

MANAGEMENT OF TECHNOLOGY

TECHNOLOGY FORECASTING

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Chapter Outline

- Introduction
- Definition
- Technology Model
- Technological Forecasting Process
- Forecasting Techniques
- Current Status
- Technology Discontinuity
- Summary



Lesson Outcome

- Explain the significance, concept and process of forecasting
- Describe the techniques of forecasting
- Assess the current status of forecasting



Introduction

- Future will never be like the past. It is dependent on the technology's characteristics, environment and the market.
- Tech that is rapidly changing- more difficult to predict the future
- Tech forecasting – to seek tech innovation



Definition of Technology Forecasting

- A process of determining the technology for the future trends

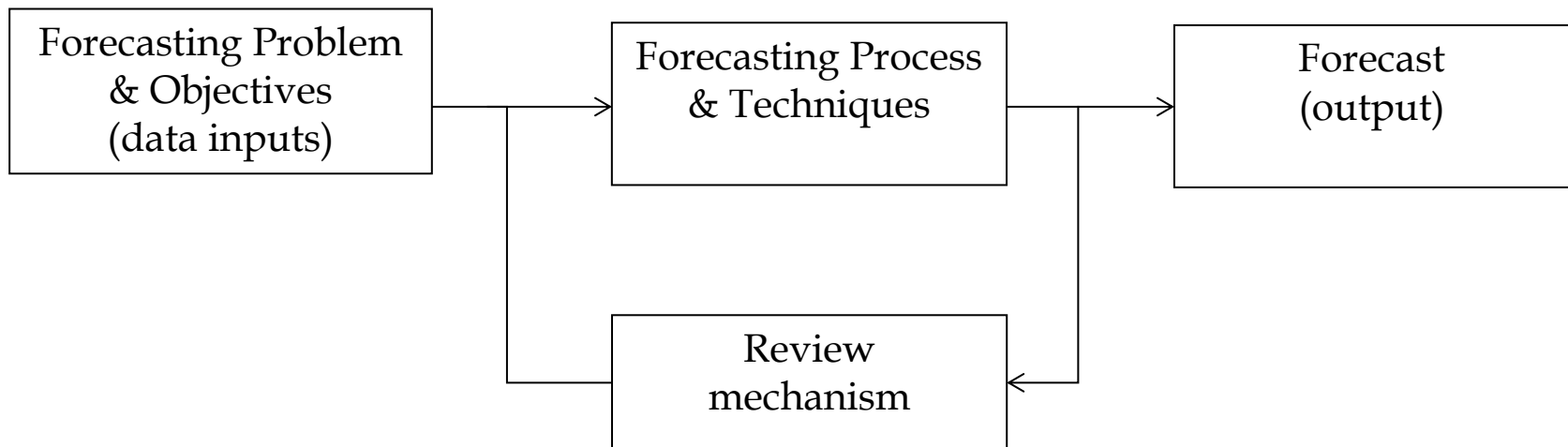
How to predict technology?

- Assumption
- Educated guess
- Facts
- All based on chosen techniques

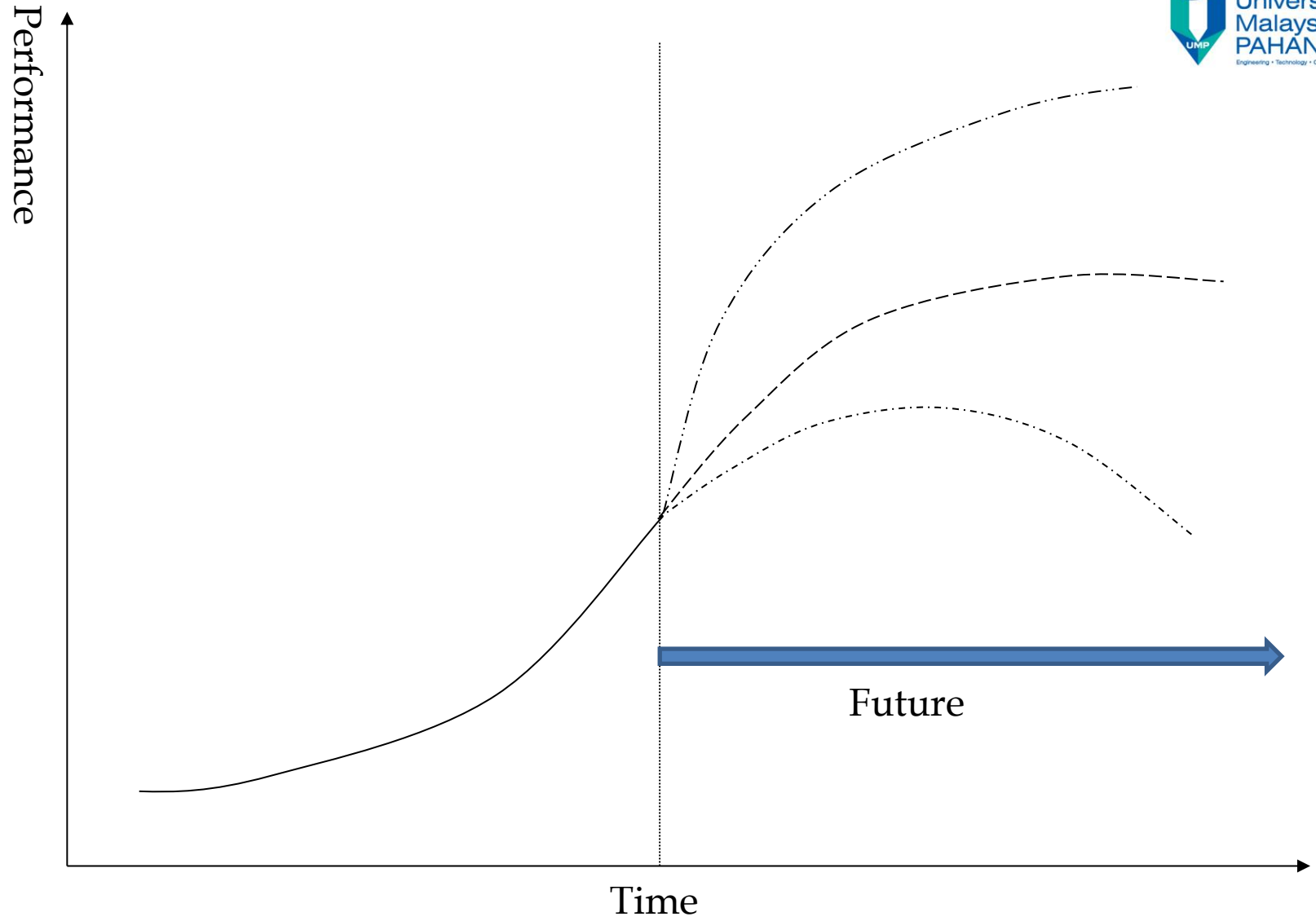


Technology Forecasting Model

- Future visions will be utilized to give directions to the present
- Forecasting can be viewed as a input-process-output system with the assemblage of the following elements

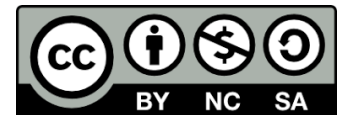


Present



Technology Forecasting Model

- Forecasting Problem and objectives
- Data inputs for forecasting
- Forecaster
- Forecasting Process
- Forecasting technique
- Forecast (output)
- Review mechanism



Technology Forecaster

- Great knowledge on tech life cycles , innovation rate and factors that improvement the development of technology

A good forecast must be:

- Is credible
- Accurate
- Methods must be clearly explained
- Assumptions must be defined and supported
- Must be quantitative if possible
- Confident with the forecasted results



Technology Forecasting Process

Make specifications of forecast

Identify variables

Select data sources

Employ forecasting technique

Use by application

Undertake reviews



Technology Forecasting Process: Specify Forecasting Expectations

Time period

- Either in general or precise period

Nature of technology

- Broadly defined or narrowly defined

Characteristics to be exhibited by the technology

- In accurate quantitative terms or generally exhibited

Probability associated with the characteristics

- Generally explained such as high or low, or in detail quantitatively



Technology Forecasting Process: Identify Environmental Variables

- Science, technology, economy and society are self-propelling complex systems where innovation is both endogenous in each one of them as well as the outcome of the interaction among them.

Environment	Factors
Technological	R&D expenditure, the number of researchers, Lab/machinery endowments, progress level of basic research, knowledge sharing facilities, etc.
Social	Interaction with users, education and learning, social rules, desires for quality of life, change orientation, etc.
Economic	Venture capital financing Entrepreneurial spirit, wide consumption, past investment in S&T, intensity of competition, innovators among consumers
Politico-legal	Tax laws, intellectual property rights and patent protection Incentives for technological achievements, etc

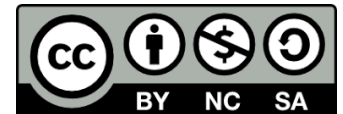


Technology Forecasting Process: Identify Environmental Variables

- Microsoft NEED to follow the developments of PC hardware technology

WHY?

- Every new successful tech needs a proper ENVIRONMENT to prosper.
- Software technology depends on the available hardware



Technology Forecasting Process: Forecasting Techniques

Exploratory Methods	Normative Methods
Technology Monitoring	Dynamic Modeling
Trend Analysis	Cross Impact Analysis
Expert Opinion	Morphological Analysis
Delphi Technique	Series Indicators
Scenario Development	

How do we chose?

- Depends on the reason of forecast
- Is the method reliable
- Will the result data be precise
- Depends on the time duration of the forecast



Technology Forecasting Process: Use by Application

Integrate forecast results into your plan for the creation of the new venture.

These will probably concern resource levels and availability and sales forecasts.



Technology Forecasting Process: Undertake Reviews

Follow the progress of the forecast by making a comparison between actual and results of forecast.

If and when a gap appears, it is time for another forecast, beginning at step1.



Technology Discontinuity

Example :

Transportation Technologies - Speed

- This is the limits of each performance of transportation tech
- This info will guide the companies whether to remain or neglect the tech before it becomes obsolete
- Also be used to decide whether the company should invest or own another company that is capable of creating this emerging tech



Technology Discontinuity

- A forecaster may use the trend to extrapolate the efficiency of white light into the future
- However there is no guarantee it will remain the same in the future
- At least the trend will give added information, permitting an educated guess and better decision making
- Management by data is much more effective than management without adequate information



Summary

- Technological forecasting helps managers in improving decision making, by providing knowledge of future changes and provides basis for planning
- Depends on the duration, tech nature, the tech characteristics and the probability
- Forecasting has gained significance in this knowledge era and it continues to be an important function in technology management of organizations



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