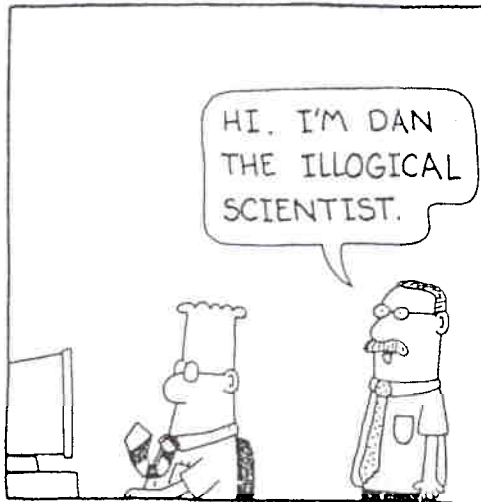
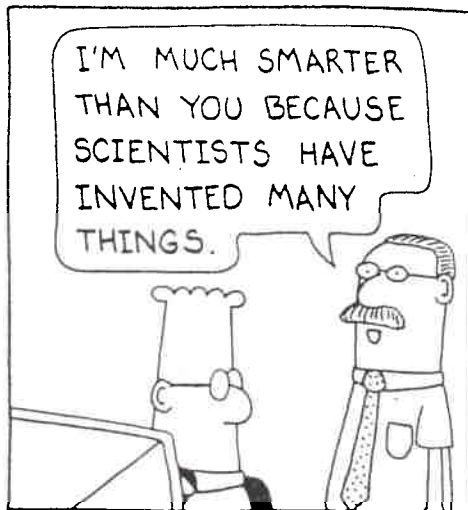
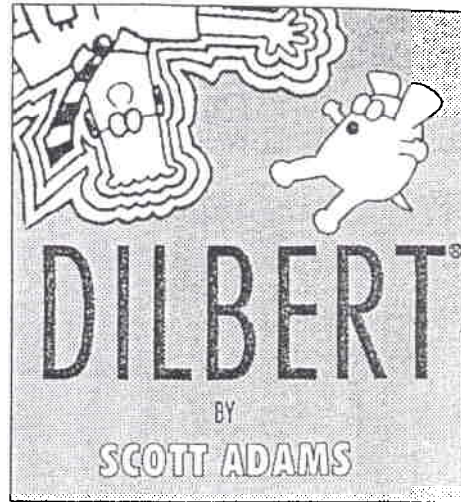


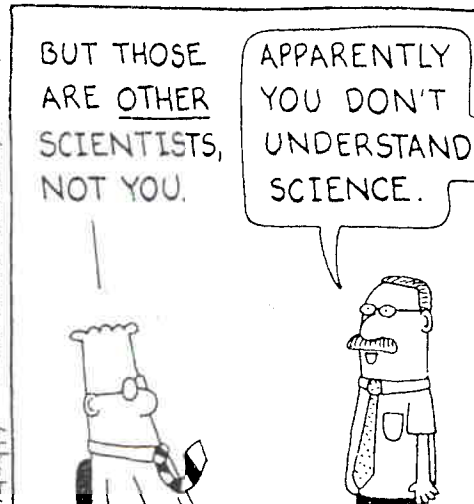
TECHNOLOGY



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INNOVATION

TECHNOLOGICAL INNOVATION PROCESSES

models of processes

*

APPROACHES TO INNOVATION CONCEPTS

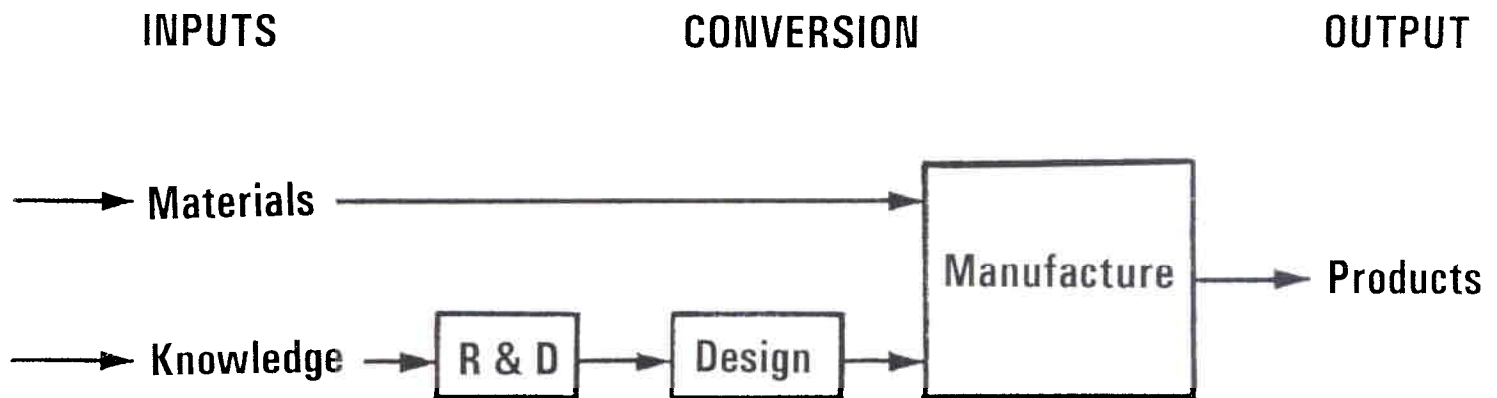
*ways of looking at,
and sources of,
innovation*

Technological Innovation

PRODUCT-ORIENTED CONVERSION PROCESS

(pre - WW II, per Twiss)

"Technology Push"



*technologist isolated from
market forces*

Technological Innovation

TECHNOLOGY/MARKET-ORIENTED CONVERSION PROCESS

(post - WW II, per Twiss)

"Market Pull"

INPUTS

CONVERSION

OUTPUT

Customer needs
or satisfactions

Scientific
knowledge

Technological
Concept

Product design

Materials

Manufacture

Products

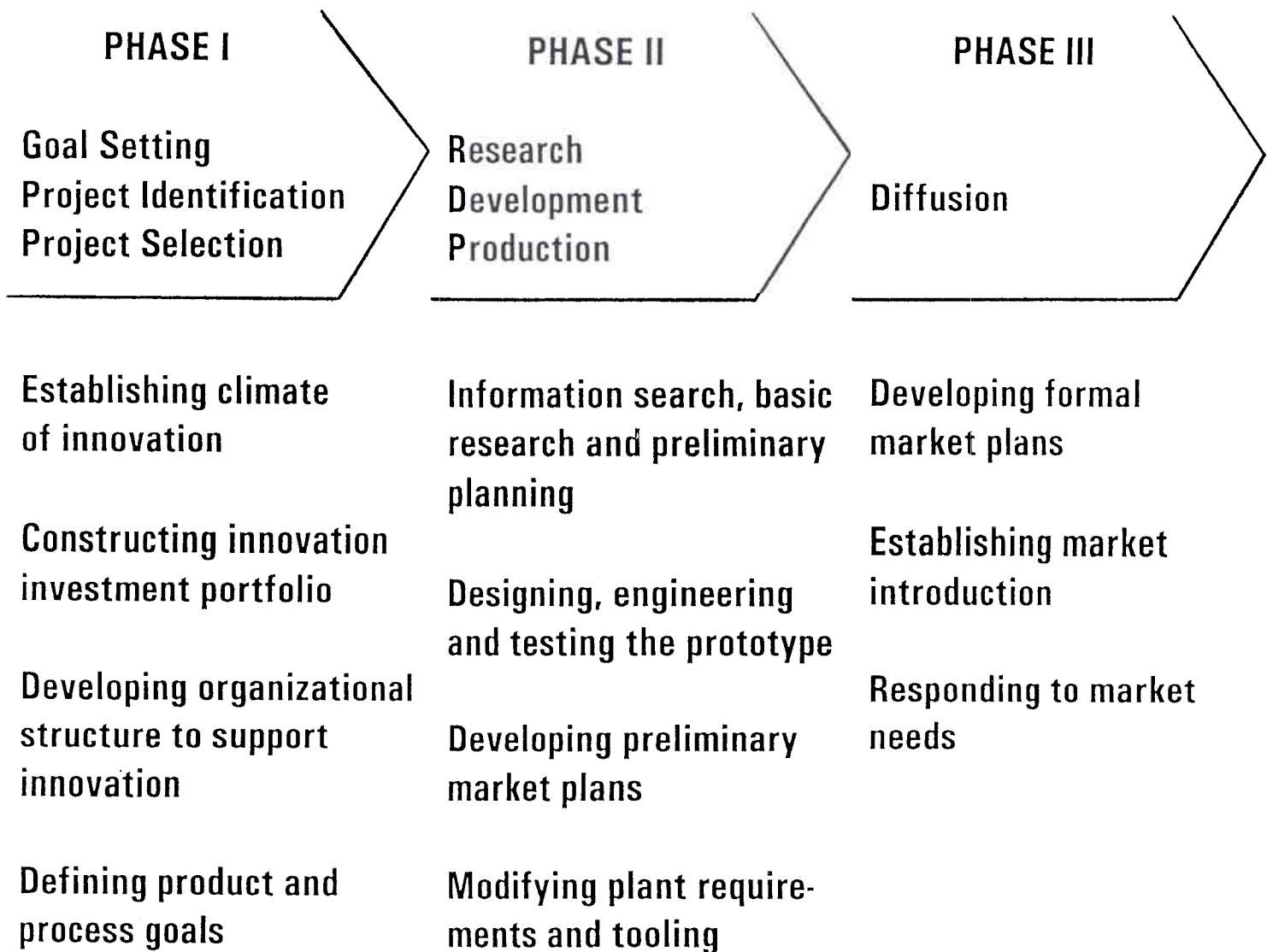
increased focus on customer needs

Technological Innovation

THREE-PHASE PROCESS

(by early 1980s, per Walcoff).

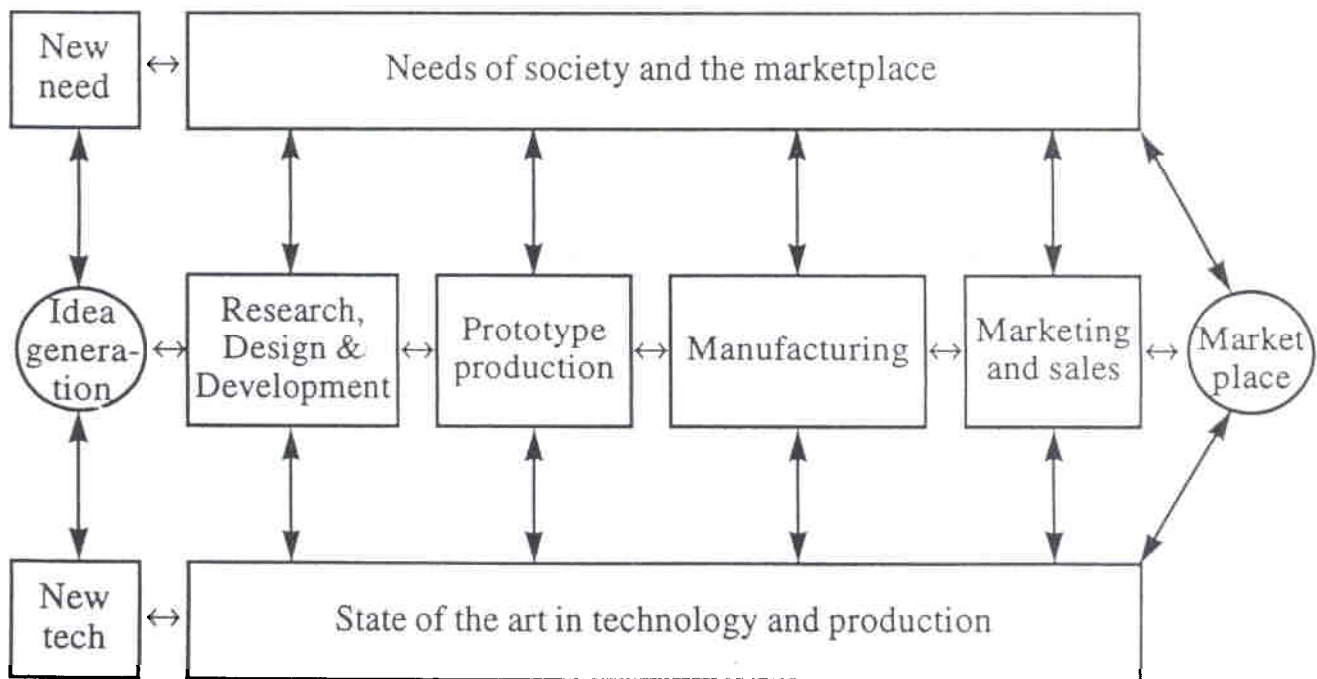
*based on empirical studies
internal organizational perspective*



Technological Innovation

COUPLING PROCESS

(by early 1908s, per Rothwell)
based on empirical studies

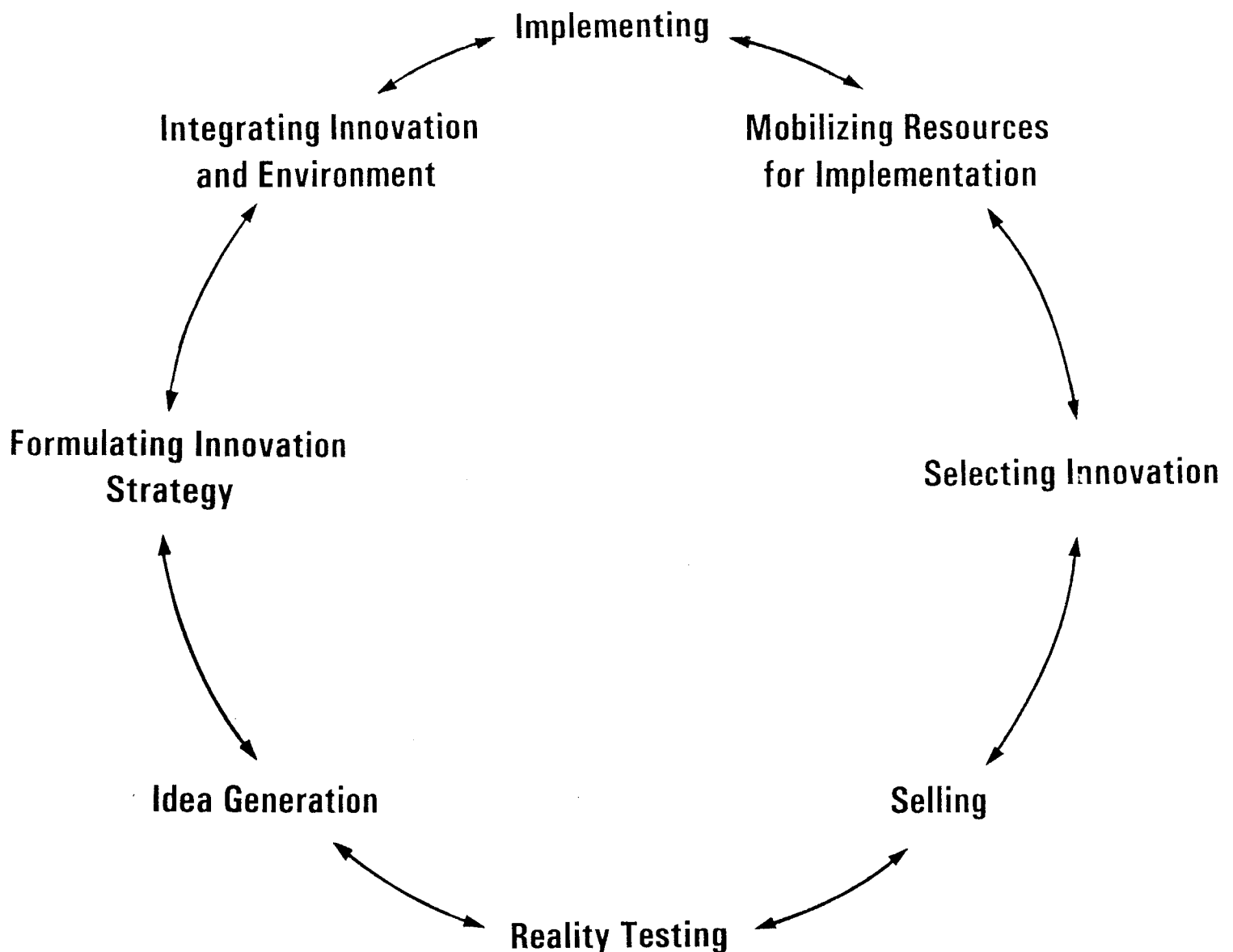


continuing interactions made explicit

Technological Innovation INTEGRATIVE PROCESS

(late 1980s, per Kamm)

circular, not linear, process

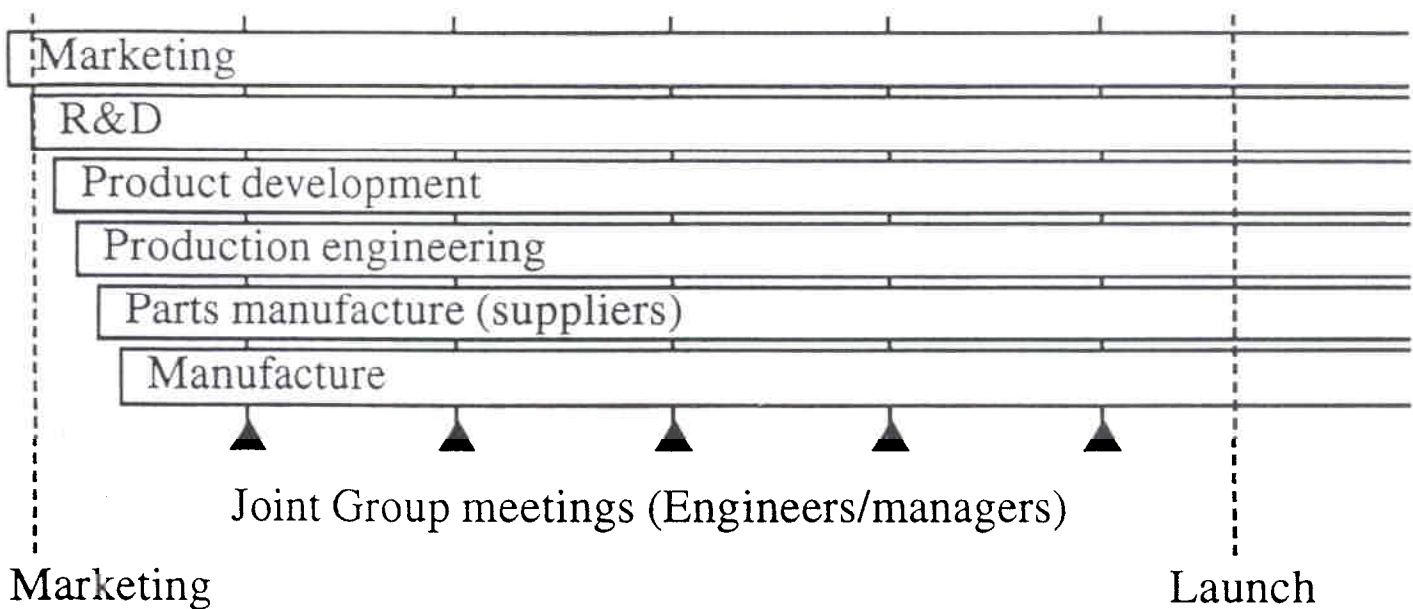


Technological Innovation

INTEGRATIVE PARALLEL PROCESS

(late 1980s, per Graves)

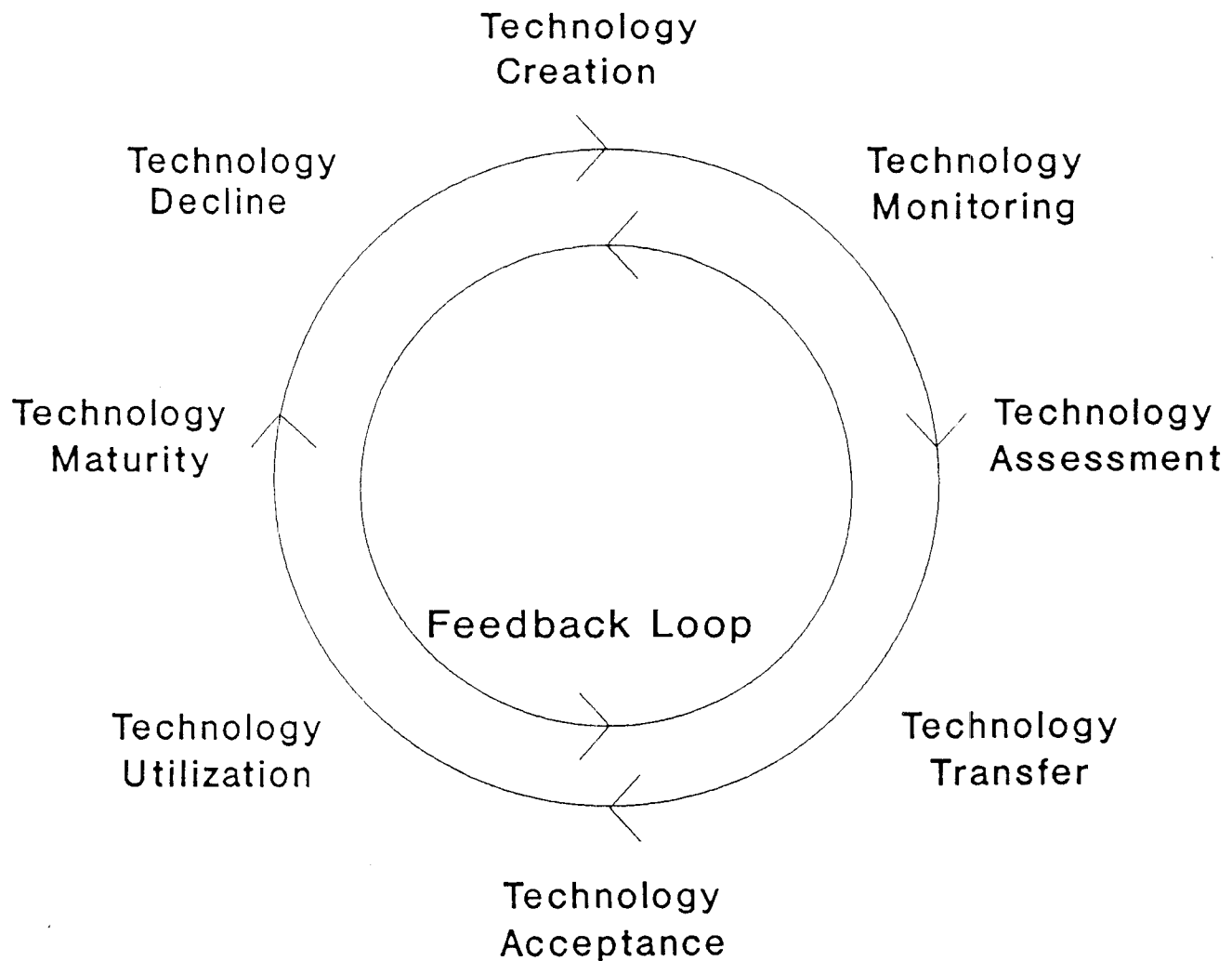
(based on Nissan)



Technological Innovation

INTEGRATIVE SYSTEM PROCESS

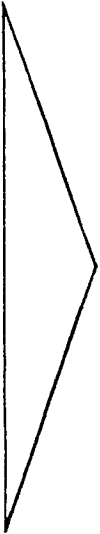
(early 1990s, per Bursic & Cleland)
System Life Cycle Approach



"Strategic Technology Management System"

TECHNOLOGICAL INNOVATION PROCESSES

*



APPROACHES TO INNOVATION CONCEPTS

Where does "The Idea" come from?

Druckes; Kamm

Approaches to Innovation Concepts

SYSTEMATIC INNOVATION

(Drucker)

**" ... systematic innovation ...
consists of the purposeful and
organized search for changes,
and in the systematic analysis
of the opportunities such
changes might offer ... "**

Approaches to Innovation Concepts

SOURCES OF INNOVATIVE OPPORTUNITY

(Drucker - 1)

1. The unexpected
2. Incongruity
3. Process need
4. Industry/market structure
5. Demographics
6. Perception
7. New knowledge

(Additional information follows)

Approaches to Innovation Concepts

SOURCES OF INNOVATIVE OPPORTUNITY

(Drucker - 2)

THE UNEXPECTED

the product, process, etc. for which there were no great expectations yet it did very well; the product, process, etc. for which there was every reason to expect success yet it failed; an unanticipated market opens up

INCONGRUITY

when demand grows steadily but profitability does not; some portion of a process that seems awkward; when producers, suppliers, etc. have arrogant beliefs about what is needed or wanted

Approaches to Innovation Concepts

SOURCES OF INNOVATIVE OPPORTUNITY

(Drucker - 3)

PROCESS NEED

task-focused; perfecting a process that already exists, replacing a link that is weak, redesigning a process around new knowledge, making possible a process by supplying the missing link

INDUSTRY/MARKET STRUCTURE

rapid growth of an industry; viability of the traditional market definition and segmentation; convergence of technologies; the way business is done is changing rapidly

Approaches to Innovation Concepts

SOURCES OF INNOVATIVE OPPORTUNITY

(Drucker - 4)

DEMOGRAPHICS

changes in the population; its size, composition, employment, educational status, age structure, income, etc.

PERCEPTION

when a change in perception takes place, the facts do not change, but their meaning does

Approaches to Innovation Concepts

SOURCES OF INNOVATIVE OPPORTUNITY

(Drucker - 5a)

NEW KNOWLEDGE

the "super-star" of entrepreneurship and innovation; the knowledge is not necessarily scientific or technical; amongst history-making innovations, knowledge-based innovations rank high

CHARACTERISTICS OF KNOWLEDGE-BASED INNOVATION:

- (1) The longest lead time of all innovations (e.g., 25-35 years)**
- (2) Almost always based on the convergence of several different kinds of knowledge**

Approaches to Innovation Concepts

SOURCES OF INNOVATIVE OPPORTUNITY

(Drucker - 5b)

NEW KNOWLEDGE (CON'T)

SPECIFIC REQUIREMENTS OF KNOWLEDGE-BASED INNOVATION:

- (1) Careful analysis of all of the
necessary factors**
- (2) A clear focus on the strategic
position**
- (3) Ability to learn and practice
entrepreneurial management**

Approaches to Innovation Concepts

SOURCES OF INNOVATIVE OPPORTUNITY

(Drucker - 5c)

NEW KNOWLEDGE (CON'T)

UNIQUE RISKS OF KNOWLEDGE-BASED INNOVATION:

- (1) The window of opportunity for establishing a position is small**
- (2) A "shake-out" sets in as soon as the window of opportunity closes**
- (3) There must be receptivity to the knowledge-based innovation**

Approaches to Innovation Concepts

INNOVATION DIMENSIONS

(Kamm)

"structured" approach

FORM

what is it ?

FUNCTION

what purpose does it serve ?

EXTENT

how "new" is it ?

TIMING

first introduction ? or ... ?

(additional information follows)

Approaches to Innovation Concepts

INNOVATION DIMENSIONS

(Kamm - 1)

FORM

Generation or adoption of:

- **technology**
(product, process, service)
- **market**
(users, buyers, clients)
- **organization**
(structure, function)

Approaches to Innovation Concepts

INNOVATION DIMENSIONS

(Kamm - 2)

FUNCTION

Improves quality

Reduces cost

Performs new functions

Enhances current market attractiveness

Increases current market offerings

Enters market not currently served

Improves learning curve

Enhances economies of scale

Permits production of better-quality offering

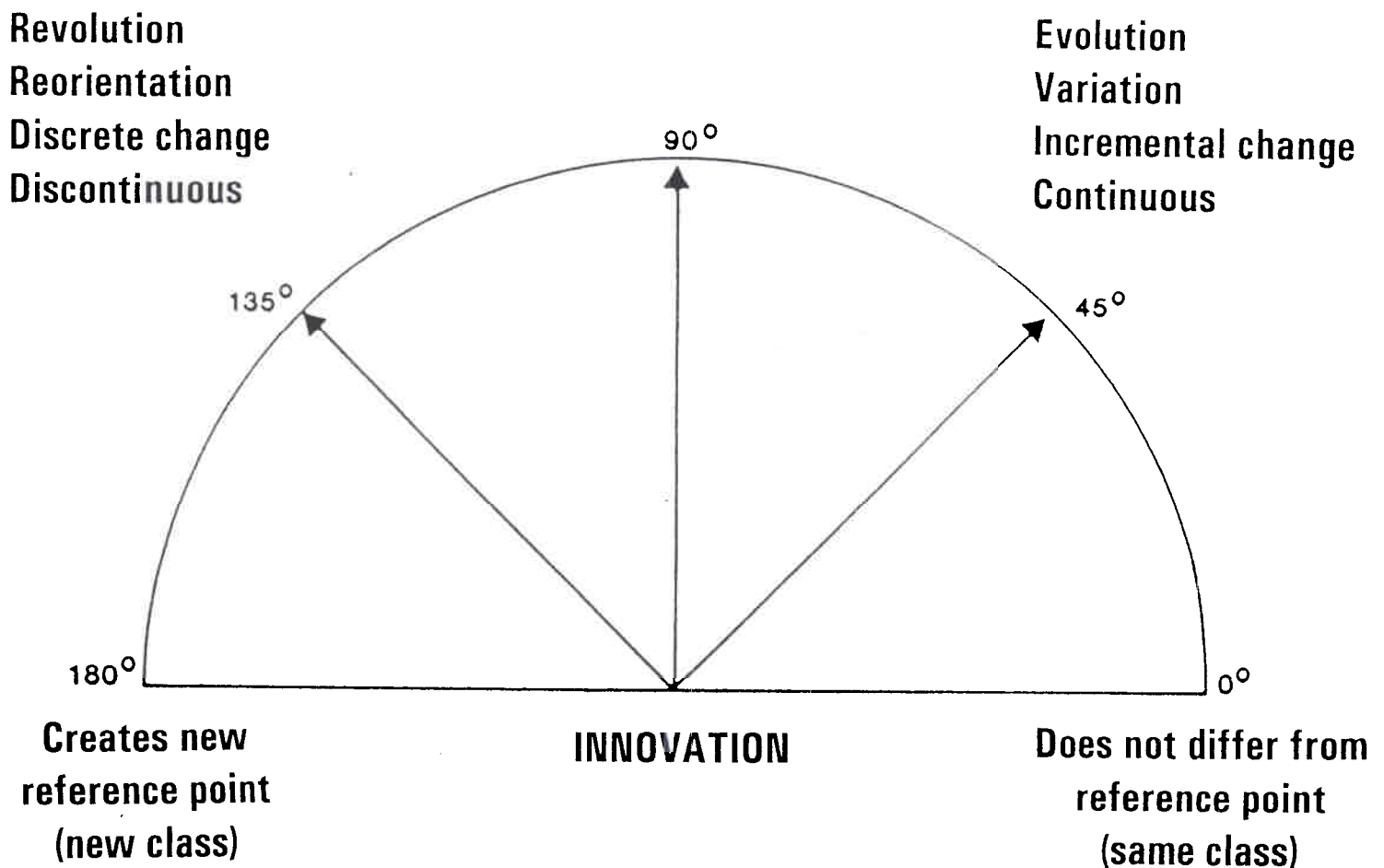
Enhances human growth and potential

Approaches to Innovation Concepts

INNOVATION DIMENSIONS

(Kamm - 3)

EXTENT



Approaches to Innovation Concepts

INNOVATION DIMENSIONS

(Kamm - 4)

TIMING

(introduction or adoption)

First-to-market

Quick second

Quick third

Late follower