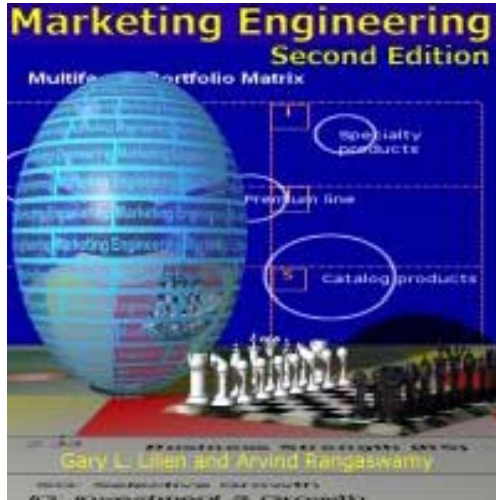# Marketing Engineering

- ❑ **Introduction**
- ❑ **Course Overview**
- ❑ **Software Overview**

www.mktgeng.com

Daily Marketing Decisions

Segmentation

Campaign effectiveness

Targeting

Sales channels

Positioning

Portfolio Management

Budgets

Marketing Mix

Market size

Market share

Pricing policy

Advertising design

Marketing & Marketing Management

■ ■

❑ Marketing is a societal and managerial process by which **exchanges** are brought about in an economy to satisfy the needs and wants of individuals and organizations

❑ Marketing management facilitates this exchange process and can be viewed as a management philosophy with associated processes and activities the enable individuals and firms to proactively bring about desirable exchanges

Example: ABC uses marketing insights and techniques

■ ■

❑ to choose who to sell to (to target a segment of the market) and who not to sell to

❑ to design its physical product offerings

❑ to set prices

❑ to position its products relative to those of competitors

❑ to develop support services and the distribution mechanisms it needs to deliver its products to customers

❑ The firm's goal is to maximize its returns, while at the same time providing value to customers through the exchange process

- make targeted customers aware of its products (through advertising, promotion, and personal selling)

- ensure that its offerings provide more value than those of its competitors in the eyes of its current and potential customers

❑ This entire marketing management process is founded on an intimate knowledge of:

- what customers value

- what they know about ABC's (and competitive) offerings

- the process those customers go through in gathering information and effecting exchange (e.g., visiting the store, ordering by phone, or through personal negotiation)

❑ At the heart of marketing management is the ability to:

- understand customers and markets

- translate this understanding into decisions and actions that produce desirable exchanges in the marketplace

Marketing Decisions

❑ Mental Models:

- Rely on Experience
- Use Practice Standards

Conceptual Marketing

Marketing Engineering

❑ Decision Models:

Marketing Engineering: Marketing Analytics for the Manager

▪ ▪

Marketing Engineering involves developing and using interactive, customizable, computer-decision models for analyzing, planning, and implementing marketing tactics and strategies……or

Concepts, frameworks and tools to the rescue!

Marketing Engineering

▪ ▪

Marketing Environment

Automatic scanning, data entry, subjective interpretation

Marketing Engineering

Data

Database management, e.g.., selection, sorting, summarization, report generation

Information

Decision model; mental model

Insights

Judgment under uncertainty, e.g.., modeling, communication, introspection

Decisions

Financial, human, and other organizational resources

Implementation

5

- ❏ Data are facts, beliefs, or observations used in making decisions.
- ❏ Information refers to summarized or categorized data. For example, the average or the standard deviation of sales across all territories or the classification of sales as low or high constitutes information.
- ❏ Insights provide meaning to the data or information, and they help the manager gain a better understanding of the decision situation.
- ❏ A decision is a judgment favoring a particular insight as offering the most plausible explanation or favoring a particular course of action.
- ❏ Implementation is the set of actions the manager or the organization takes to commit resources toward physically realizing a decision.

Trends in Software Supported Decision Making

- ❏ **Marketing managers have high-powered personal computers connected to networks, 7/24, everywhere.**

- ❏ **Volume of marketing data exploding.**

- ❏ **Firms reengineering marketing for the information age (e.g., Using Customer Relationship Management systems).**
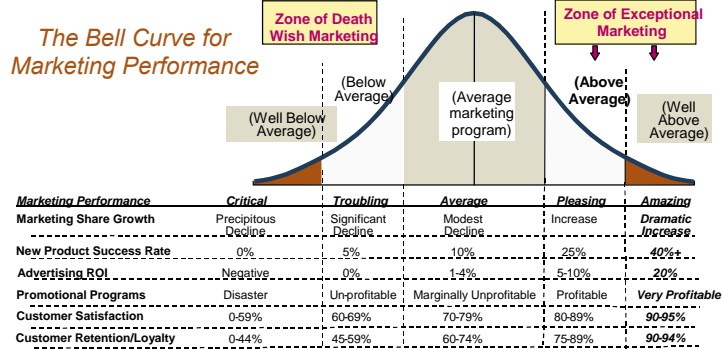
- ❏ **Faster Faster Faster !!!!**

21st Century Marketing Decisions

- ❑ **We have too much data of the wrong kind, not enough of the right kind (information has no value by itself, but generates value through its use).**

- ❑ **Humans are imprecise information processors (in both analyzing and synthesizing information).**

- ❑ **Computers/mathematical models are *consistent* information processors.**

- ❑ **Managers ➔ (Possibility of)
  + Models   Better Decisions**

The Opportunity for Marketing Analytics

The Bell Curve for Marketing Performance

Zone of Death Wish Marketing

Zone of Exceptional Marketing

(Below Average)

(Average marketing program)

(Above Average)

(Well Below Average)

(Well Above Average)

Marketing Performance	Critical	Troubling	Average	Pleasing	Amazing
Marketing Share Growth	Precipitous Decline	Significant Decline	Modest Decline	Increase	*Dramatic Increase*
New Product Success Rate	0%	5%	10%	25%	*40%+*
Advertising ROI	Negative	0%	1-4%	5-10%	*20%*
Promotional Programs	Disaster	Un-profitable	Marginally Unprofitable	Profitable	*Very Profitable*
Customer Satisfaction	0-59%	60-69%	70-79%	80-89%	*90-95%*
Customer Retention/Loyalty	0-44%	45-59%	60-74%	75-89%	*90-94%*

**The objective is very simple.
To improve marketing performance.**

7

Key Concepts Behind Marketing Engineering
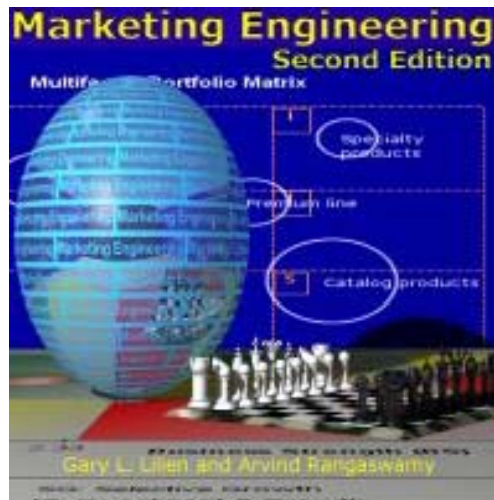
Models are the core of ME: Analytics….What is a Model?

❑ A model is a stylized representation of reality that is easier to deal with and explore for a specific purpose than reality itself.

Models are the core of ME: Analytics….What is a Model?

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❑ A model is a stylized representation of reality that is easier to deal with and explore for a specific purpose than reality itself.

❑ Models do not capture reality fully but focus only on some aspects.

❑ They are simplified depictions, or analogies, of real-world phenomena and systems.

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❑ *Specific purpose: People develop models with a specific purpose in mind.*

❑ The purpose of a marketing model could be to

- understand or influence certain types of behavior in the marketplace (e.g., repeat purchase of the firm's products)

- improve planning and prediction associated with a specific marketing issue (e.g., customer response to a new ad campaign)

- facilitate communication within the firm about a particular marketing problem

Models are the core of ME: Analytics….What is a Model?

❑ Decision Models Characteristics

  ❑ Purpose

    ❑ Reason for its construction and circumscribes its domain of applicability

    ❑ Ex. arrive at good advertising budgets., identifying attractive market segments

  ❑ Assumptions

    ❑ context or framework for a model

Models are the core of ME: Analytics….What is a Model?

❑ Decision Models Characteristics

  ❑ Variables

    ❑ aspects of a marketing phenomenon that are not fixed.

    ❑ Ex. the firm's sales, the likelihood that customers will purchase a new product, the calling patterns salespeople use, and the intensity of competition

Models are the core of ME: Analytics….What is a Model?

❑ Variables

  ❑ Controllable variables: those that the firm controls, such as the level of advertising and the product features to be designed into a new product.

  ❑ Noncontrollable variables are those that are under the control of other players in the market, such as suppliers and competitors.

  ❑ Environmental variables are noncontrollable variables that are not under the control of any one player in the marketing system.

Models are the core of ME: Analytics….What is a Model?

❑ Variables

  ❑ Controllable variables: those that the firm controls, such as the level of advertising and the product features to be designed into a new product.

  ❑ Noncontrollable variables are those that are under the control of other players in the market, such as suppliers and competitors.

  ❑ aging of the population, new regulations or industry capacity.

❑ Input variables

▪ controllable, noncontrollable, and environmental variables are referred to as independent

❑ Output (dependent) variables are those whose values are determined by a set of independent variables.

❑ For example, in many marketing models, product sales are driven by the level of advertising spending and the quality of the product.

Models are the core of ME: Analytics….What is a Model?

❑ Decision Models Characteristics

❑ Relationships

❑ Between the variables, based on marketing theories and managerial insights, specify how changes in one variable affect another variable.

❑ Change in package design can be hypothesized to increase customer attention at the point of- purchase.

❑ Most marketing decision models use mathematical functions to represent how independent variables (e.g., advertising expenditures) affect dependent variables (e.g., sales).

Models are the core of ME: Analytics….What is a Model?

❏ There are many types of models:

- Verbal
- Graphical
    - Box and Arrow
- Mathematical
    - Graphical
    - Spreadsheets

Verbal Model

❏ Lavidge and Steiner (1961) state that advertising moves consumers' mental states along the following chain:

awareness *to knowledge to liking to preference to conviction to purchase.*

Verbal Model

Sales of a new product often start slowly as "innovators" in the population adopt the product. The innovators influence "imitators," leading to accelerated sales growth. As more people in the population purchase the product, sales continue to increase but sales growth slows down.
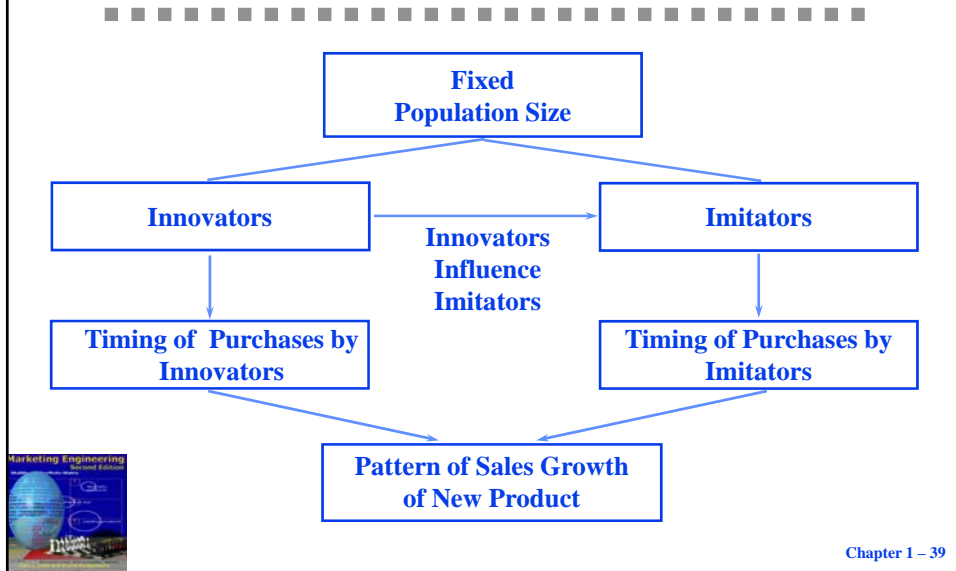

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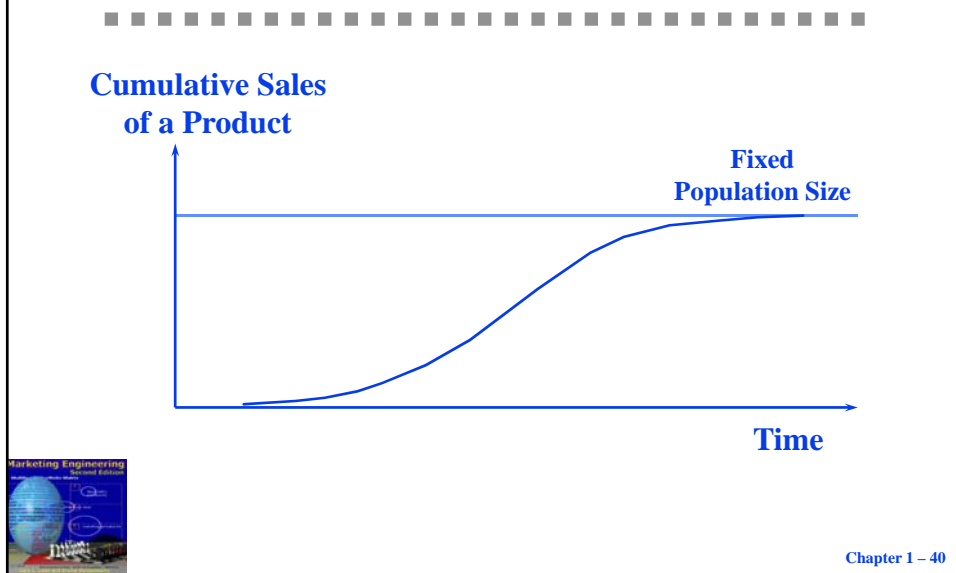 - Box and Arrow
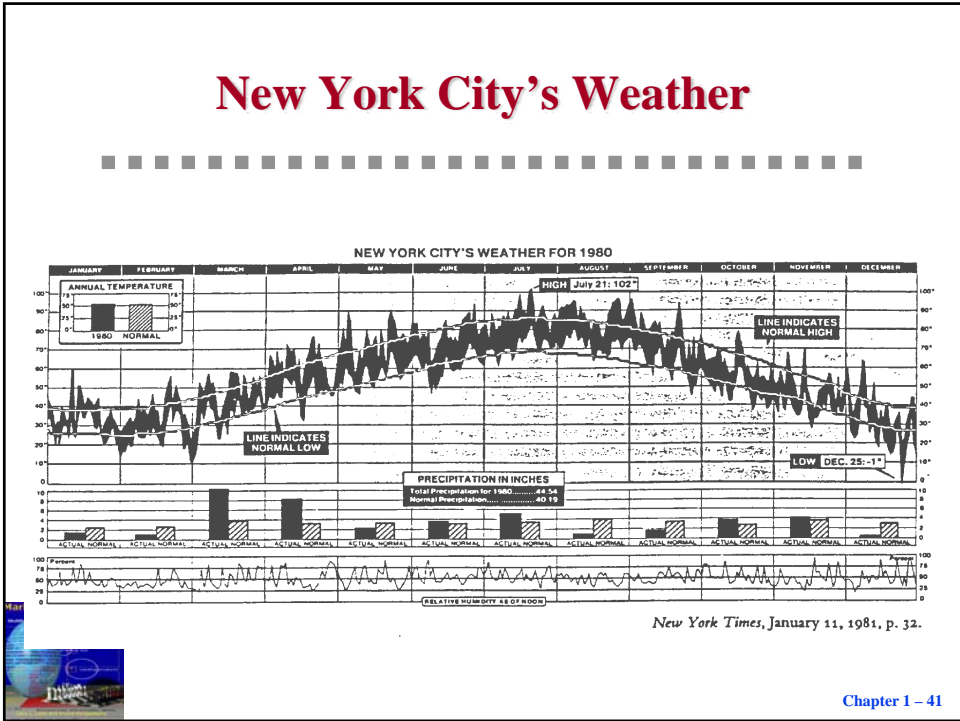- Mathematical
  - Graphical
  - Spreadsheets

Box and Arrow Model

```
                    ┌─────────────────────┐
                    │       Fixed         │
                    │  Population Size     │
                    └─────────────────────┘
                   ╱                       ╲
        ┌──────────────────┐        ┌──────────────────┐
        │    Innovators    │───────▶│     Imitators    │
        └──────────────────┘        └──────────────────┘
                 │          Innovators           │
                 │          Influence            │
                 │          Imitators            │
                 ▼                               ▼
   ┌──────────────────────┐        ┌──────────────────────┐
   │ Timing of Purchases by│       │ Timing of Purchases by│
   │     Innovators       │        │      Imitators       │
   └──────────────────────┘        └──────────────────────┘
                 ╲                           ╱
              ┌─────────────────────────────┐
              │   Pattern of Sales Growth   │
              │       of New Product        │
              └─────────────────────────────┘
```

Graphical Model

Cumulative Sales of a Product

Fixed Population Size

Time

15

New York City's Weather

■ ■

New York Times, January 11, 1981, p. 32.

Mathematical Model

■ ■

Sales= a(1−e⁻ᵇˣ)

$Sales = a(1 - e^{-bx})$

a = Market potential

b = rate at which sales will approach market potential

Market Potential

x (Advertising Effort)

16
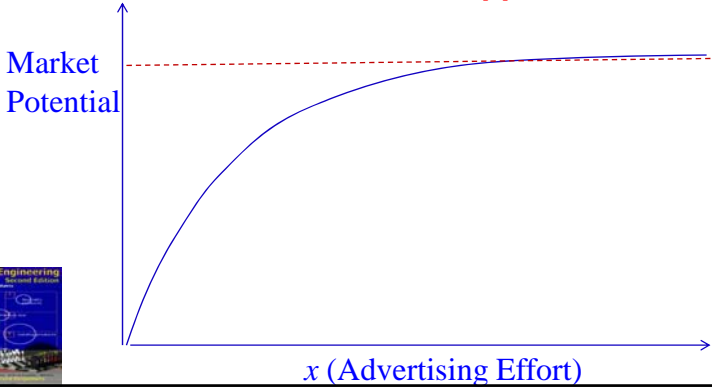
Mathematical Model

■ ■

$$\frac{dx_t}{dt} \;=\; (a + bx_t)(N - x_t)$$

x_t = **Total number of people who have adopted product by time t**
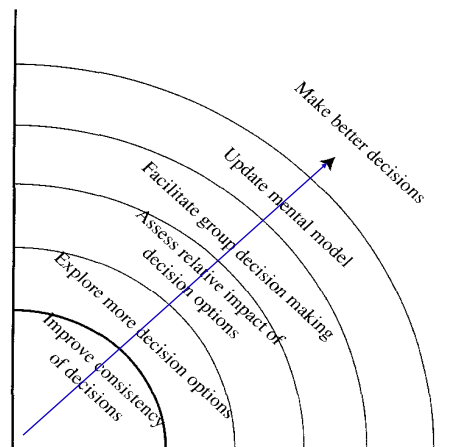
N = **Population size**

a,b = **Constants to be determined. The actual path of the curve will depend on these constants**

Benefits of Using Decision Models

■ ■

17

Why managers choose not used decision models?

▪ ▪

❑ Mental models are often good enough?

❑ Models don't solve managerial problems, people do?

❑ Managers do not observe the opportunity costs of their decisions

❑ Model requires precision

❑ Model emphasize analysis

END

▪ ▪