

New Product Development



NPD Agenda

Strategy, Structure & Process

Foundation
elements

Overview of
new product
processes

Building a business case for your product

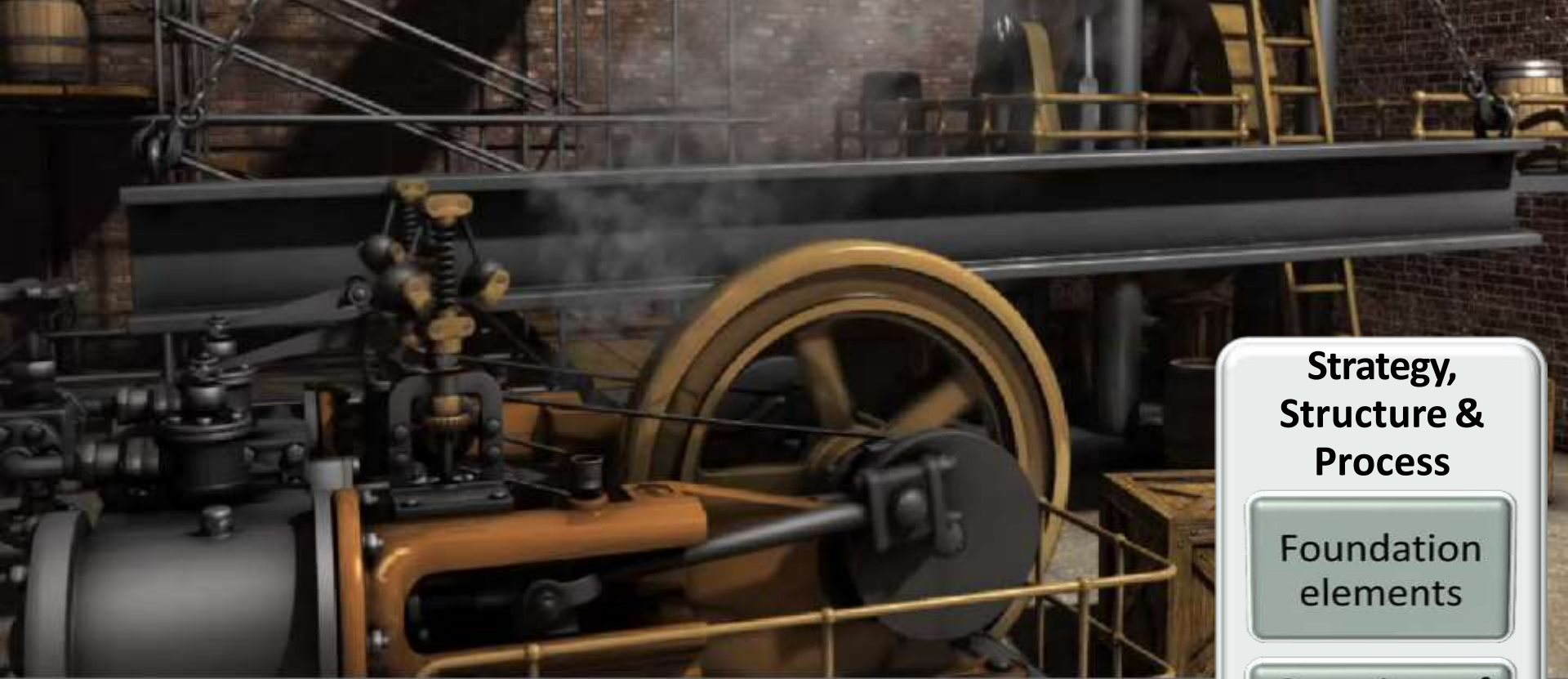
Ideation &
research

Building the
business case
& design

Development and launch activities

Validate &
develop

Launch &
post-launch
efforts



Strategy, Structure & Process

Foundation
elements

Overview of
new product
processes

Strategy, structure & process



Increasing demands on development processes

1980s

Quality/ technology

Above PLUS

1990s

Low Cost

Early 2000s

Above PLUS

Increased speed

2010 +

Above PLUS

Product glut & hypercompetition

Open innovation & coopetition

Globalization

Economic impacts



Foundation vs. project elements

Foundation

Focus on systematic series of actions

- Structures, roles, incentives & norms
- Process metrics

Business and product strategies

- Vision, technologies & portfolio

Overall corporate climate & culture

Project

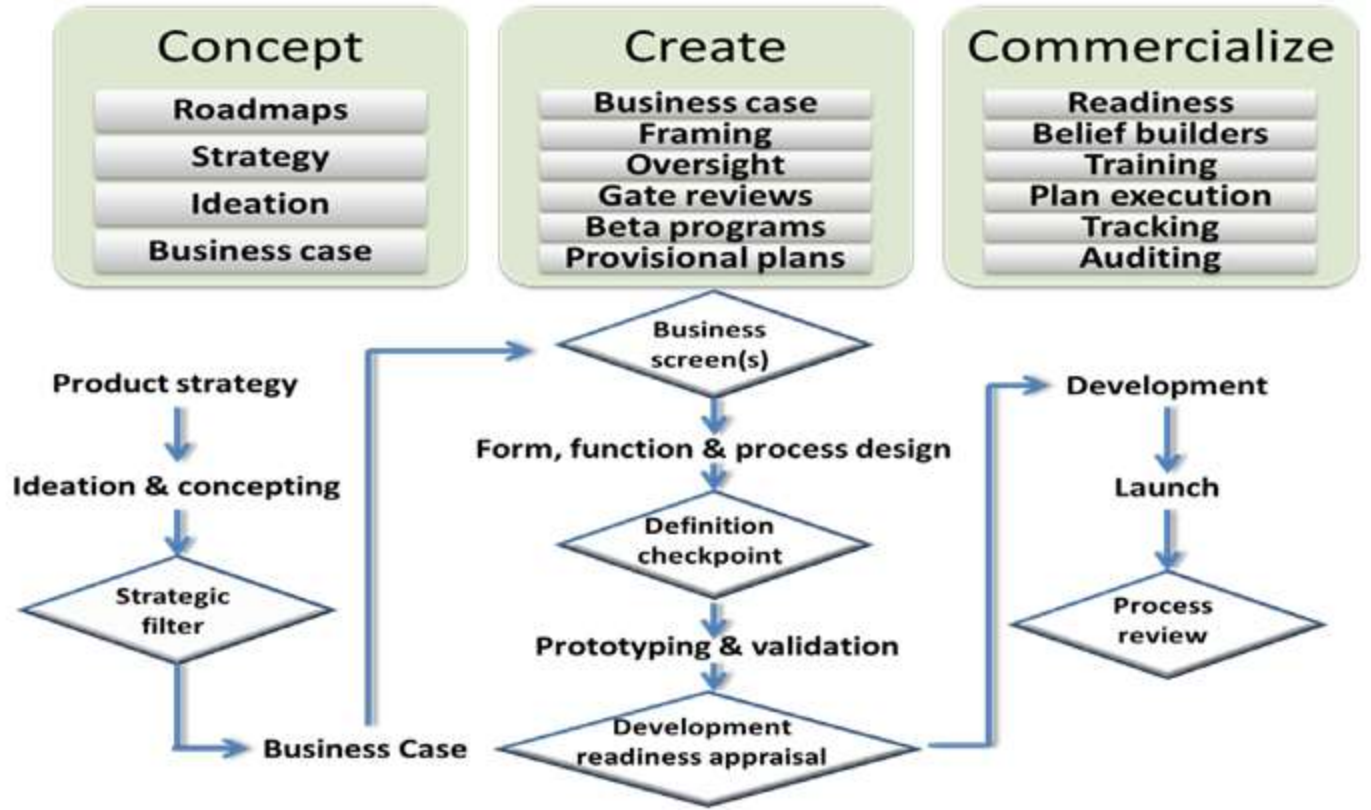
Focus on specific product projects

- Plans, schedules & timelines
- Project metrics

Specific product concepts, definitions, development

Project team and contributor inputs

The 3C Framework for Product Manager / Owner





Time commitment changes

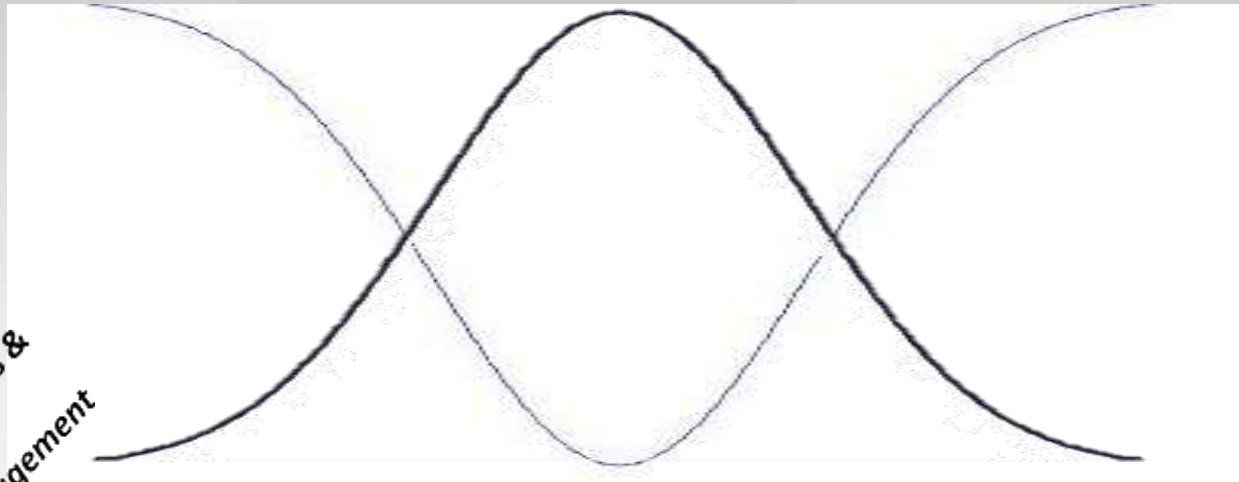
Concept

Create

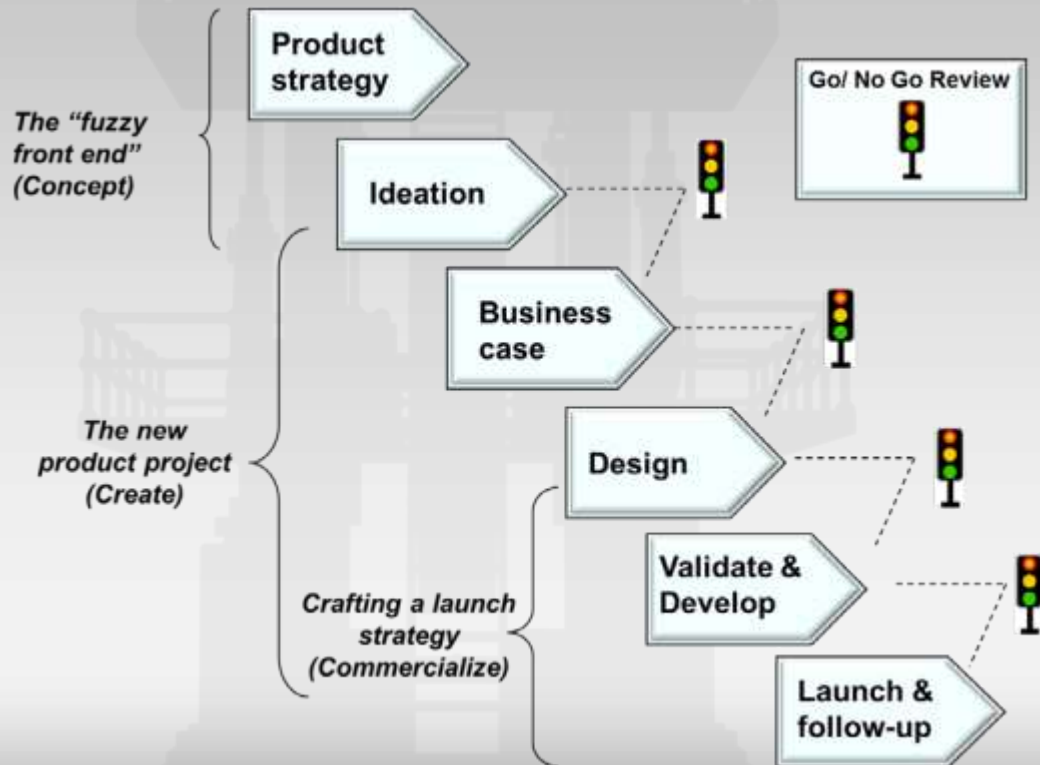
Commercialize

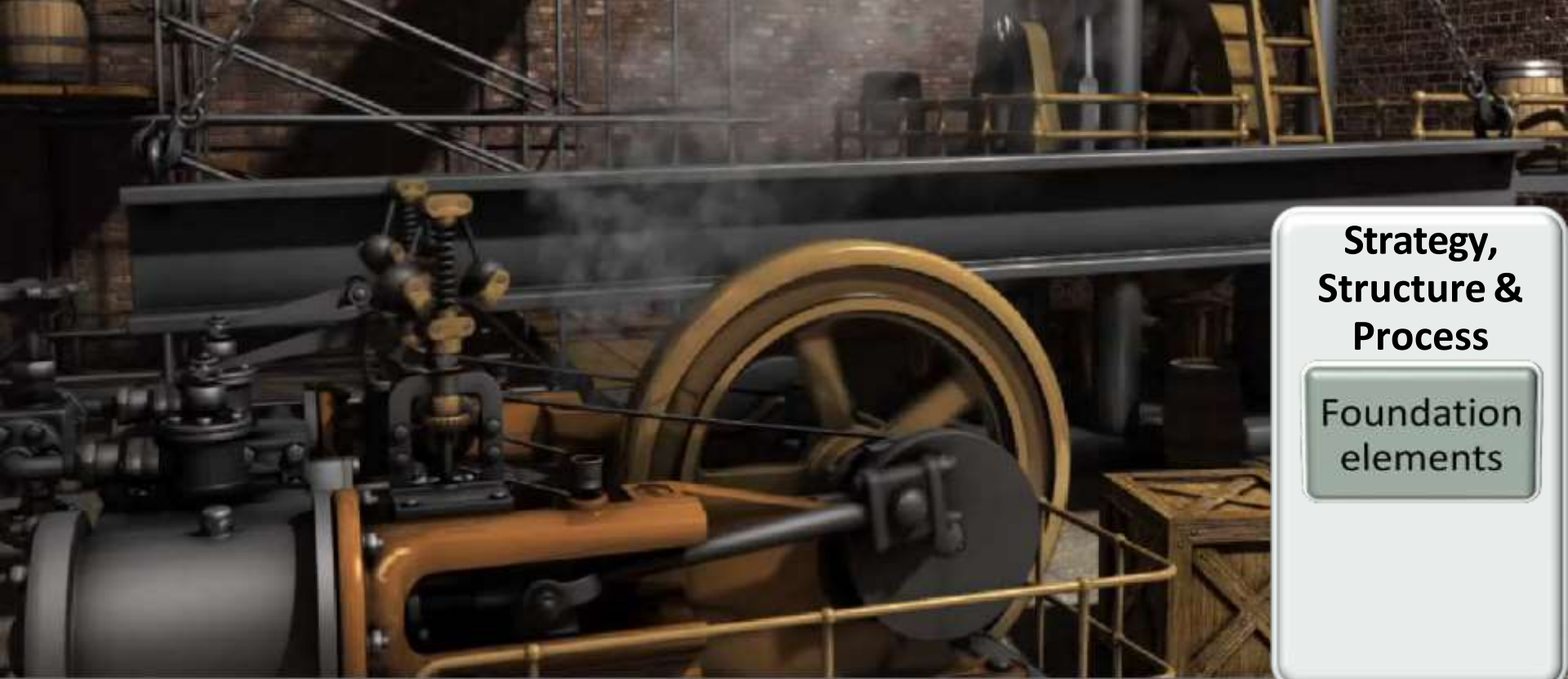
Strategy & marketing

Operations & project management



Conventional Project View of NPD





**Strategy,
Structure &
Process**

Foundation
elements

**NP Foundation Elements
Part 1**

Business planning, product strategy &
portfolio management



What is the fuzzy front end?"

The activities that typically precede what is traditionally considered the “official start” of a new product project.



Fuzzy front end



<https://www.youtube.com/watch?v=hgn7rk1N648>



**Time is an
irreplaceable
resource.**



Open innovation concepts

Co-development	Working with outside partners in development
Collaborative innovation	Networks, alliances, consortia
Joint venture	Formal legal arrangement
Open innovation	Leveraging external sources of technology & innovation
Open-source models	Informally structured collaborations

Source: M. Docherty, "Primer on Open Innovation, PDMA Visions, April 2006, p. 13.



Create opportunity road maps

Roadmapping is a graphical multi-step process to forecast future market and/or technology changes, and then plan the products to address these changes. (Product Development & Management Association glossary.)

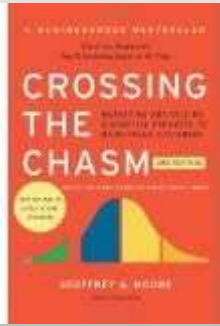
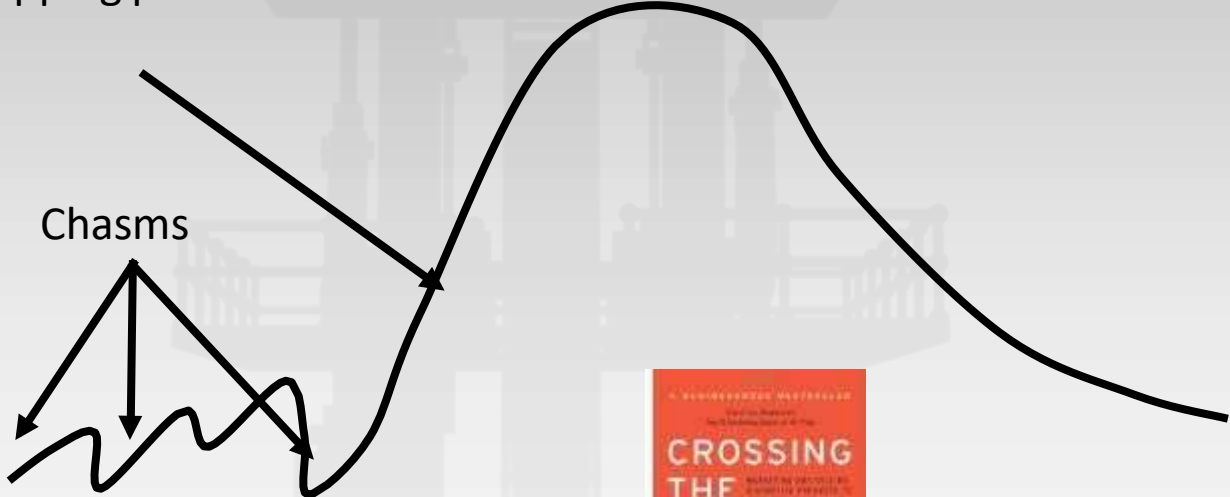
Knowledge of S-curves may be part of the roadmapping and/or product life-cycle management.





Technology market curve

Tipping point



Geoffrey A. Moore



Link strategies to results

What is your product portfolio strategy?

How does your product innovation strategy link with your ...

- Business strategy?
- Brand position and equity?

Create a “balanced scorecard” type of screening model to evaluate and rank new product projects that are part of the portfolio.



**Start with
the end in
mind.**

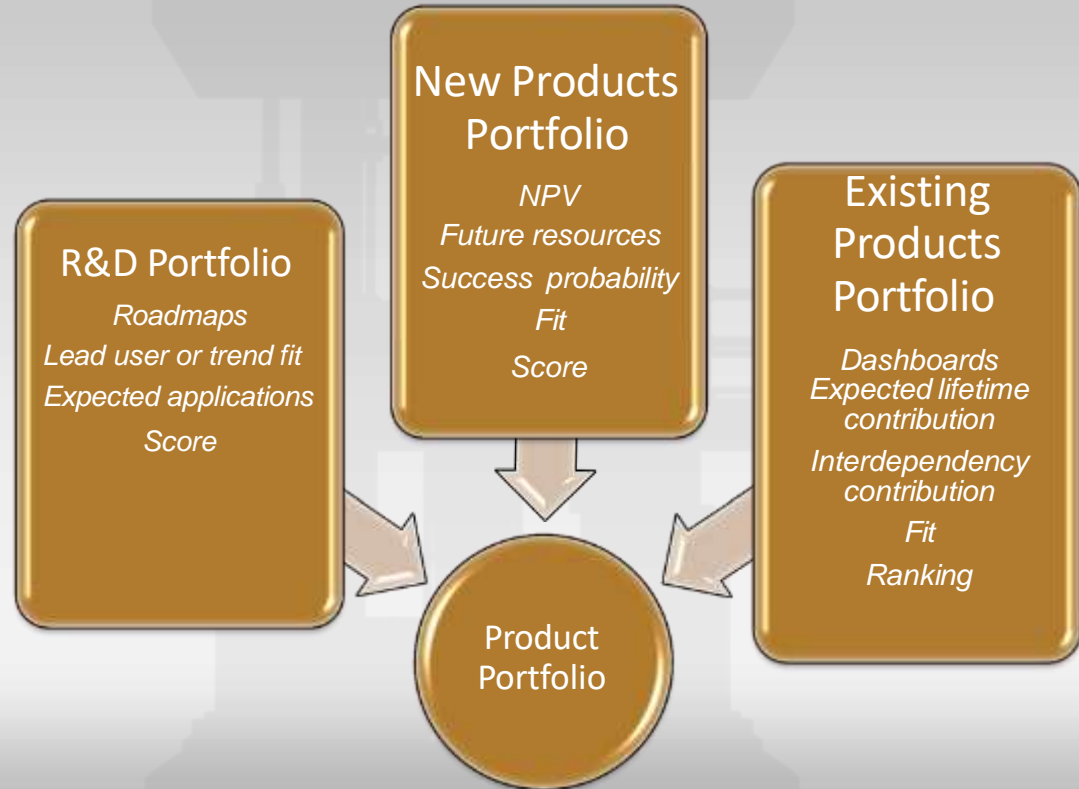


Explore a broad domain of market acceptance forces

**Sources of market
acceptance or
friction:**

- Potential buyers
- Competitors
- Trade intermediaries
- Suppliers
- Complementors
- Other stakeholders

Define product portfolios





Use portfolios to reduce risk

A portfolio is a set of products (i.e., existing assets and planned investments) that provide an appropriate level of diversification to minimize random risk.

Portfolio management refers to the alignment of the portfolio with business strategies, culture, brand architecture, and external factors, as well as the prioritization of products and projects.



Why is a “portfolio” necessary?

Financial planners stress the importance of a diversified set of investments to reduce risk. Since the duration, intensity and frequency of market changes is hard to predict, a mix of funds helps manage risk. In addition, planners recommend rebalancing your portfolio on a regular basis as priorities change. These tips apply to product portfolios as well.



Add pipeline management

Pipeline management refers to a balanced spacing (and trade-offs) of new product projects across the process.

- Do you have an ongoing pipeline of new products? Does it “fit” your culture?
- Are there different projects at different stages of development – with different time horizons?



Manage product life cycles

Plan for changes in products and marketing mixes over time to improve long-term profitability.

Knowledge of the adoption curve may be part of the analysis.

What has been the life of similar products?

- What do market force changes imply?



Rationalize products periodically

Products to consider for elimination (rationalization) are often at the end of the product life cycle, but can be at other stages as well.

Develop criteria for ongoing evaluation

- Consider product *line* impacts
- Sales volume, revenue, profitability
- Part commonality
- Functionality
- Customer need/competitive advantage



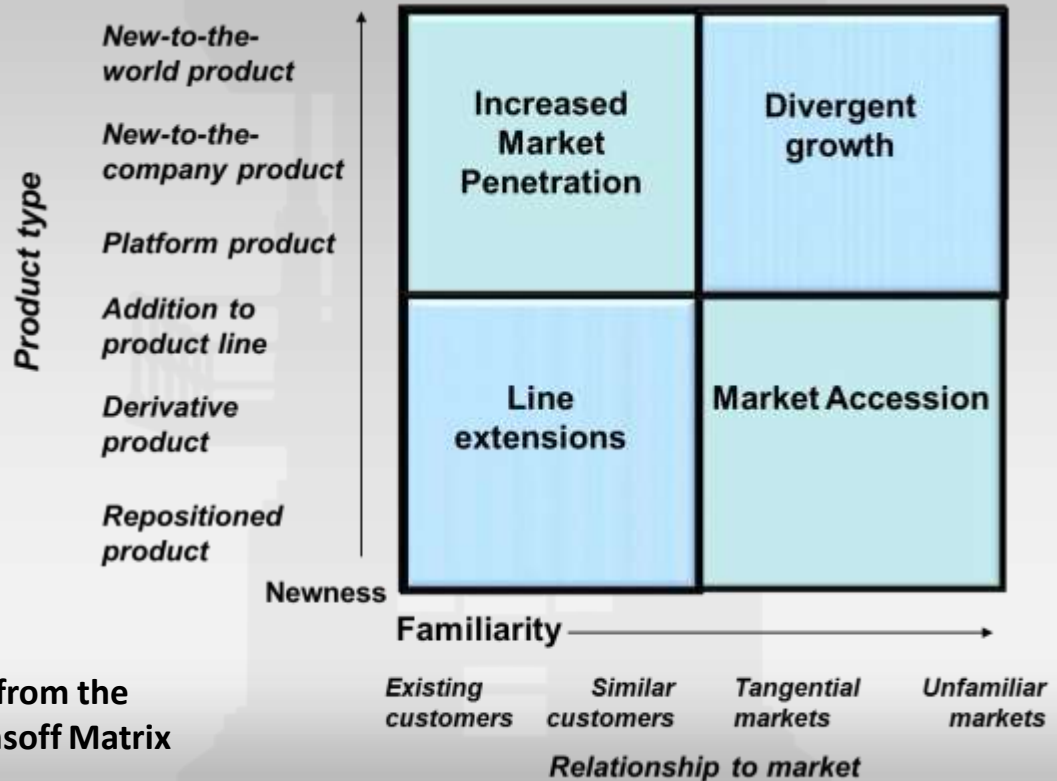


Define rationalization strategies

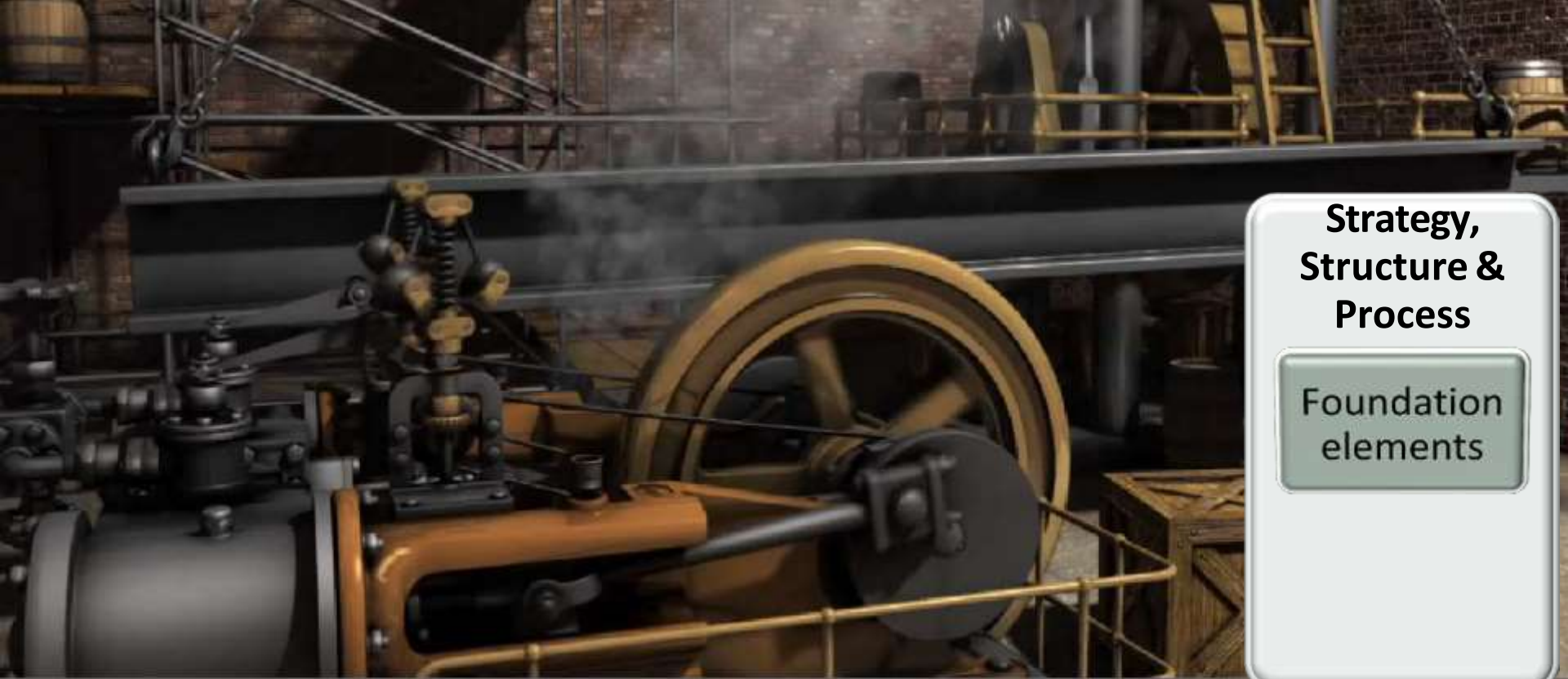
Combine functionalities into one product/Eliminate product

- Raise price to reduce customer demand
- Lower price to reduce inventory
- Sell rights to another company

A NP portfolio planning matrix



Adapted from the classic Ansoff Matrix



**Strategy,
Structure &
Process**

Foundation
elements

NP Foundation Elements

Part 2

Organizational culture and structure

The image features a vertical split. The left side shows a close-up of a large, dark metal flywheel from a steam engine, with a wooden handle and a black flywheel cap. The background is a brick wall with industrial structures. The right side is a light gray background with a faint silhouette of a person. A black rectangular sign with white text hangs from two chains at the top.

Is there an innovation culture?

What is your firm's "posture" toward innovation, risk-taking, and product development?

How well is product development linked to business strategy? Is your firm proactive or reactive?

How active are employees in the process?

What is being or can be done to influence innovation and creativity?



Collaboration & power

“The more power you have, the more important it is to exercise power collaboratively. You may get your way acting unilaterally – but almost always at a cost, and usually you have a smaller stock of power the next time you need it. Power and political capital grow when you act through others ... Never compete where you don’t have to.”

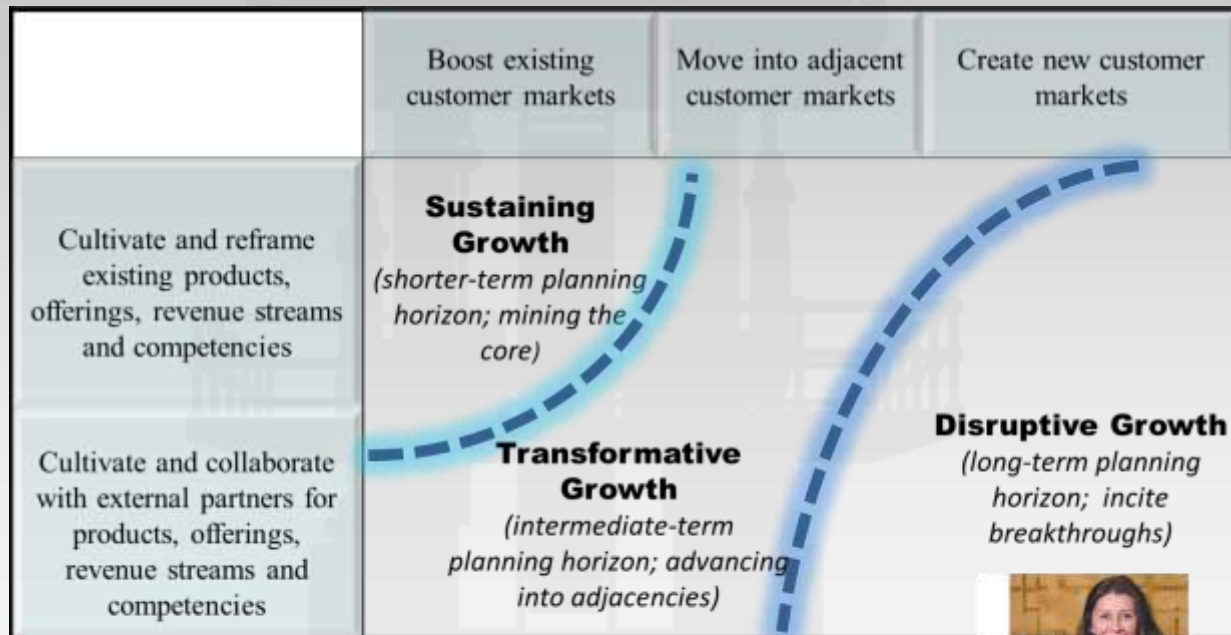
Harvard Business Review, October 2004, p. 10.



Google's 9 Principles of Innovation

1. Innovation comes from everywhere
2. Focus on the user
3. Think 10x, not 10%
4. Bet on technical insights
5. Ship and iterate
6. 20% time
7. Default to open
8. Fail well
9. Have a mission that matters

Gorchels' product/business model portfolio





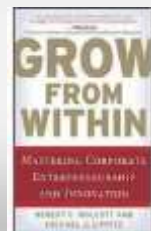
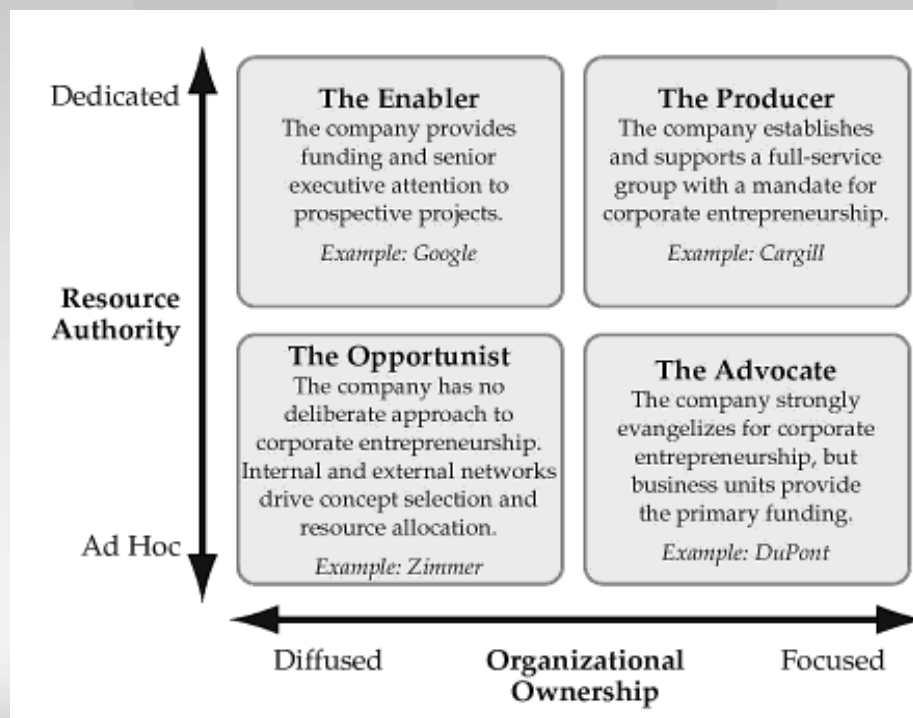
The Innovation Paradox

Robert C. Wolcott

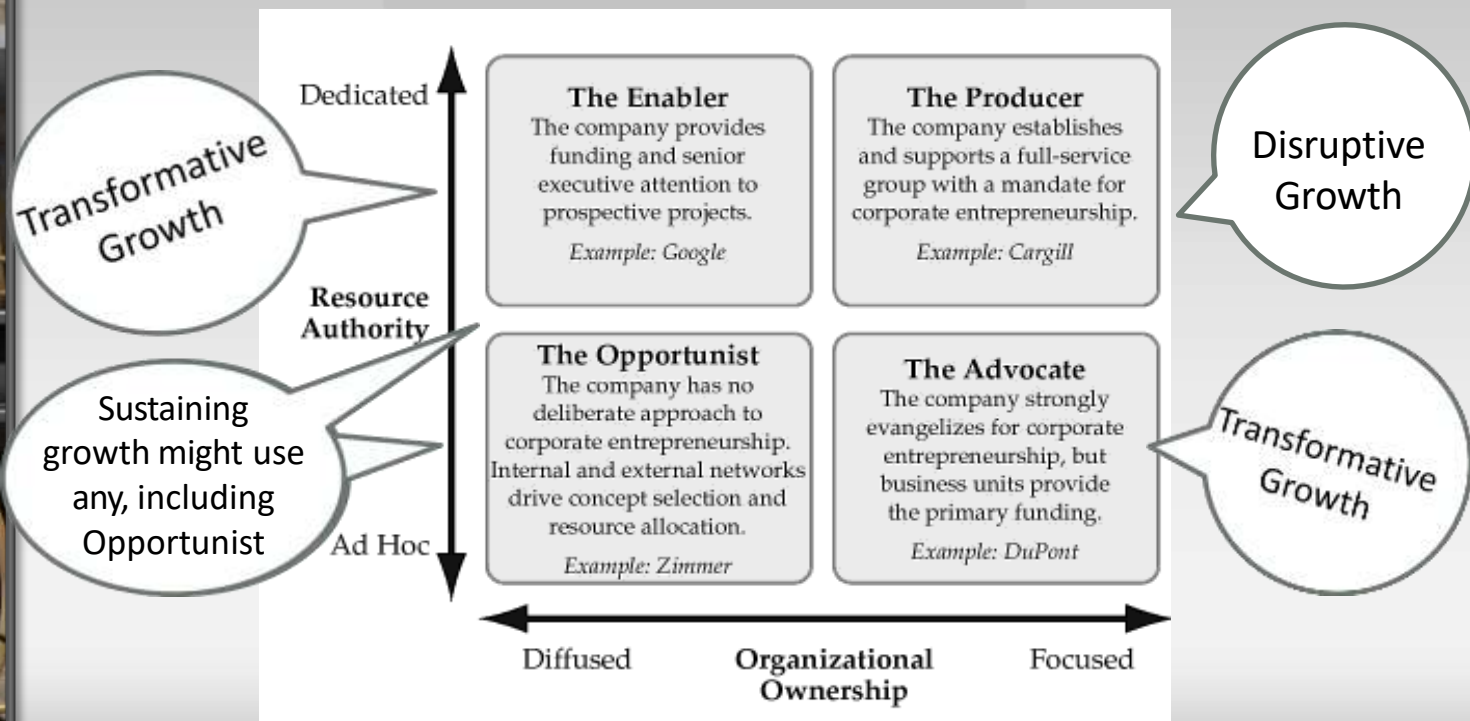


<https://www.youtube.com/watch?v=H06C7Lahha8>

Wolcott-Lippitz Innovation Structures



Strategy/structure alignment

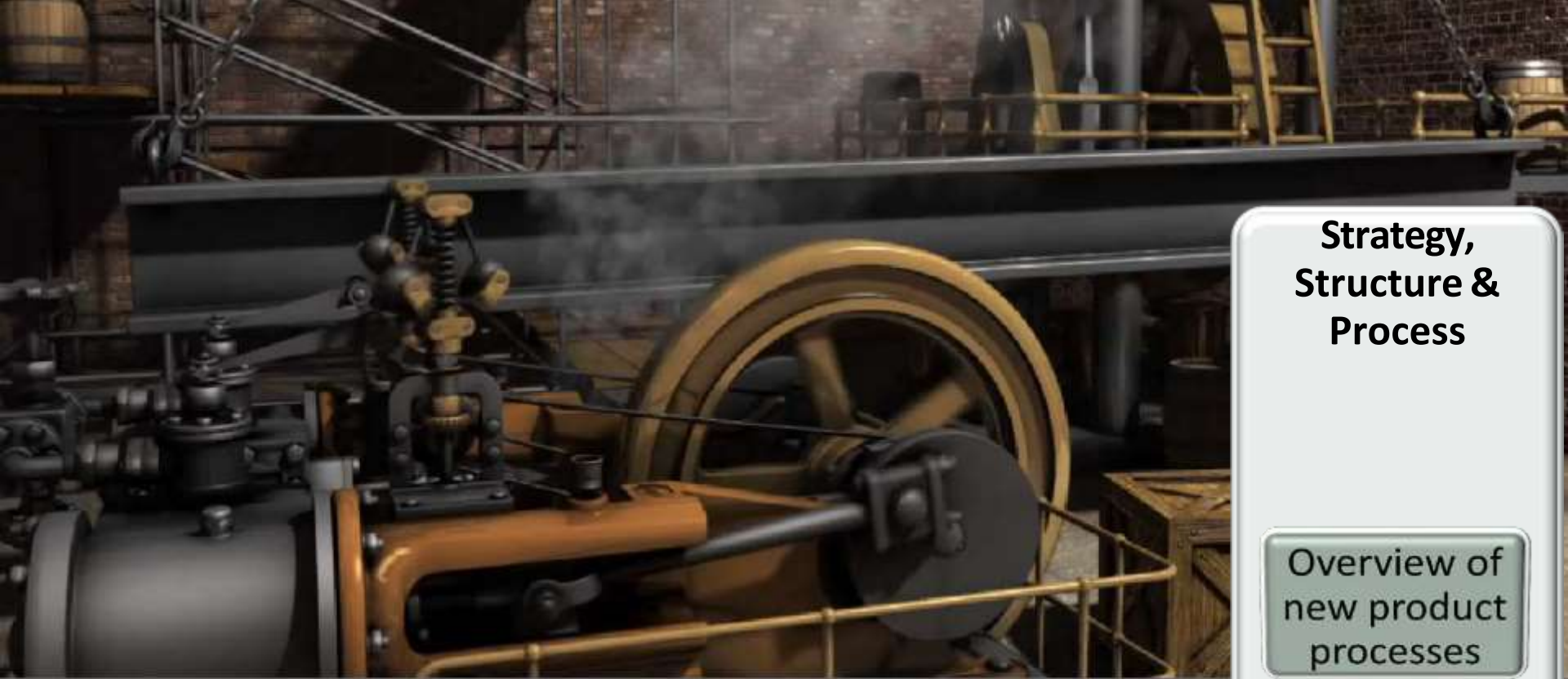




Dan Pink – Innovation Motivation



<https://www.youtube.com/watch?v=Soe4TX-STJw>



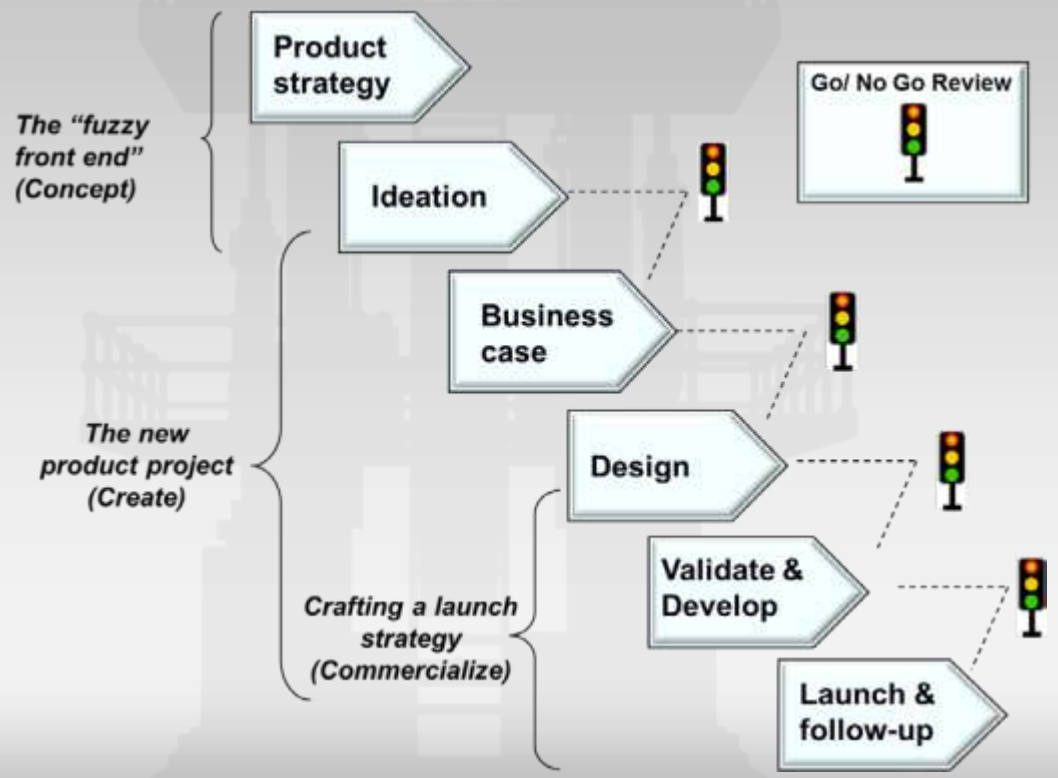
**Strategy,
Structure &
Process**

Overview of
new product
processes

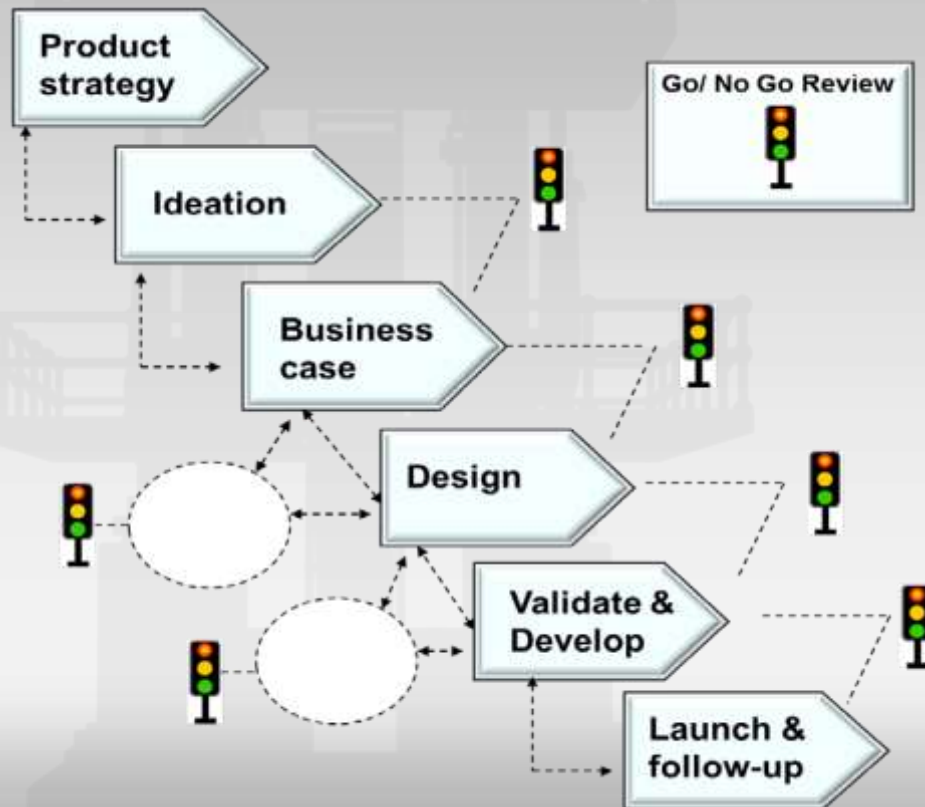
Introduction to the NPD process

Project-specific elements of NPD

Conventional Project View of NPD



In reality it may not be so linear



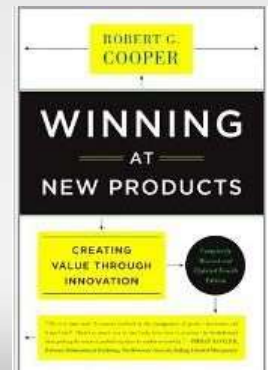


And it should be scalable

Line extensions and low-risk projects may be best suited to an abbreviated version by combining steps and/or using some self-managed reviews

Breakthrough and platform projects may require sub-steps throughout the process


IN EITHER CASE, maintain clear metrics and accountability



Robert Cooper



Customize for your needs

What steps () – from strategy through launch – and what sequence make sense for your business?

Who is/should be involved in the process and in what capacity?

What key activities, deliverables, and performance review metrics () are most appropriate?

Have you designed key marketing tasks early into the process?

Stage-Gate Process™

A process pioneered by Dr. Robert Cooper that divides the development effort into distinct time-sequenced stages separated by management decision gates. Multifunctional teams complete each stage prior to obtaining approval to proceed to the next stage.

This is a variation of project management applied exclusively to new product development.

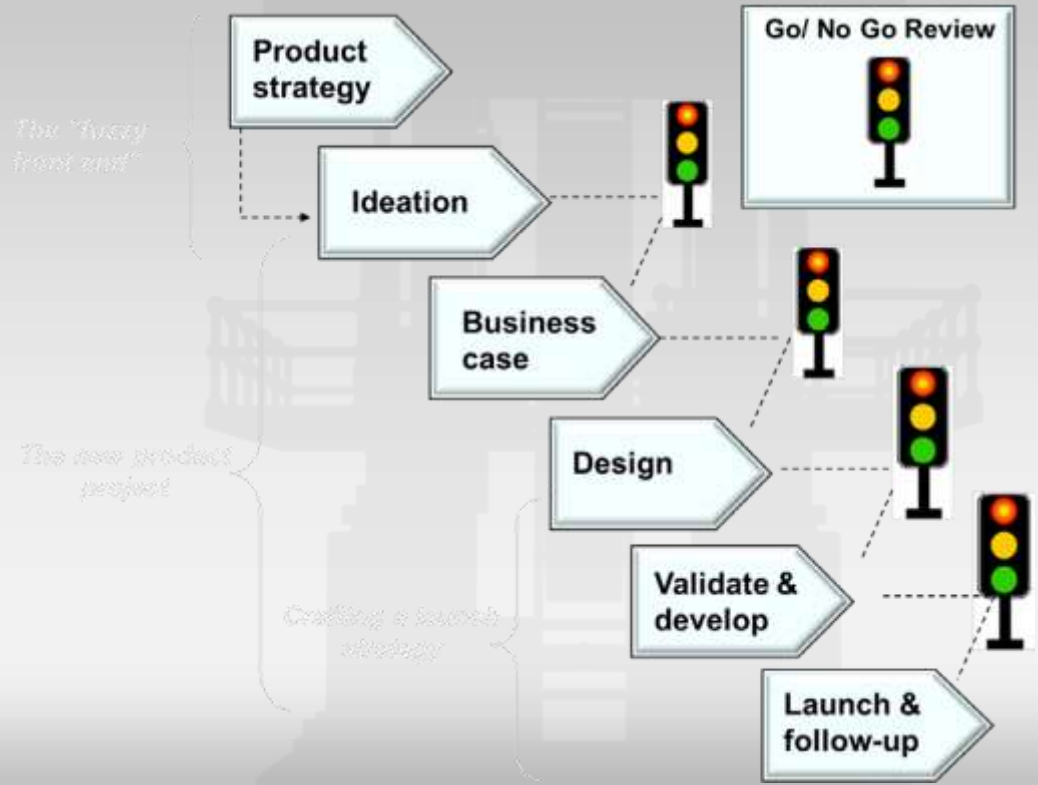
The emphasis is on a single project or portfolio.

Variations may be called gates, checkpoints, stoplights, project reviews, etc.





DECISION reviews





The review process

Idea

Does the concept have merit for us?

Business case

Is it economically and technologically feasible?

Design

Is the concept sufficiently defined to justify capital expenditures?

Validate & develop

Is the entire company ready for full-scale ramp-up and execution?



Two types of reviews



Portfolio reviews re-prioritize projects to balance the overall portfolio and improve resource allocation.

- conducted by management team
- perhaps 2-4 times per year

Project reviews focus on individual new product projects.

- meetings between project team and management team
- conducted at each stoplight
- may also require reprioritizing the individual project within the portfolio

Purpose: quality control and decisions

- A series of reviews *incrementalize* the decision process

There is no ONE right metric

Financial comparisons (most common)

- NPV, payback, IRR
- productivity index ($\text{NPV} \div \text{resources remaining}$)

Checklists

- Yes/no

Scorecard models

- Weights
- Ratings





Product Strategy

The "fuzzy front end"

Product strategy

Ideation

Business case

The new product project

Design

Validate & develop

Scaling & launch strategy

Launch & follow-up



Product Innovation Strategy

Product strategy is a foundation element of the process

- It precedes project-specific considerations of product development

The core strategy should include both new (innovation) and existing products.

The innovation strategy should consider the portfolio and pipeline of new products.

The image features a vertical industrial scene on the left side, showing a large brass flywheel and various mechanical parts of a steam engine. On the right side, a dark rectangular sign with a metallic border is suspended by two chains from the top. The sign contains the text 'Innovation strategy components' in a bold, white, sans-serif font. The background behind the sign is a light gray with a faint silhouette of a factory building.

Innovation strategy components

Statement of goals

- e.g., % sales from new products, diversification, market dominance

Areas of focus

- e.g., which competitors, markets

Alignment with corporate direction

- e.g., fast follower or innovator

Resource commitment

Relevant platform and roadmap issues

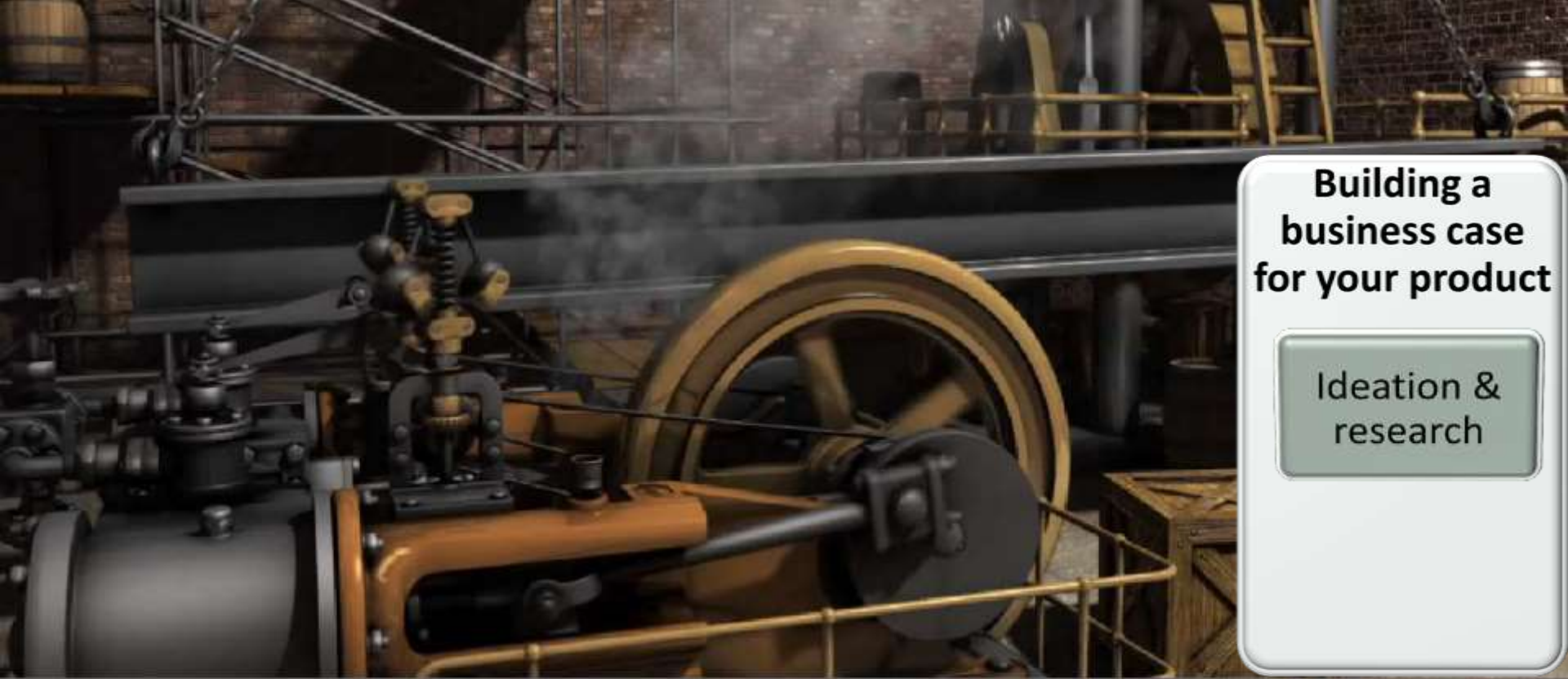


Roadmap basics

A product roadmap is the business plan for the product owner:

- containing probable scenarios based on current expectations, forecasts & assumptions,
- to aid in managing a product line's growth

A roadmap is not a project plan, but rather a strategy, business planning and communication tool.



**Building a
business case
for your product**

Ideation &
research

Moving beyond strategy

Generating ideas and refining concepts



Ideation

The "fuzzy front end"

Product strategy

Ideation

Business case

Design

Validate & develop

Launch & follow-up

The new product project

Creating a launch strategy





Let's discuss how to ...

- Create novel product and market opportunities through ideation
- Estimate rough market potential
- Capture voice of the customer for concept refinement, positioning and target pricing
- Estimate sales for the business case





Ideation phase

Ideation is the process of exploring diverse and potentially “hidden” ideas for new products and services

It should flow from (or at least not be inconsistent with) product strategy initiatives

The output should be a preliminary description of a product concept from the gathering of inexpensive information – although this step may “bleed into” the business case phase



Activities of ideation

- Identify sources of ideas
- Stimulate idea flows
- Enrich ideas
- Rank ideas
- Re-evaluate “shelved” ideas
- Catalog ideas and concepts



Expand your idea sources



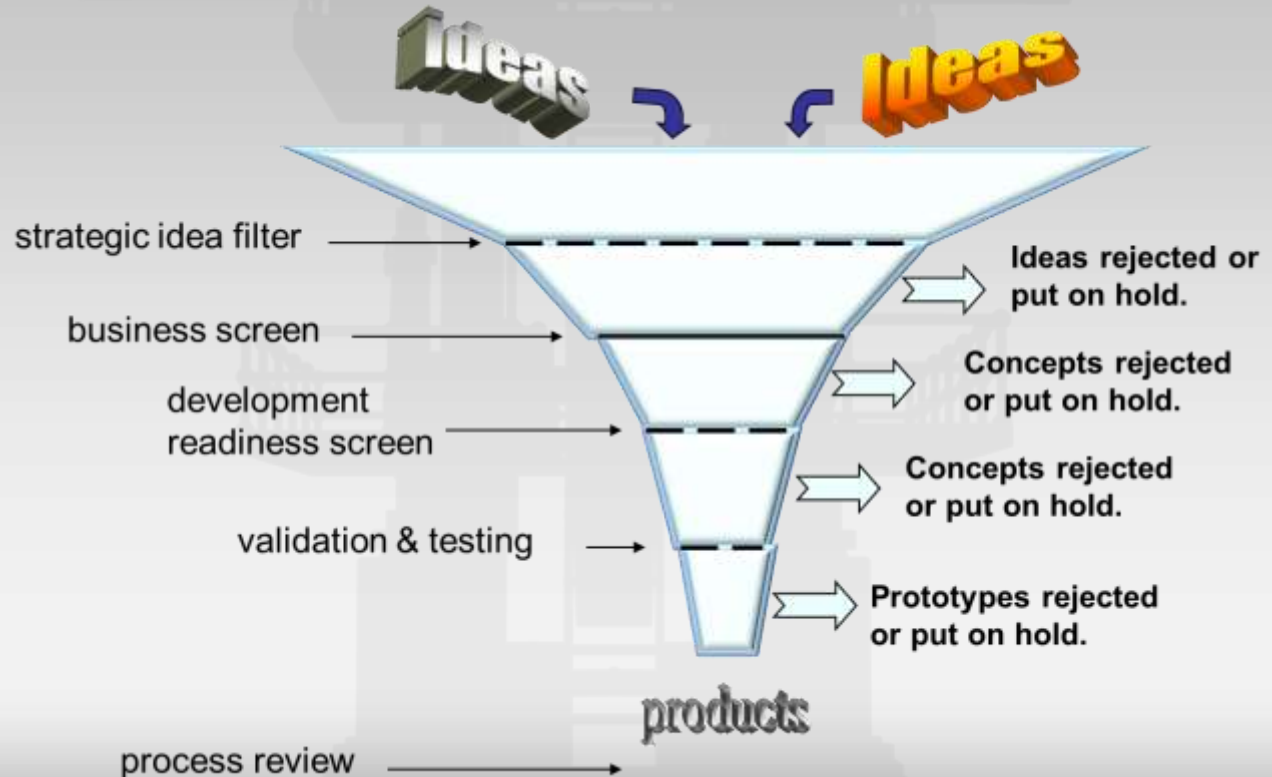


Henry Chesbrough: Open Innovation

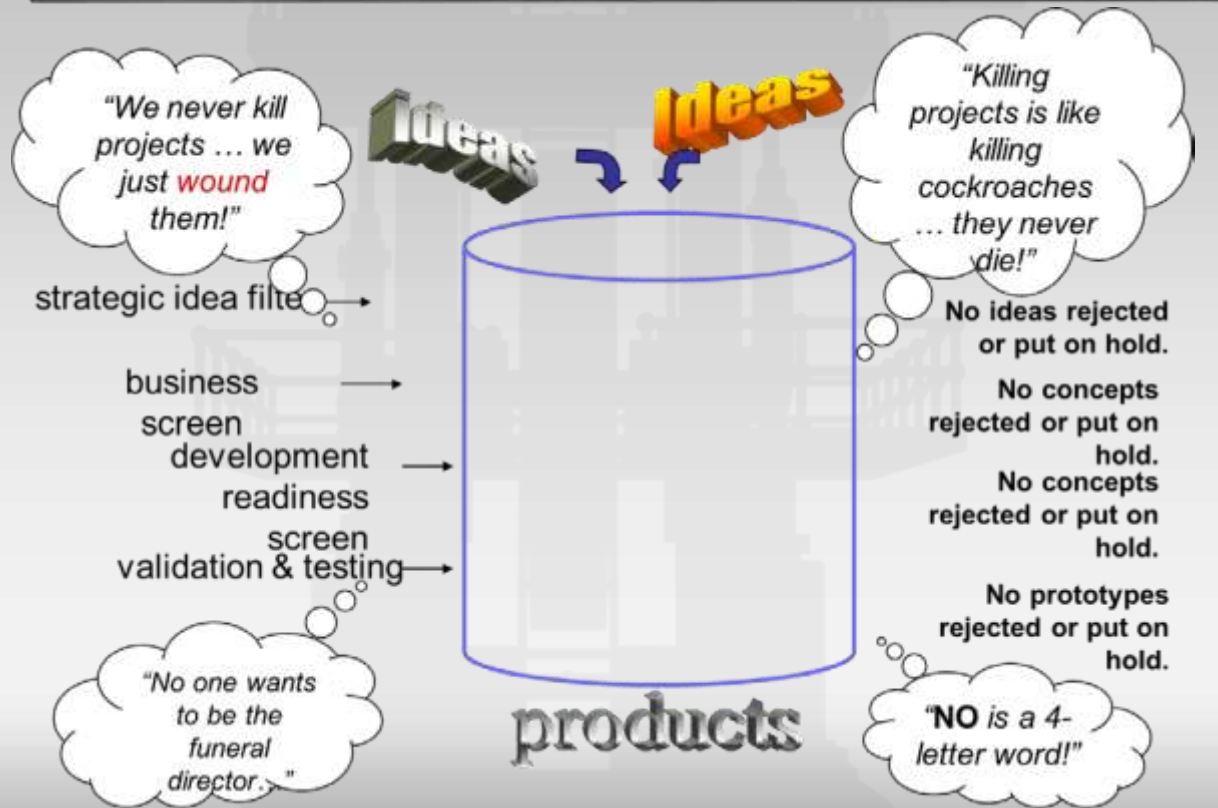


<https://www.youtube.com/watch?v=2UDBaDtwXfl>

Use an idea funnel approach



Avoid idea tunnel





Example criteria to consider

Fit within the company's business and culture
Compatibility with the company's core technologies
Compatibility with the company's marketplace niche
Ability to satisfy a specific customer need
Possibility of achieving major market share
Potential sales and profits

Net present value return
Time for payback of development costs
Cost of major tooling and machinery
Susceptibility to competitive attack
Fit within with capabilities of existing and contemplated staff
Growth potential of the product line



Example criteria to consider (cont.)

Possibility of follow-on products

Likelihood of being first in the marketplace with the new product

Possibility of catching the competition by surprise

Location of the market (local, national, or international)

Existence of a channel to the marketplace

Potential downside risks of proceeding

Potential risks of not proceeding

Possible synergistic effect with current product lines

Existence of identified lead customers

Development cost and time

Existence of a product champion



Example criteria to consider (cont.)

Patentability and trade secrecy

Likelihood that the new product will provide distinct competitive advantages to the company

Availability of technology

Resources required

Ability to leverage available technology

Urgency and criticality

Uniqueness

Technical merit

Possibility of creating or dominating a niche market

Speed of entry into the marketplace

Philip A. Himmelfarb,
Survival of the Fittest



Ideation approaches

Trend capturing

Lead user studies

Design thinking

Ethnographic methods

What if ?





How to capture trends

Skim information sources expansively

- Monitor a broad range of publications/online sources
- Read local papers when you're traveling

Share trend-watching with others

Be alert in observation

Test media new to you

Periodically look for connections

- Content analysis





Lead user studies

Network to identify people, industries or groups who have the greatest need (and likelihood) to have solutions for components of the problem you are trying to solve

Collect insights from different types of lead users

Adapt concepts to your internal requirements



Ethnographic methods

Some categories

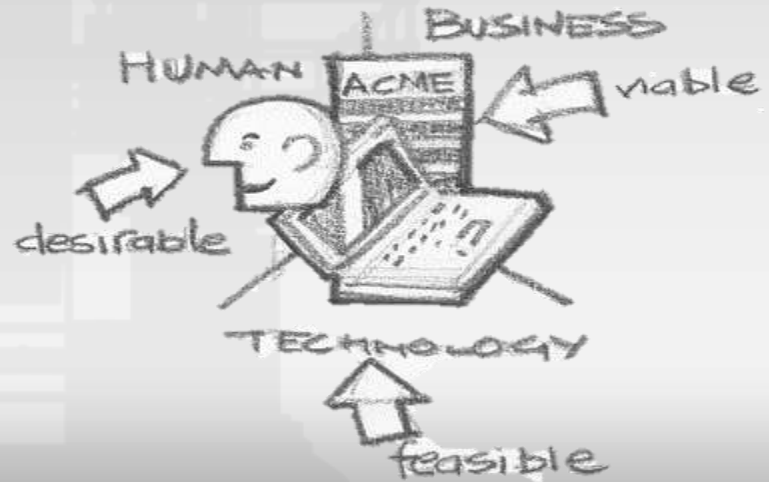
- Client visit programs
- Customer and consumer observation
- Digital tracking

Some considerations

- Maintain a “real-world” context
- Most ethnographers conduct verbal interviews in addition to observation
- Face-to-face is preferable to remote or group techniques
- Collect the customer’s own words

Design Thinking

Product design is the set of holistic properties of integrated form and function, of aesthetics and utilitarian benefits





IDEO Design Thinking



<https://www.youtube.com/watch?v=M66ZU2PClcm>



What if ... ?

Free-flowing brainstorming

- Change lenses
- Challenge orthodoxies
- Break patterns
- From literature and/or patent search
- From competitive comparisons

Directed product-question techniques

- SCAMPER

Open-ended customer questions



Market potential for “raw” ideas

Assesses the *potential* for industry sales

- Overall market size
- Market segment growth rates

Estimates from secondary data

- Government statistics
- Industry data

Estimates from primary data

- Sales force & channel estimates
- Panel consensus
- Delphi & visionary forecasts

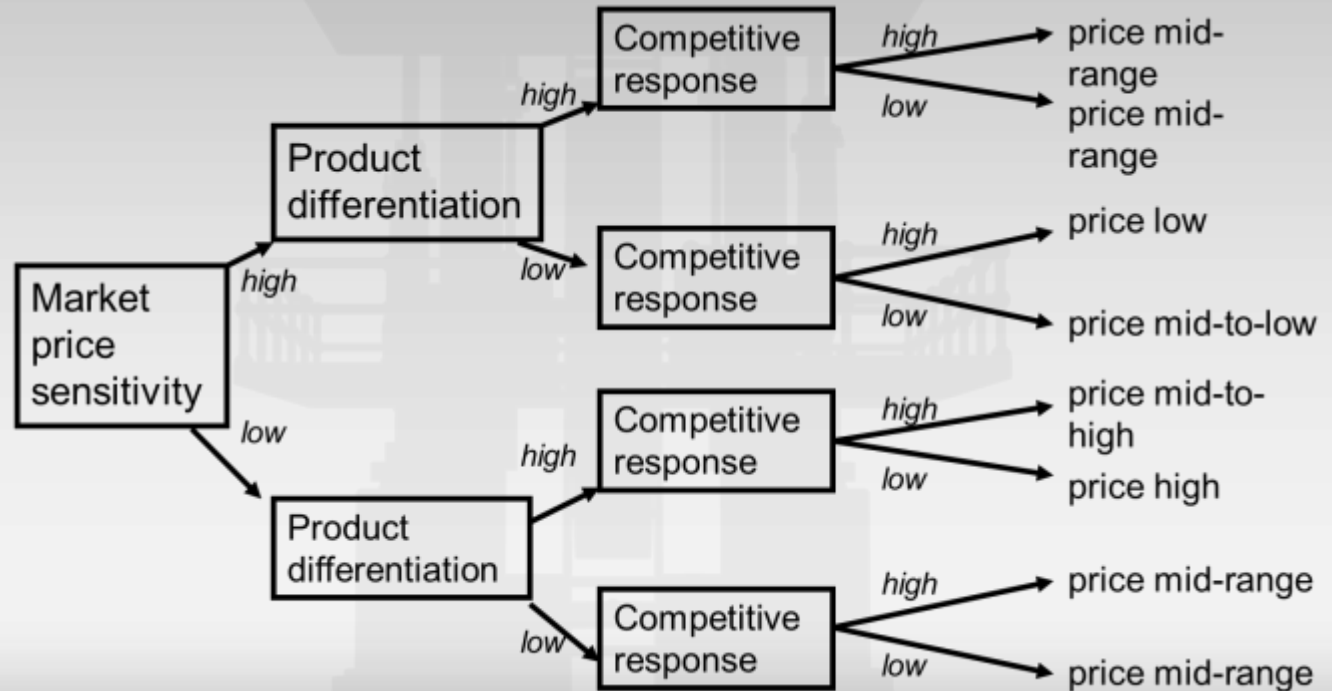


Estimate value of “innovative” products

Functional substitute analysis

- How is the basic function performed now?
- What do the present methods cost?
- What improvements are needed in the present method?
- What value would improvements have?

Some factors affecting pricing decisions





Preliminary sales forecasts

The more you know, the smaller the opportunity

Ask **'why'** customers will buy and **'why not'**

Downscale market potential through segment reduction



Concept testing

The process by which a concept statement is presented to customers for their reactions. These reactions can either be used to permit the developer to estimate the sales value of the concept or to make changes to the concept to enhance its potential sales value.

Informal concept testing may be part of the ideation phase, with more formal concept testing being conducted as part of the business case development. Customer input might be obtained throughout the process.



Concept development

Product or service diagnostics & dashboard

Overall attitude toward product

- liking, believability and intention-to-buy

Attribute ratings

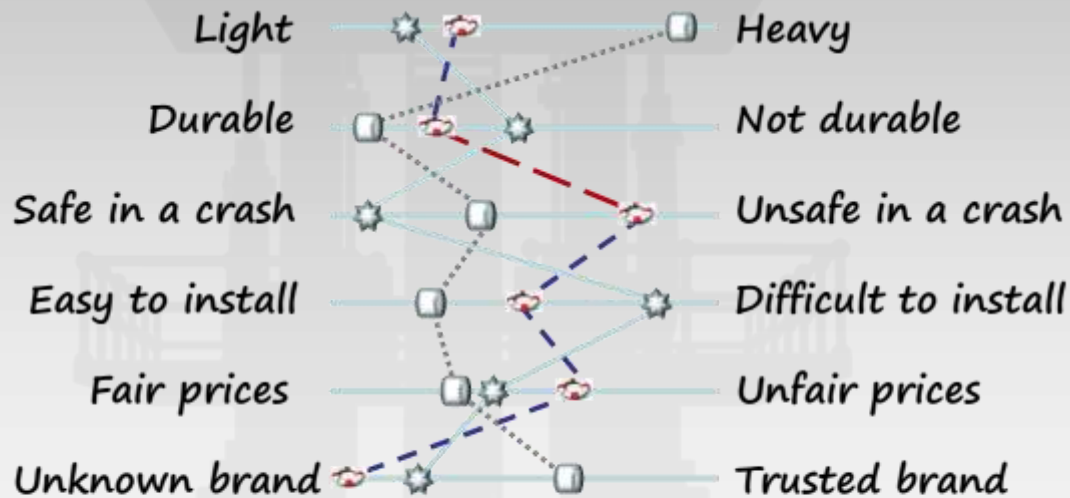
Competitive positioning

- customer perceptions

Channel feedback



Competitive product scaling



Product A



Product B



Product C





Refining initial sales estimates

- market potential (*from secondary and expert sources*)
- x market share (*from your share on similar products*) **OR**
- x % likely to buy (*from customer surveys & channel input*)
- x expected number of purchases (*from customer input*) x price
- = **preliminary sales forecast**
- ± impact of market friction (*internal assessment*)
- ± corrective action taken by company to affect market friction
 - any cannibalization of existing products (*internal assessment*)
- = **net sales forecast**



Projections

The initial sales numbers should be projected into the future, taking into account business cycles, seasonality, growth curves of analogous products, and other relevant adjusting variables





Forecasting comparisons

	Forecasting existing products	Forecasting new products
Data	History	Assumptions
Analytics	Statistical	Judgmental
Forecast	Point	Range
Plan	Certainties	Contingencies
Measurement	Accuracy	Meaningfulness

Source: Kenneth Kahn, "Solving the Problems of New Product Forecasting," *Business Horizons*, Sept-Oct, 2014.



Define the core project team

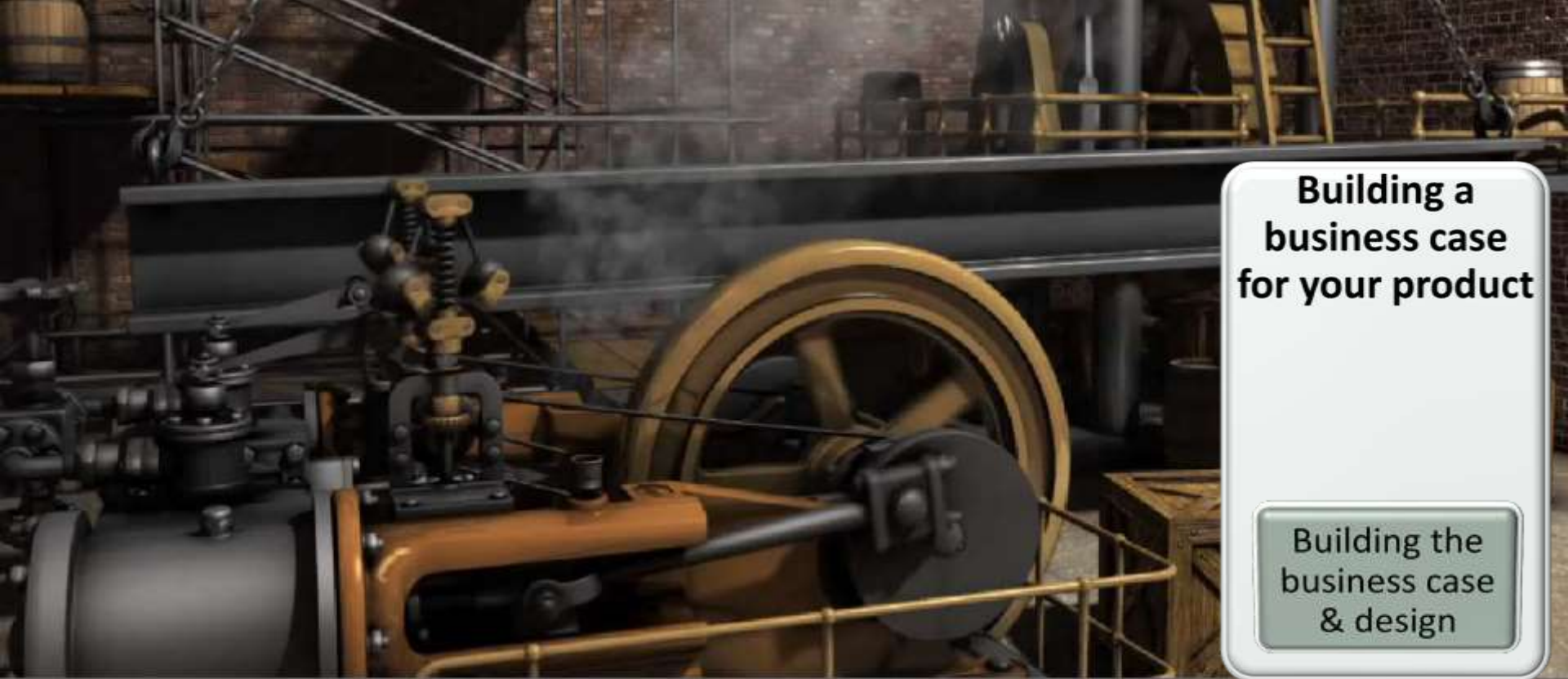
Attributes

- Cross-functional vs. work group
- Parallel tasking
- Complementary skills
- Mutual accountability

Responsibilities

- Product development plan
- Business case
- Functional contributions





**Building a
business case
for your product**

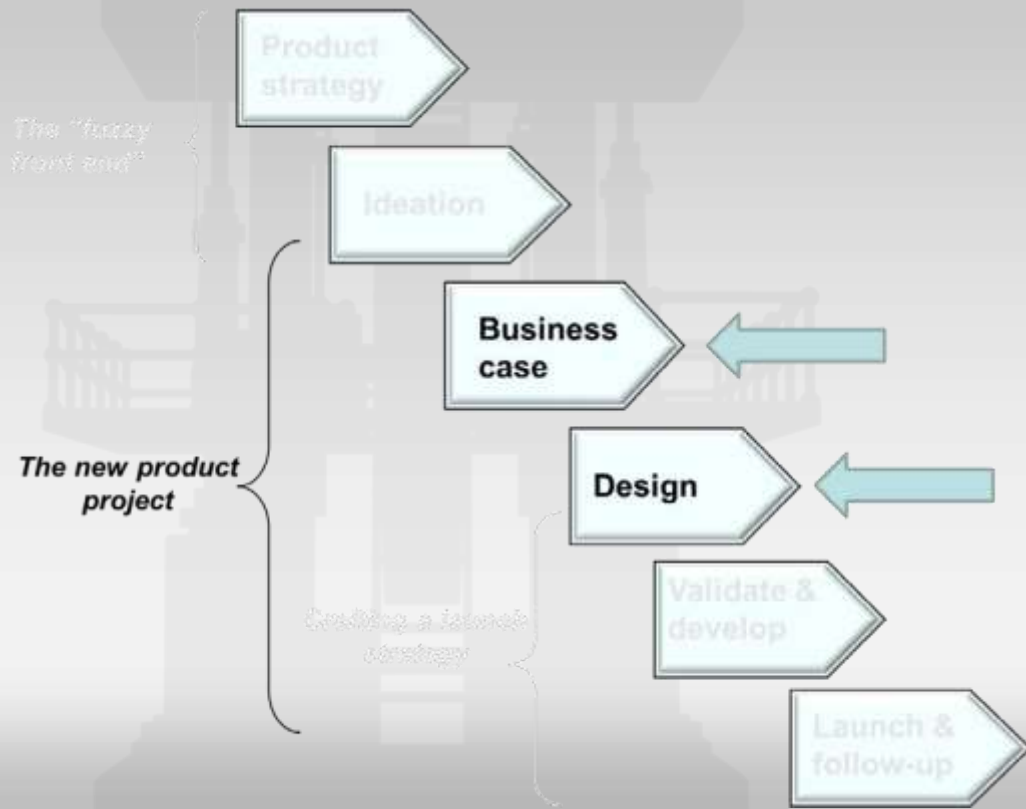
Building the
business case
& design

The business case process

Building the case for investing in your product



Business case & design





Business case phase

The business case phase involves refining the knowledge on the

- size of product opportunities
- estimated financial performance
- manufacturability of the product
- risks and risk reduction

The output of this phase may include

- the product definition
- change from **core** to **project** team
- a detailed project plan



Business Case Defined

A Business Case is:

A structured proposal for an investment (product, business, or process change) that functions as decision-support for decision-makers.

A *business case* includes:

- Concept definition

- Opportunity (or needs) assessment (technical and economic)

- Proposed benefits and costs

- Risks

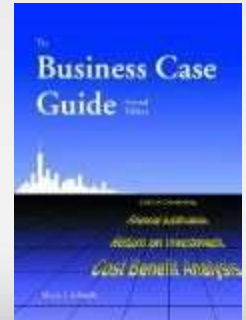
- Assumptions

- Constraints

- Alternatives

- Implementation plan

Marty J. Schmidt, *The Business Case Guide*,





Remember ...

A Business Case . . .

- Is an economic proposal
- Is uncertain (i.e., has risk)
- Consumes resources
- Needs structure
- Should not be formulaic
- Should inform, persuade, and guide



Product concept

Is critical to articulate **what** the product is, and **what it is not**

Definition creates **useful limits & focus** to guide downstream business case preparation activities

Affects **accuracy** of *opportunity assessment* activity

Needs to be in “plain speak”



Dealing With Uncertainty

Uncertainty exists in all forecasts

Removing *all* uncertainty eats *all* profits

Yet, uncertainty should be reduced ...

- Build and apply financial “models”
- Use scenarios
- Focus on major friction or acceptance factors
- Forecast in increments: time, cost targets, market segments, product versions, etc.
- Learn from others, self ... “lessons learned”
- Big cause of failure: *Optimism*



Time Effects

Time is major variable in business case

- 100% market share - but in 50 years - is probably not “success”
- Issue is the option to use money elsewhere

Model costs and sales in time periods

- Small periods at first
- Early investments hurts most
- For sales, “more and sooner” is best
- For costs, “less and later” is best

Customer behavior

- Consider sales and purchasing cycles



Translate VOC to requirements

Solicit input from customers who are knowledgeable and cooperative

Test among larger group of customers

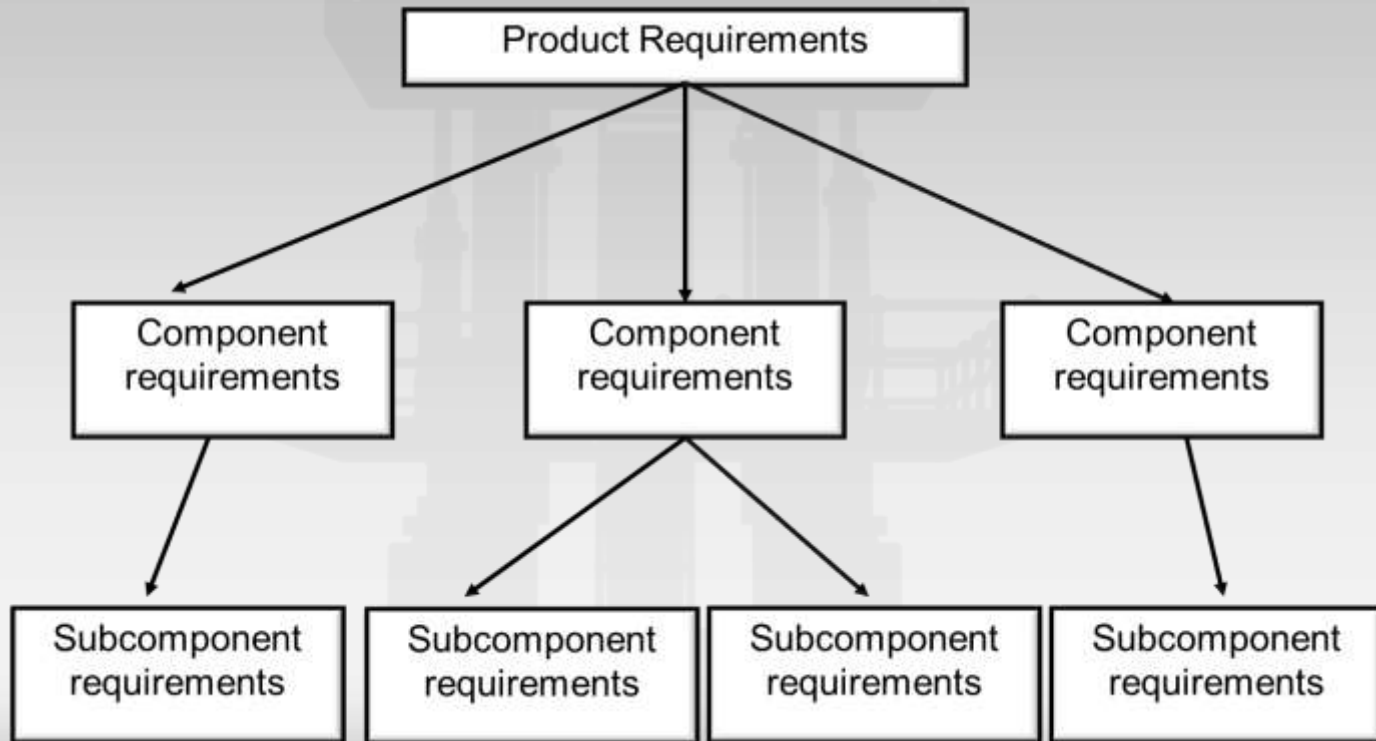
- Compare several versions of a concept
- Assess “value” and intent to buy

Assess technical feasibility

Convert benefits to “designable” characteristics

Revise metrics based on competitive positioning

Specify all requirements





Pre-evaluate the business case

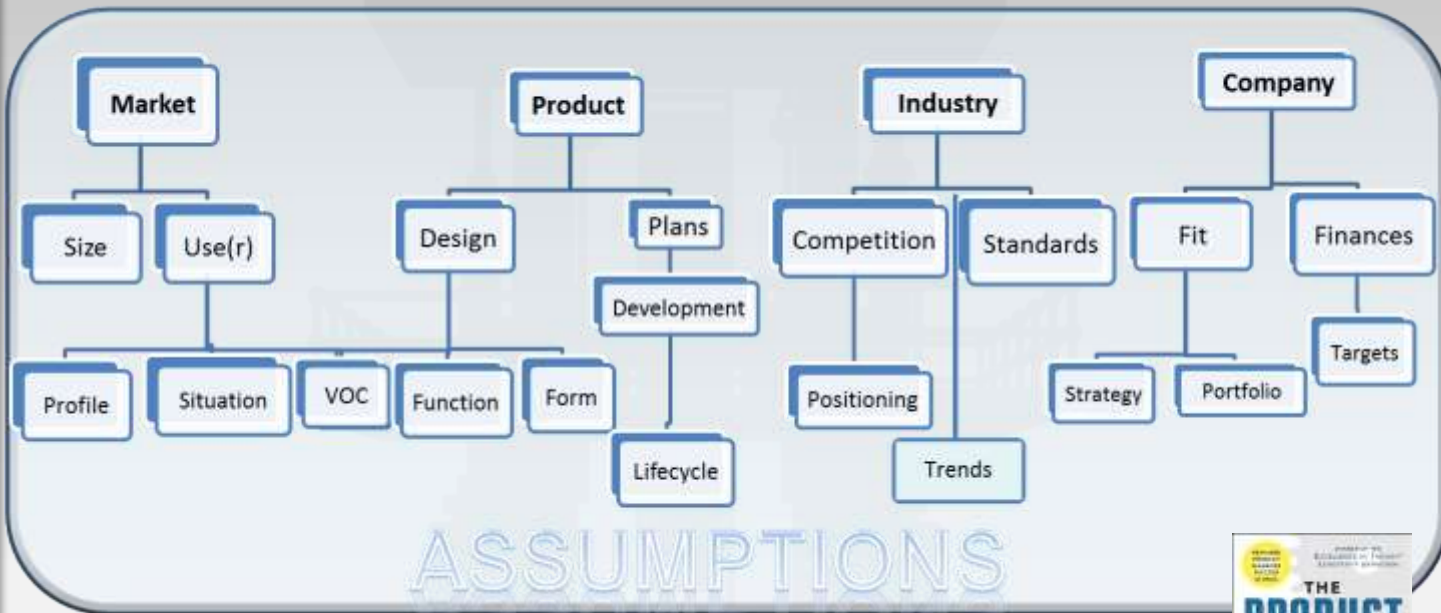
Ask yourself (negative questions):

- Why isn't this already in the market?
- What is a functional substitute and how is it doing?
- Who is better positioned to sell and deliver this?
- How can we fail?
- How would we attack or cause a competitor to fail if they introduced this?

Ask yourself (positive questions):

- What should we have or do to feel 100% confident (if I or a loved-one were to be solely responsible for the success of the new product)?
- What would bring success faster?

Business case components



ASSUMPTIONS





Business case review



Will the product as defined provide the customer benefits sought earlier?

Will it pass the appropriate review criteria for your company?

Does the entire team agree on the defined product requirements?

Is the product defined precisely enough to move to development?

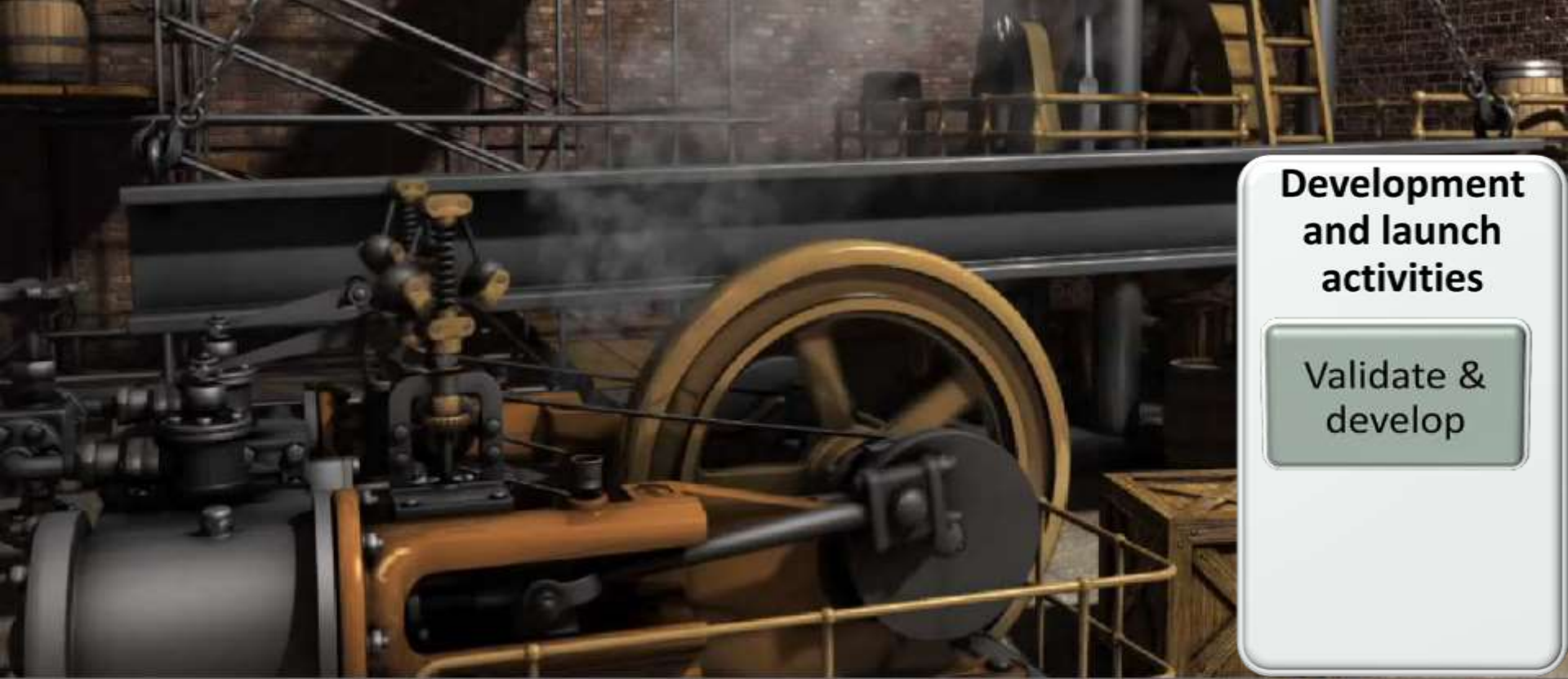
Would it still pass the earlier screens?



Key deliverables

Detailed product definition including features and performance requirements (i.e., desired customer benefits)

Creation of a team “contract” signed by all specifying the target market and freezing some or all aspects of the product definition



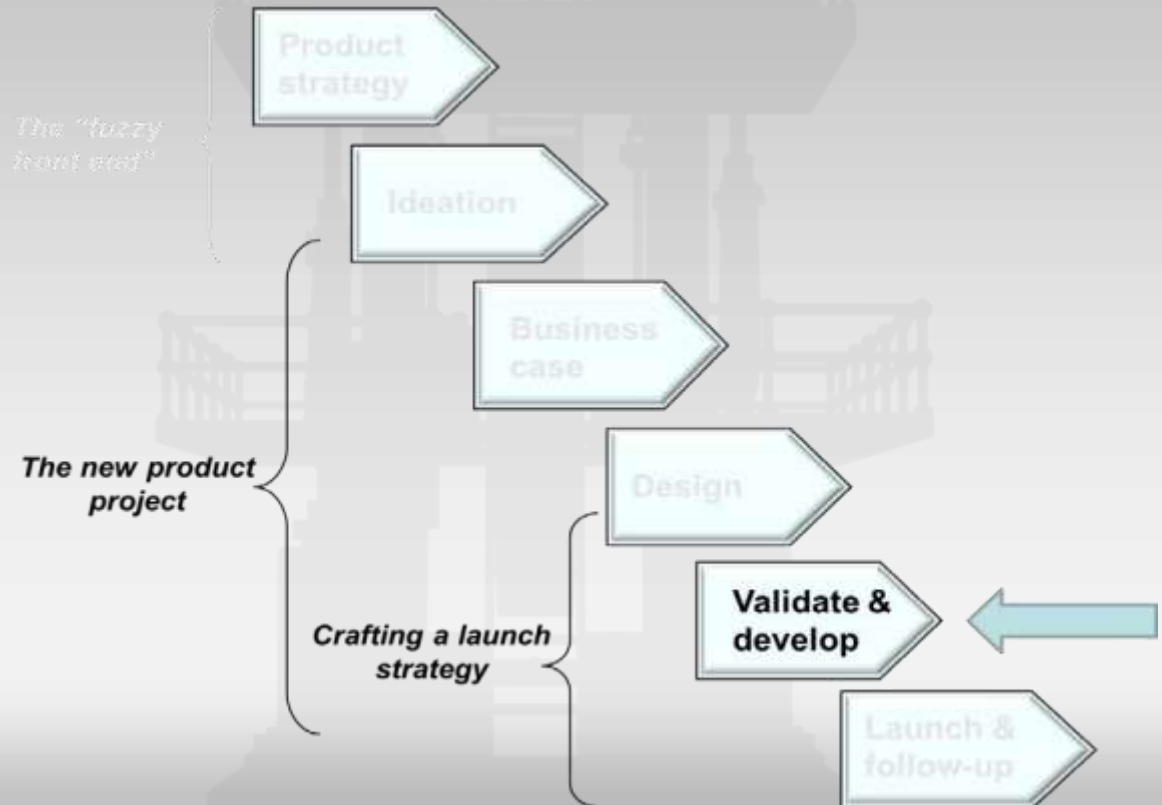
**Development
and launch
activities**

Validate &
develop

The development project

Team coordination & product validation

Product development & validation





Development phase

Team management process

- Stay aligned with the business case
- Control scope creep

Gate review meeting oversight

- Maintain ongoing communication with management

Continued product & quality testing

Systems check

Creation of launch plan

- Preparing launch team, plan & programs



What is scope creep?

Scope creep is defined as adding features and functionality (project scope) without addressing the effects on time, costs, and resources, or without customer approval.





Team decisions & processes

Who should be the team leader and why

Functional vs. co-location

Amount of time devoted to project

Establish mission and roadmap

Integrate knowledge, project & risk management

Avoid motivational mistakes



The validation & testing phase

This phase involves extended product tests, most likely a combination of in-house (alpha) and external (beta) trials

Tests may be conducted prior to, simultaneously with, and/or after development



Usability – prototyping

Alpha

- Prototype testing within the organization

Beta

- Prototype testing with potential buyers

Gamma

- Tests conducted among stakeholders who are potential influencers of or barriers to new product acceptance

Delta

- Monitoring wear of product during usage



Beta program decisions

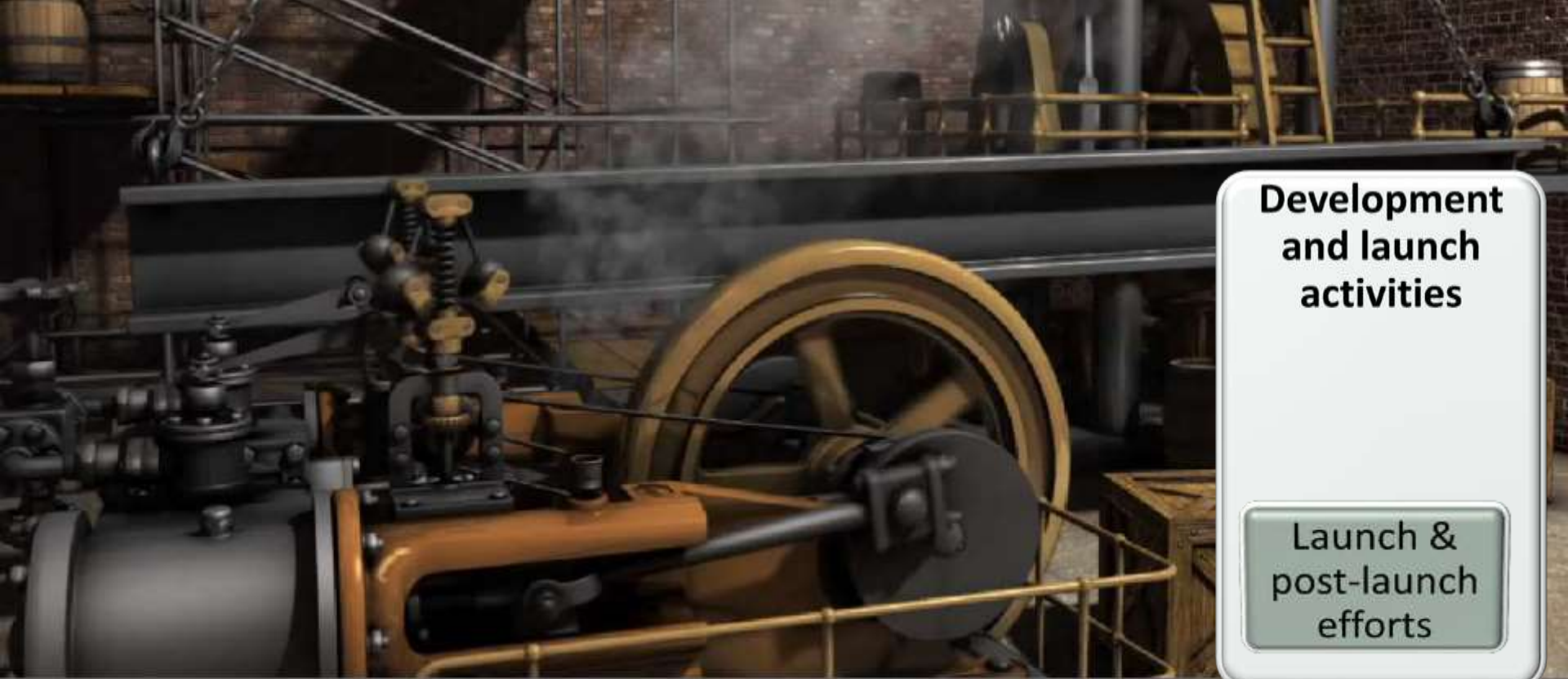
What is the “ideal” profile of beta test sites?

How many test sites (and why)?

How long should the program be?

Who pays for what?

What are the mutual communication and support requirements?



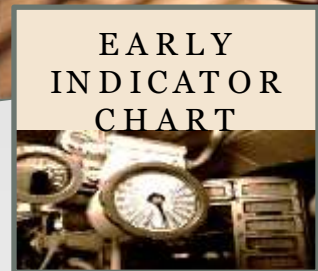
**Development
and launch
activities**

**Launch &
post-launch
efforts**

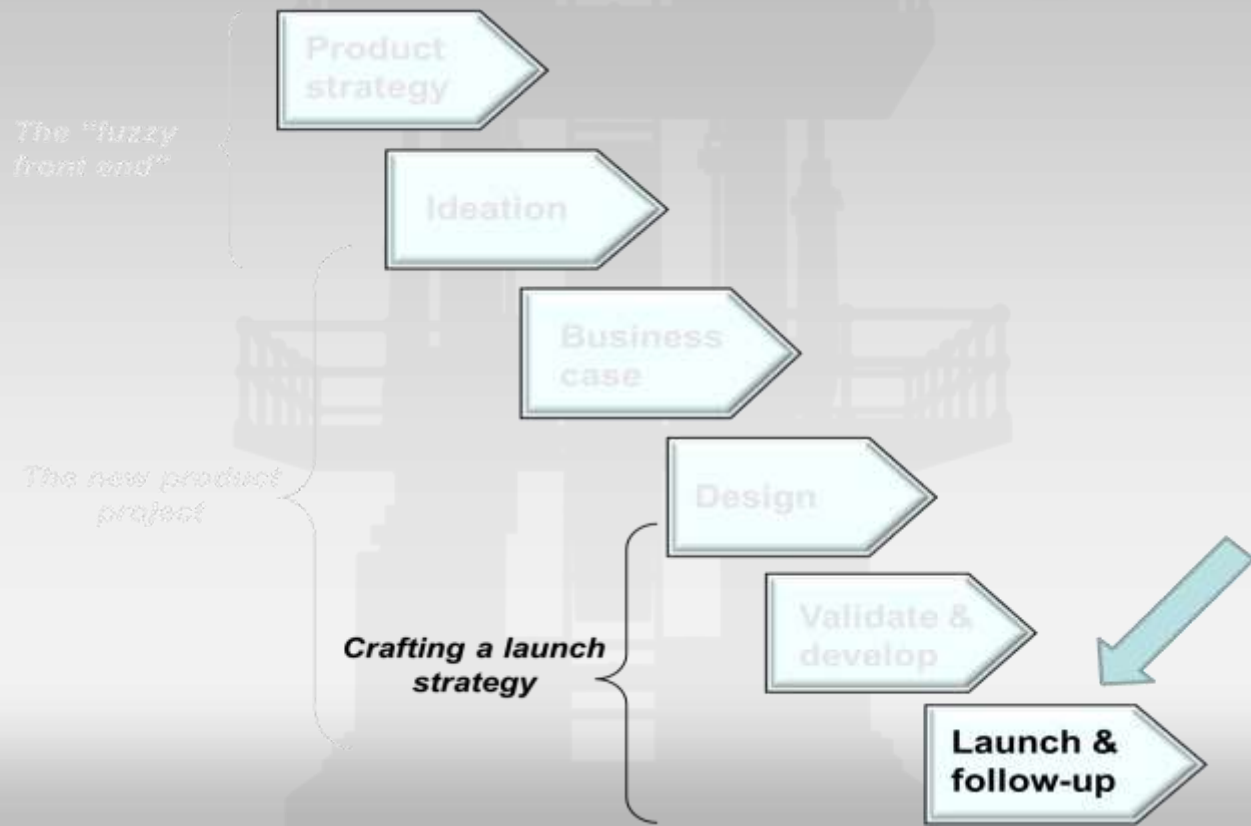
Commercialization

Launch and follow-up activities

Prepare documents in advance



Launch & follow-up





Launch is another project to manage

Who is the primary target market?

What specifics do you need to ensure?

When should you plan your launch?

Where should you launch the product?

Why is your product better?

How should you market your product?





Who

is the primary target market?



New or existing
customers

Demographics

Psychographics





**Are you using
the “right”
variables to
define the
target
segments?**



Consumer Market Segmentation

Demographics

- Age, gender, income

Geography

- Country, urban/rural

Psychographics

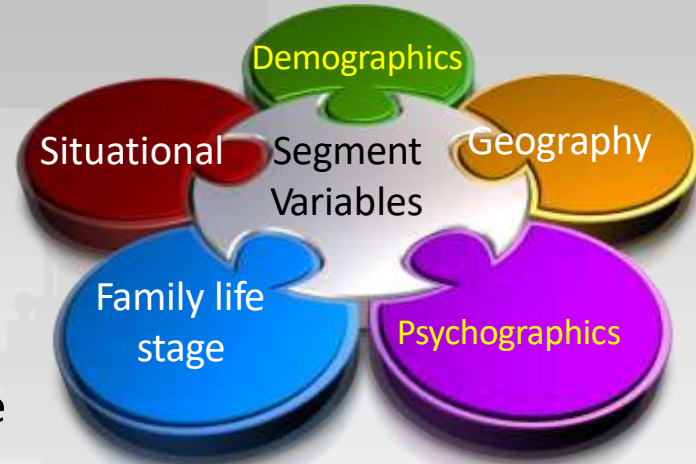
- Attitudes, interests, lifestyle

Family life stage

- Single, family, empty nester

Situational factors

- Urgency, order size, gift





What specifics must you ensure?



Product attributes

Brand

Solutions attributes

Price/value fit



Where

should you plan your launch?



Entry sequence

Priority markets

Sales channels

When

should you plan your launch?

- Impact on other products/
services
(inventory management and roll-overs)
- Competitive situation
(before, concurrent, after)
- Significant trade shows / events



C. Merle Crawford

C. Merle Crawford • Anthony Di Benedetto

Why

is your product better?



- Really, *really* know the differential advantage
- Make it visible





How

will you market the product?



- Field sales plan
- Advertising strategy
- Product support



POST-LAUNCH REVIEWS





Early Measures to track

Pre-launch and early launch

- Compare actual against milestone activity chart
- Compare actual against event schedule
- % resellers stocking product
- # sales calls (per call reports)
- Awareness





Later measures to track

Post-launch

- unit sales
- returns
- discounts
- customer acceptance
- competitive response
- service calls
- shareholder value



Control plan

Determine frequency of tracking

“Red alert” strategies or contingency plans





Process review follow-up

After the product is launched, a final review is necessary

- How effective was the *process*?
- Would process improvements make the next launch better?
- Is the product effective in terms of the objectives established for it?
- Are there any “red flags”?
- Should corrective action be taken?



Post-launch audit

What did we learn?

“Good judgment comes from experience... and a lot of that comes from bad judgment.”



Key points

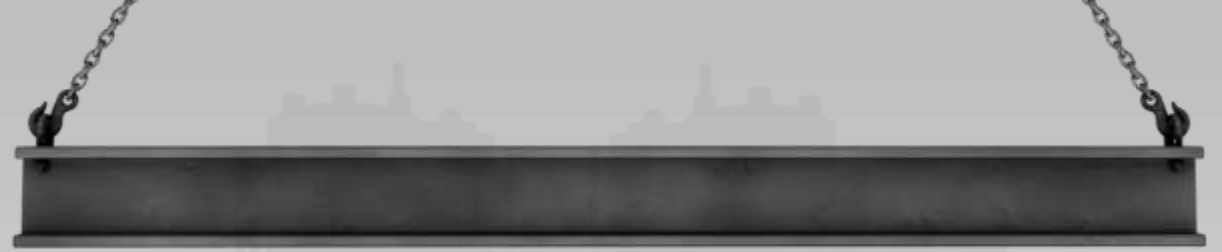
Manage both foundation and project-specific elements of NPD

Use market insight to define products and reduce friction

Create business cases as investment proposals

Integrate knowledge, project & risk management

Prepare launch plans early, implement carefully, and monitor post-launch



Thanks

Ashish Tiwari

