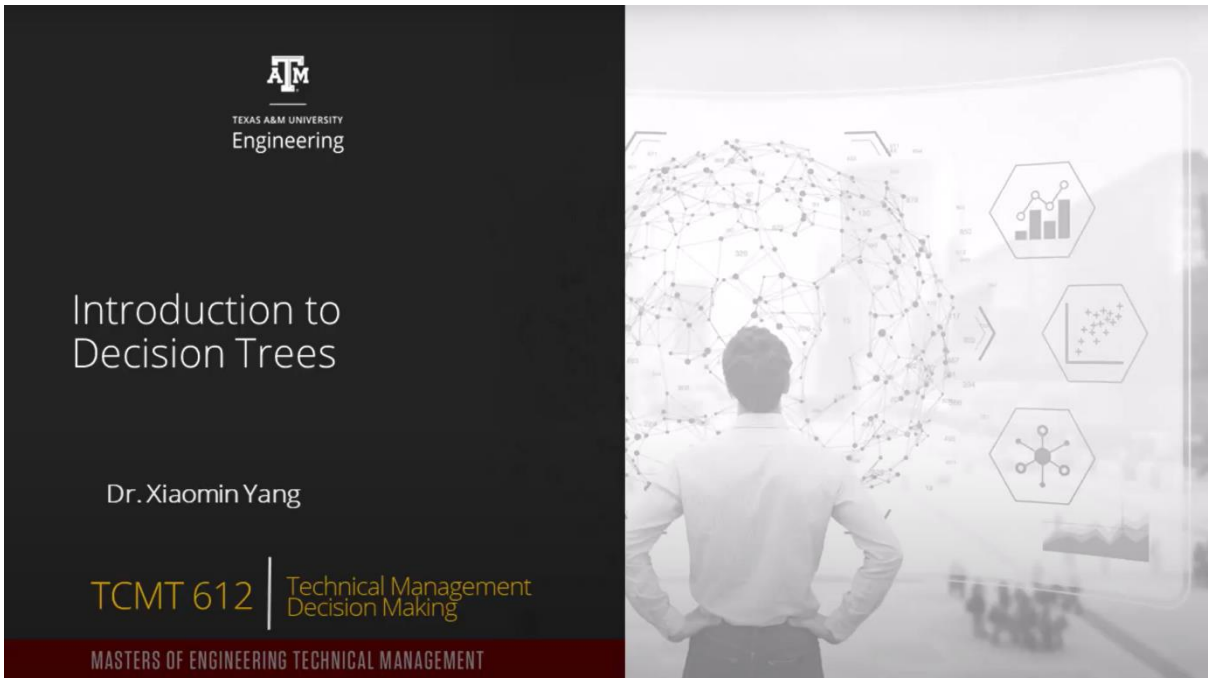
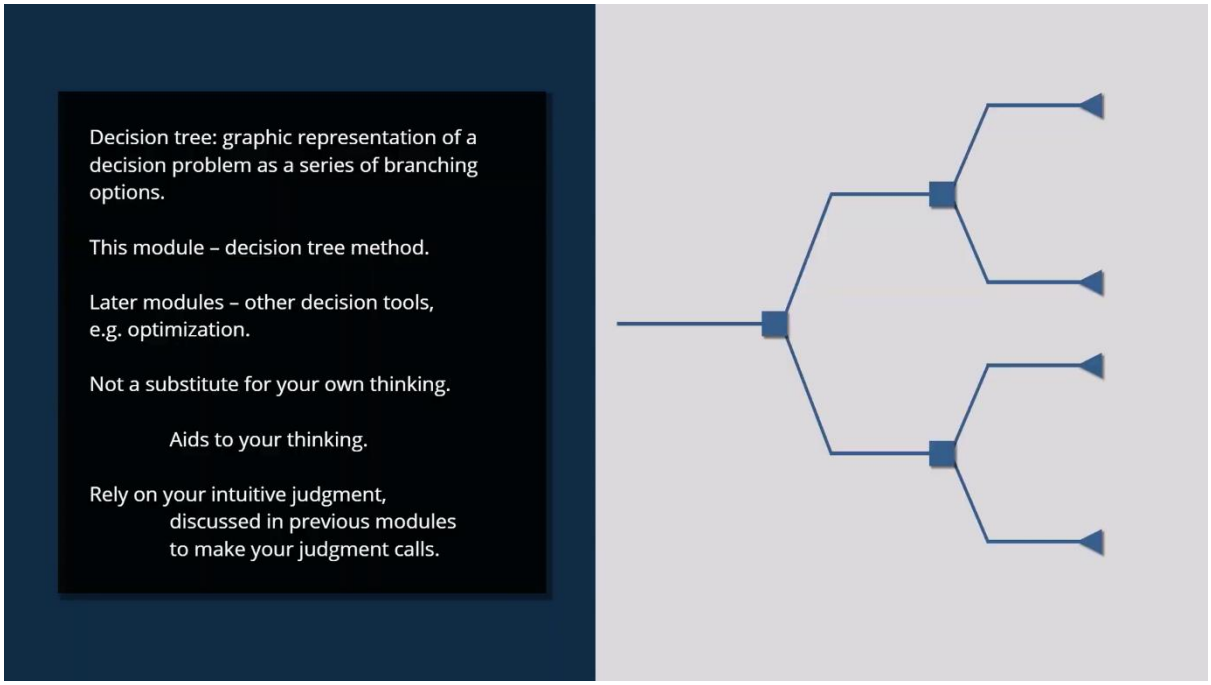
M4L6. Introduction to Decision Trees

Slide #1



Slide #2



The decision tree is a graphic representation of a decision problem as a series of branching options.

It is one of the support tools that can help us evaluate options.

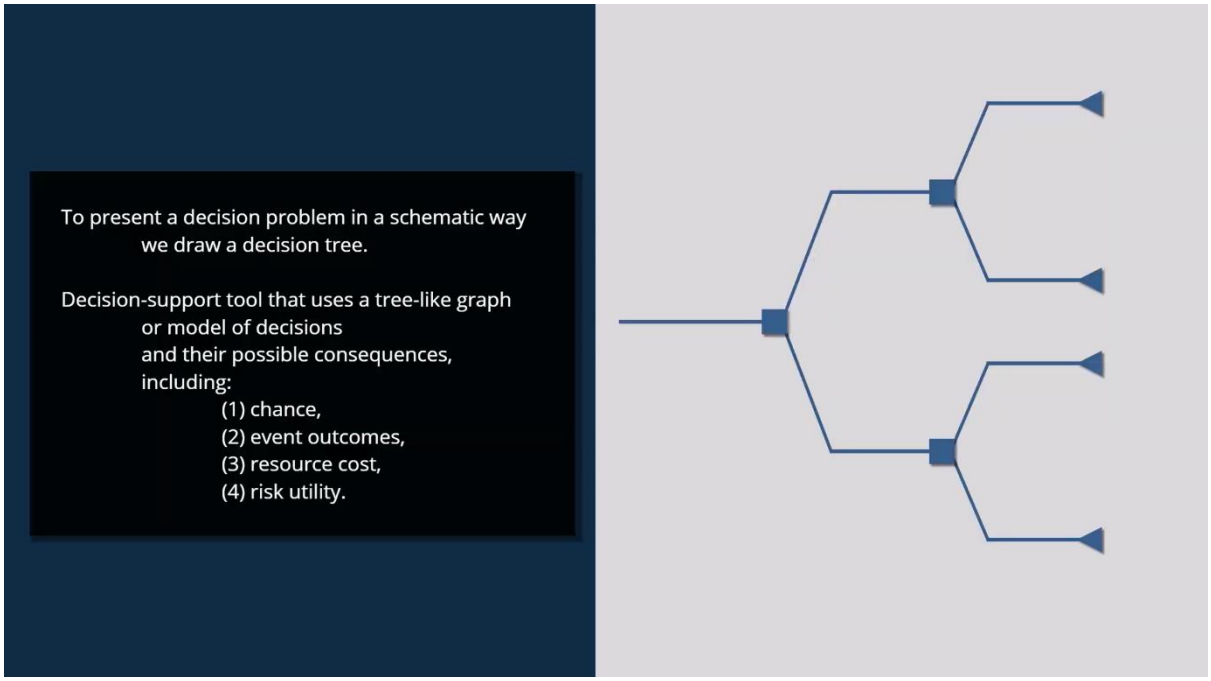
In this module, we will concentrate on the decision tree method.

In later modules of this course, we will discuss other decision tools, such as optimization.

As powerful as those tools are, they are not a substitute for your own thinking. Rather, they are aids to your thinking.

You will rely on your intuitive judgment that we discussed in previous modules to make your judgment calls.

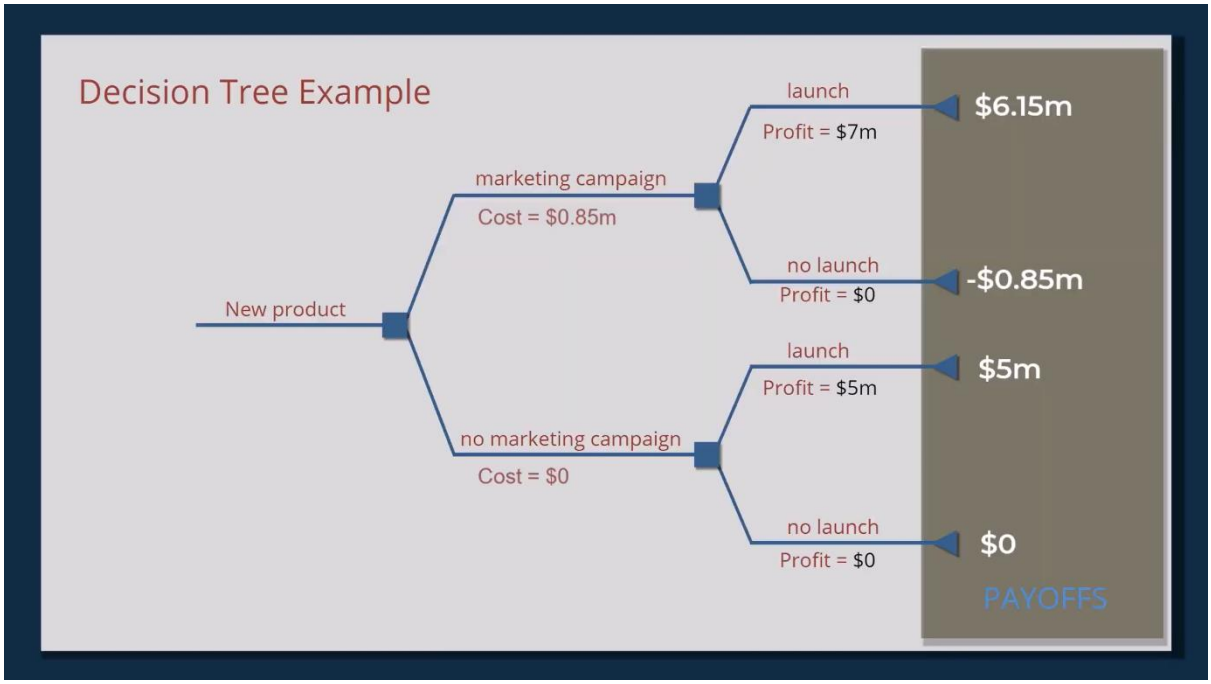
Slide #3



To present a decision problem in a schematic way, we draw a decision tree.

A decision tree is a decision support tool that uses a tree like graph or model of decisions and their possible consequences, including chance, event outcomes, resource cost, and risk utility.

Slide #4



An example is as follows.

It represents the following decision problem.

A company is considering producing a new product.

Prior to launching the product, the firm can conduct a marketing campaign or not. Suppose that a marketing campaign costs 2.5 million dollars.

Suppose that if the product is marketed and launched, it will generate a profit of 7 million dollars without counting the marketing cost.

If the product is marketed but not produced, it will generate no revenue and no production cost, so the profit will be zero.

If the product is not marketed but produced, it will generate a profit of five million dollars.

Finally, if the product is neither marketed nor launched, then the profit will be zero.

A decision node indicates that the decision maker has a decision to make.

The alternatives available to him at that decision node are represented by the branches that originate from the right side of the decision node.

For instance, the firm must decide whether to launch the product.

At the end of the tree are the consequences or payoffs from the sequence of decisions.

Payoffs are expressed in terms relevant to the decision maker's goal.

Here the goal is to make money, so they are represented in monetary terms.

Having represented a decision problem by a tree, the next step is to solve it.