Software Conceptual Design

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Lecture - 11
Using the Function-Behaviour-Structure Design Framework

So, last time we spoke about Function Behaviour and Structure. We discussed that functionalities are realized by various structures that interact with each other these interactions are termed as behaviours.

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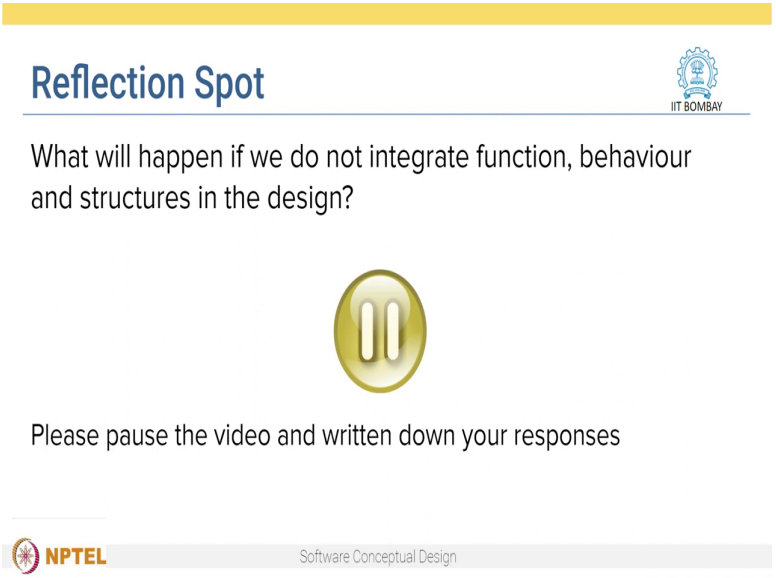

Yes, we also looked at the function, behaviour and structure elements of a mood based music player, but you also mentioned that we need to integrate the function, behaviour and structure. Why do we need to do that?

Yes, that is an important question. So, learners, what will happen if you do not integrate function, behaviour and structure? Pause the video write your answers in the notebook, and then continue.

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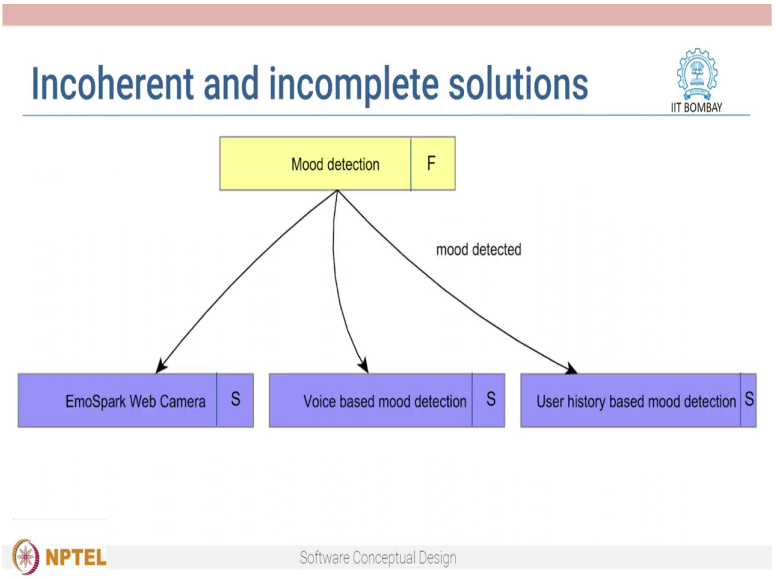

So, if you do not integrate function, behaviour and structure the design would be many solutions and incoherent. For example, mood based music player, if you had only focused on the functionality of mood detection, we would have created many solutions for achieving this functionality. This is not decidable.

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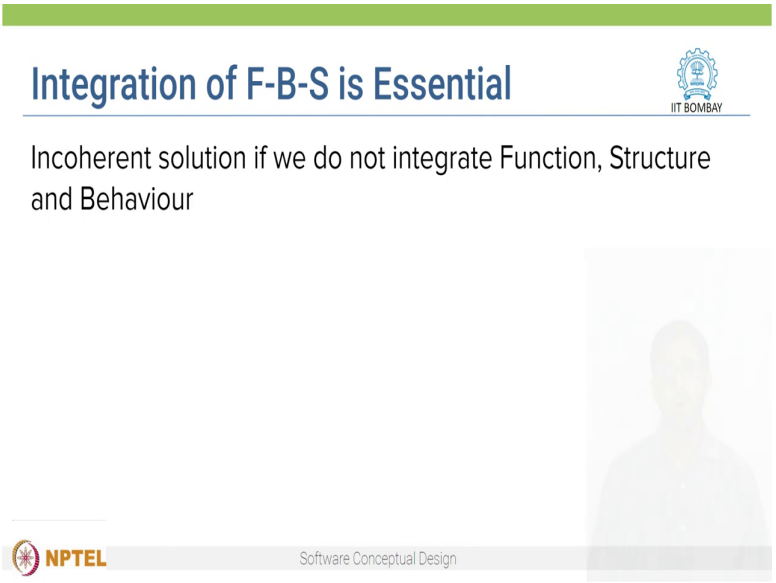

Ok. So we will have an incoherent solution if we do not integrate the function, structure and behaviour, but what are the benefits of integrating them?

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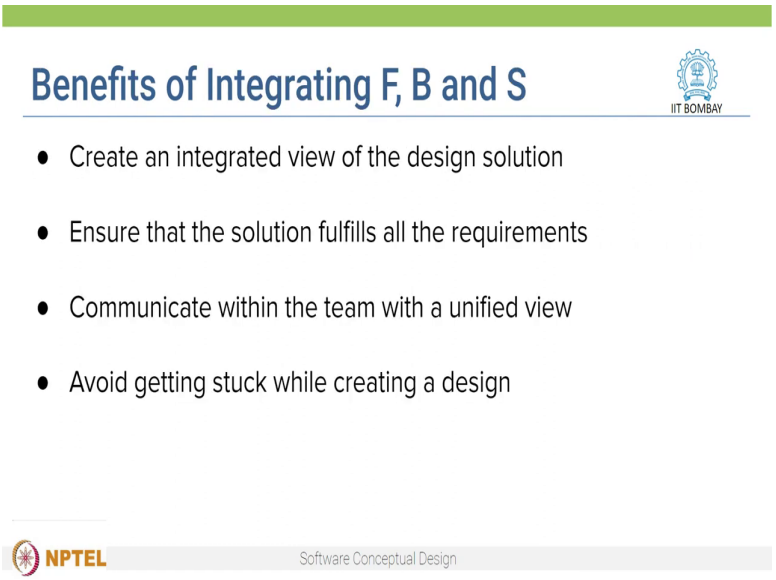

While creating conceptual design, it is useful to integrate function, structure and behaviour for the following reasons; it helps us create an integrated view of the design solution, we also can ensure that the solution fulfils all the requirements, this unified view can be used to communicate within the team and the various stakeholders, it is also a useful technique to avoid getting stuck while creating a design.

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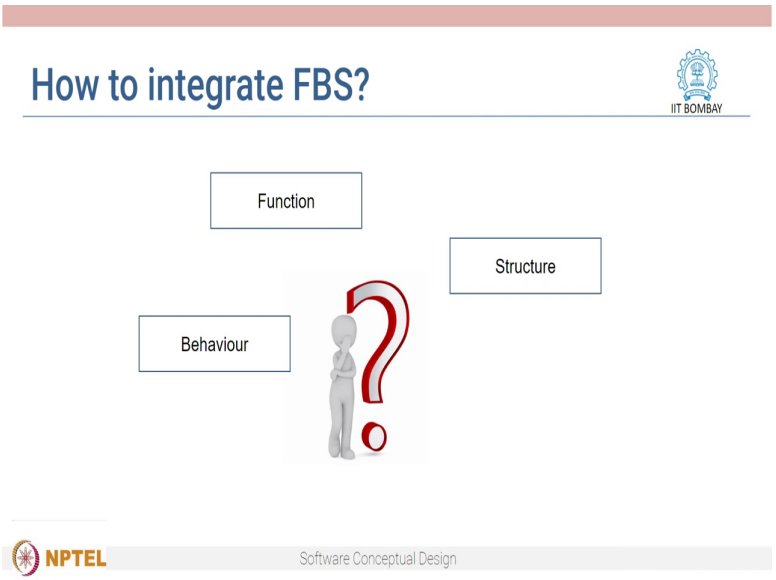

Ok. So, now, I have this individual FB and S. Now, how do I go about integrating the function structure and behavior?

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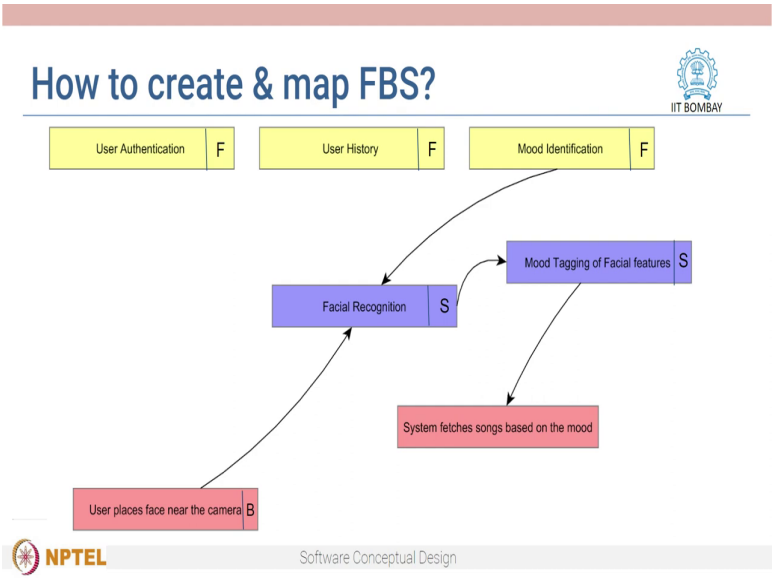

One way you could do is to start from known solution. For example, we know that there are cameras that can deduct mood automatically. These could be the structures in the designed solution. But we also need to evaluate if these structures are applicable in the current problem and adaptive. In the next step, we can start thinking in terms of end user as well as a system to generate behaviours.

For example, a user would place the camera to automatically start playing songs the system could fetch song lists based on a particular mood and so on and so forth. In the next step, we map all the structures that work together when a behaviour happens. In this way, we identify structures, behaviours and map them. The next step would be to identify how the structures and behaviours satisfy a particular requirement. So, now, we have identified structures, behaviours and functions and also mapped them.

Ok, so this looks something like a graph right?

Yes, it is called the Function Behaviour Structure - FBS graph. The nodes are the FBS links connect the FBS just like a graph you could start from any of the nodes F, B or S and move on to the next as you identify and connect them.

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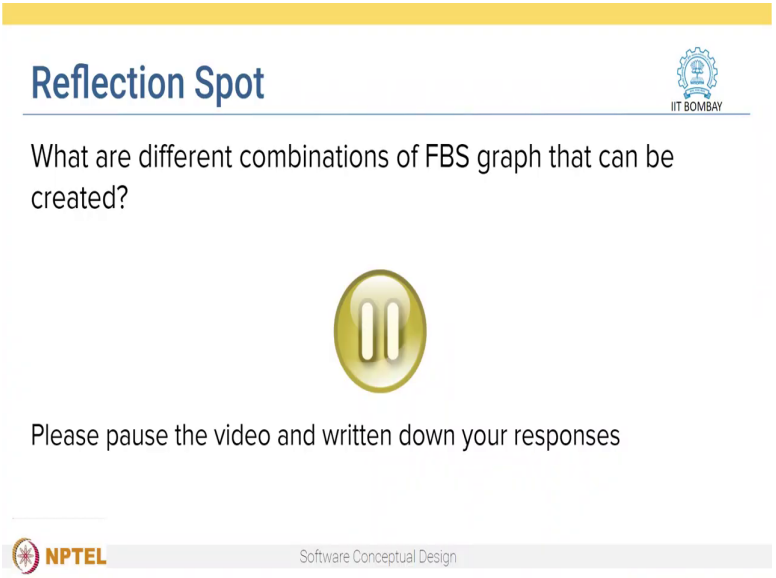

So, learners, here is a question for you, can you think of combinations of FBS graph and the kinds of graph that can be created? Pause the video write your answers in the notebook and continue.

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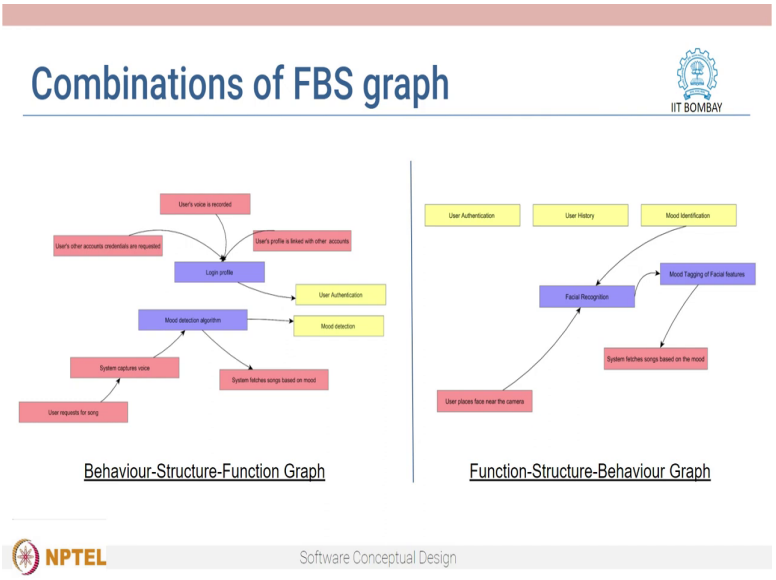

As you can see on the screen, there are combinations of the FBS graph, in this graph, the behaviours are mapped to the structures and then the function BSF. In other graph, functions are broken down and mapped to structures which are combined to different end-user behaviours FSB. So, there can be many types and kinds of FBS graphs.

Oh ok. So, there are many possible FBS graphs for a given problem, but how will I know if the graph that I have created is good enough?

That is a good question there is a checklist of things in to keep in mind to self evaluate a FBS graph.

Ok. That sounds interesting.

You know there is a learning environment where you could do all this, create a FBS graph and self evaluate it for different software design problems.

Really! well, that sounds like a very cool solution.

Yes, think and link is a learning environment where the learners are taken through the steps of creating the FBS graph as well as evaluating it.

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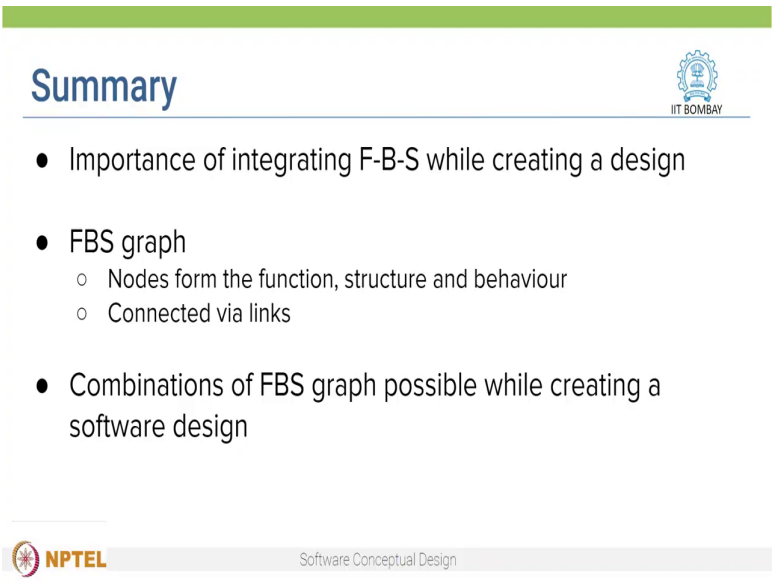

In this video, we saw the importance of integrating FB and S while creating a design. We also saw that one of the ways to integrate them is to create a FBS graph.

Yes, in an FBS graph, the nodes they form the function, structure and behaviour and these nodes are connected via links.

You also saw that there are many combinations and kinds of FBS graph possible for a software design problem. A checklist is available to self-evaluate the FBS graph. In the next

LeD, we will explore how to use think and link to create and self evaluate a FBS graph to various software design problems.