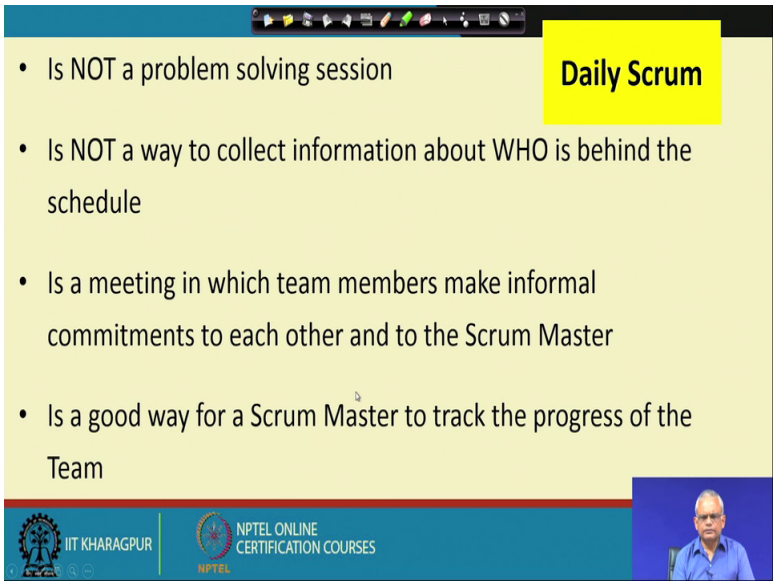
Obviously, the product owner would like to select those stories user stories which are most value adding to the customer. And, the team members will like to take up those stories which you will require least cost of development, but he scrum member ensures that during a sprint planning meeting where they select a sprint backlog to be completed in one month, that the team agrees to realistic goals otherwise it will put undue pressure in the team or they may not have enough work.

(Refer Slide Time: 15:38)



The daily scrum meeting is this morning everyday very small meeting about 15 minute, stand-up meeting, to indicate that they just need to discuss and they do not allow you to become long meeting. It is not a problem solving meeting just to take status of what was done yesterday? What they are planning to complete today and are they facing any obstacles. And, this is the one of specific concern for the project manager the scrum master, who would try to remove the obstacle that are been faced.

(Refer Slide Time: 16:20)



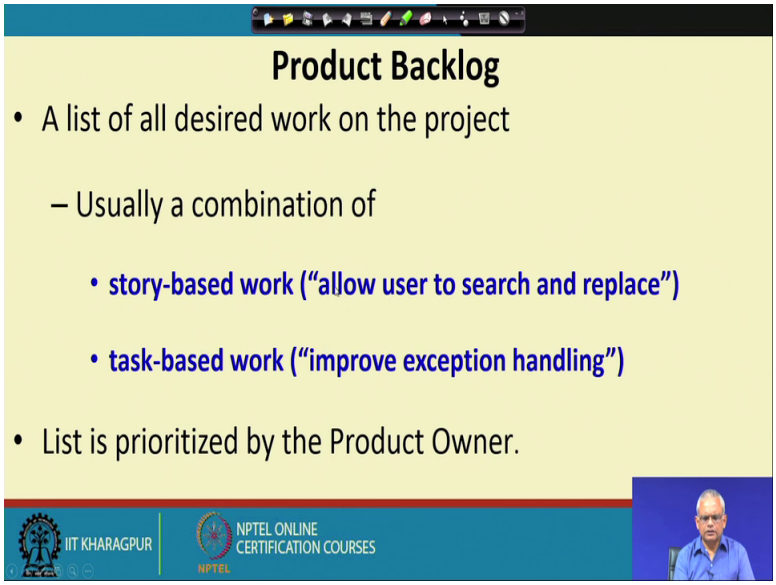
The daily scrum is not really a problem solving session as you said is just for collecting information and removing any obstacles. Here the team members make informal commitments to each other and to the scrum master and this is the way that the scrum master can track the progress of the team.

(Refer Slide Time: 16:44)

The spring review meeting is done at the end of the sprint; the team presents the increment that has been completed, typically in the form of a demonstration of the new increment that has been completed. It is a informal meeting this 2 hour preparation

should be enough and the participants are typically customer representatives management representatives product owner and other team members.

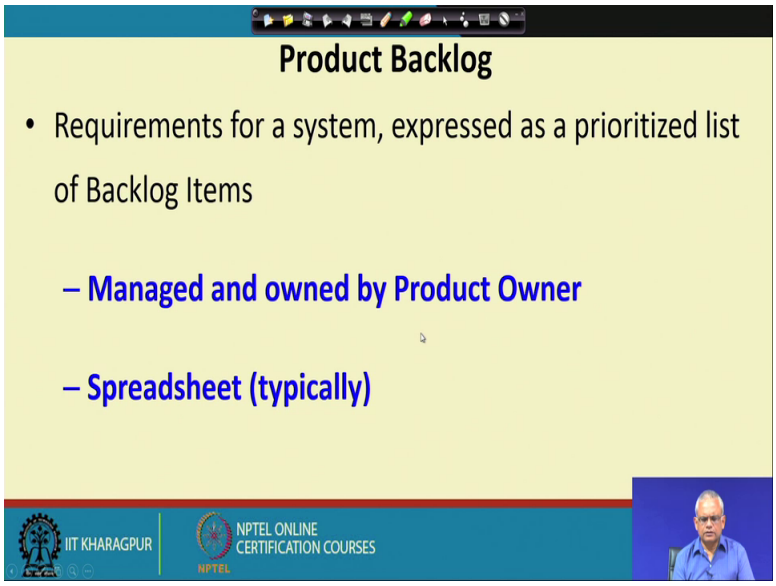
(Refer Slide Time: 17:16)



The product backlog contains all the work that needs to be completed towards the development. There are 2 types of entries here these are typically maintained in a excel file one is the story based which are basically something like functional requirements simpler form of (Refer Time: 17:42) functional requirements like, allow the user to search and replace or allow the user to create new book entries and so on.

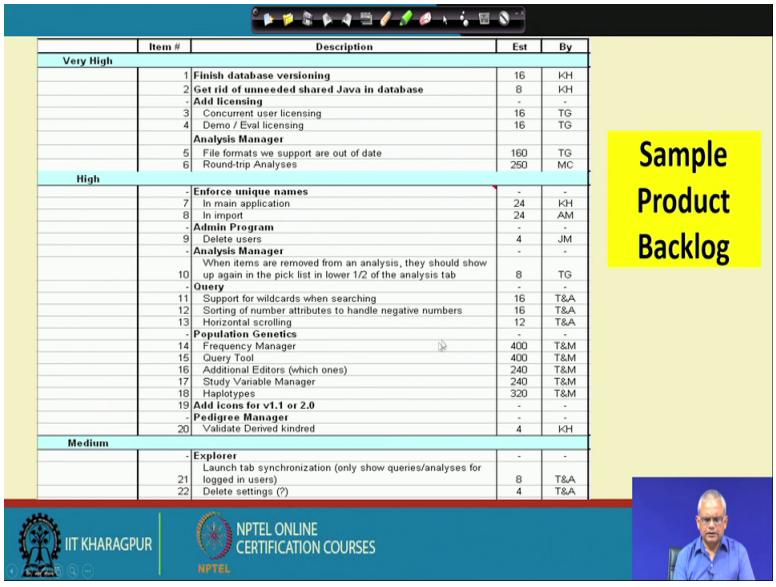
But, he another type of entry in the product backlog are task based, these not really functional requirement, but small items that might have to be completed which are not yet been done. For example, improve the exception handling facilities or refined graphical interface and so on. And, once the entries have been populated in the product backlog prioritized by the product owner the continuous basics.

(Refer Slide Time: 18:35)

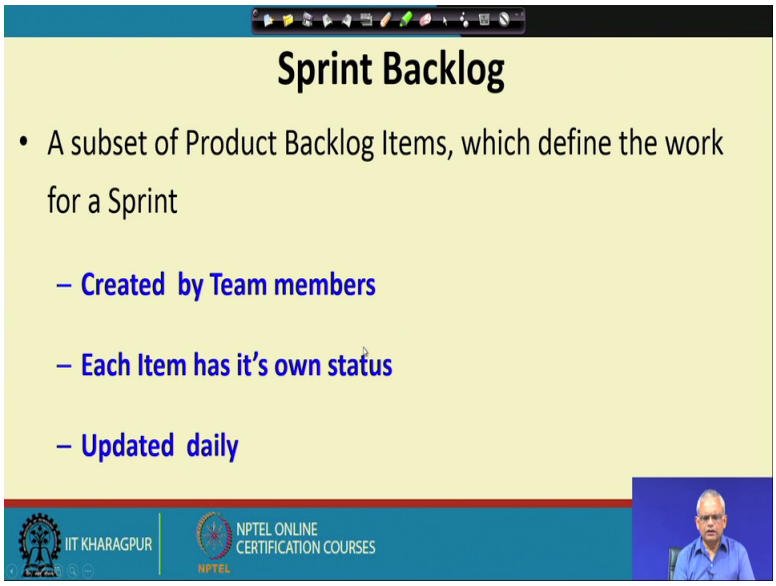


The product backlog is typically maintained by the product owner and it is typically a spread sheet something like this; different priorities, high priority, very high priority high priority medium priority and so on.

(Refer Slide Time: 18:47)

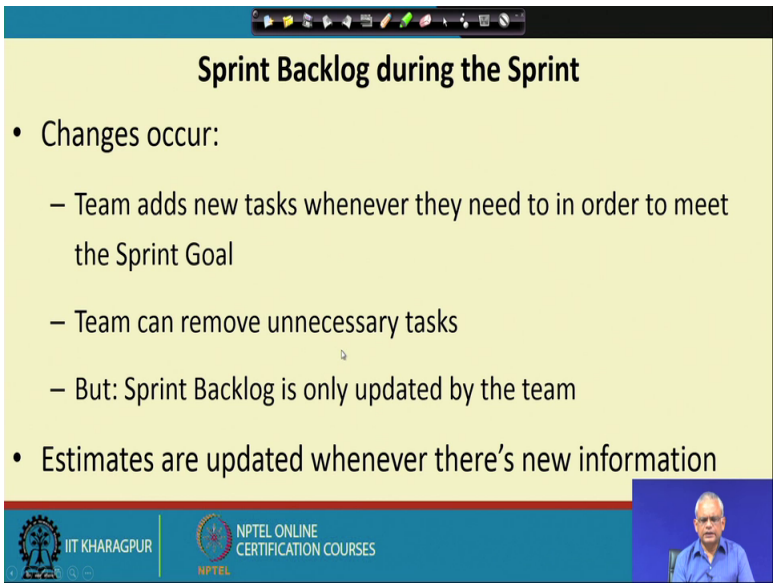


(Refer Slide Time: 18:55)



The, sprint backlog are the subset of the backlog items which are selected for the next sprint. And, here the sprint backlog even items can get added here because the members team members may find that some items need to be completed for example, the database connectivity is to be completed and so on.

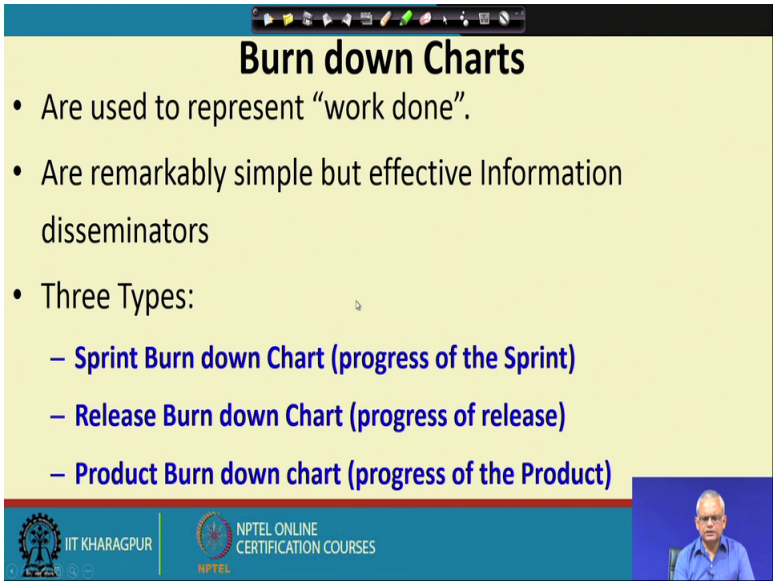
(Refer Slide Time: 19:30)



So, they update daily as we mention that the sprint backlog changes during the development the team members may add new entries they can remove unnecessary tasks,

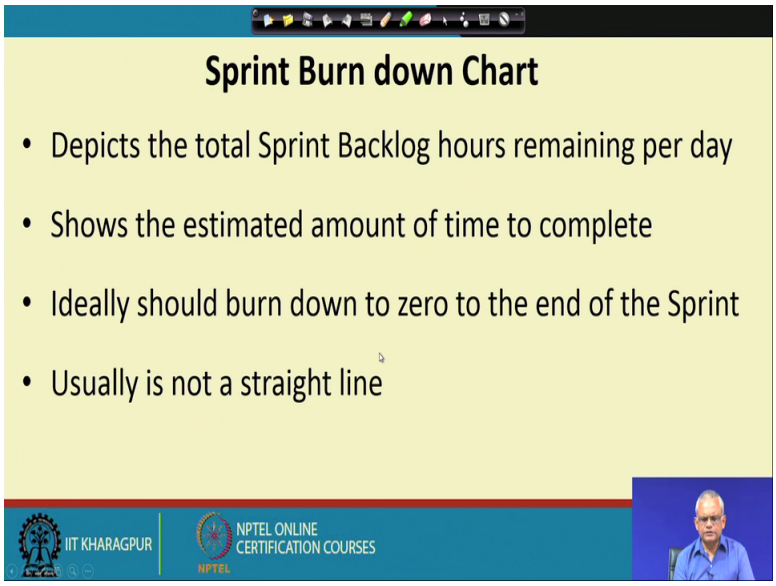
but then the sprint backlog is maintained by the team. Let the product backlog is which is maintained by the product owner the sprint backlog is maintained by the team.

(Refer Slide Time: 20:04)



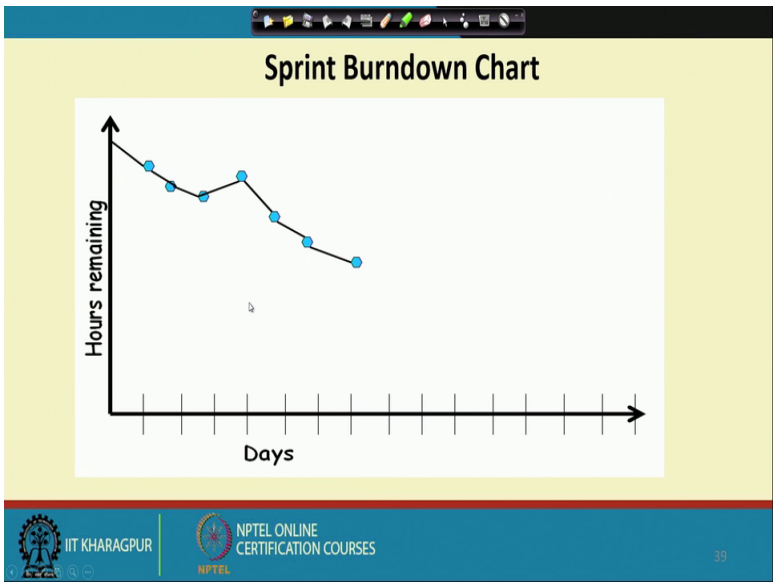
There are some charts to keep track of the progress of the work these are very simple charts, but they are very effective 3 main types of charts are used the sprint Burn down chart, which is how much progress has been achieved during the sprint. Release Burn down chart how much progress has been achieved till the next release? Product Burn down chart this is for the entire work to complete how much progress has been achieved let us look at this chart.

(Refer Slide Time: 20:38)



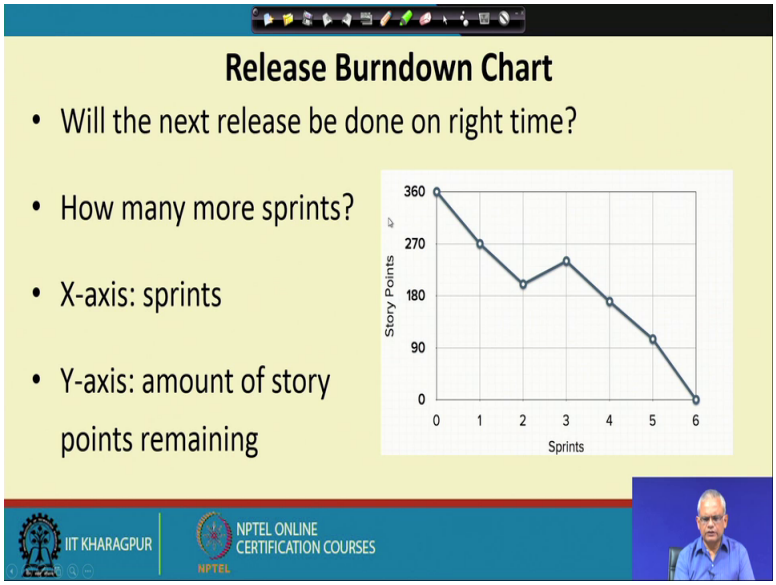
The first one is the sprint Burn down chart it captures how much progress has been achieved the current sprint or more accurately how much how many hours are remaining for the sprint to complete? As, you will see the diagram the chart shows the estimated amount of time to complete, and at the end of the sprint the number of hours remaining will burn down to zero. Typically not a straight line, because sometimes the work progress is very fast sometimes there are obstacles not much progress is done over some days and so on.

(Refer Slide Time: 21:32)



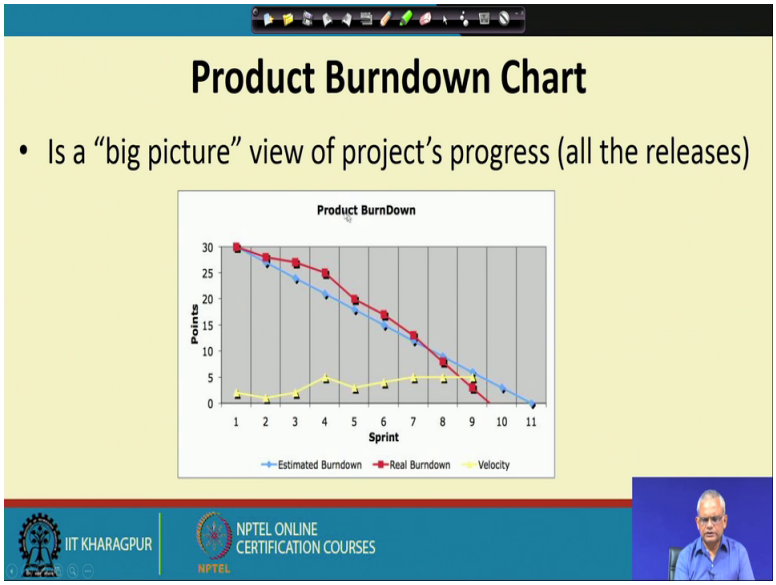
This is a burn down chart and as the days progressive the hours remaining comes down every day, it is updated the chat is updated.

(Refer Slide Time: 21:45)



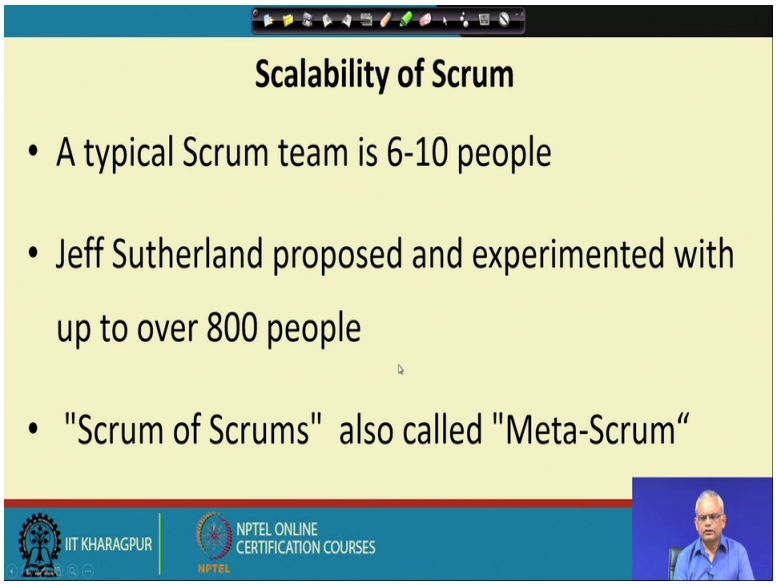
The release burn down chart is for the next release how much work is remaining? It is release can consist of many sprints and as it is sprint complete this gets updated.

(Refer Slide Time: 22:07)



The product burn down chart is how much work remaining until the development completes? So, we have the estimated here and then the real burn down and, then the velocity with how quickly these are being burnt?

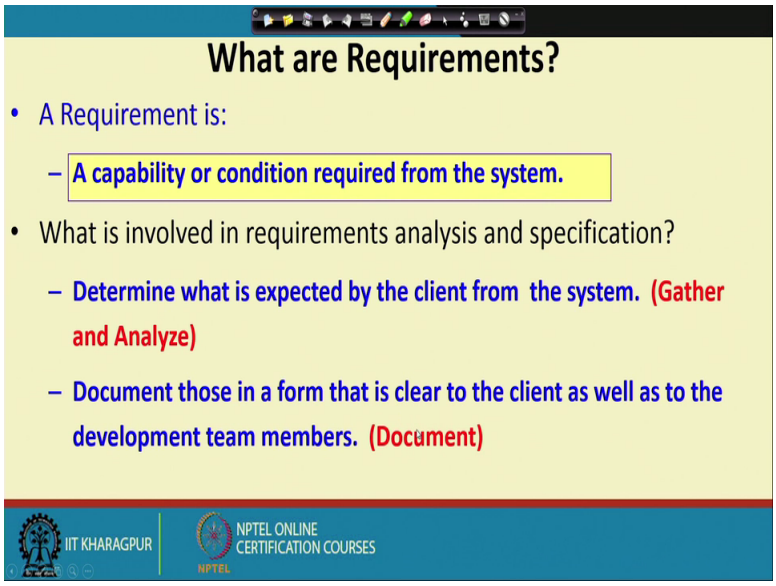
(Refer Slide Time: 22:26)



Scrum is typically design for small teams, but then there are some who have tried it for large projects. For example, Jeff Sutherland reported that he has experimented with over 800 people, which is called as the scrum of scrums. The work is divided among many scrum teams the product owners, the scrum masters meet and they decide on the features that will be done and it is team and it is also called as a meta scrum.

We have been looking at various life cycle models starting with very intuitive classical model, classical waterfall model and then various waterfall based models, and then the evolutionary, and the incremental models, and some models based on those principles and then we were focusing and agile models. Now, let us start our discussion on the requirements analysis and specification.

(Refer Slide Time: 23:58)



This is a important phase in software development before we start discussing requirements analysis and specification. First let us try to answer the question that what is a requirement? A requirement, we can define as a capability or condition required from the system to be developed. A system typically consists of many capabilities and conditions. For example, if you are developing a library software, than the capability is maybe we can create books, we can create members, we can issue books return books and the conditions may be that to be a web based software and so on.

Let us see in more detail, but then we can define roughly that a requirement is a capability or a condition that is required of the system. A capability is a facility that the software provides to the users. For example, the users can issue book return book etcetera each of that is a capability of the software.

And, condition is not really a facility provided, but then it is more general purpose for example, it runs and it is a web based software so on. As, you proceed we will be able to make a distinction between the capability will understand what are the capabilities, how to identify? And, the conditions that are required from the system.

Now, let us see how to go about doing the requirements analysis and specification? What are the main activities that are involved to carry out requirement analysis and specification? The first work that needs to be done is to understand, what really the customer has in mind that is we will have to gather the requirements on the customer.

Hopefully the customer has all the requirements in their minds, we need to gather this by meeting the customer and using few techniques that we will discuss. And, then we need analyze what we have gathered from the customer, because as we gather the requirements it can have several problems in the requirements we will identify what are the problems and how to overcome them?

And, once we have got all the requirements and we have overcome all the problems in it, then we get down to requirement specification, that is document all the requirements, that have been gathered and all the problems that have been after all the problems in that have been removed, prepare the SRS document, which captures the requirement the SRS stands for software requirement specification document. And, as we will see it is a important skill how to write the SRS document?

We have to write in a form that subsequently captures all the requirements well organized. According to some accepted standards have requirement specification and the requirements up to the clear to the clients; by looking at the SRS document they should be able to check that it meets all the requirements.

And also the development team members it is a valuable document and by reading the SRS document they should be able to know, what is to be done? The SRS document development writing the SRS document is a very important skill.

In the next lecture we will see how to do requirement analysis and specification and how to develop the SRS document we will look at some case studies and based on that, we will see what are the issues how to go about doing the requirement analysis and specification.

Thank you.