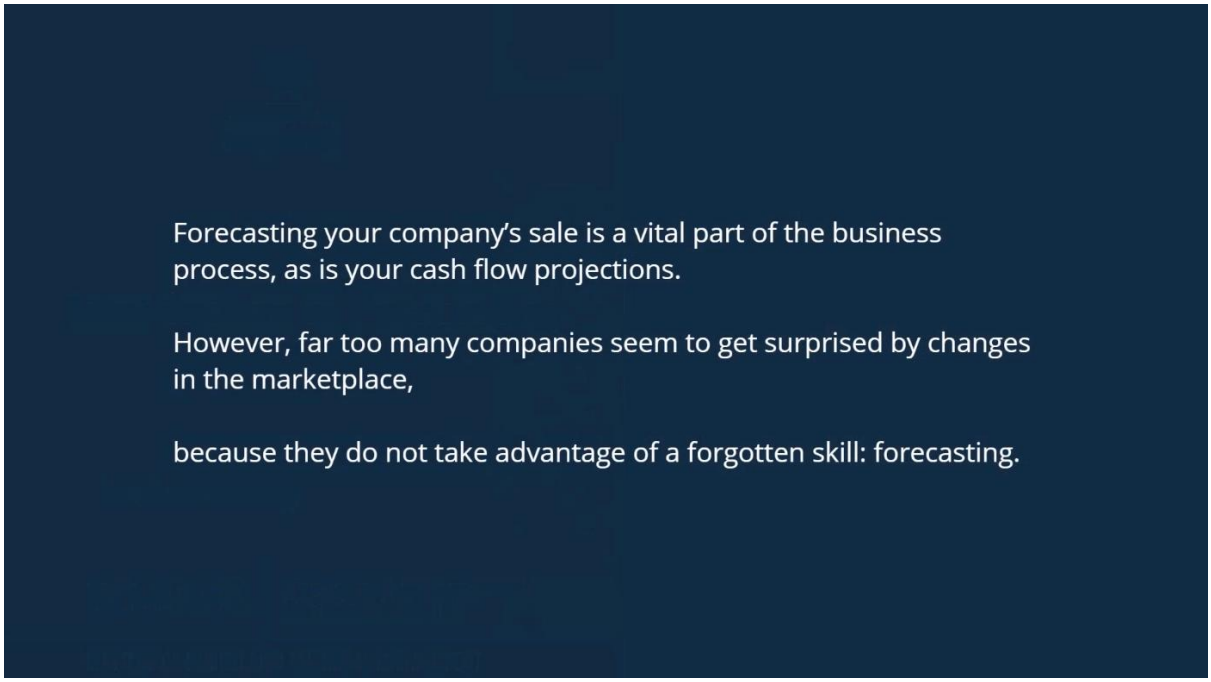
M6L1. Introduction to Forecasting

Slide #1

In this topic, we will discuss the forecasting of a company's sales.

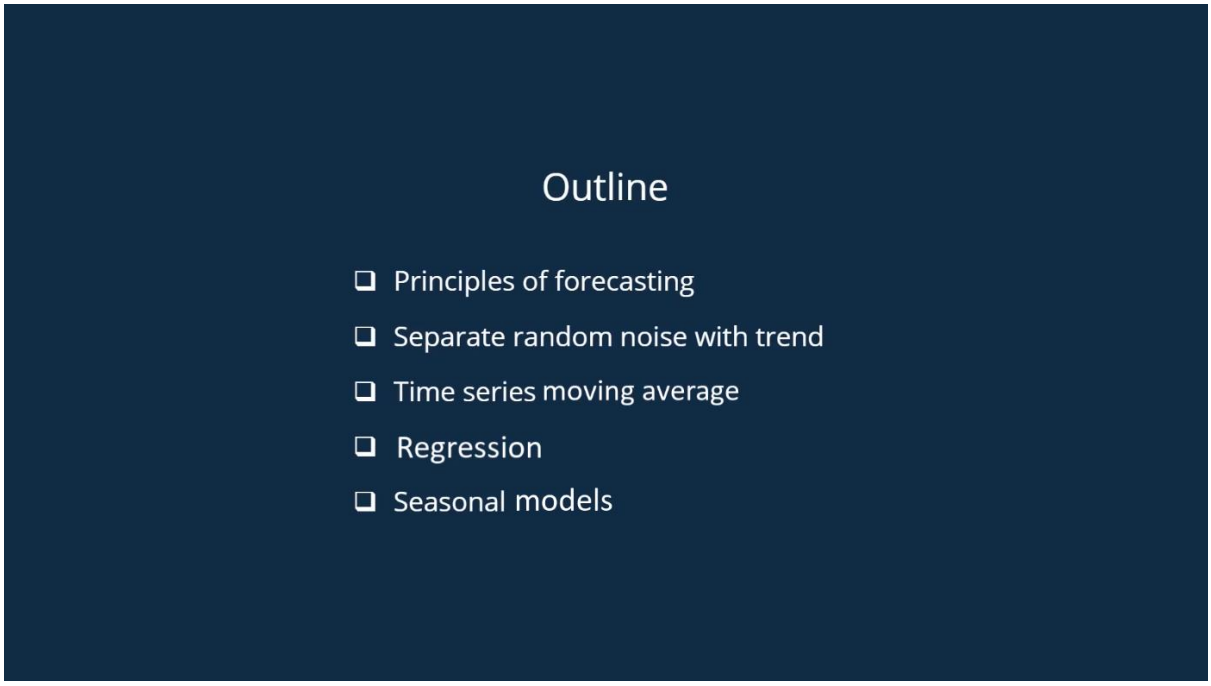
Slide #2



Forecasting your company's sale is a vital part of the business process, as is your cash flow projections.

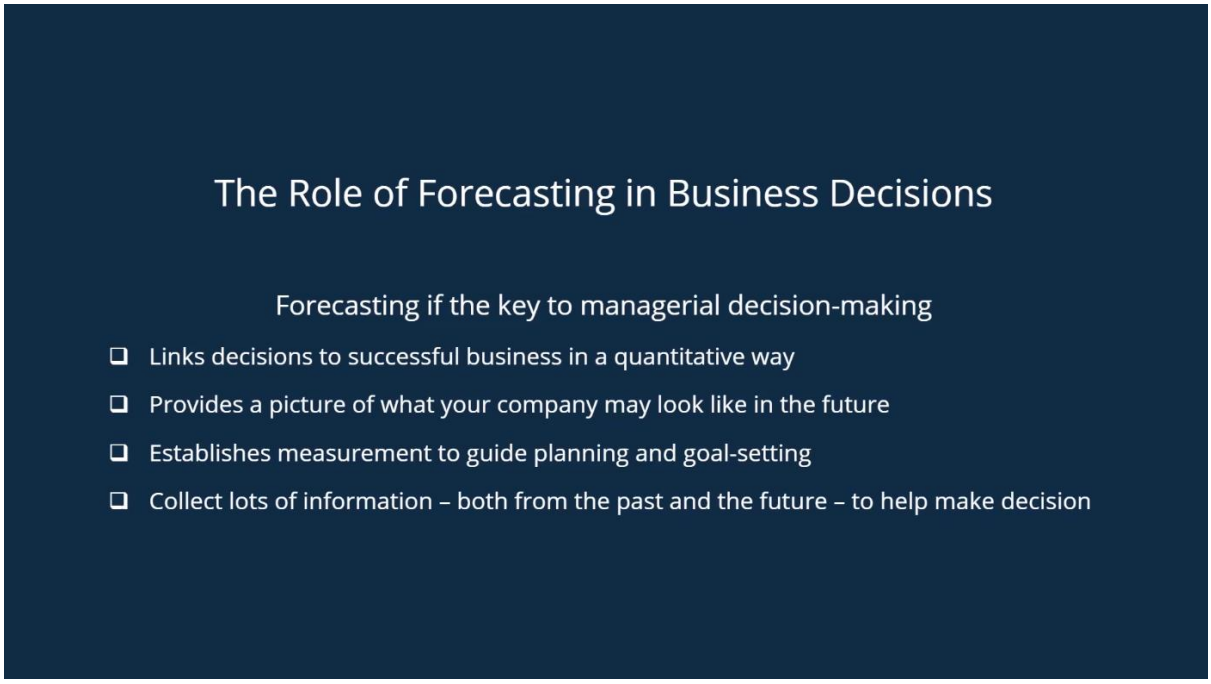
However, far too many companies seem to get surprised by changes in the marketplace because they do not take advantage of a forgotten skill, forecasting.

Slide #3



In this module, we will discuss the principles and risks associated with forecasting, followed by some quantitative forecasting methods, such as runs tests to separate random noise with trend, moving average time series techniques to make a short-term forecasting, and regression analysis for long-term trend analysis, as well as seasonal models to make accurate forecasts of long-term seasonal effects.

Slide #4



Forecasting is the key to managerial decision-making.

First, forecasting links decisions to successful business in a quantitative way. Forecasting is one of the most powerful quantitative methods for assisting with business decisions. Successful business decisions rely on quantitative forecasting methods to narrow possibilities and help predict what options will have the greatest chance of success. Whether you are making a purchase decision, or a marketing decision, or a financing decision, it is essential to obtain an accurate picture of what will happen in the future to assist in the decision-making process.

Second, forecasting provides a picture of what your company may look like in the future. The ultimate goal of forecasting is to come as close as possible to an accurate picture of the future. Forecasting can be broadly considered as a method or technique for estimating many future aspects of a business or other operational activities of the business.

Third, forecasting establishes measurement to guide planning and goal setting.

Planning for the future is a critical aspect of managing any organization. The long-term success of an organization is closely tied to how well the management of the

operation is able to foresee its future and to develop appropriate strategies to deal with likely future scenarios.

Fourth, a good forecasting process will enable an organization to collect lots of information to help make decisions. To supplement managers judgment, forecasters rely on a variety of data sources and forecasting methods. For instance, the forecaster may employ statistical techniques for analyzing sets of historical data. The best forecast gets as many people as possible from the company involved. Those people are managers, salespeople, financial analysts, business intelligence specialists, and so on.

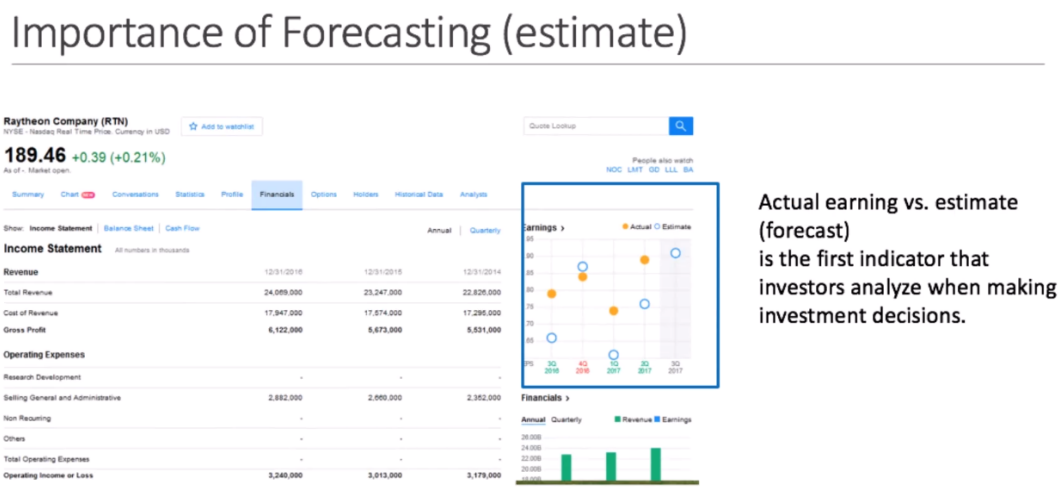
The use of forecasting information is a foundation for decision making. Information will increase the business decision's reliability.

A common mistake is leaving the job of forecasting to managers.

It is prudent to involve everybody in an organization in the forecasting process.

So the best practice is to get as many people as possible from your company involved in the forecasting process and involved in the data collection and interpretation.

Slide #5



To illustrate the importance of forecasts to a company, I took a snapshot of the financial performance information of a company from the Yahoo Finance website.

Basically, this set of data represents the most important information of a company.

The left side includes forward real financial statement parameters, such as the revenue, operating expenses, and so on.

Note that the top chart at the right side is actual earning versus estimate.

It is one of the two most important financial performance charts shown on the summary page of a company.

Actual earning versus estimate is the first indicator that investors analyze by making investment decisions.

They measure accurate results against the forecast to judge the executive's capability of executing the company's business plan and create value in a competitive environment.

A successful business executive is a forecaster first.

As a manager, you must first do your forecast right so that you can make the right decisions to meet the expectations.

The key point I want to make here is your management and your investors are judging your performance based on how well you execute your business plan to meet the forecasted estimate.

If you do not do your forecast correctly, then you are setting yourself up for failure.

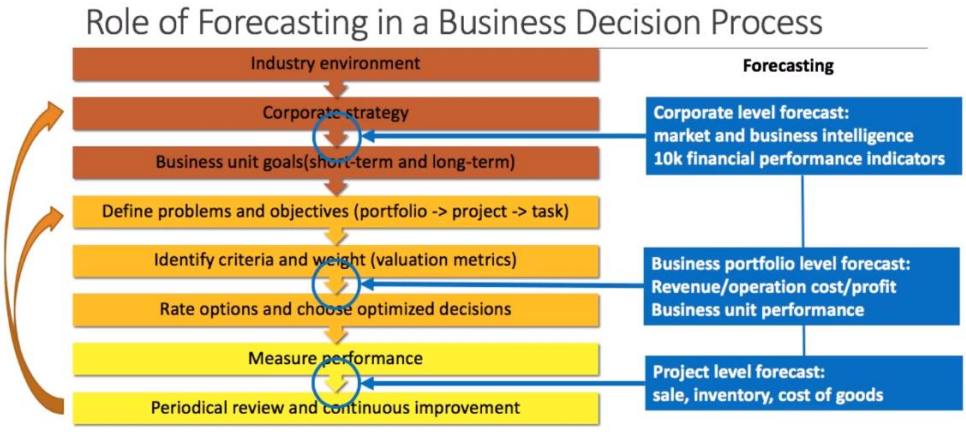
On the other hand, if you do the forecast right, you will be able to achieve what you promised to the investors, to your management.

So forecasting is the foundation of your performance.

You want to build everything else on the right foundation.

That means you want to do forecasting right.

Slide #6



This flowchart shows the different levels of forecasting and where the forecasting data is incorporated into the business decision making process.

First, corporate level forecast focuses on the overall market and business intelligence.

The forecast is typically performed by the chief financial officer of a company, and the forecasting results are presented in the company's annual report, form 10-K.

The corporate level forecasted data will be used by the top executives of a company to decide on the selection of business objectives for a corporation and for different units of the organization.

Second, business unit level portfolio level forecast aims at generating a company's future view of revenue operation cost and profit.

That information typically is reported on the business unit's financial performance report.

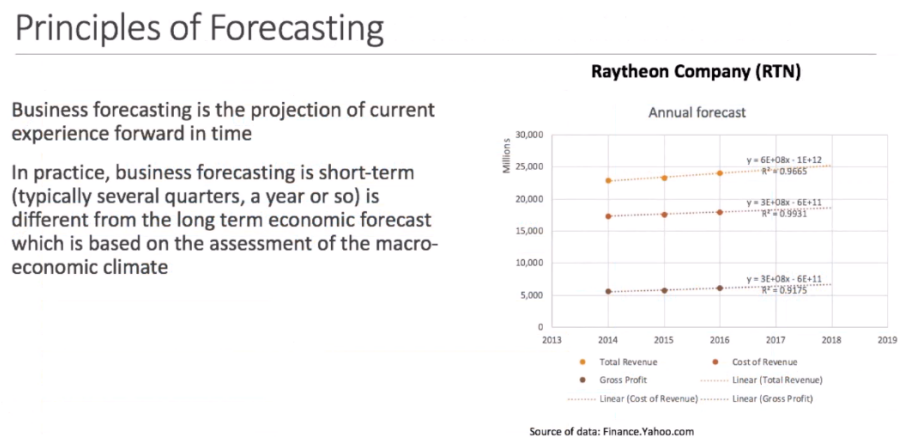
The economic data will be incorporated into the portfolio evaluation that senior managers can rely on to choose options to maximize business value and minimize the operating risk.

For example, the data of decision trees comes from the business level forecasting.

The third, project level forecast predicts future sale, inventory, cost of goods, and so on.

Project managers use the project level forecasting data to manage the performance of their projects and adjust their decisions accordingly to minimize execution risk of their project.

Slide #7



Forecasting is a serious business. The performance of a manager is judged based on their capability of executing plans against the targets which come from forecasting. In principle, you manage what you can measure and forecast.

Companies' executives are held responsible for meeting and exceeding the financial forecasting. Business forecasting is the projection of your current experience forward in time. For example, if sales have increased by 10% each year for the past four years, our forecasts of the expected sale increase next year is 10% or more.

In practice, business forecasting is short-term, typically several quarters or a year or so, which is different from the long-term economic forecast, which is based on the assessment of the macroeconomic climate.

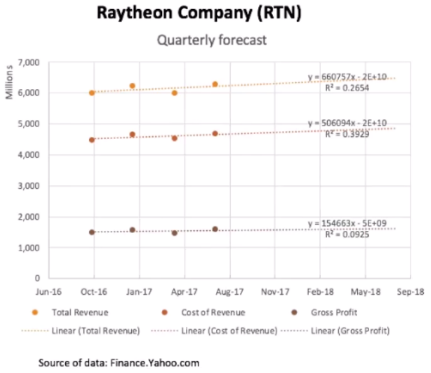
In forecasting, it is difficult to predict those economic and political conditions which are completely outside the control of a company. So business forecasters need to project a company's future performance based on historical trends and predictable future events or conditions. We need to leave those long-term forecasts to the economists.

Slide #8

Principles of Forecasting (cont.)

Forecasting is an integral part of company planning and performance management process

For managers who use forecasting in decision making, must understand the business implications of items to be forecast and forecasting techniques



Source of data: Finance.Yahoo.com

Forecasting is an integral part of companies planning decision making process, although planning and forecasting are different.

Forecasting is generally used to predict or describe what will happen.

For example, the sale demand, cash flow, or recruitment levels.

Planning, on the other hand, involves the use of forecasting data to help in making good decisions about the most attractive alternatives for the organization.

Forecasting predicts what will happen in the future, and planning focuses on what actions the company will take, given different scenarios.

For example, if a forecast shows that the demand will fall in the next year, management may want to prepare a plan of action, which will compensate the predicted drop in demand.

Generally speaking, the relationship between forecasting and the planning is that forecasting provides inputs to the planning process.

However, this view may be too simple and may lead to errors.

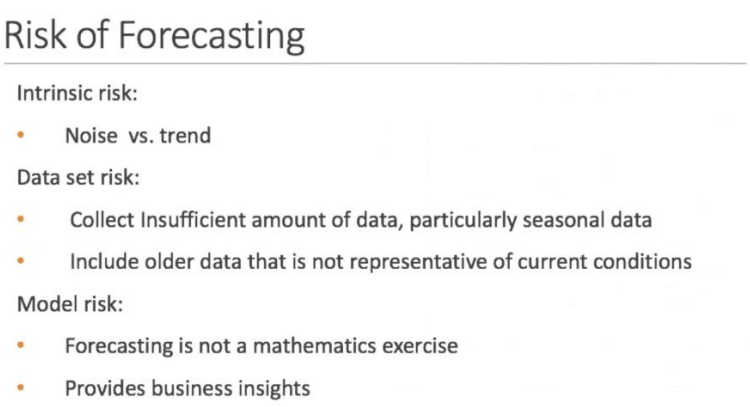
For managers who use forecasting in decision making must understand the business implications of items to be forecasted and the forecasting techniques.

The rule of forecasting is to reduce uncertainty and to aid in decision making.

You still need to incorporate the forecasting, intuitive reasoning, and strategic thinking into the decision-making process to choose the best course of action.

A manager needs to understand the advantage and limitation of your forecasting technique and the reliability of your forecasting data when making decisions.

Slide #9



Forecasting is a risky business.

There are three distinct sources of forecasting risk.

The first is intrinsic risk.

The intrinsic risk is a random variation that is beyond explanation with the data and tools you have available.

The business data is the noise rather than presenting a trend.

If a manager just predicts the future based on the random business data, he may set unrealistic expectations on business and making wrong decisions.

We will discuss how to mitigate the intrinsic risk in this lecture.

The second source of forecasting risk is data set risk.

This kind of risk is due to insufficient amount of data, particularly seasonal data.

This is usually a smaller source of forecasting error than intrinsic risk.

The data set risk can be reduced in principle by obtaining a larger number of data.

However, when you are predicting time series, more data is not always better.

Using a larger sample may mean including older data that is not as representative as the current conditions.

The third type of risk is model risk.

Model risk is a risk of choosing the wrong model for forecasting.

For example, making wrong assumptions about whether or how the future will resemble the past.

Forecasting is not a mathematical exercise, rather it provides business insights.

So business forecasting must make business sense, and choice of model needs to fit the purpose of your business.

We will cover how to handle model and the data set risk in the forecasting method lectures.