Software Engineering
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Risk Management

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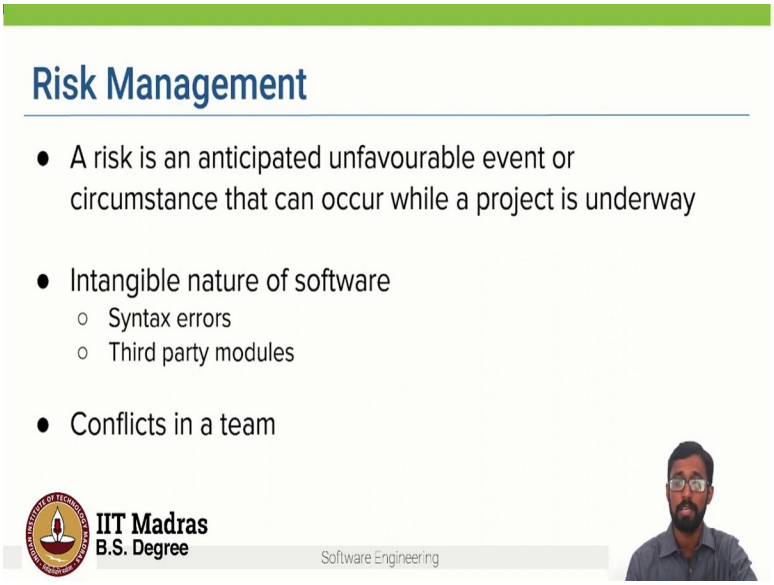

In the previous video, we looked at different ways in which we can create a schedule for a project. So, another aspect of project management is to identify and mitigate risks which can occur in our project. So, what is a risk? So, a risk is an anticipated unfavorable event that can occur while a project is underway.

So, it is anticipated because based on previous experiences, or particular characteristics of this project, we can anticipate that such a risk can happen. And it is unfavorable because these are things which can derail the project or maybe even cause the delays and even stop development of the entire project.

And in the case of software, the intangible nature of software also makes it difficult to identify risks because it is difficult to control something which we cannot see. So, let us take the example of building a house. So, we have a contractor or a construction manager who overlooks the entire construction. And he or she can see how the construction of the houses taking shape.

So, for example, setting the foundation, you add slabs, you add the frame, the roofing, interiors, painting, so in all these activities, these are visible to the manager, he can see how the construction is taking place and can assess the progress of the work as well as control. However, in the case of software, it is not often the case. For example, a simple syntax error can break an entire system.

And also, third party modules which we use, they can have certain vulnerabilities, or it might be outdated. And this can also delay the project. So, another thing to note is that software is built by people working in a team. And conflicts or disputes within the team can also cause delays, or disrupt software development.

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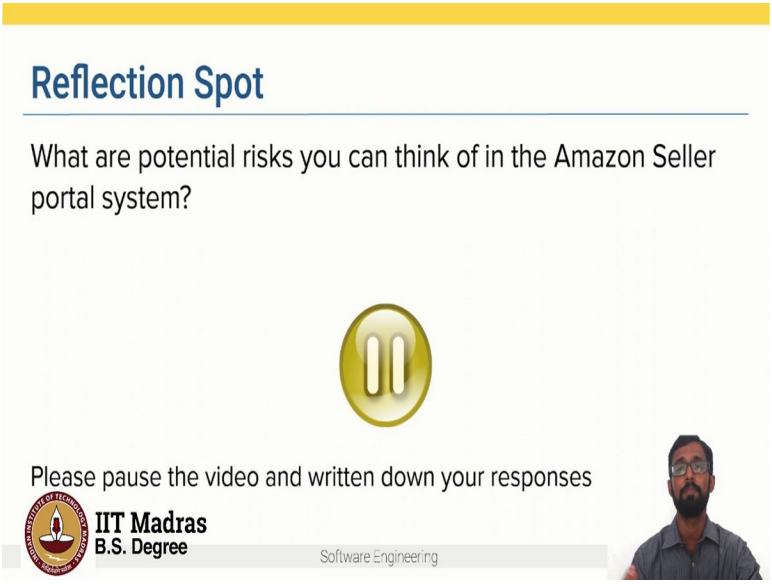

Now, that we have seen what risks are and why it is important to identify and mitigate risks. Let us reflect on what are potential risks in a system like the Amazon Seller portal. So, what do you think are potential risks or categories of risk in the Amazon Seller portal? You can pause this video and think of some potential risks before proceeding.

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So, many of you would have thought about risks related to the technical aspects of the project. And these risks are known as technical risk. And these kinds of risks occur due to the development team's insufficient knowledge about the product. And it can occur at any stage in the software development process in the requirement phase, the design, the implementation, testing or even the maintenance phase.

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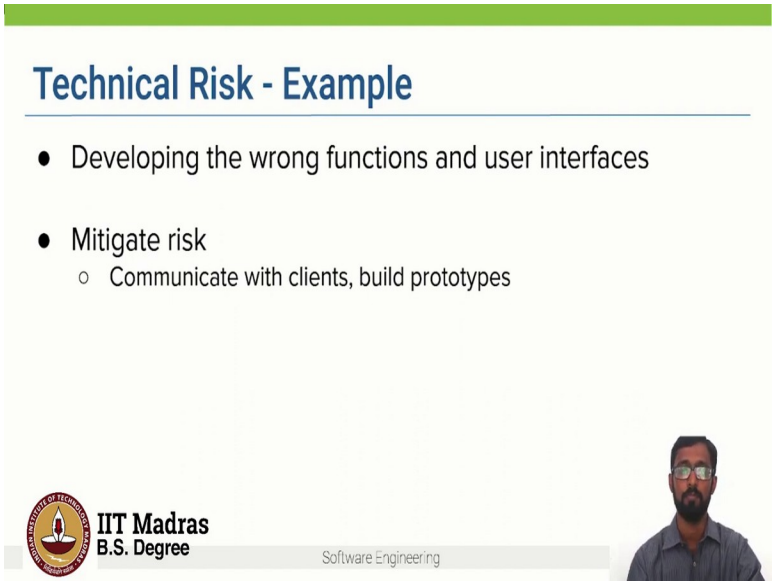

So, what are examples of technical risk? So, one is the team develops a wrong function or the user interfaces. And this can occur mainly due to ambiguous or incomplete requirements which we get from clients. So, how can we mitigate this risk? So, we have seen this earlier

also we need to communicate with clients or we build prototypes and get feedback from them so that we do not develop the wrong functionality or interface.

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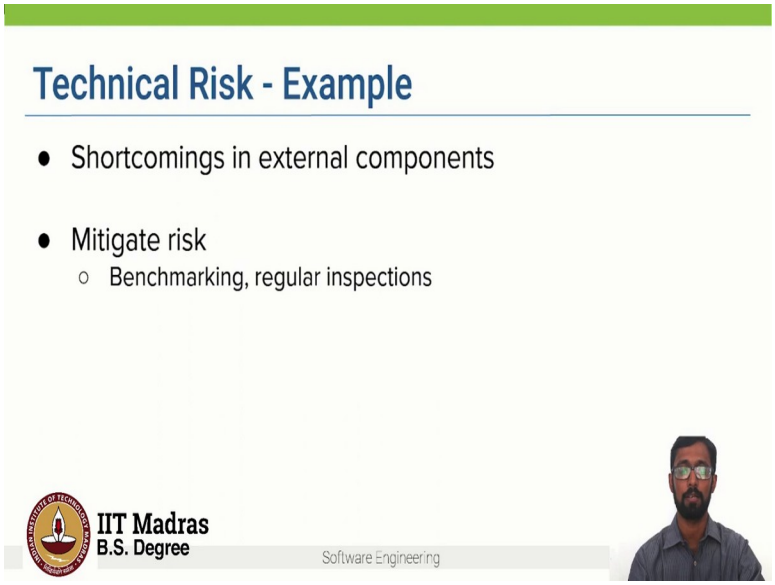

Another example of a technical risk is shortcomings in the external components. So external components are components which are built by a third-party vendor, and these might be buggy, it might not be up to the market, it might have certain vulnerabilities. So, how can we mitigate this risk? By benchmarking, by periodic and regular inspections to see that the module is up to the mark.

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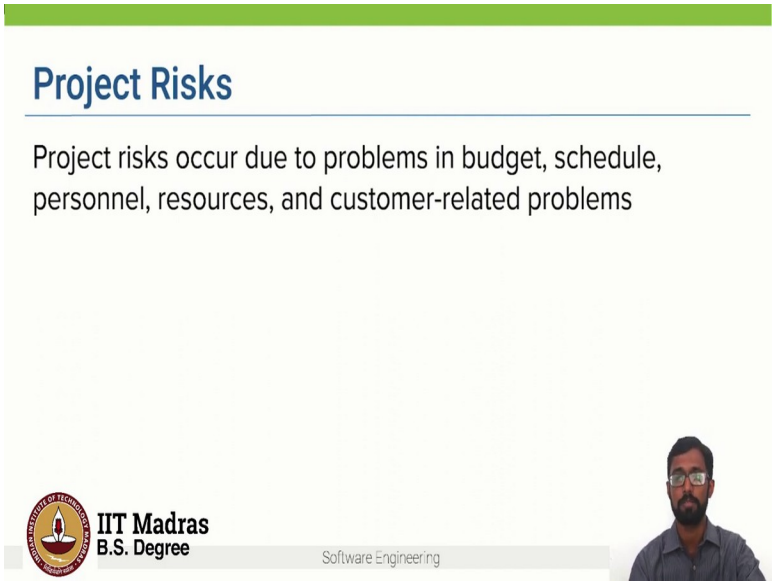

Now, the next category of risks are project risks. So, project risks occur due to problems in the budget, the schedule, personnel, resources or even customer related problems. So, all type of risks, which are non-technical can be categorized as project risks.

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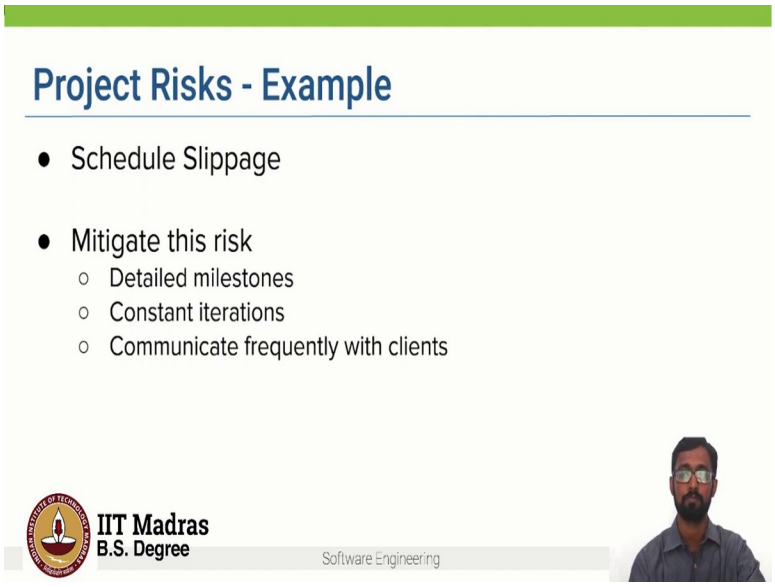

So, the most common risk is scheduled slippage, the project falls behind schedule. And how can you mitigate this risk? One is you create detailed milestones. So, we saw in the previous video about project scheduling, and we create detailed milestones in the schedule itself so that the entire team is aware of the different milestones. And we constantly iterate and we communicate frequently with the clients even if we are falling behind schedule.

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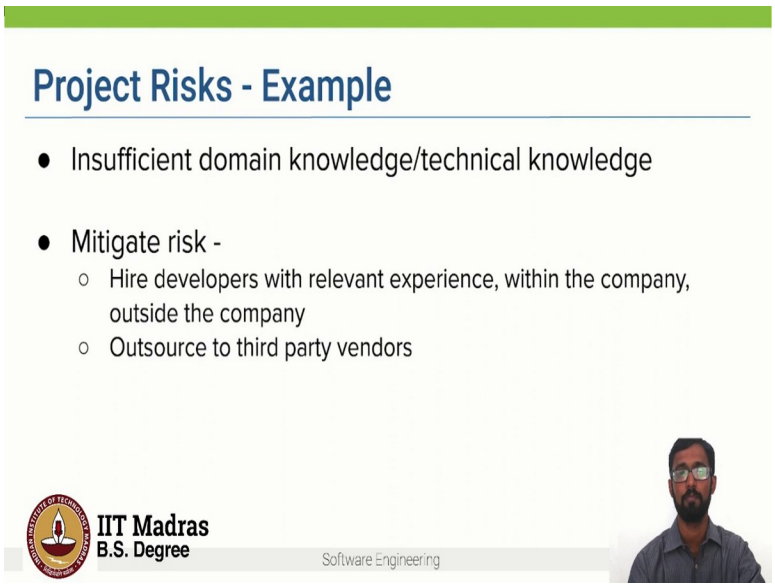

Another example of a project risk is insufficient domain knowledge or technical knowledge by members in the team. So, for example, in the Amazon Seller portal, maybe members of the team they would not have worked in an E-commerce application before. So, how do we mitigate this risk? Mainly by hiring, hiring the right kind of people with relevant experience, maybe within the company who are working in different projects or outside the company. And we can also outsource important modules to experienced third-party vendors as well.

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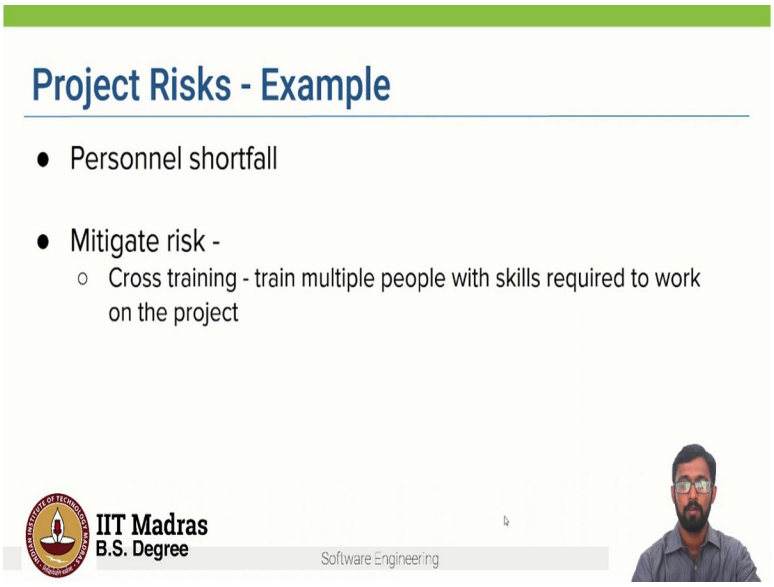

Another type of project risk is personnel shortfall. People might leave the project or organization in between. And how can we mitigate this risk? This risk can be mitigated by cross training, we train multiple people with skills which are required to work on the project. So, for example, in the Amazon Seller portal, maybe we make multiple people work on the payment gateway module. As it requires specialized knowledge, so it is good if multiple people work on that project.

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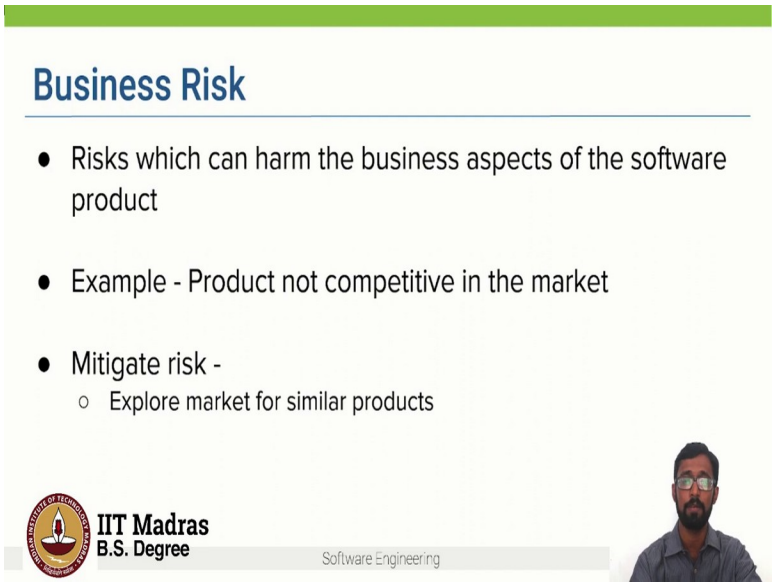

Now, another category of risks are known as business risk and these risks are risks which can harm the business aspects of the software product. So, for example, by the time the product is complete, maybe it is not competitive in the market, there might be other products which are doing much better. So, the way to mitigate this risk is to explore the market for similar products, address the gaps which are there in these products.

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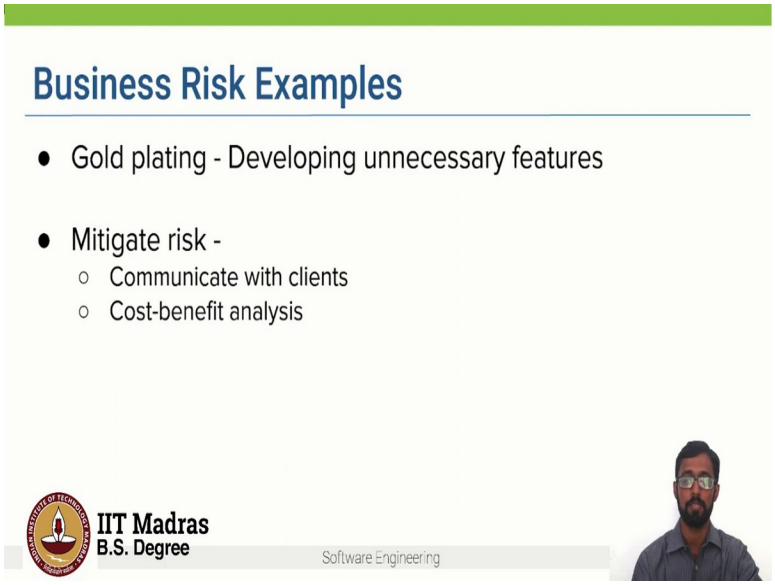

Another example of a business risk is gold plating. We develop unnecessary features, so the development team feels that there are some features which are very good, which are very nice

to have, even though the clients have not expressed the need of such a feature. And this is known as gold plating. And how can we mitigate this risk?

Again, we communicate with the clients to see if they really require this feature, and also do a cost benefit analysis, is the feature important, is it worth it, does it add value, does it satisfy the users' needs and based on this we make a decision.

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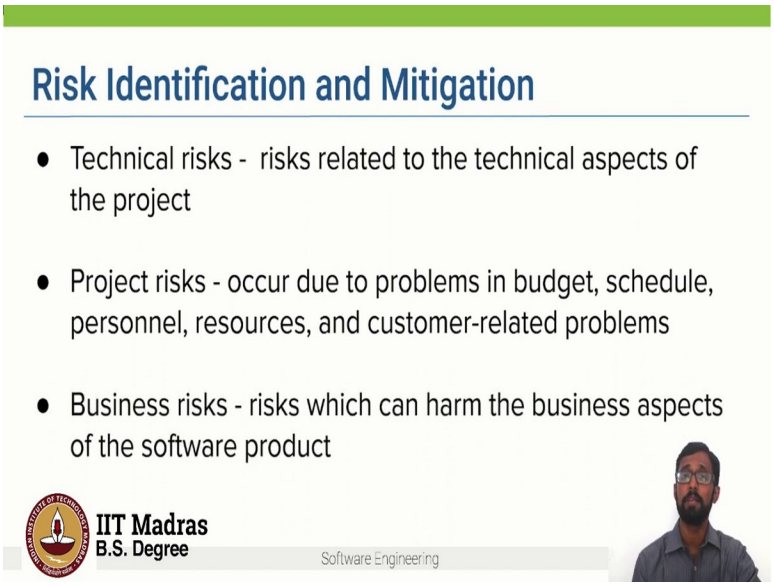

So, to summarize, we looked at several types of risks and how to mitigate them. We looked at technical risks, which are risks related to the technical aspects of the project. Then there are project risks which occur due to the non-technical aspects like budget, scheduling and other factors. And business risks or risks which can harm the business aspects of the software product.

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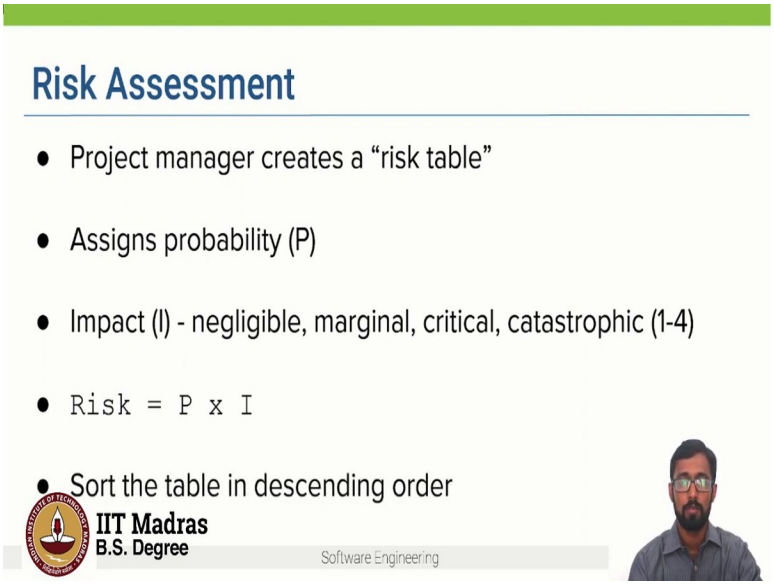

Now, another important aspect is to assess which risk have to be worked on. So, the project manager along with other team members, they come up with a set of risks for the project. So how do they do that? So, they ask everyone in the team for the worst-case scenario. And based on this, the project manager creates what is known as a risk table. And for each risk, the project manager he or she assigns a probability P from 0 to 100.

And what is the potential impact of this risk? So, if this occurs, is it a negligible risk, is it marginal is critical, or is it catastrophic, which can derail the entire project. So, what is the impact of that particular risk? And then, the risk is calculated for each of the identified risks by multiplying the probability with its impact. And then you sort the table in descending order, and then you decide which risks do you actually want to work on.

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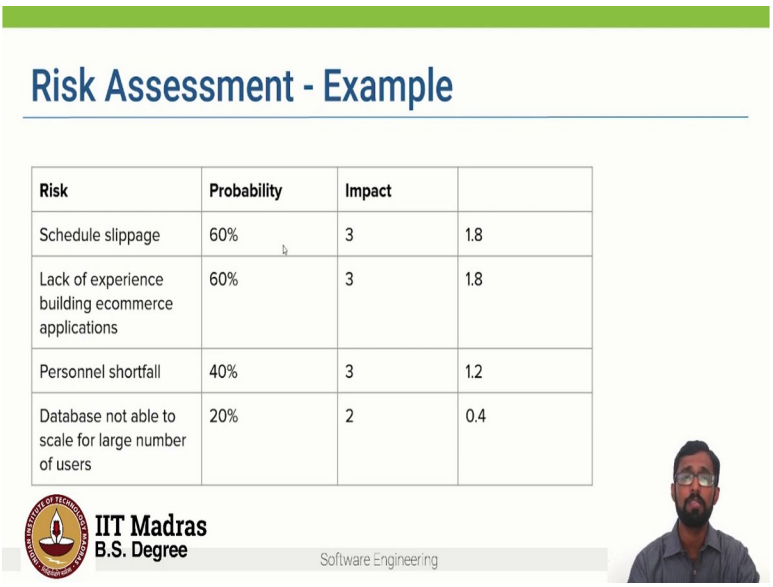

So, let us take the example of the seller portal. So, maybe as a project manager, I decide that schedule slippage, and lack of experience building ecommerce applications, these are serious risks and their impact is also high. And even personal leaving, although the probability I decided as a manager is slightly lesser, the impact is quite high.

Whereas another risk of the database not being able to scale for large numbers, the impact of that is less, and maybe the project manager believes that the team has sufficient technical expertise to mitigate this risk. So, based on, so the project manager identifies these risks, and then assigns a probability and an impact to each of them, and then sorts this table in descending order, and then the team or the manager decides which risks to actually work on.

So, you cannot work or anticipate all the risks which can happen in the project, but you focus on the most important ones. And then the project manager can decide to mitigate these risks by maybe creating milestones, by conducting regular meetings with the team and clients. And to mitigate the lack of experience, the manager will make sure that they hired the right people outside and within the company. So, in this way, we saw how we can identify, assess which risks are important and mitigate these risks as well.