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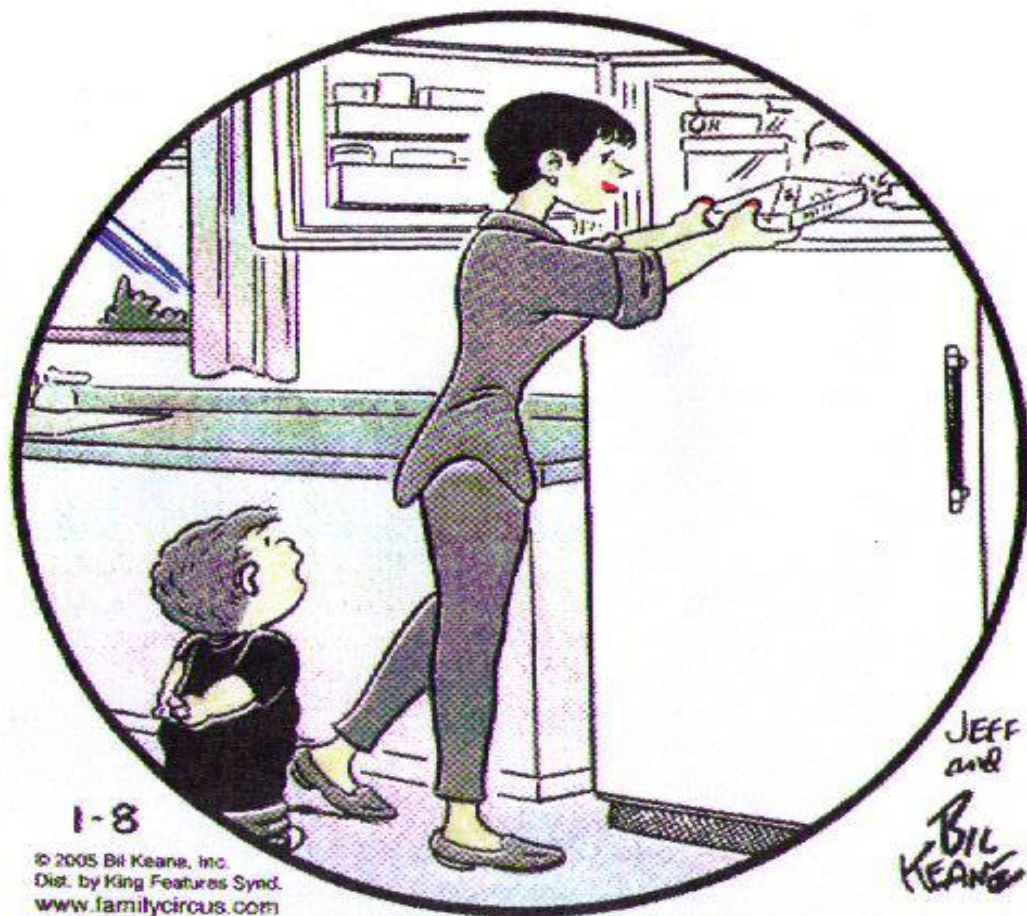
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**NEW PRODUCT DEVELOPMENT AND
INNOVATION**

Definition of New Product

- Either the development and introduction of a product not previously manufactured by a company into the marketplace, or
- The presentation of an old product into a new market not previously explored by a company

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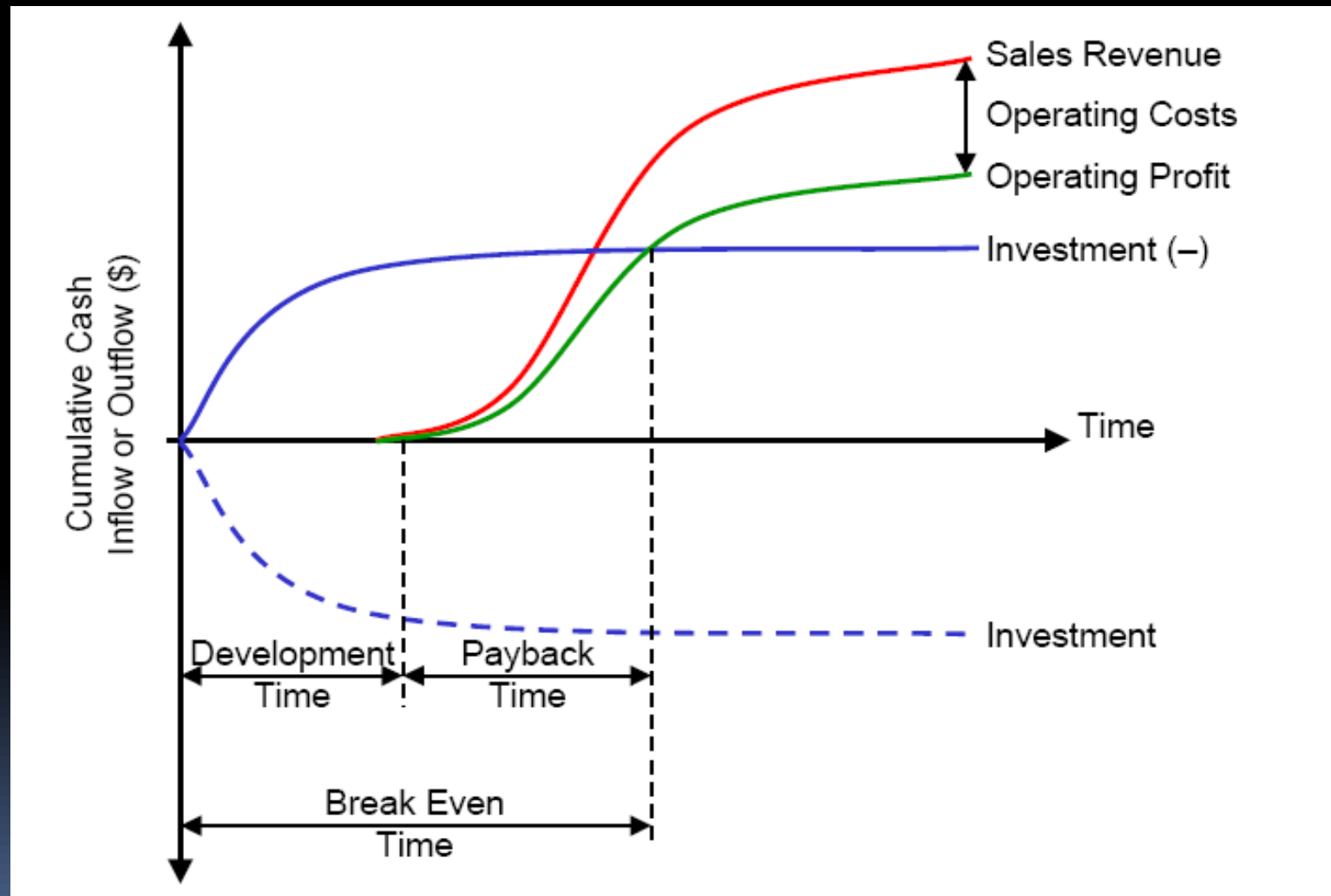
"Can we have something new and improved for dinner?"



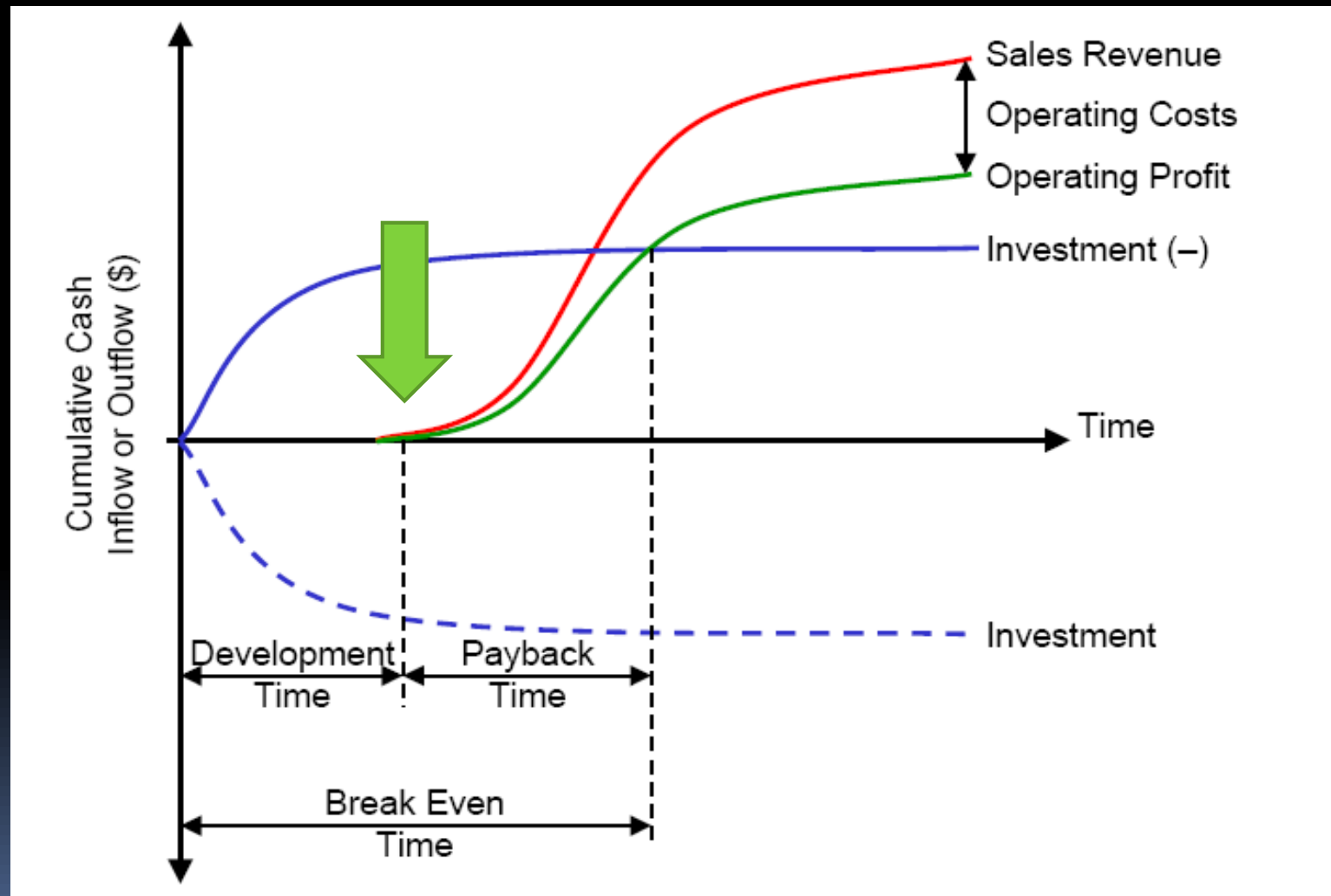
Why New Product?

- Product life cycles
 - Company reasons (*Demand and Supply*)
 - Marketplace reasons (*Consumers' trend*)
 - Technological reasons
 - Government regulations
- 

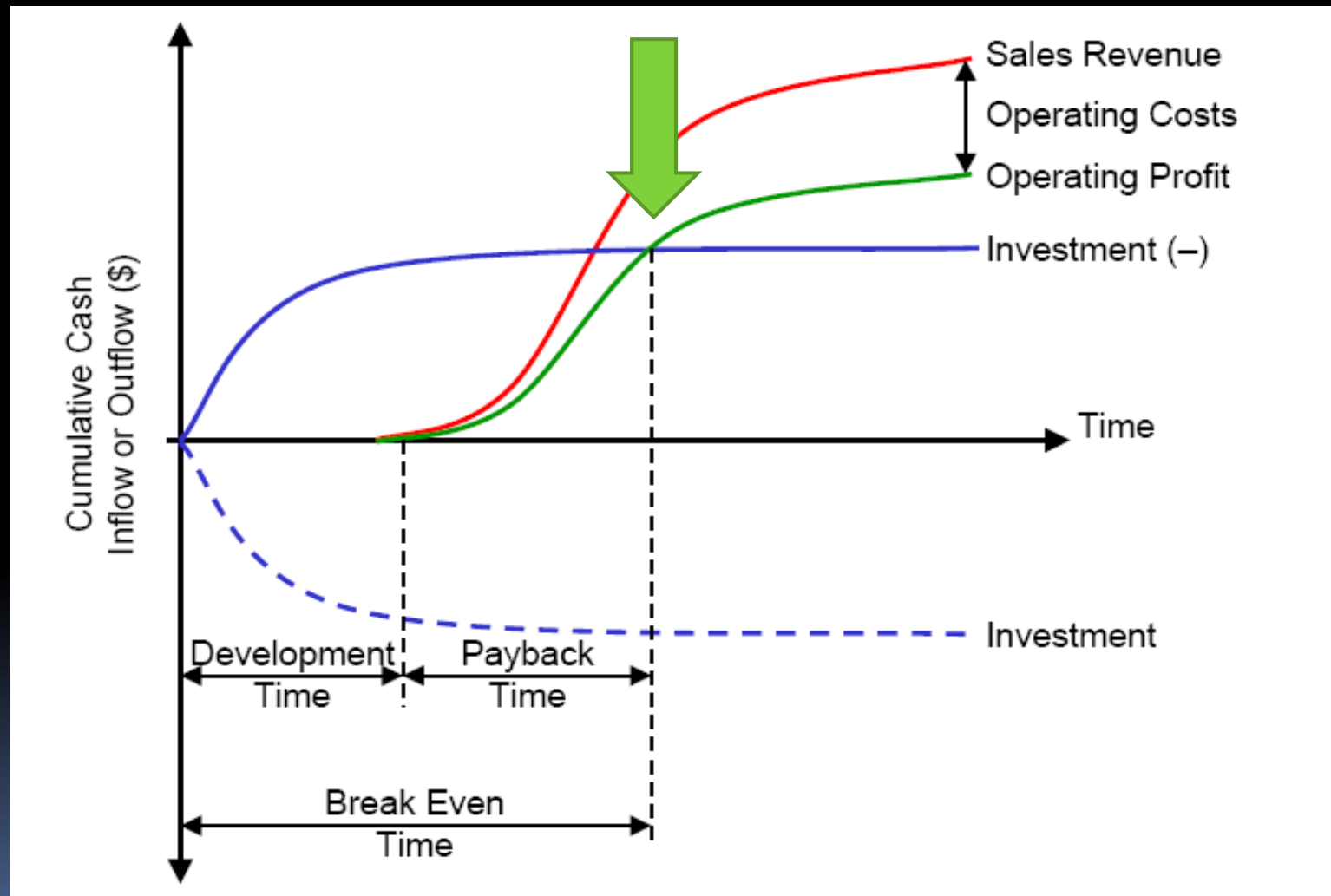
Product Development Cash Flow



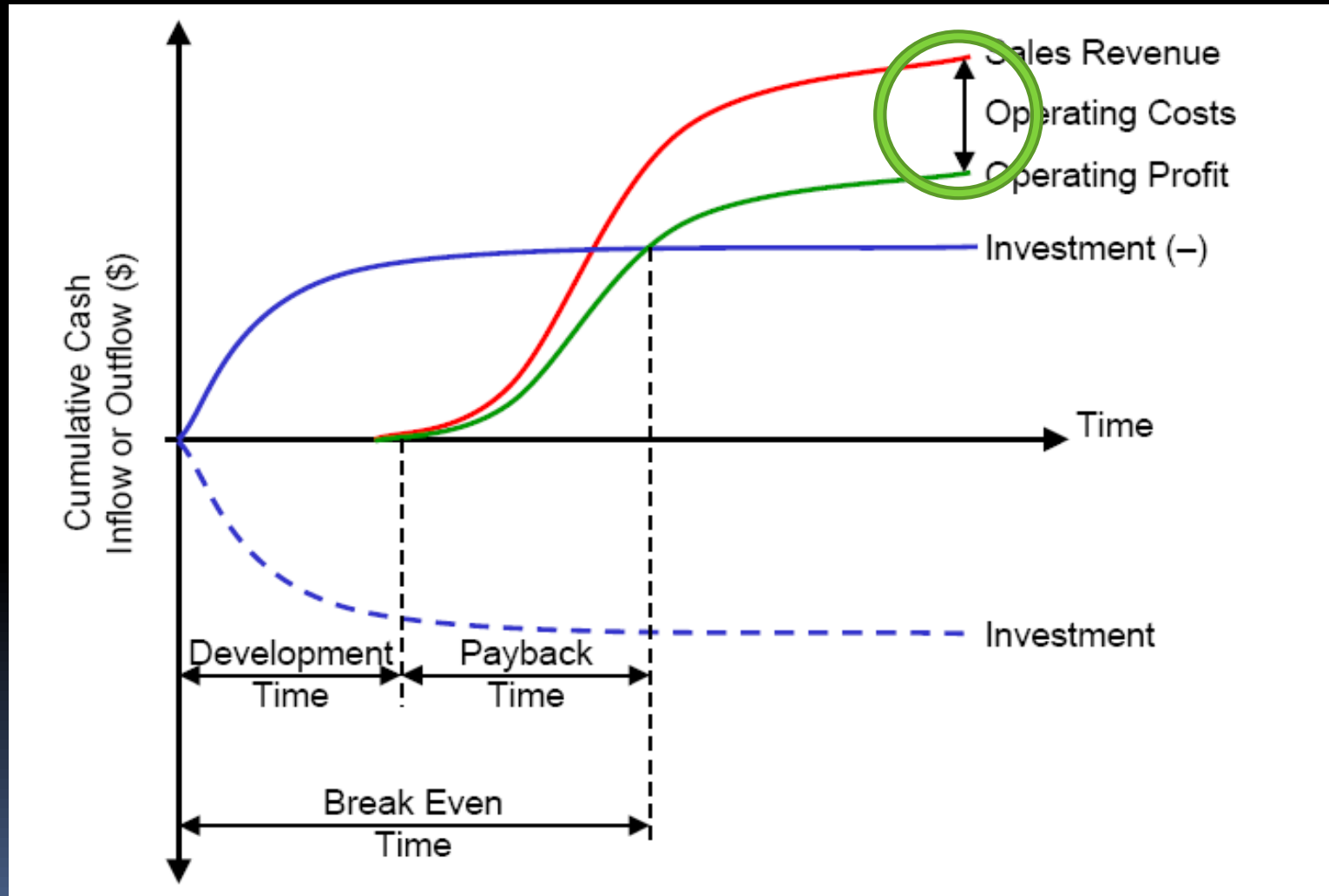
Product Development Cash Flow



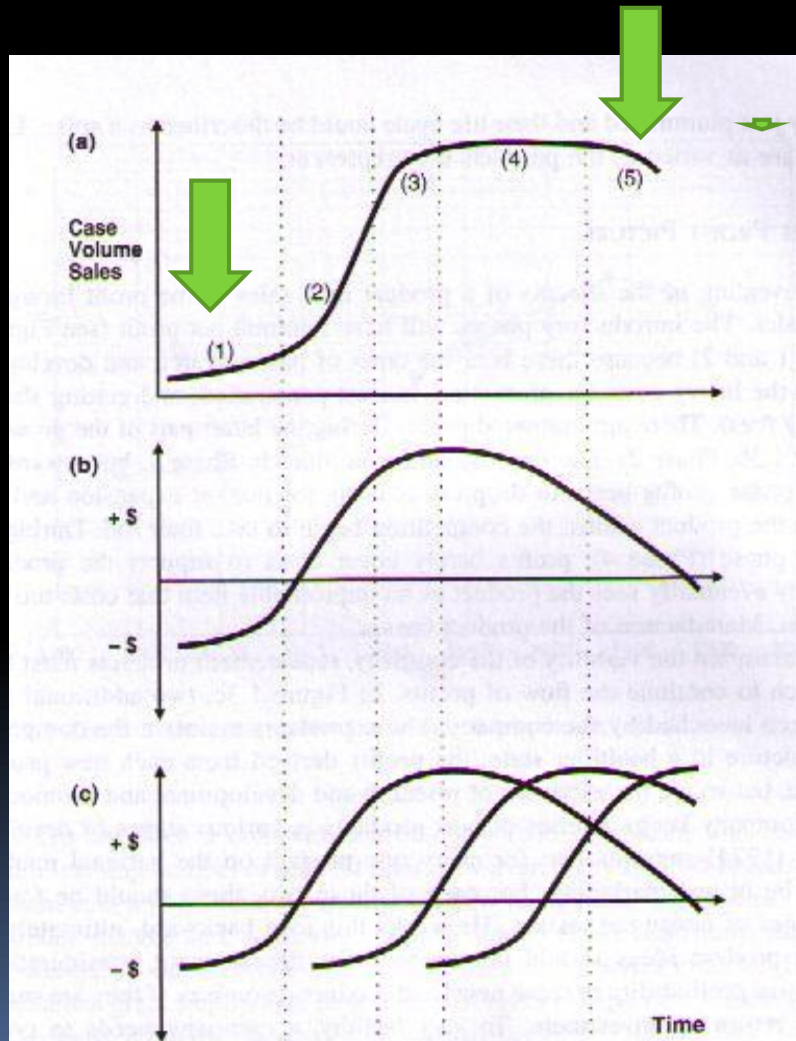
Product Development Cash Flow



Product Development Cash Flow




Life Cycle of a Product in 5 Periods



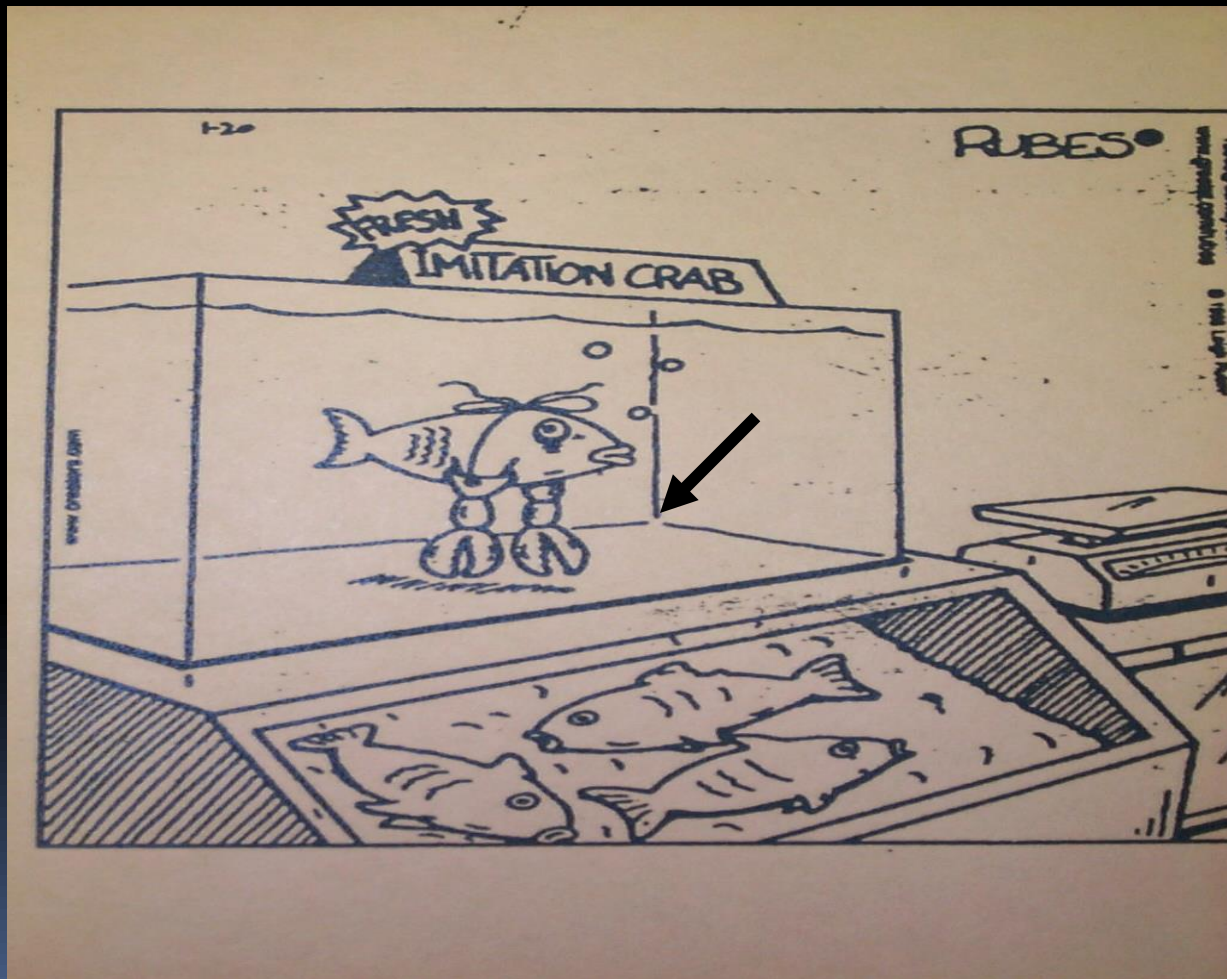
- (1) Introductory
- (2) Strong growth
- (3) Decline in growth
- (4) Maturity
- (5) Decline in volume



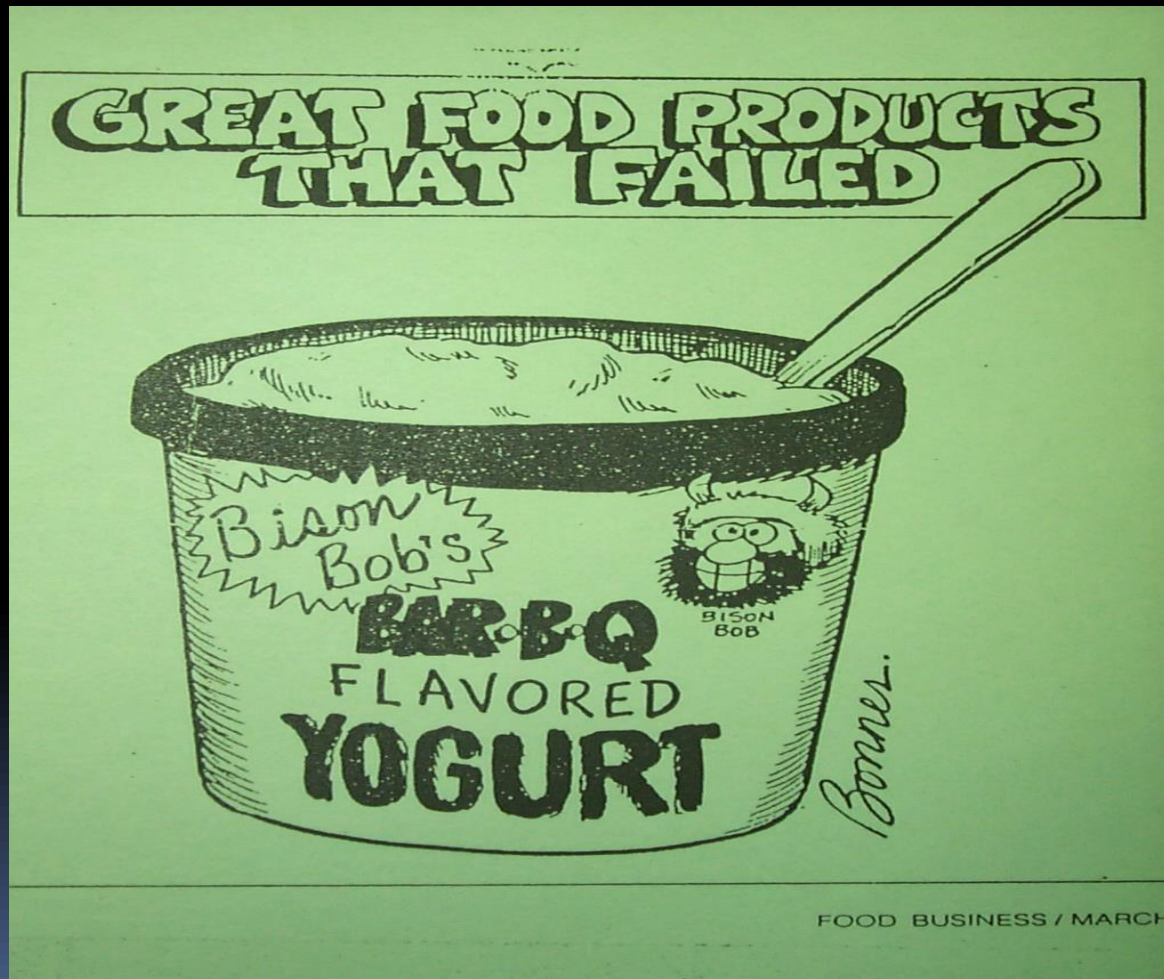
Marketing Strategy for Product Life Cycle

- Understand that profits have a predictable pattern
 - Early stages: *focus is on product information*
 - Later stages: *focus is on brand promotion*
 - Use market segmentation in maturity stage to maintain strong core customer basis
- 

Is a "New-to-World" Product?



Is A "Never before" Product?




FOOD BUSINESS / MARCH

However, A New Product needs:

- *To meet **the definition***
- *To meet **the market trend***
- *To meet **consumer's need***
- *To meet **company's image***




Classifications of New Product

- *1. Line extension*
 - *2. Reposition*
 - *3. New form*
 - *4. Reformulation*
 - *5. New packaging*
 - *6. Innovative or value-added products*
 - *7. Creative products*
- 



General Stages of New Product Development Process

- Intention
 - Ideation
 - Prototyping
 - Development
 - Test market
 - Production
 - Launch
- 

New Product Development Process

A disciplined and defined set of tasks and steps that describe the normal means by which a company repetitively converts embryonic ideas into salable products or services

Product Development Stages in *Nabisco Co.*

- **1. *Concept development***

- Ideation: brainstorming and screening
- Market research + R&D

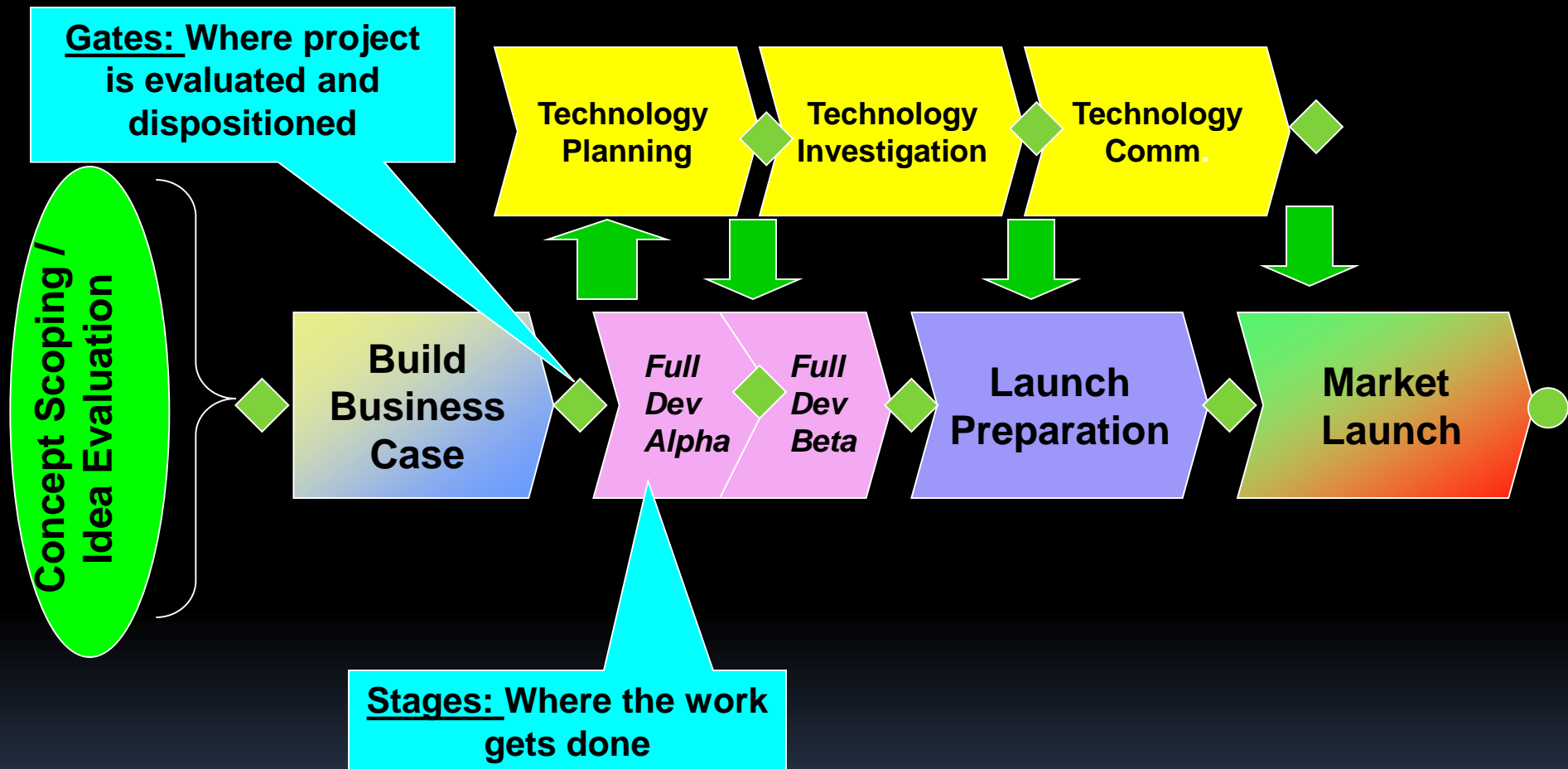
- **2. *Protocept development***

- Transformation: from concept to prototype
- Bench top to pilot plant
- Consumer Focus group
- *Multifunctional team: Marketing, R&D, production, etc*

Product Development Stages in Nabisco

- **3. *Pilot plant scale up***
 - Prototyping
 - Modification of formulations
 - Optimization
 - Shelf life study
 - In-home use test
 - Logistics
 - Engineering involvement
- **4. *Production development***
 - Full scale running
 - Commercialization
 - Fine tuning process

NDP Process involve Technology and Marketing



One of the big benefits of the process is to get engineers to focus on what is most important – not necessarily stuff that is urgent.

Operating Without a Process?

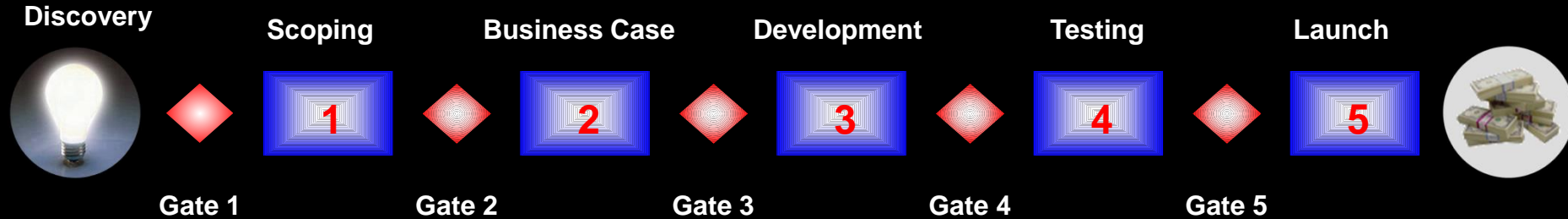
- **Technology Driven**

- *R&D Driven*
- *Build it they will come*

- **Marketing Driven**

- *I love the idea, let's do it*
- *The CEO asked me to do it*
- *I had this idea and other two persons are OK with it*

We Need A Structured NPD Process



Commonly referred to as the original NPD Process that made popular by Dr. Robert G. Cooper:

The Stage-Gate[®] Product Development Process

Stage

*Activities/Work take Place
During a Stage*



- Cross functional work in parallel
- Early definitions get fine tuned as project advances
- Must have a **plan** to follow
- Ensure communication/collaboration
- No one team owns the stage
- *Market research + Early product definition ensure reduced cycle time*

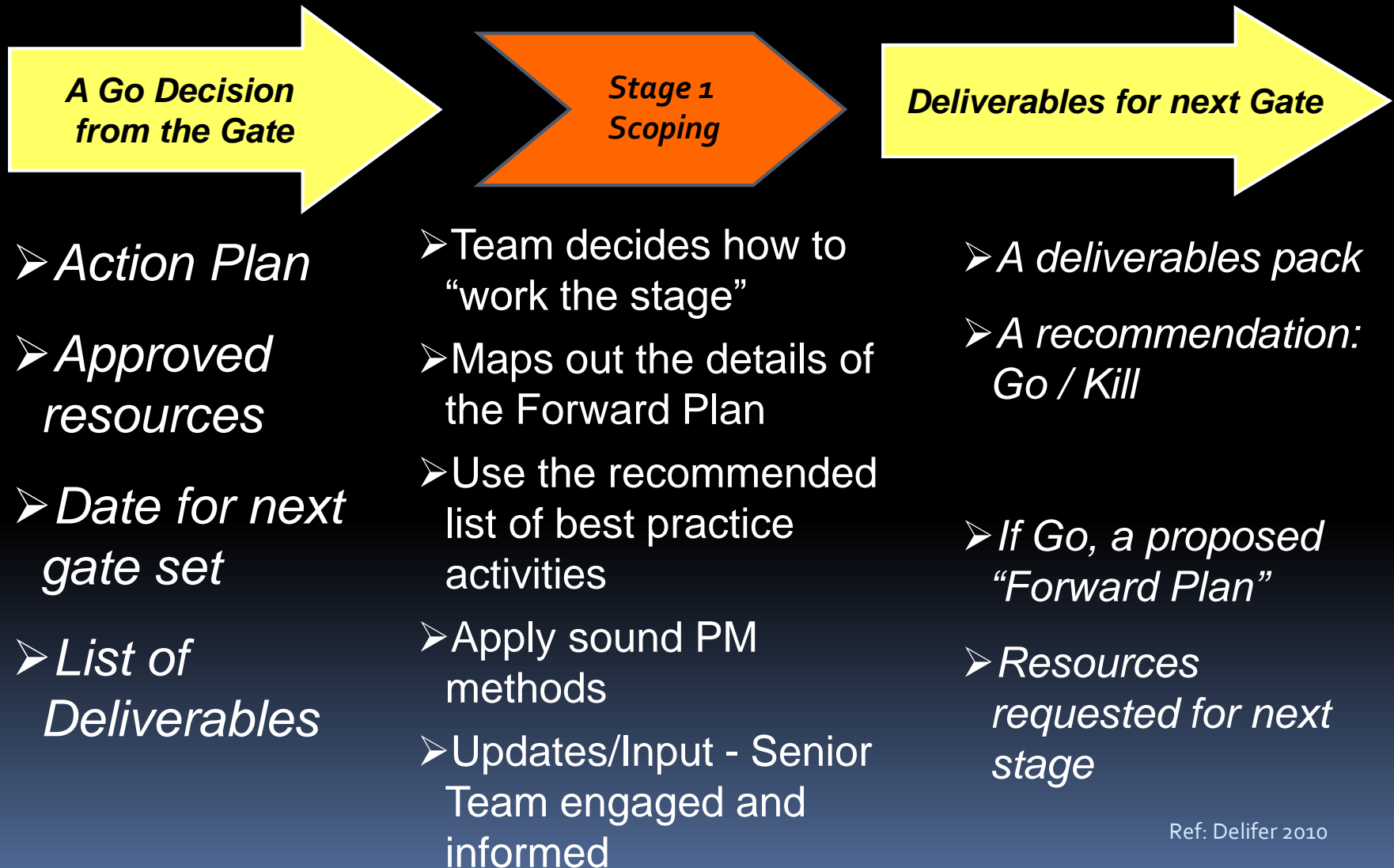
Gate

Individual Project Review and Decisions are made at Gate

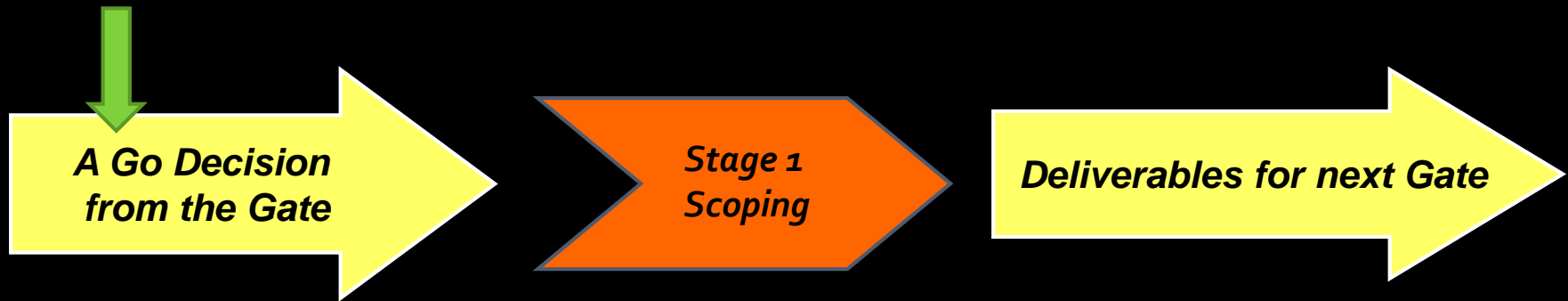


- Individual projects reviewed
- **Decision Point:** Go/ No Go/ Hold/ Recycle
- Scoring based on criteria
- Gatekeeper meeting
- Project Decisions
- Resources Allocated
- **Quality evaluation of deliverables**

How Stages Work?



How Stages Work?



➤ *Action Plan*

➤ *Approved resources*

➤ *Date for next gate set*

➤ *List of Deliverables*

➤ Team decides how to “work the stage”

➤ Maps out the details of the Forward Plan

➤ Use the recommended list of best practice activities

➤ Apply sound PM methods

➤ Updates/Input - Senior Team engaged and informed

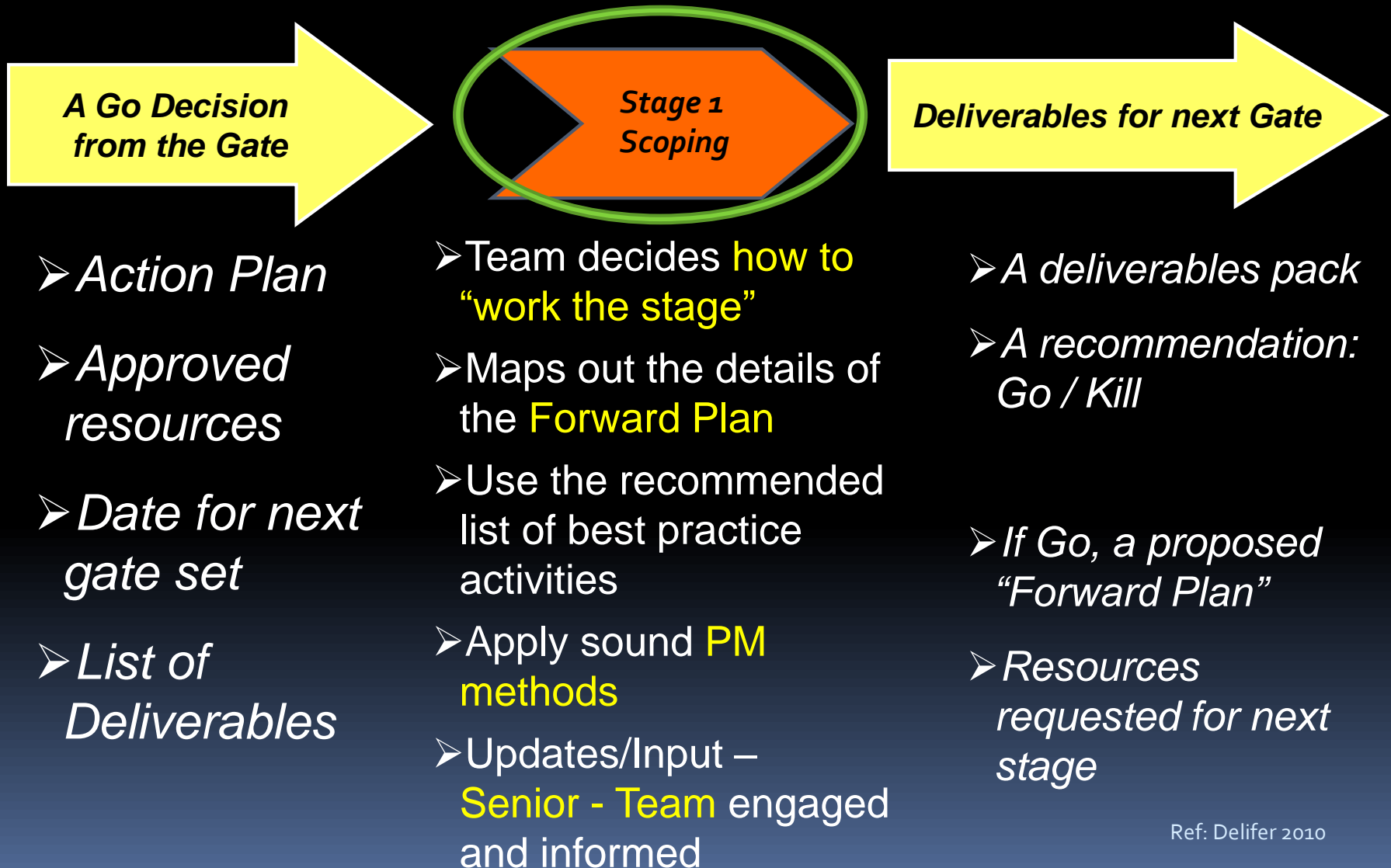
➤ *A deliverables pack*

➤ *A recommendation: Go / Kill*

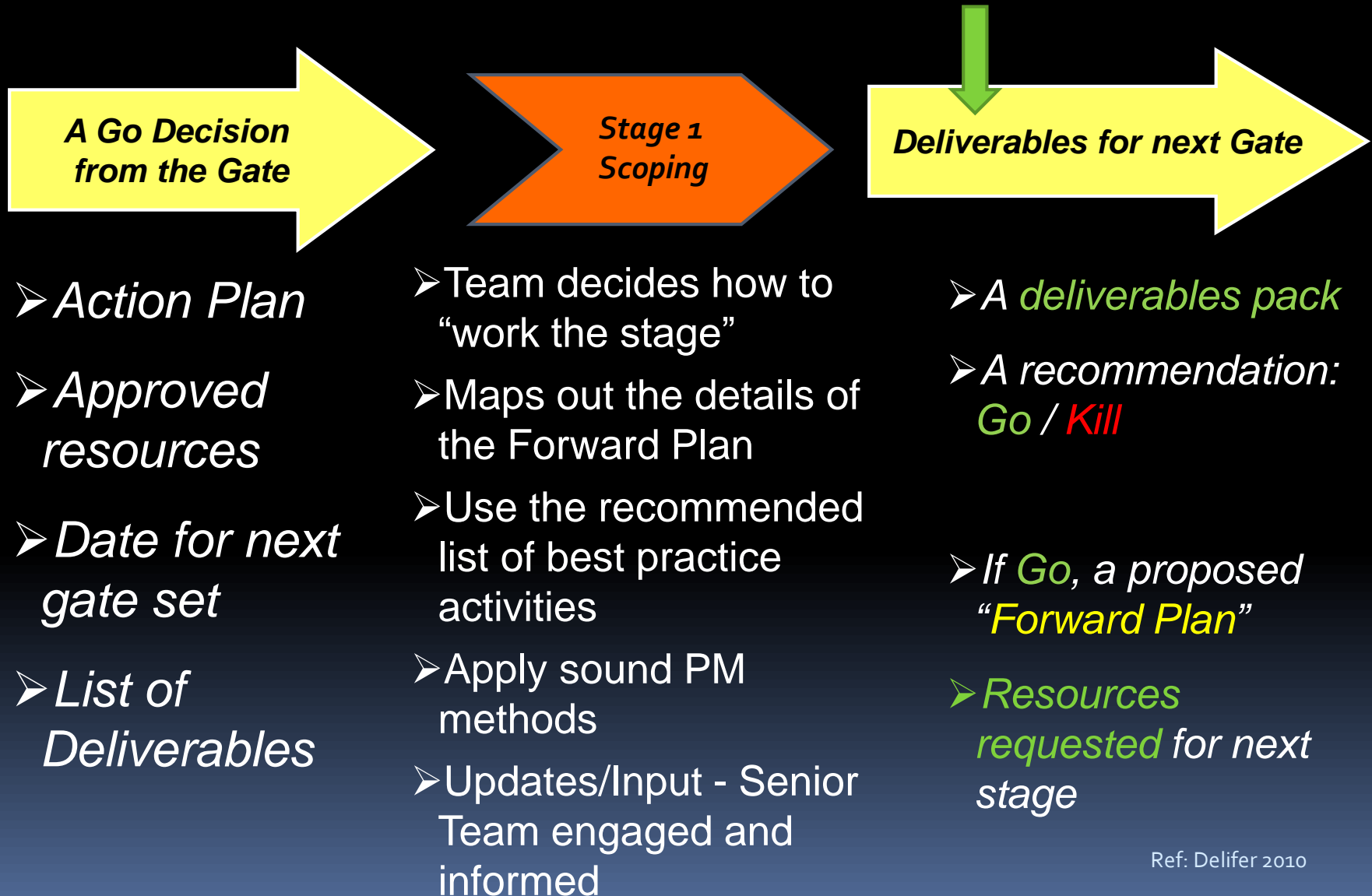
➤ *If Go, a proposed “Forward Plan”*

➤ *Resources requested for next stage*

How Stages Work?

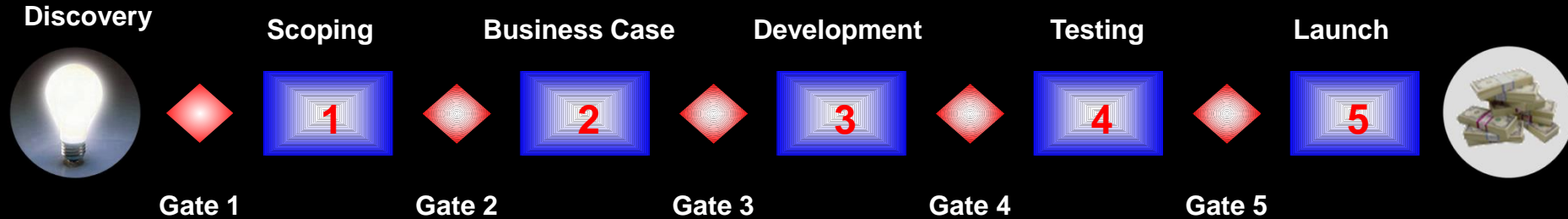


How Stages Work?



The ♦ Gates in the Stage-Gate Process

*Each **stage** is preceded by a **Gate***

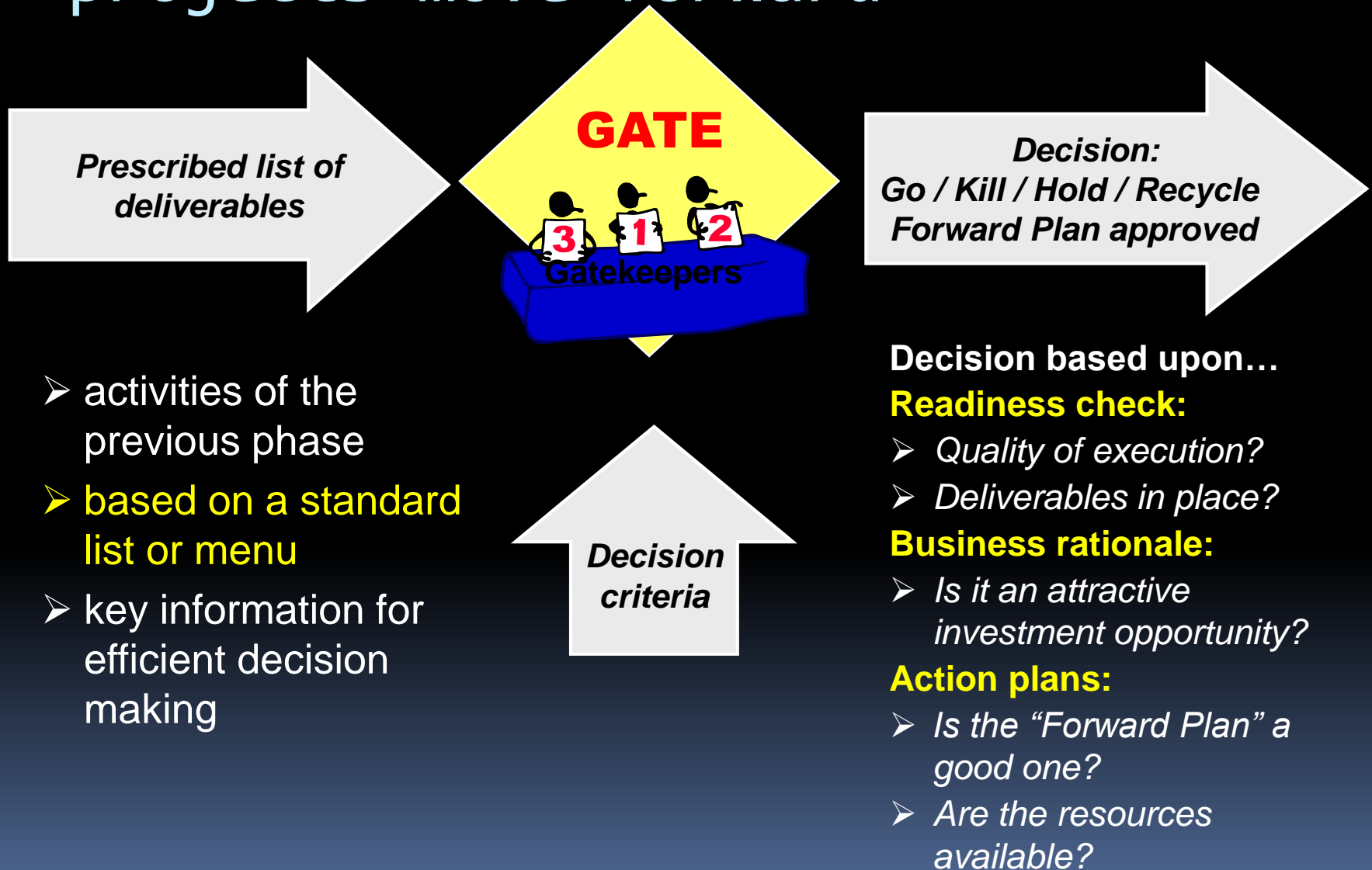


Gates = Decision Points or Go / Kill Points

*Gates are where **projects get resources** & **are prioritized**
– get on management's radar screen*

***Gates** are the **quality control check points** in the process*

Gates ensure that only the right projects move forward



Gate Scorecards

Benefit: Make better gate decisions, based on consistent, *market-based* criteria.

Accolade

Home My Profile Help Logout

Recent Items

Project

- My Gates
- Gate Line-up
- My Projects
- My Assignments
- Add New Project
- My Timesheets
- Status/Risk Dashboard

Process

Resource

Portfolio

Ideas and Concepts

- Idea Portal
- Add New Idea
- Add New Campaign
- My Ideas
- Concept Dashboard

Welcome

- Get Started
- Accolade Overview
- Process Manual
- Accolade Add-Ins
- Accolade Support

Concept: Innova

Home Stages Gates Metrics Details

Discovery

Initial Screen (Apr 08, 2010)

This stage is a relatively quick, internal screen to determine if further investigation in the next stage.

Scoping

Name
Preliminary Integrated Project
Preliminary Roadmap
Preliminary Market Assessment
Preliminary Technical Assessment
Preliminary Production/Supply
Preliminary Cash Flow Analysis
Preliminary Business Case
Gate 2 Scorecard
Executive Gate Presentation

Apply Reset Expand All Collapse

Accolade Stage-Gate Criteria: Di-HydroTech

Team Leader - Jane Doe

Current Stage - Scoping

Are there any Killer Variables? No

CRITERIA	0	4	7	10	RATING
Strategic Fit & Importance <ul style="list-style-type: none"> fit w/ company strategy importance of project impact on business 	<ul style="list-style-type: none"> Not aligned with strategy Not important Low impact 	<ul style="list-style-type: none"> Somewhat aligned with strategy Somewhat important Modest impact 	<ul style="list-style-type: none"> Supports strategy Important Positive impact 	<ul style="list-style-type: none"> Aligns very well with strategy Very important High impact 	3
Product & Competitive Advantage <ul style="list-style-type: none"> unique customer benefits value for money competitive rationale customer feedback 	<ul style="list-style-type: none"> Limited benefit Low value No competitive rationale Negative feedback 	<ul style="list-style-type: none"> Modest benefit Fair value Marginal competitive rationale Neutral feedback 	<ul style="list-style-type: none"> Positive benefit Good value Good competitive rationale Positive feedback 	<ul style="list-style-type: none"> Significant benefit Great value Strong competitive rationale Very positive feedback 	4
Market Attractiveness <ul style="list-style-type: none"> market size growth margins competitive situation 	<ul style="list-style-type: none"> Small/non-existent market Limited growth Low margins Highly competitive 	<ul style="list-style-type: none"> Modest market Fair growth Modest margins Competitive market 	<ul style="list-style-type: none"> Significant market Positive growth Good margins Modestly competitive 	<ul style="list-style-type: none"> Large market High/potentially high growth Very good margins Weak competition 	3
Synergies: leverages our core competencies in: <ul style="list-style-type: none"> technology/manufacturing marketing, distribution/sales 	<ul style="list-style-type: none"> No opportunities to leverage core competencies Required skills/experience/resources are not attainable 	<ul style="list-style-type: none"> Some opportunities to leverage core competencies Required skills/experience/resources not present but may be accessible 	<ul style="list-style-type: none"> Considerable opportunities to leverage core competencies resources are present, but not fully accessible 	<ul style="list-style-type: none"> Excellent opportunities to leverage core competencies Required skills/experience/resources are present and accessible 	4
Technical Feasibility <ul style="list-style-type: none"> Size of technical gap Familiarity with technology Technical complexity 	<ul style="list-style-type: none"> Does not meet requirements Feasibility not demonstrated Low likelihood of manufacturability 	<ul style="list-style-type: none"> Meets some requirements Limited demonstration of feasibility Modest likelihood of manufacturability 	<ul style="list-style-type: none"> Meets most requirements Technical issues, but actions can address Good likelihood of manufacturability 	<ul style="list-style-type: none"> Meets all requirements Feasibility demonstrated clearly Very high likelihood of manufacturability 	8
Reward to the Company <ul style="list-style-type: none"> size of opportunity financial return level of risk and ability to address risks 	<ul style="list-style-type: none"> Poor, limited opportunity NPV & IRR negative Very high level of risk and no ability to address 	<ul style="list-style-type: none"> Modest opportunity NPV & IRR are modest High amount of risk and some ability to address 	<ul style="list-style-type: none"> Good opportunity NPV & IRR are good Moderate risk and ability to address 	<ul style="list-style-type: none"> Excellent opportunity Very positive NPV & IRR Acceptable risk and solutions 	4
SCORE TOTAL*					4.33

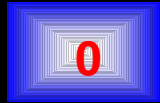
Must exceed at least a 5.0 average to proceed to next gate.

GATE SCORECARDS

Used by decision-makers to ensure assessment of projects on standardized, best-practice criteria.

Flyover from A to Z

Discovery



Scoping



Business Case



Development



Testing



Launch



Gate 1

Gate 2

Gate 3

Gate 4

Gate 5

Purpose

To gather input for new or enhanced product ideas

A relatively quick, qualitative assessment to determine whether the project is worth further investigation.

To conduct a detailed investigation to develop a product definition and a business case.

To develop a prototype product, validated with customers.

To provide final and total validation of the entire project: the commercial product, its production, and its marketing.

Implement production and marketing launch plans.

Key Deliverables

- Inquiry Form
- Screened Idea

- Preliminary Business Case

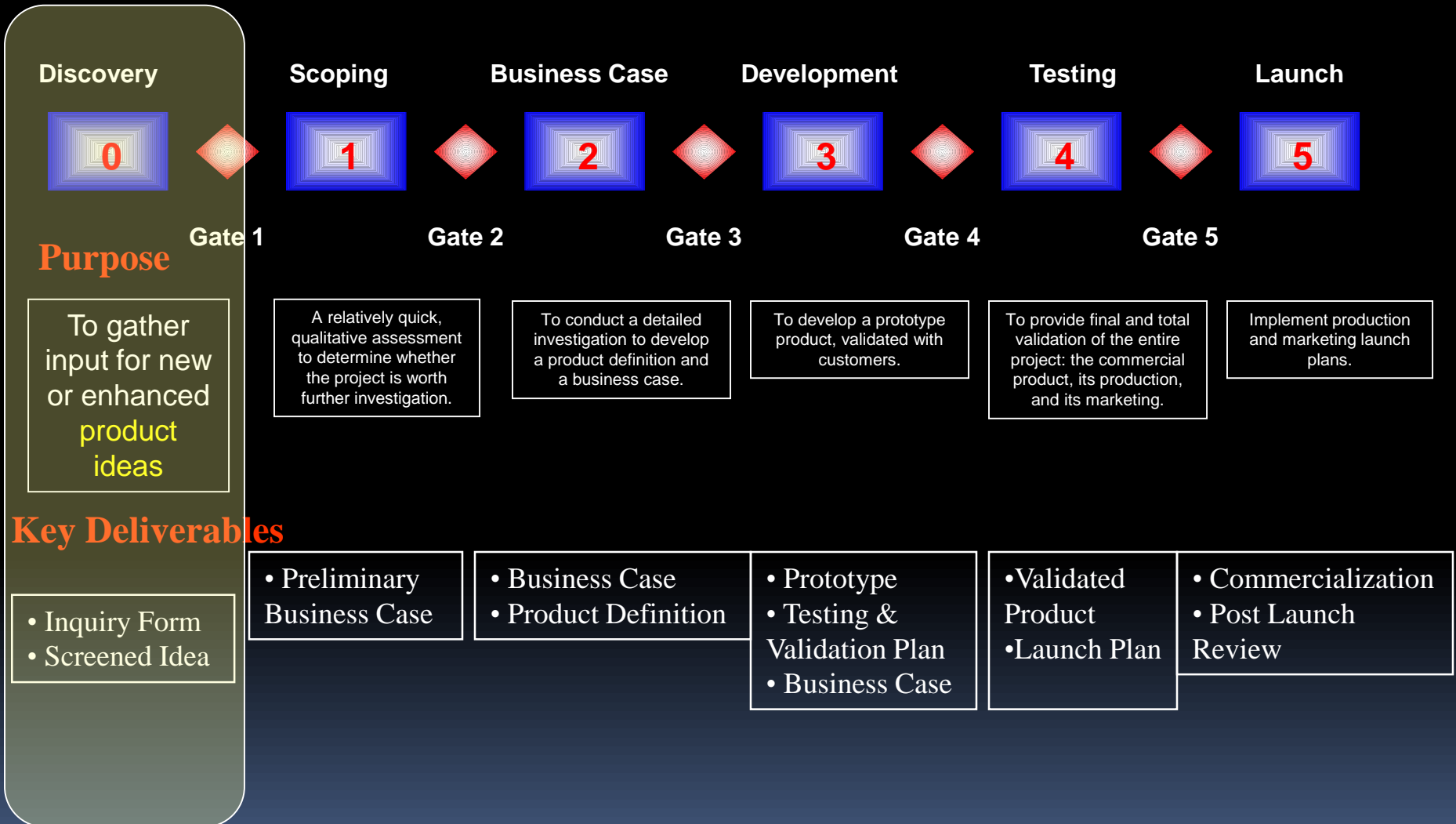
- Business Case
- Product Definition

- Prototype
- Testing & Validation Plan
- Business Case

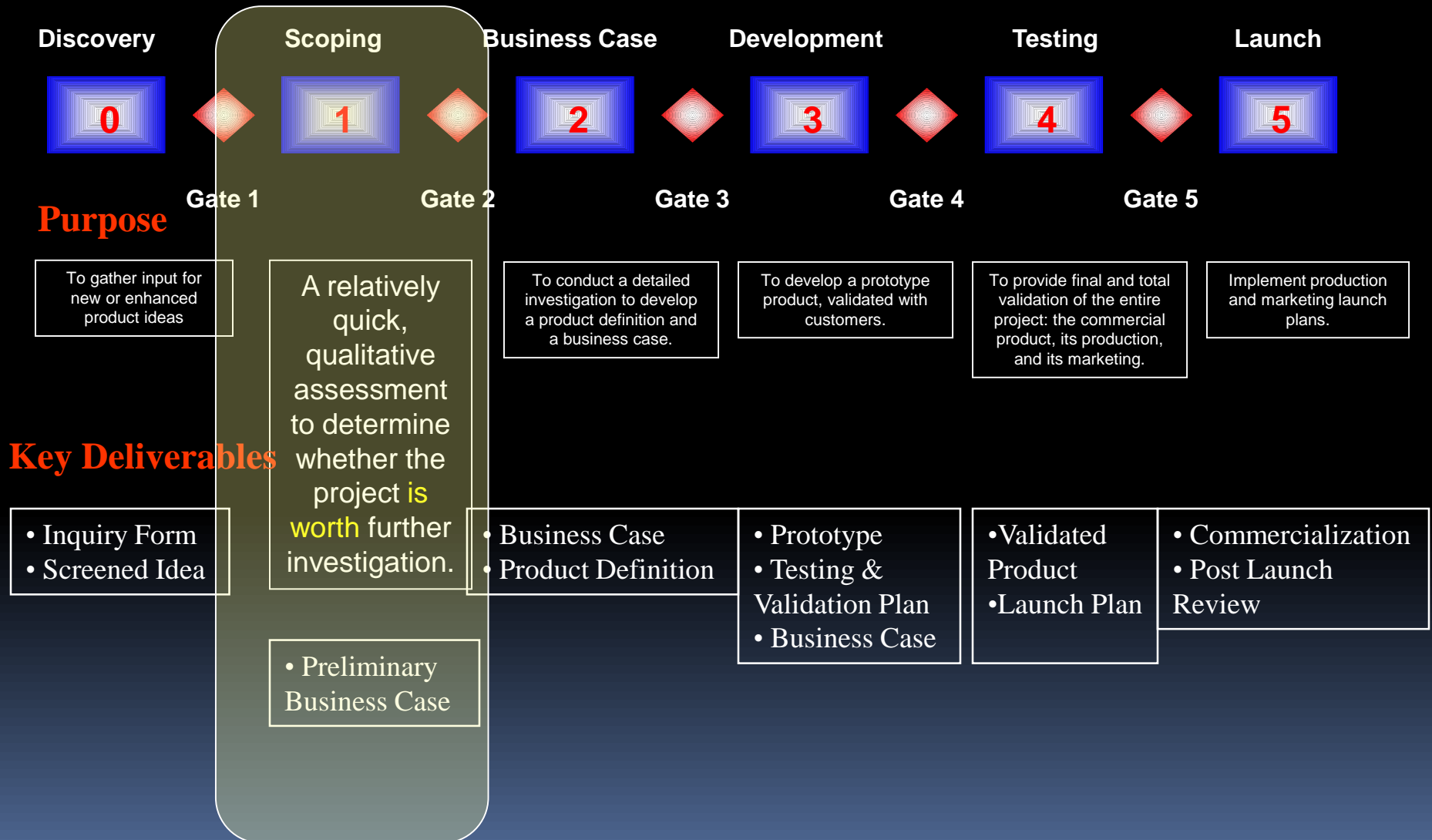
- Validated Product
- Launch Plan

- Commercialization
- Post Launch Review

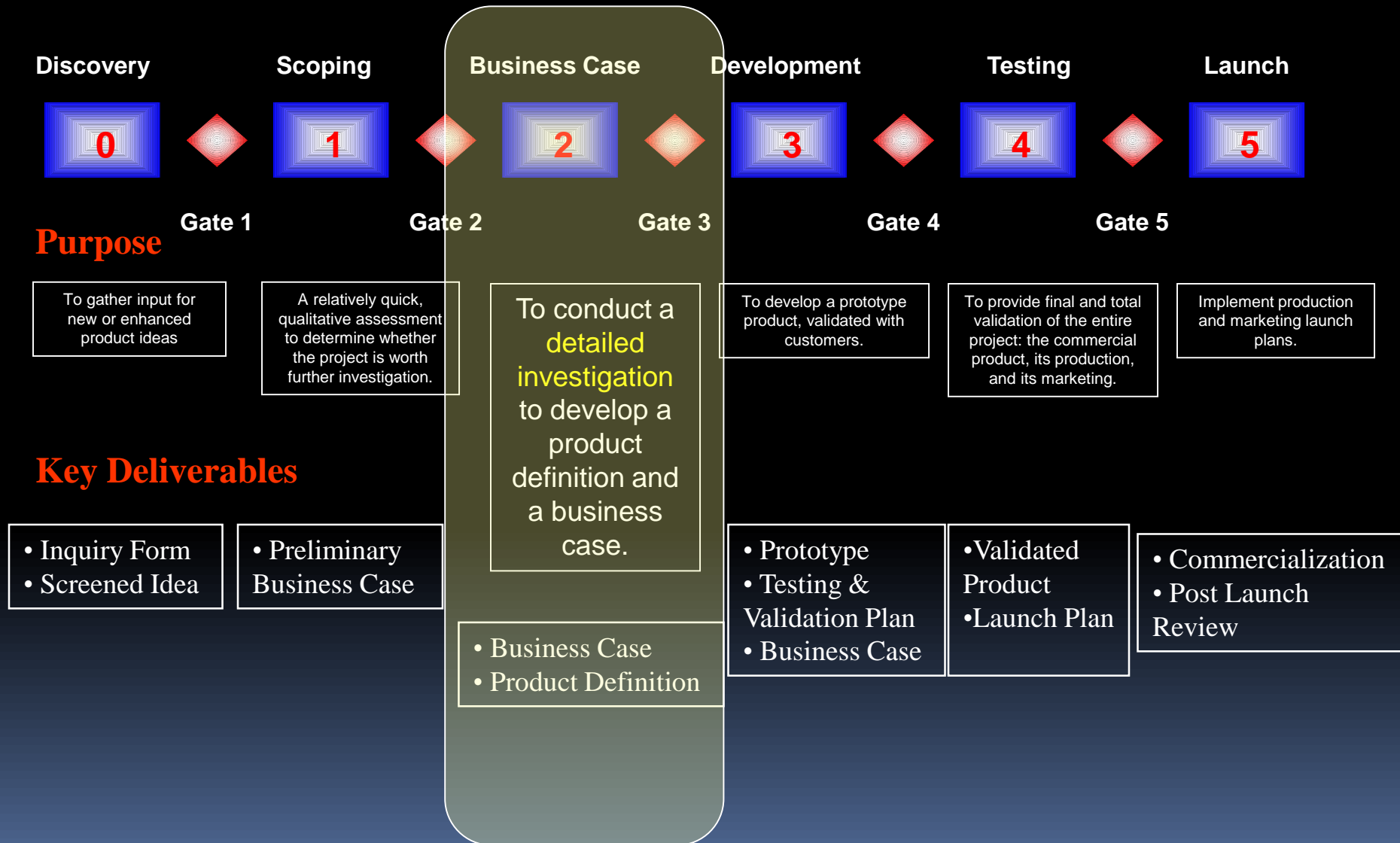
Flyover from A to Z



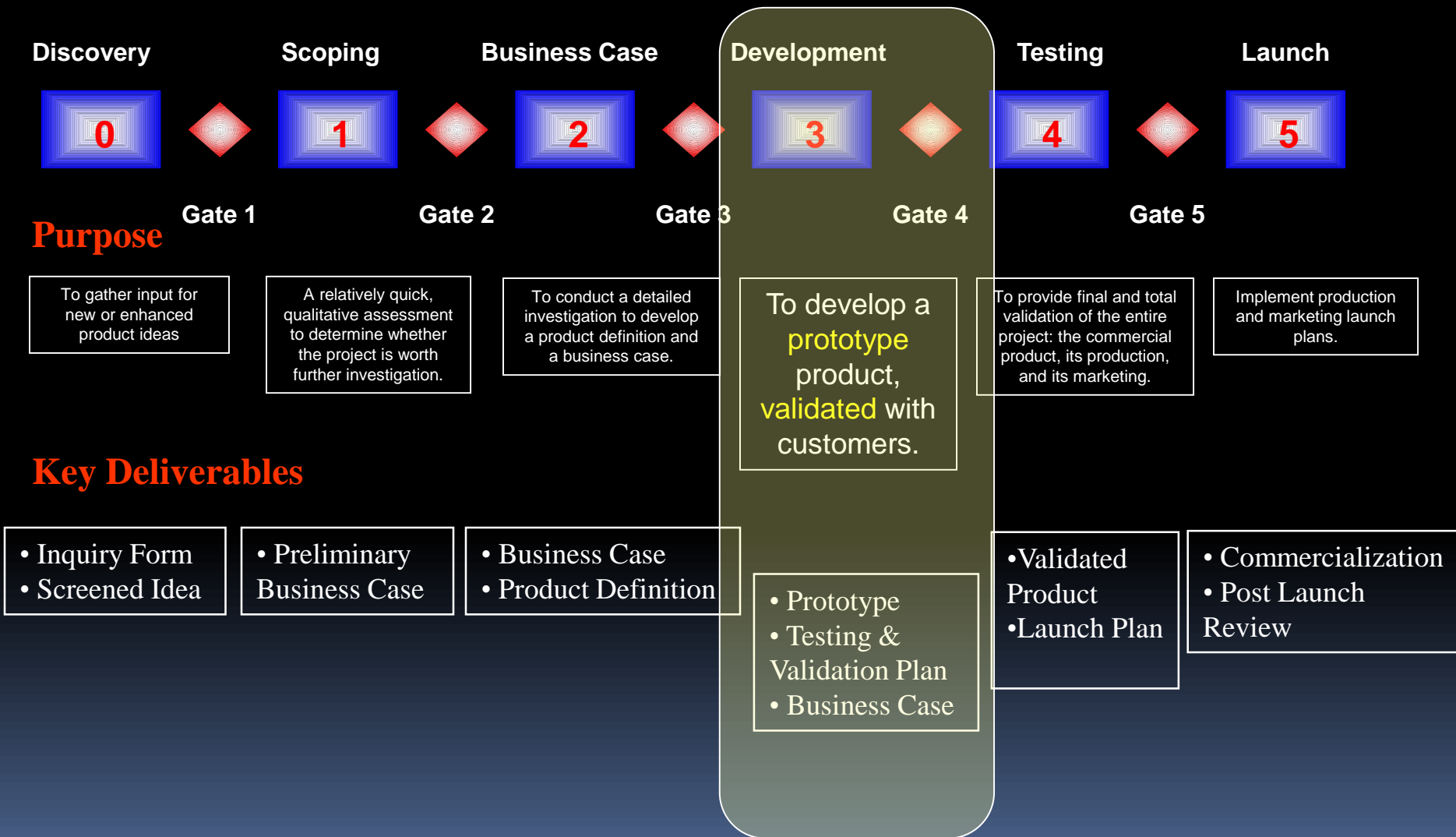
Flyover from A to Z



Flyover from A to Z

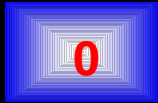


Flyover from A to Z



Flyover from A to Z

Discovery



Scoping



Business Case



Development



Testing



Launch



Purpose

Gate 1

Gate 2

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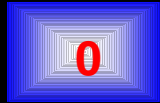
- Prototype
- Testing & Validation Plan
- Business Case

- Validated Product
- Launch Plan

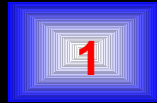
- commercialization
- Post Launch Review

Flyover from A to Z

Discovery



Scoping



Business Case



Development



Testing



Launch



Gate 1

Gate 2

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- Business Case
- Product Definition

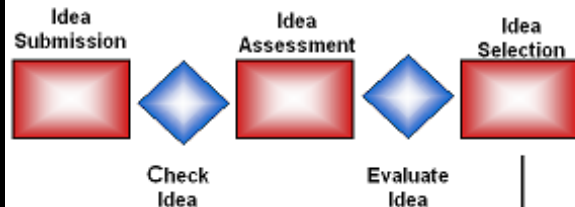
- Prototype
- Testing & Validation Plan
- Business Case

- Validated Product
- Launch Plan

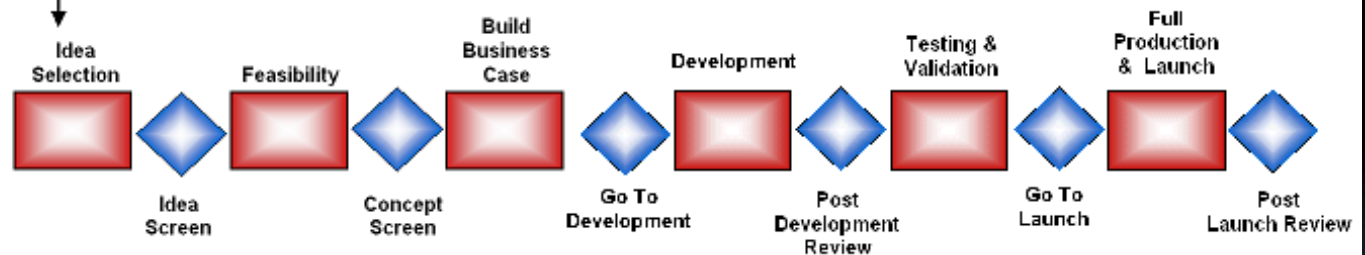
- Commercialization
- Post Launch Review

From Ideas to a Winning Product

Idea Management Process



Project Migration



New Product Development Process

From Ideas to a Winning Product

Idea Management Process



Check
Idea

Evaluate
Idea

Project Migration



Idea
Screen



Concept
Screen



Go To
Development



Post
Development
Review



Go To
Launch



Post
Launch Review

New Product Development Process

Generic Stage-Gate Process

Discovery



- Brainstorm with Industry and Technical Experts
- Intellectual Property Analysis
- Preliminary Market Assessment

Scoping



- Expert Opinions on Concept Feasibility
- Research on Standards and Regulations
- Examination of Aftermarket Environmental Issues
- Competitor Profiles
- Examination of Industry Situation and Trends
- Preliminary Technology Assessment
- Investigation of Licensable Technologies
- Research on Product Requirements
- Concept Testing

Build Business Case



- Identification and Investigation of Potential Strategic Partners
- Detailed Market Studies
- Channel Research
- Trademark Research
- Detailed Technical Assessment
- Business Model Assessment
- Positioning Research
- Pricing Research
- Identification and Profiling of Target Markets
- Assessment of "Make" vs. "Buy" Options

Development



- Evaluation of Alternative Production Processes / Procedures
- Expert Problem-solving and Decision-making Support
- Sourcing of Testing, Measurement and Monitoring Equipment
- Supplier Research
- Packaging Research
- Materials Research

Testing and Validation



- Assessment of Critical Test Criteria
- Expert Review of Test Findings
- Research on Optimal Test Methods
- Benchmarking Studies

Launch

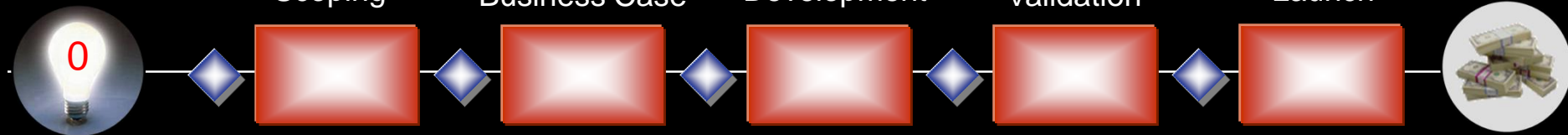


- Identification of New Markets and Market Segments
- Ongoing, Automatic Intelligence Gathering Related To:
 - Scientific and Technical Advances
 - Competitor Activities
 - Market Conditions and Trends
 - Patent Activity
 - Changes in Standards and Regulations
- Identification of New Users in Current Segments
- Research on Opportunities for Product Improvement



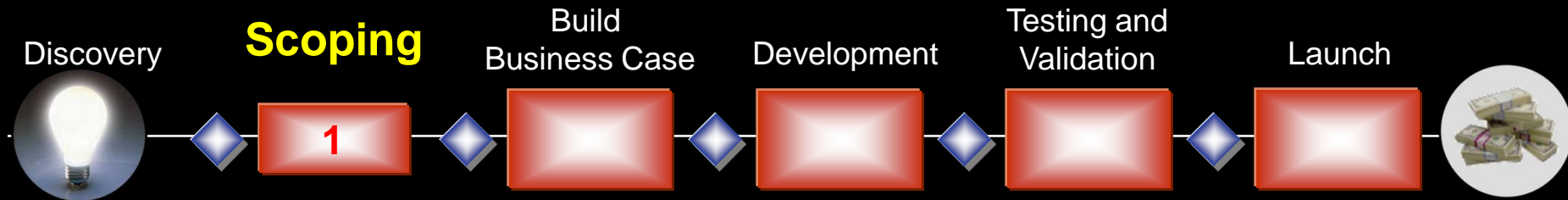
Stage-Gate Process: Stage 0

Discovery



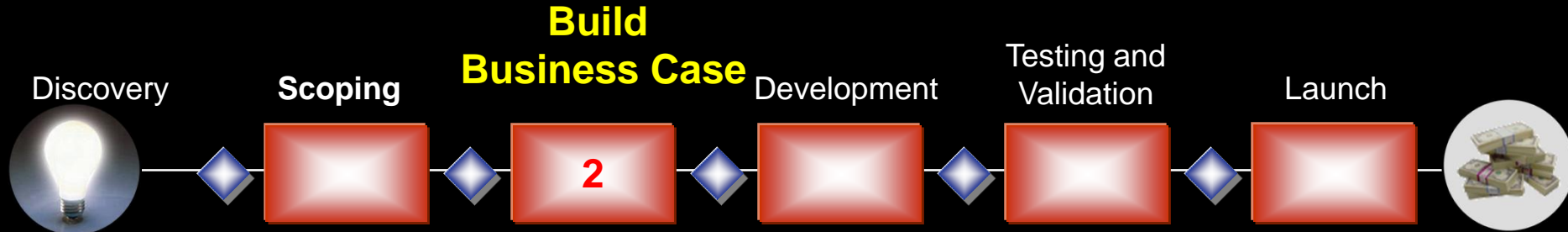
- Opportunities identification
 - Search for *existing products in market*
 - Look back *the products invented/developed in history*
- Brainstorm with Industry and Technical Experts
- **Intellectual Property** Analysis
- Preliminary Market Assessment

Stage-Gate Process: Stage 1



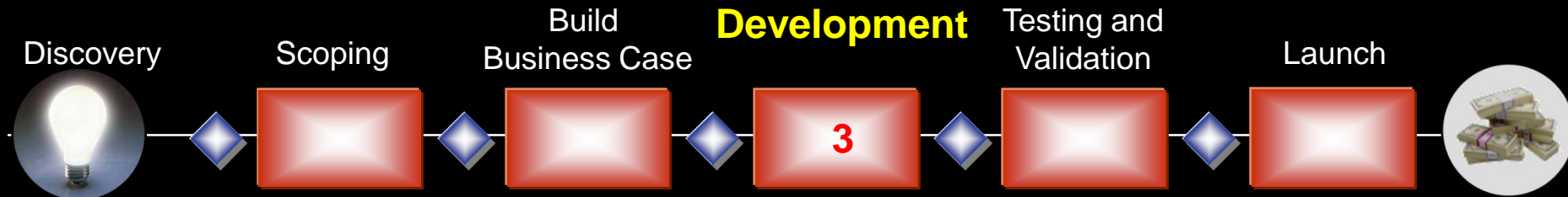
- **Expert** Opinions on **Concept Feasibility**
- Research on **Standards and Regulations**
- Examination of Aftermarket **Environmental Issues**
- **Competitor Profiles**
- **Examination of Industry Situation and Trends**
- Preliminary Technology Assessment
- Investigation of **Licensable Technologies**
- Research on Product **Requirements**
- **Concept Testing**

Stage-Gate Process: Stage 2



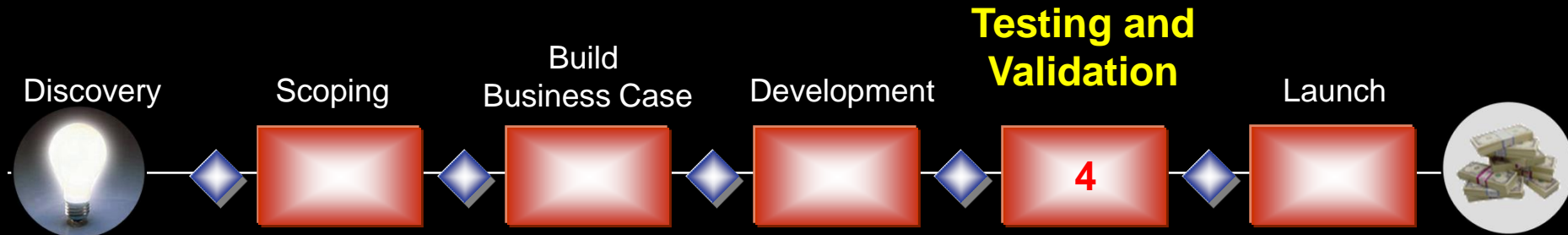
- Identification and Investigation of Potential **Strategic Partners**
- Detailed Market Studies
- **Channel and Trademark** Research
- Detailed Technical Assessment
- Business Model Assessment
- **Positioning** Research
- **Pricing** Research
- Identification and Profiling of **Target Markets**
- Assessment of “**Make**” vs. “**Buy**” Options
- **Project establishment**

Sample Stage-Gate Process: Stage 3



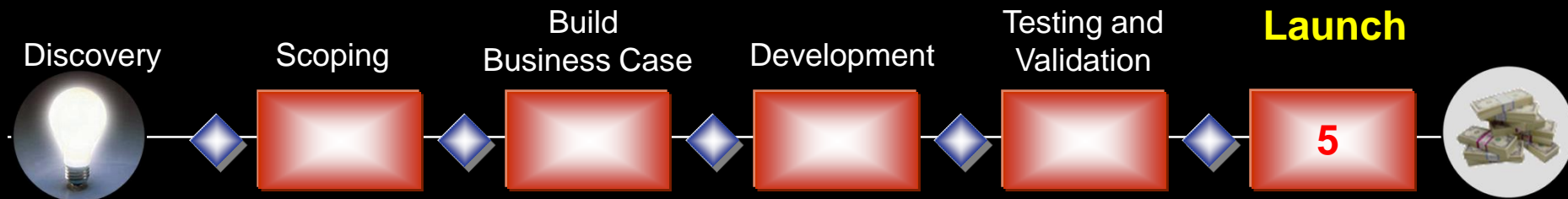
- Evaluation of **Alternative** Production Processes/ Procedures
- Expert *Problem-solving* and *Decision-making* **Support**
- Sourcing** of Testing, Measurement and Monitoring Equipment
- Supplier* Research
- Packaging* Research
- Materials* Research
- Refinement**

Stage-Gate Process: Stage 4

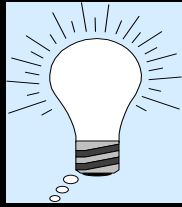


- Assessment of **Critical Test Criteria**
- Expert Review of **Test Findings**
- Research on **Optimal Test Methods**
- Benchmarking** Studies

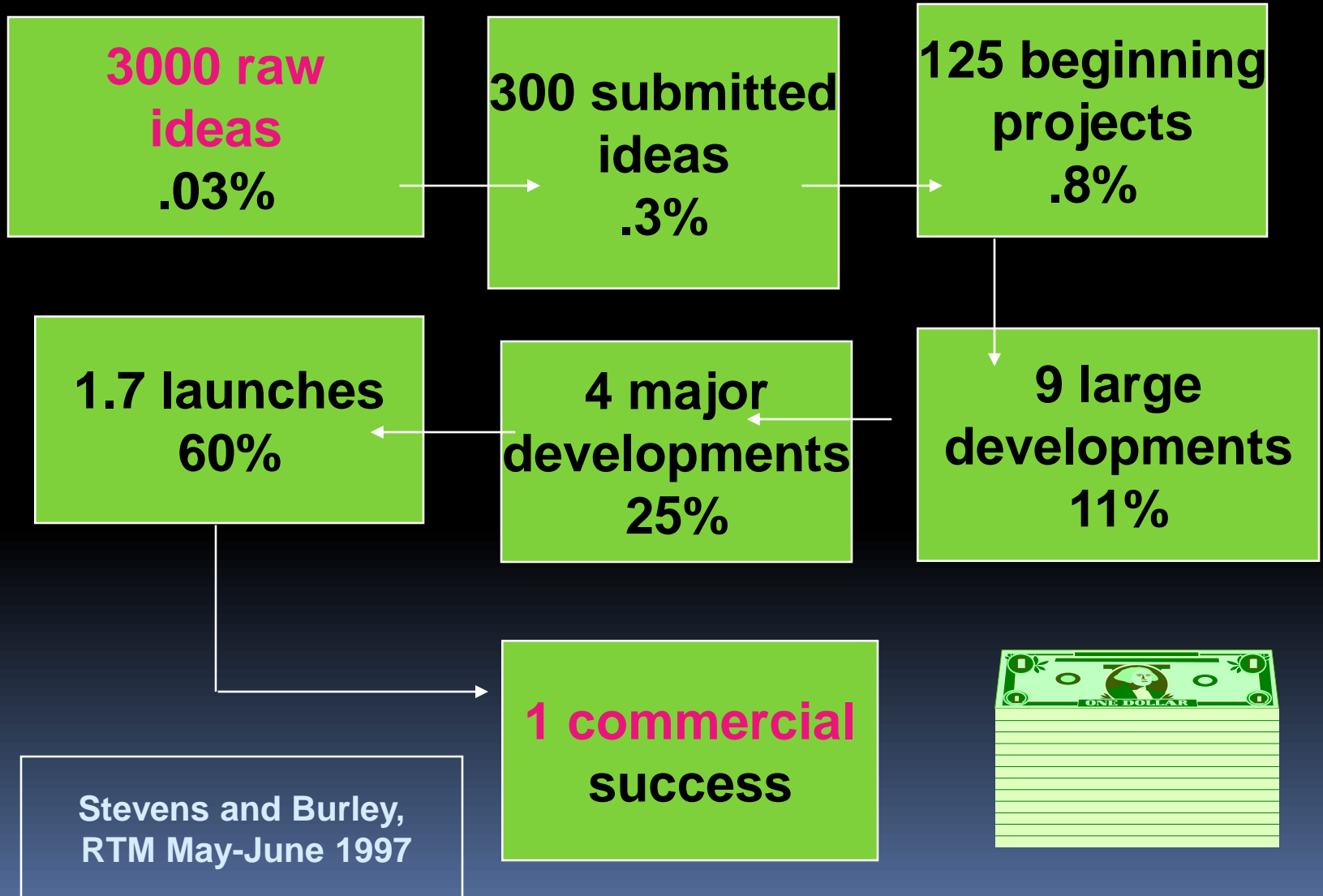
Sample Stage-Gate Process: Stage 5



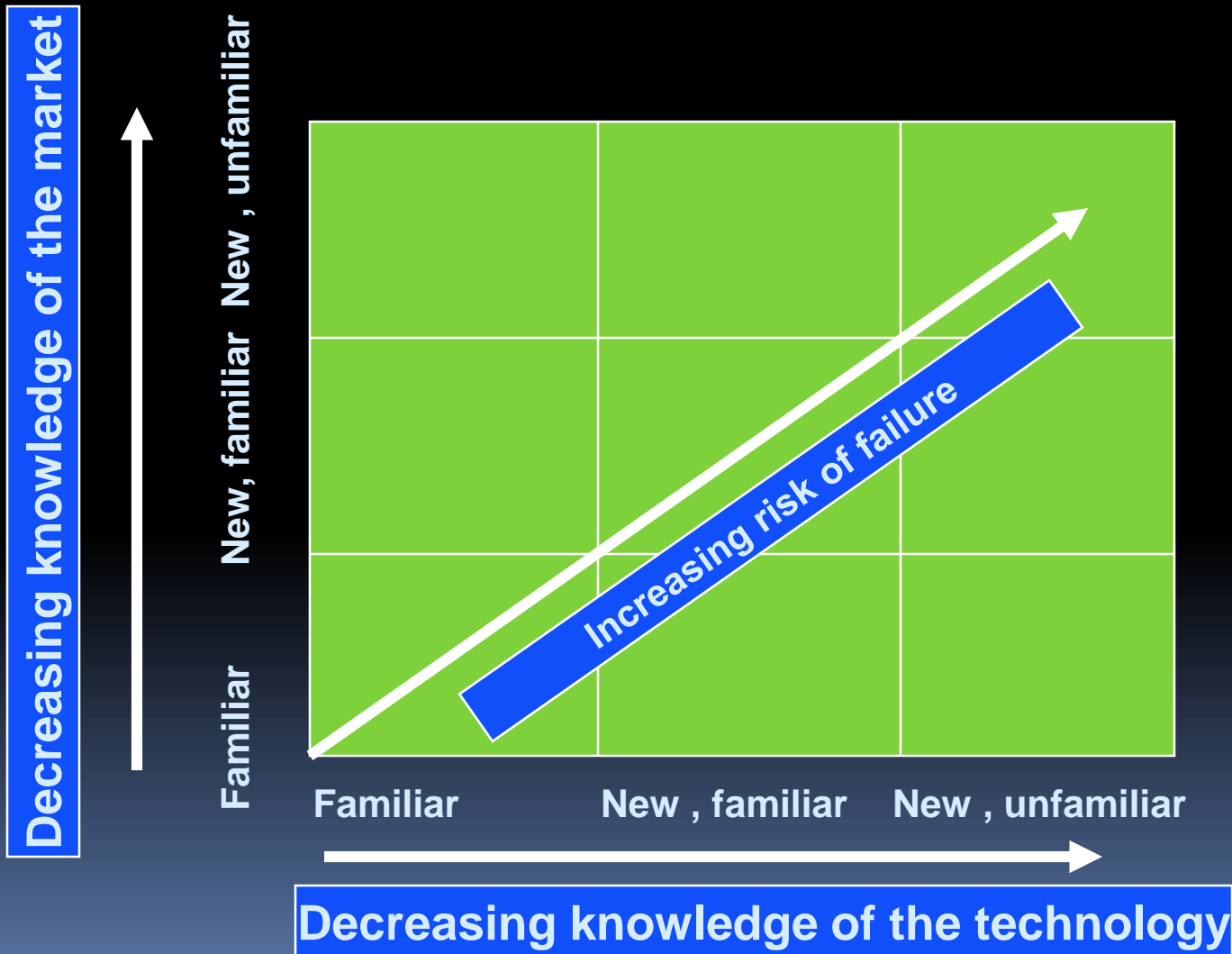
- Identification of **New Markets** and **Market Segments**
- Ongoing, Automatic **Intelligence Gathering** Related To:
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 - *Competitor Activities*
 - *Market Conditions and Trends*
 - *Patent Activity*
 - *Changes in Standards and Regulations*
- Identification of **New Users** in Current Segments
- **Research on Opportunities for Product Improvement**
- Review



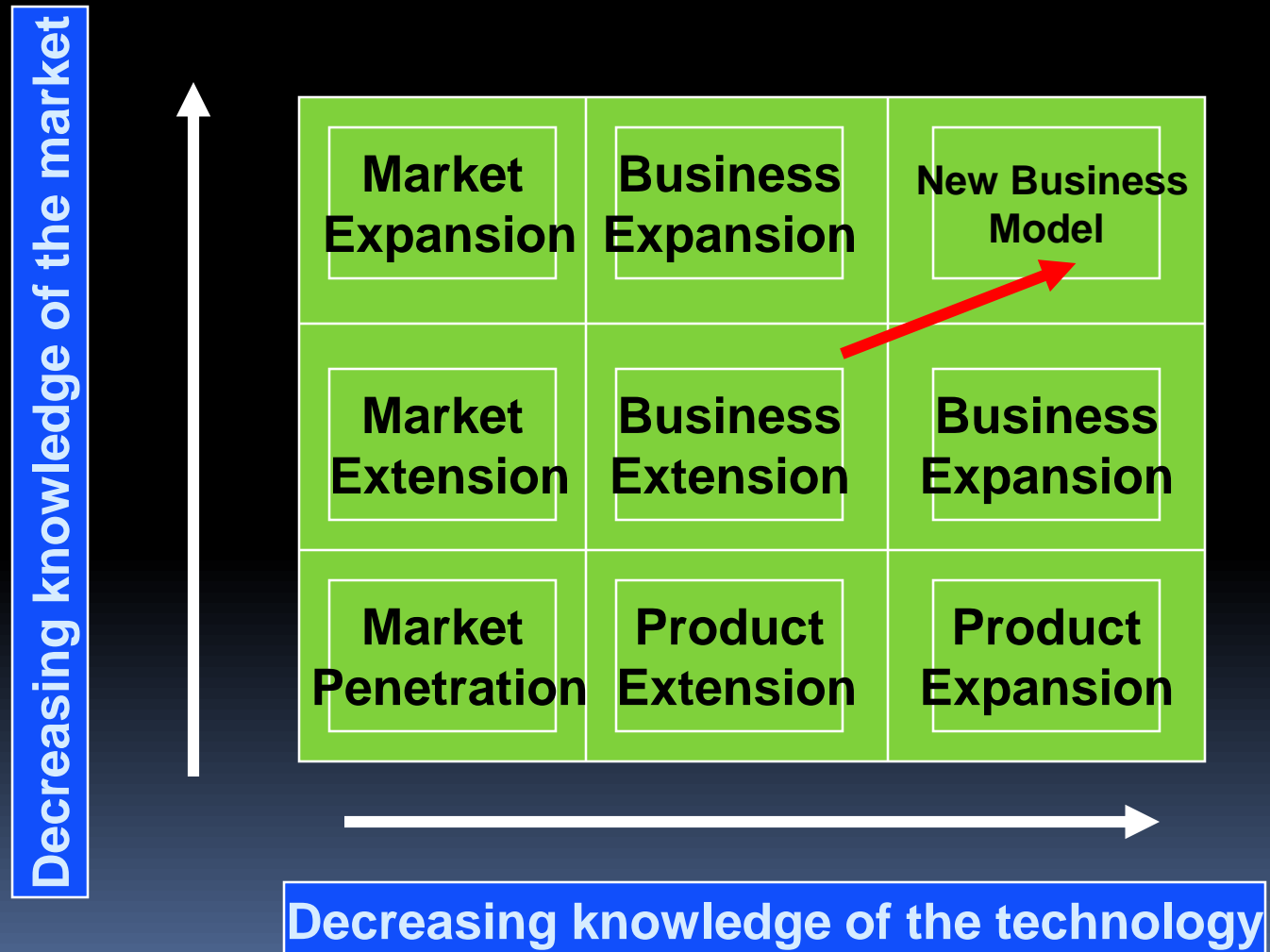
Success Rate Entirely New Products



Familiarity Matrix: A Guide Place Your Project in One of the Nine Boxes



Familiarity Matrix: A Guide Place Your Project in One of the Nine Boxes

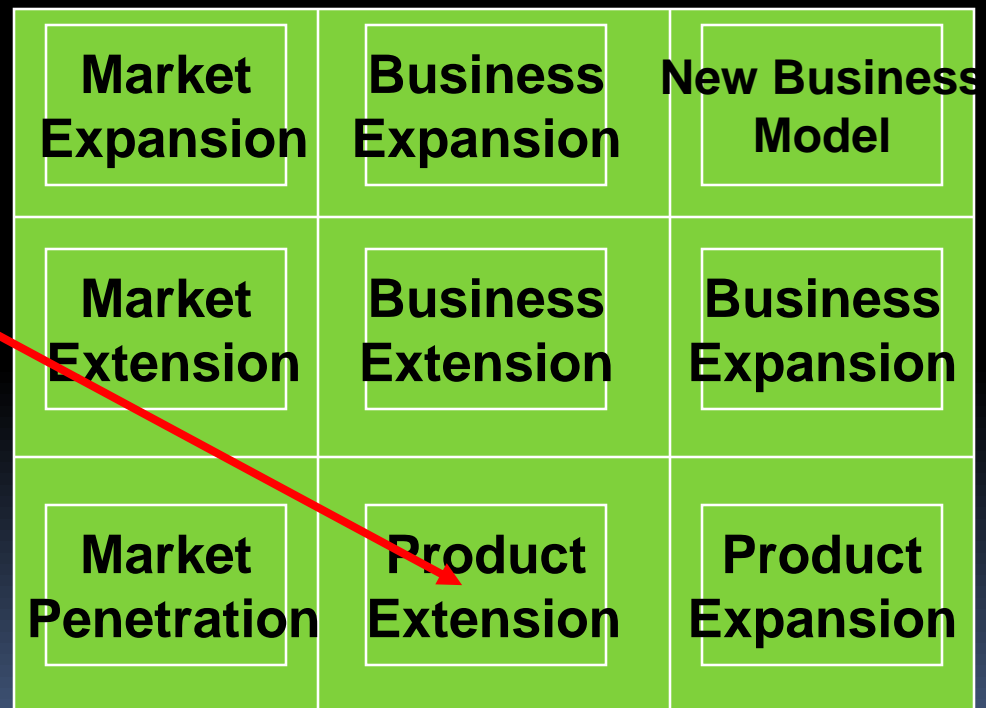


Familiarity Matrix: A Guide Place Your Project in One of the Nine Boxes

Probability of Success

New Product with unrelated technology in existing market:

50%

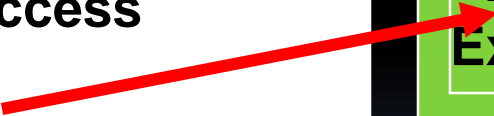


Market Expansion	Business Expansion	New Business Model
Market Extension	Business Extension	Business Expansion
Market Penetration	Product Extension	Product Expansion

Familiarity Matrix: A Guide Place Your Project in One of the Nine Boxes

**Probability of
Success**

**Existing product in
a new market:
15%**



Market Expansion	Business Expansion	New Business Model
Market Extension	Business Extension	Business Expansion
Market Penetration	Product Extension	Product Expansion

Familiarity Matrix: A Guide

Place Your Project in One of the Nine Boxes

**Probability of
Success**

**Improved product
in existing
market:**

75%

“Suicide Square”

.03%

Market Expansion	Business Expansion	New Business Model
Market Extension	Business Extension	Business Expansion
Market Penetration	Product Extension	Product Expansion

Familiarity Matrix: A Guide Place Your Project in One of the Nine Boxes

**Probability of
Success**

**New Product in
a New Market:**

5%

Market Expansion	Business Expansion	New Business Model
Market Extension	Business Extension	Business Expansion
Market Penetration	Product Extension	Product Expansion

Causes of New Product Failure

Inadequate Market Analyses

Product Problems or Defects

Lack of Effective Marketing

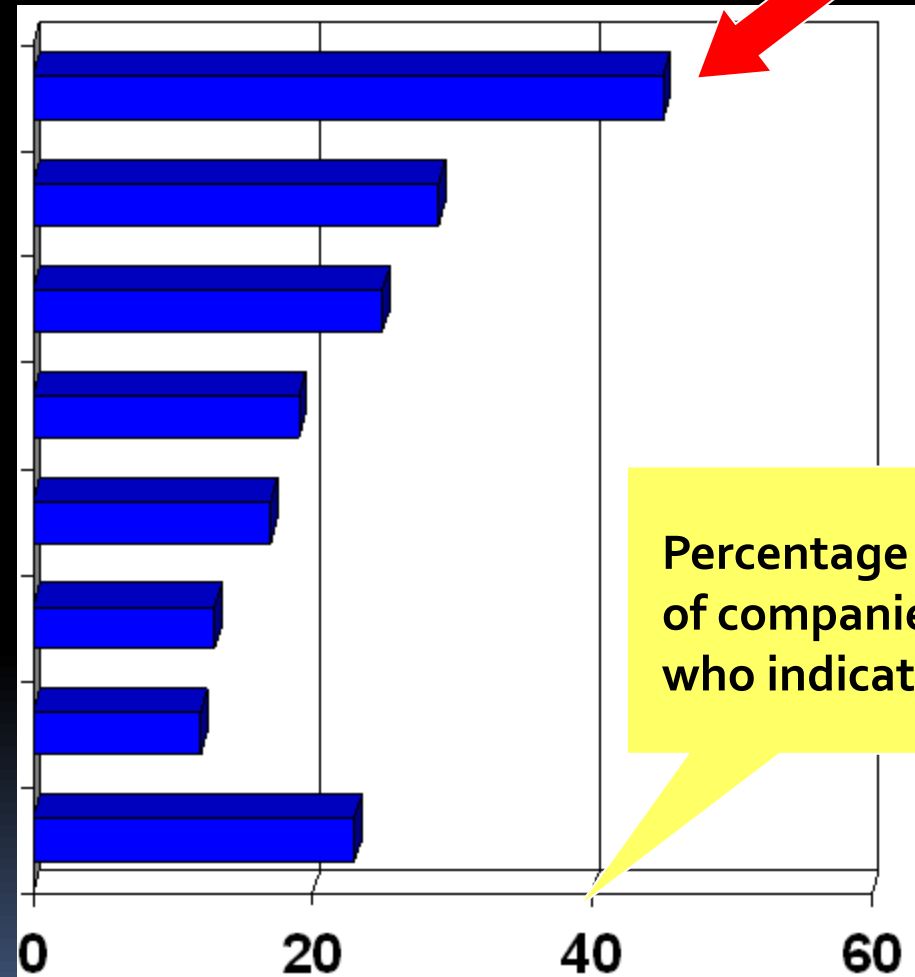
Higher costs than anticipated

Competitive Strength

Poor Timing of Introduction

Technical or Production Problems

Other Problems



Final Remarks: The Stage-Gate Process

- 1. To ensure to spend resources on the Right projects*
- 2. To ensure to do the projects the Right way*
- 3. To shorten the time to market*


*New product development is **complex**, its success depends upon **cross-functional cooperation and support** that often extends across an entire organization;

- *Gate meetings are **deadlines**;
- *Decisions can be made based on **complete information**;
- ***Link to project planning**;
- *Reminders & alerts for **tracking progress**.



Q & A ...

Thanks!



Professor Yao-wen Huang
huang188@gmail.com