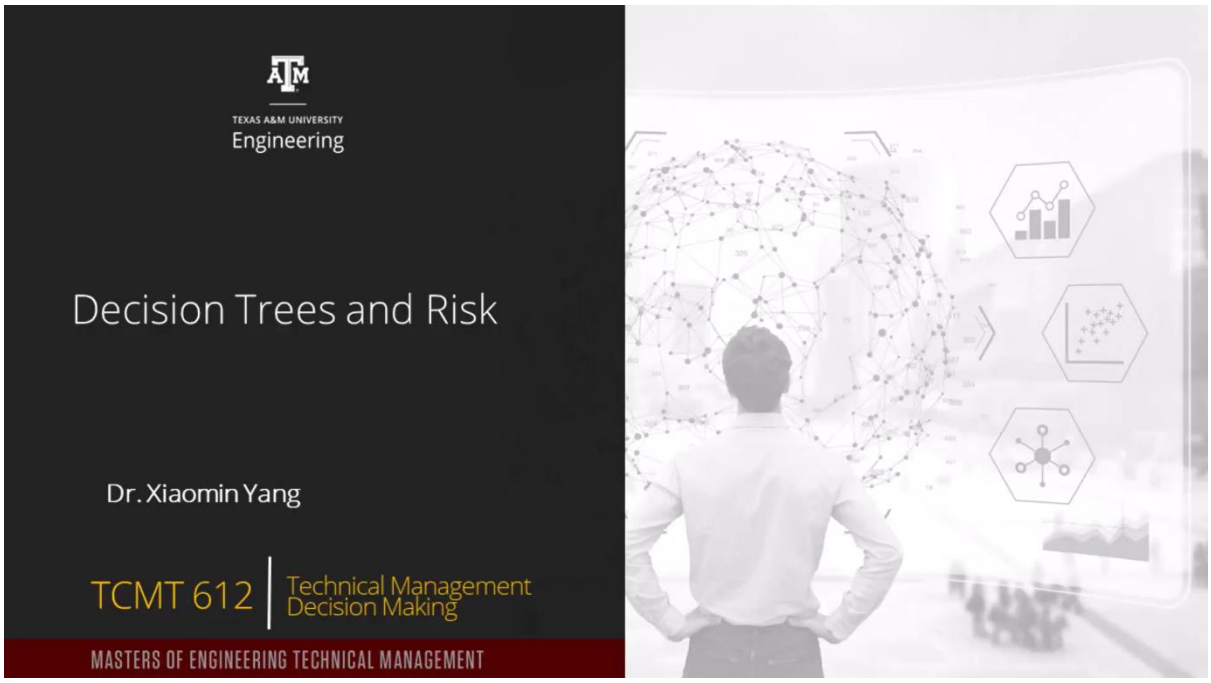
M4L14. Decision Trees and Risk

Slide #1



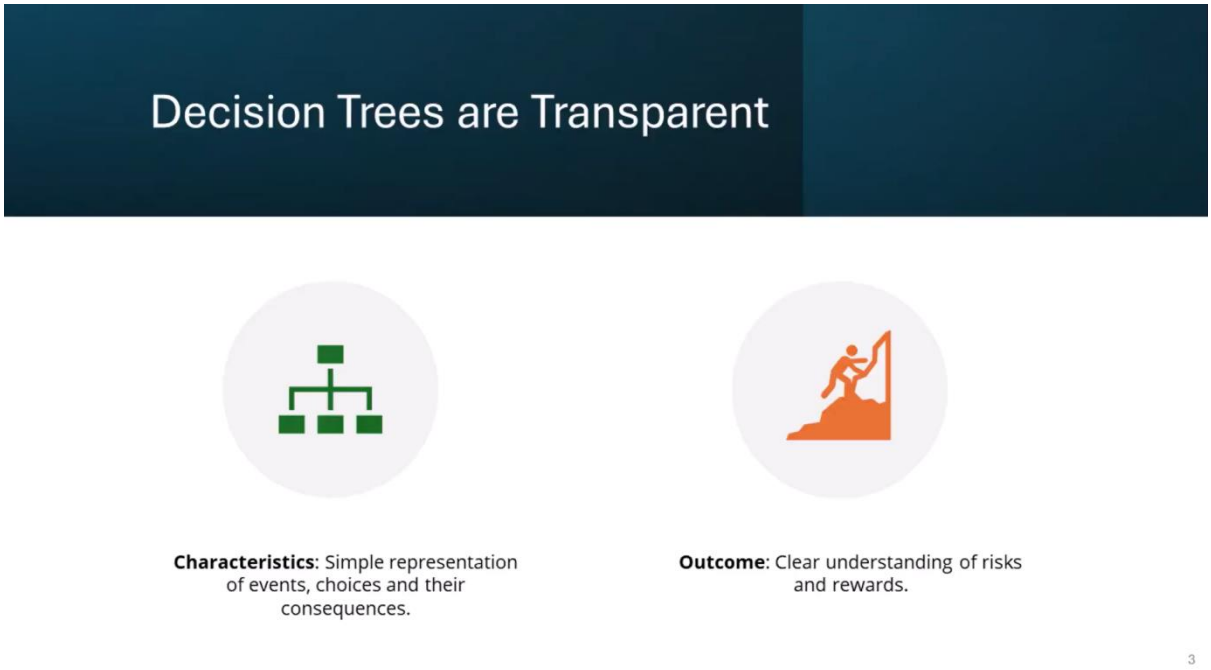
We will discuss the use of decision trees for business decision making, including the advantages of the method and the incorporation of human risk tolerance. into decision trees.

Slide #2

The decision tree method stands out as a powerful tool for decision making in business due to several key advantages.

Let us reiterate the advantages of decision tree method, its capacity to visualize decision options and assess expected value empowers managers to navigate uncertainties and capitalize on opportunities effective lies on opportunities effectively.

Slide #3



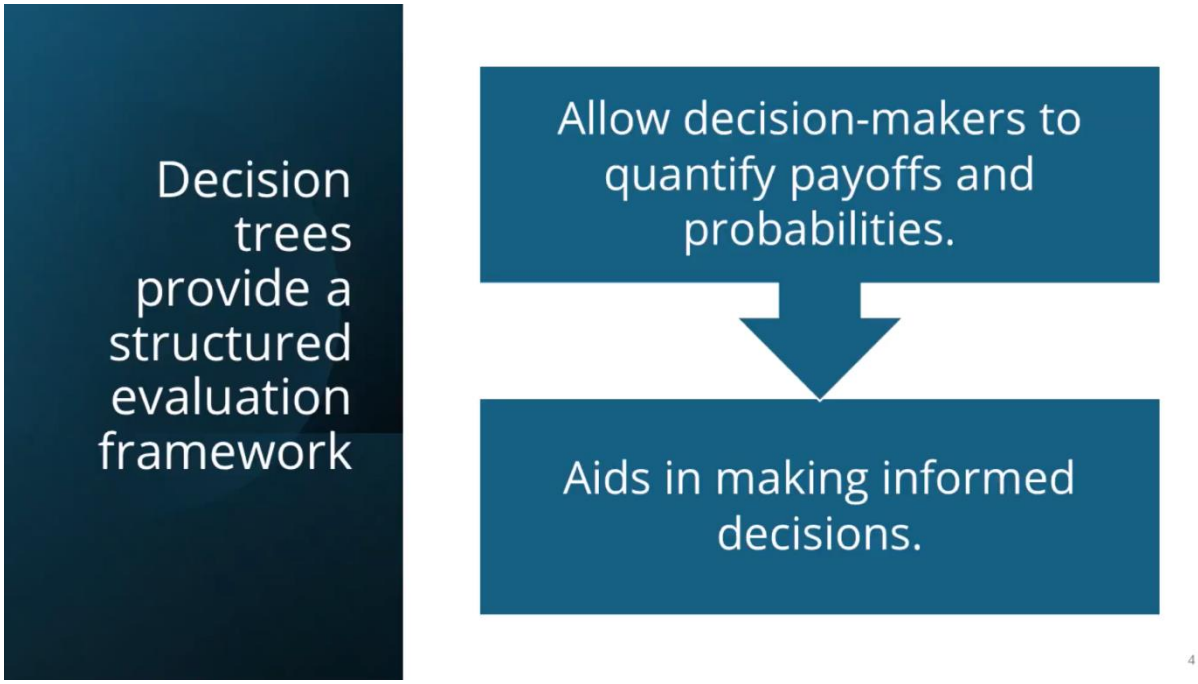
Firstly, decision trees are transparent.

These graphical models clearly lay out events, choices, and their consequences in a straightforward manner.

For instance, a retail company deciding whether to expand into a new market can visualize various outcomes like market acceptance and profitability based on different decisions made at each branch of the tree.

This transparency helps managers and stakeholders understand the potential risks and rewards associated with each option before committing resources.

Slide #4



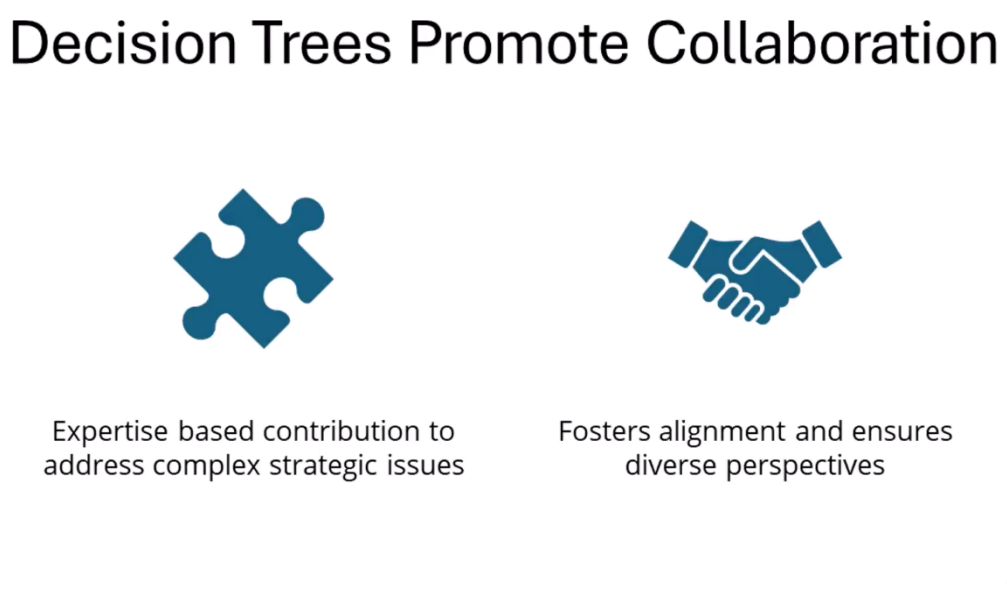
Secondly, decision trees provide a structured evaluation framework.

They allow decision makers to quantify payoffs and probabilities associated with different outcomes directly on the tree.

This structured approach aids in making informed decisions based on data rather than intuition alone.

For example, a manufacturing firm considering investment in new technology can use a decision tree to weigh the costs against potential productivity gains, incorporating probabilities of success and market conditions.

Slide #5

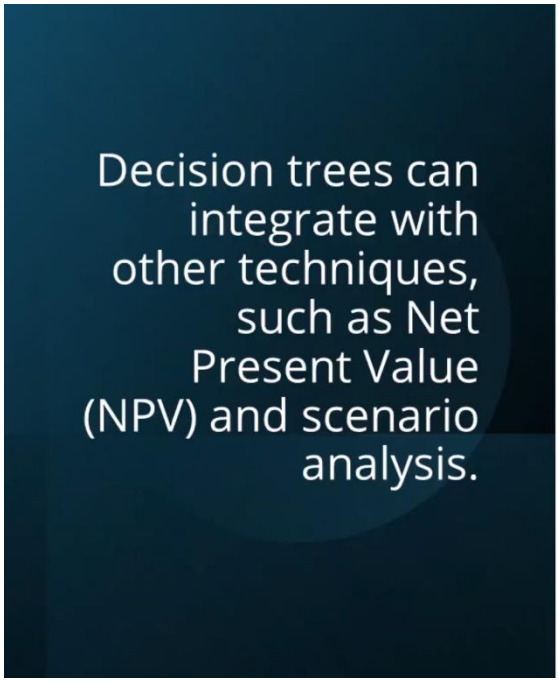


Furthermore, decision trees promote collaboration within organizations.

Different departments can contribute their expertise to create comprehensive decision trees that address complex strategic issues.

This collaborative approach fosters alignment across organizational levels, ensuring that decisions reflect diverse perspectives and strategic goals.

Slide #6



Prioritizing drug development projects based on financial feasibility and market potential.

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Moreover, decision trees are flexible and can easily integrate with other decision making techniques.

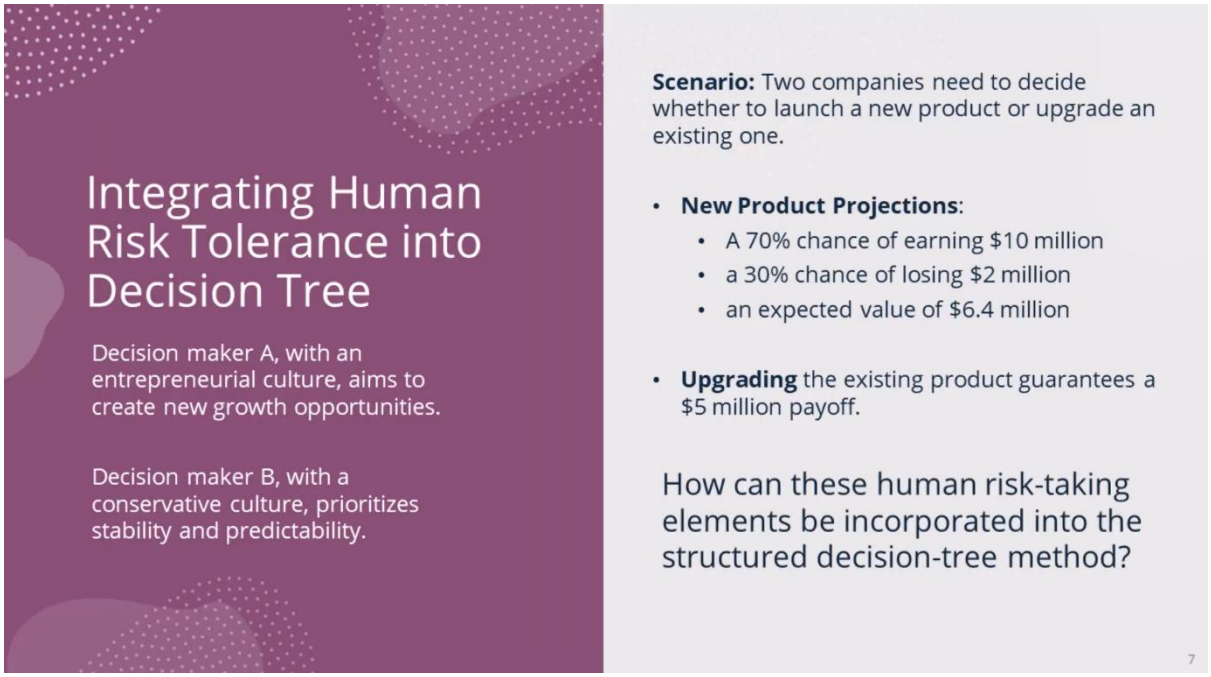
Techniques such as net present value or scenario analysis can be applied within the decision tree framework to enhance evaluation accuracy.

This integration enables comprehensive analysis of various scenarios, helping businesses choose optimal strategies.

For instance, a pharmaceutical company using decision trees alongside NPV calculations can prioritize drug development projects based on both financial feasibility and market potential.

The decision tree methods transparency, structured evaluation framework, support for collaboration, and flexibility in integrating with other techniques make it an invaluable tool for businesses aiming to make well informed decisions in dynamic environments.

Slide #7



Incorporating human risk-taking psychology into decision tree analysis is a collaborative approach that merges objective data analytics with a decision maker's emotional attitude towards risk.

This method is particularly valuable when dealing with decisions that have significant consequences, especially those affecting individuals, as it accounts for the variability and potential impact of different outcomes beyond just their short-term financial return.

Consider a scenario where two companies need to decide between launching a new product or upgrading an existing one.

The new product offers a 70% chance of earning 10 million dollars and a 30% chance of losing 2 million dollars, resulting in an expected value of 6.4 million dollars.

In contrast, upgrading the existing product guarantees a 5 million dollar payoff.

decision maker in Company A, with an entrepreneurial culture, aims to create new growth opportunities.

On the other hand, decision maker in Company B, with a conservative culture and a cost leadership strategy, prioritizes stability and predictability.

Despite having the same expected value, these decision makers are likely to make different decisions due to their distinct competitive advantages and risk appetites.

How can these human risk-taking elements be incorporated into the structured decision tree method?

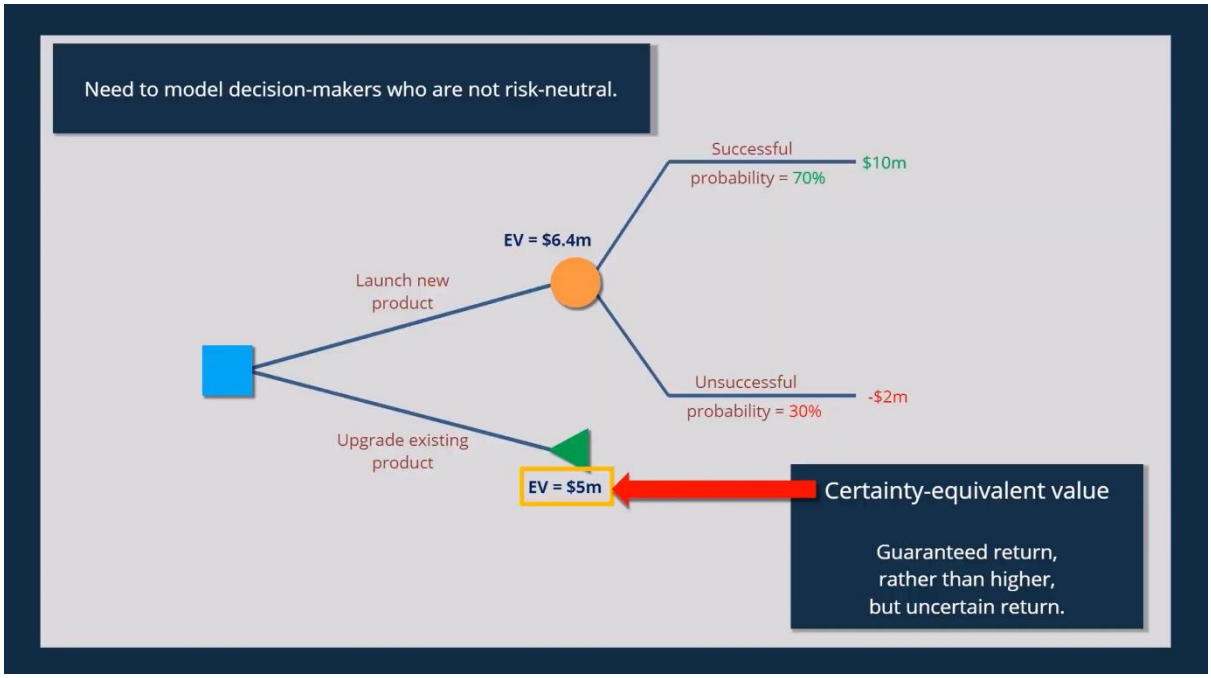
Slide #8

Let us first talk a little bit about the people's risk profiles, the manager's attitude toward risk.

People in an organization have different attitudes toward risk.

This YouTube video demonstrates human beings risk tolerance behaviors.

Slide #9



Consequently, we need some way to model decision makers who are not risk neutral.

We can use the concept certainty equivalent value to measure a person's risk preference.

Certainty equivalent value is a guaranteed return that someone would accept rather than take a chance on a higher but uncertain return.

For instance, in the product decision case, if a decision maker would accept 5 million dollars to upgrade an existing product, rather than choose a new product with uncertainty, his certainty equivalent is five million dollars.