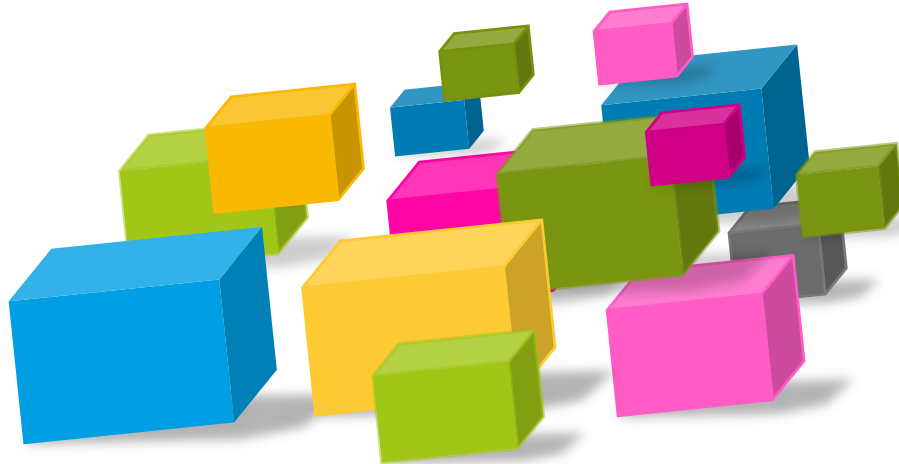


# The Innovation Process – The 4 Steps A Strategy Map Approach

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1. Why Innovation
2. A Unified Strategy and Innovation Process Framework
3. Innovation cuts across Strategy - Perspectives
- 4. The Four Steps of the Innovation Process**
5. Innovation Management Strategy Map
6. The Four Steps in more Detail
7. Causal Linkages across Perspectives; how the innovation process and overall strategy align.
8. Appendix: Types of IT Product Qualities



“Companies create considerable competitive advantages when they have the capability to bring innovative products – well matched to targeted customers’ needs and expectations – to the market fast and efficiently. Product Innovation is a prerequisite for participation in some dynamic, technologically based industries, such as pharmaceutical, semiconductors and telecommunications.

Exceptional Innovation capabilities determine the industry leaders.”

Kaplan and Norton



In General, Corporate Strategy focuses on 4 Internal processes:

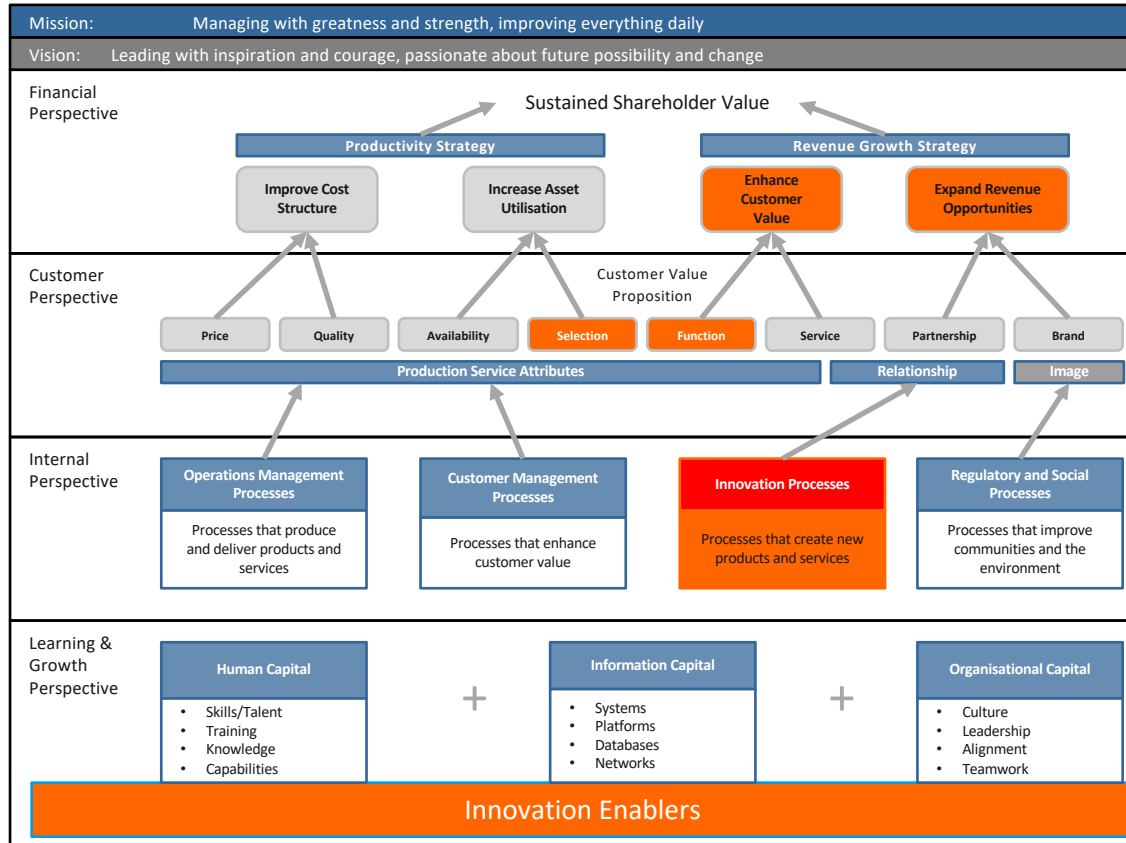
- 1) Customer Management Processes
- 2) Operational Management Processes
- 3) Innovation Processes
- 4) Regulatory and Social Processes

This presentation focuses on **Process 3**. The others are detailed in separate presentations.

These processes are discussed in the context of the Balanced Scorecard and Strategy Map Framework. In this context this framework unifies:

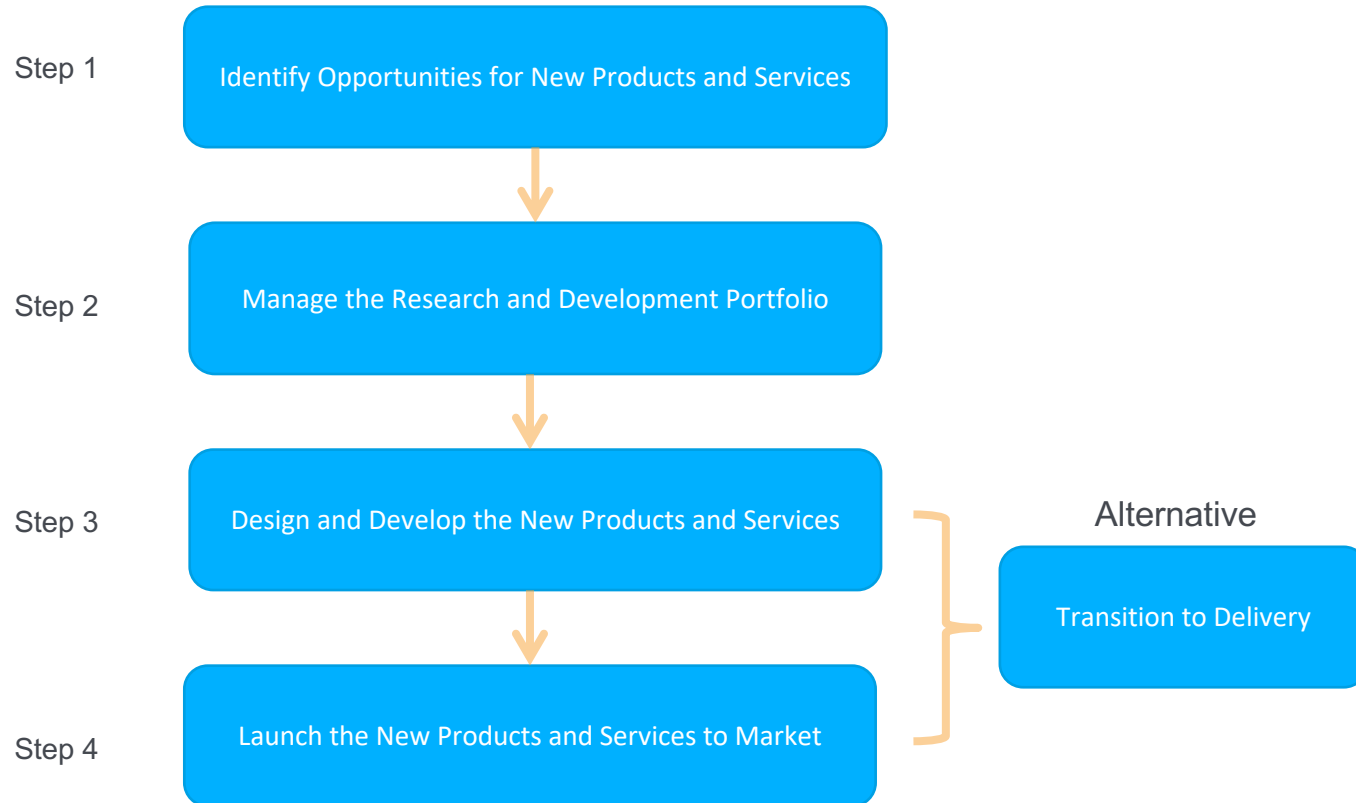
- The means to capture and communicate strategy,
- The strategy process, the 'why',
- The innovation process, the 'How': This is the 'How' part of the strategy, the strategy is the 'why'. (see Golden circle, last slide)

# Innovation Cuts Across Strategy – Strategy Map Example



The Four Core Internal Processes are defined in context of the whole Strategy. Each process provides a 'how', the overall strategy is the 'why'

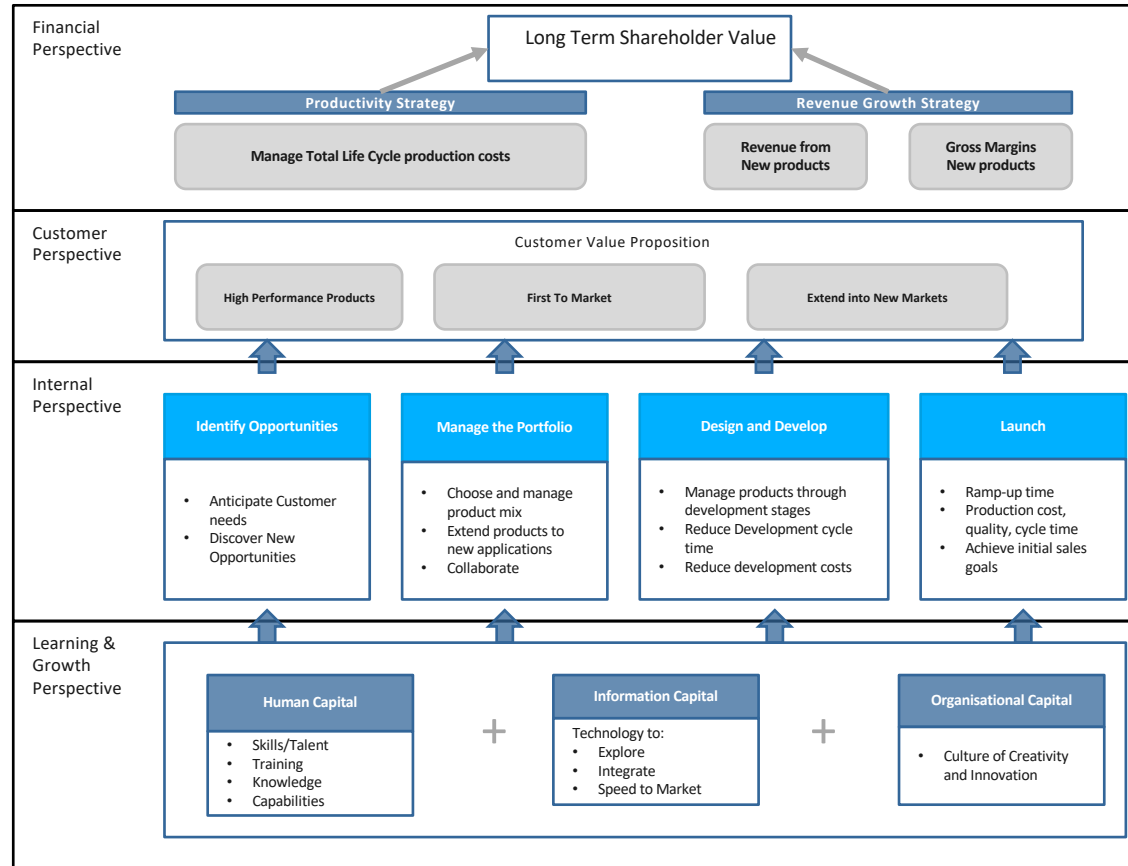
# The Four Steps of The Innovation Process



# Innovation Management Strategy Map – Internal Processes



The linkages across perspectives is discussed later in pack.



Four Core  
Internal  
Innovation  
Processes

Key  
Innovation  
Enabler Areas



# The 4 Steps Detail





## Identify Opportunities for New Products and Services

Discover new ideas, products and services:

- Utilise Knowledge from past products and understanding;
- Voice of customer, market surveys – what do they need, desire;
- Relationships with Universities, Research labs etc;
- Ideation – use communities (internal/external),
- Filter – internal/external use external expert communities to filter.
- The Fuzzy Front End

Ideation Tooling: to manage the funnel, e.g. Hype, Spigit, Brightidea, Ideation, OI Engine, IdeasMine, BrainStorm, Crowdcity, etc...

**Output:** List of Ideas



## Identify Opportunities for New Products and Services

### Measures

Objective	Measure
Anticipate Future Customer Needs	Time spent with key customers; % new projects based on client input
Discover and develop, new more effective, or safer products and services	No. or % new projects or concepts presented for development Improved product quality(e.g. 40% faster, safer)
	Number of new value-added Services identified



### Manage the Research and Development Portfolio

Once the ideas have been generated then evaluate:

- Decide which products to fund, defer, kill;
- Decide how to develop: Internally, externally collaboratively, licensed or outsourced.

**Output = Aggregate Portfolio Project Plan (APP)**

- Now Evaluate Continuously

R&D portfolio should have a mix of project types:

- **Basic Research** – create new science and technology knowledge; later applied to a product;
- **Breakthrough Development** – create entirely new products;
- **Platform Development** – next generation of products;
- **Derivative Development** – enhanced features or qualities of current products, or to a target market
- **Alliances** – acquire new product from another company

**Each of the 5 types, has very different resource requirements, project times and risk profiles**

- The APP *links the projects to the strategy, allocates people and funding, schedule/plan.*
  - The objectives of each project are clear and now accomplishable. Later slides suggest Strategic objectives and measures

# Step 2 Measures



## Manage the Research and Development Portfolio

Objective	Measure
Actively manage the portfolio to meet goals	Actual verses desired mix of projects
	Actual verses desired spend on each type
	Technology ranking
	NPV of products in pipeline
	Reach
Extend current platforms into new or existing markets	Option Value from portfolio
	Strategic Alignment
	No. leveraging existing platforms
	No. of life-cycle extension projects
	No of Licensed products
Extend product portfolio through collaboration	No. of patents
	No. of joint projects
	No. of technology partners



### Design and Develop the New Products and Services

This is an extremely complex set of activities (stages) that cuts across, multiple functions of a business to bring idea to market: **Stages often are:**

1. **Concept Design & Development** - may start with market research, competitive analysis, etc
2. **Product Planning** – test concept, build models, prototypes etc.
3. **Detailed Product and Process Engineering:**
  - Build Prototype Products
  - Simultaneously Build Tooling for Production
  - Cycle through Design-Build-Test, many times, to meet goals:
    - Functional Goals
    - Quality Goals (see Appendix 1 for nbn IT Qualities)
    - Cost, Production time etc
  - For just IT development there are over 80 different process types, including: Rapid Prototyping, Agile, Waterfall, Less, Open UP, RUP, XP, SCRUM, Blue Mix, SAFe, etc
  - **Toyota designs multiple concepts/products in parallel**

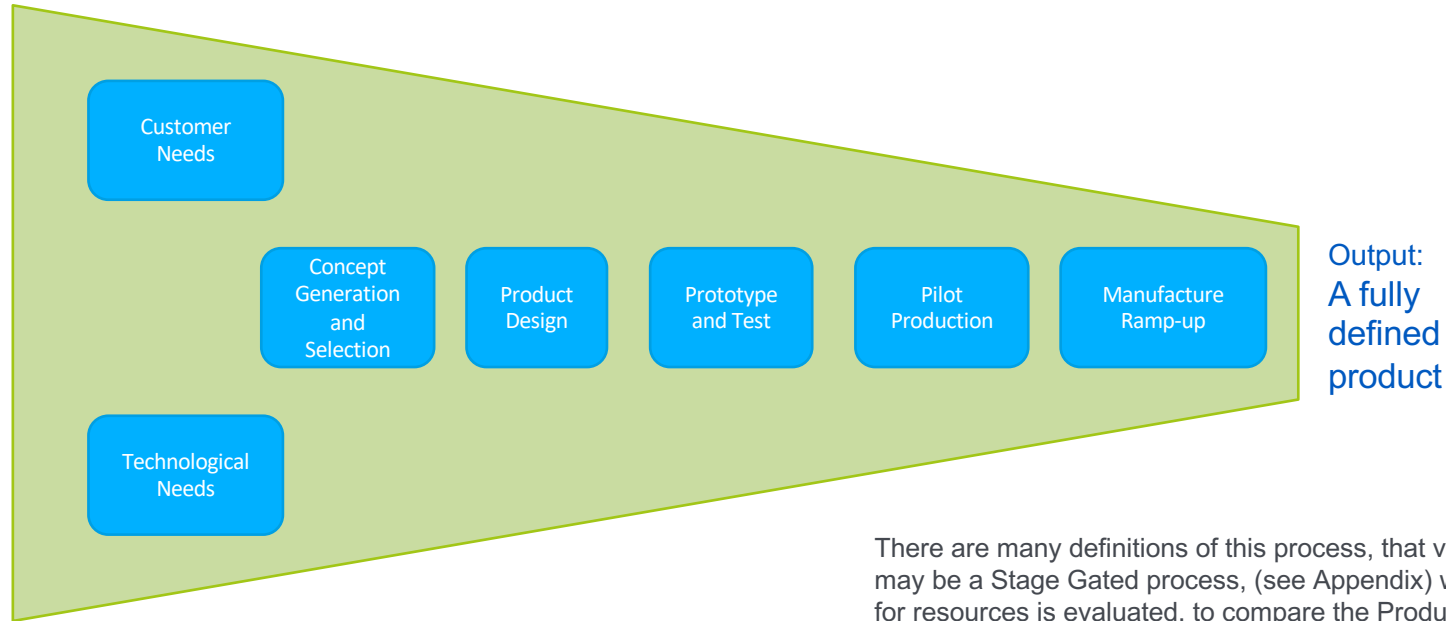
**Output: A Fully Defined Product**

## Step 3 – An Example



### Design and Develop the New Products and Services

Design and Develop is sometimes described as a Funnel, maximum flexibility at the start and as project evolves the concepts, designs and processes become more well defined, as options get discarded.



There are many definitions of this process, that vary greatly. It may be a Stage Gated process, (see Appendix) where competition for resources is evaluated, to compare the Products in the funnel.

# Step 3 Measures



## Design and Develop the New Products and Services

Objective	Measure
Manage the project portfolio	No. Patents, or patent citations.
	Project yield (% projects through stage to stage).
	No. projects entering each phase of development process.
Reduce Development cycle time	No. projects reviewed using stage gate, SDLC or formal review.
	No. project delivered on time.
	Average time at Dev, Test, Launch stages.
Manage development costs	Total time to Market.
	Actual Verses Budgeted Spend at each stage.



### Launch the New Products and Services to Market

**The output of the prior process** is the release of a product, now ready for ramp-up into commercial production.

The 'product' may be defined as a specification or design, or a tangible product (e.g. code in IT).

- Release product for ramp-up to full production.
- Build production facilities and Component Approach.
- Pilot: Test Manufacturing processes.
- Start Commercial production at low volumes
- Finish when target production levels achieved.

In some organisations this may be a hand over of the product specification via a transition activity to a dedicated 'Product or Deliver' Group.

Caution: handoffs are not lean.





### Launch the New Products and Services to Market.

Objective	Measure
Rapid Launch of new products	Time from start of pilot to full volume production
	No. of Redesign cycles
Effective production of new products	No. of New launches Vs Target
	Manufacturing Cost, Yield, Failures
	Number of new value-added Services identified
	Warranty and Field service costs
Effective Marketing, distribution, sales	Customer satisfaction, complaints
	Safety or Environmental incidents
	Revenue Targets
	Backorders



# Strategic Causal Linkages

Objectives and Measures in the Encompassing Strategy



**Customer:** Excellent Innovation processes offer customers a value proposition consisting of:

- 1) **Specific Performance Attributes (Qualities)** of the products or services that provide competitive offering. e.g. safety, availability, reliability, low failure rate, reduced size/weight, user experience, etc.
- 2) **Time to Customer**, faster to market, first to market.
- 3) **Extend Existing products** into the market. E.g. a drug for headaches, reduced heart attack risk. Hondas core motorcycle engines extended into mowers. Cannon has taken camera innovation into copiers and printers.

**Financial:** Excellent Innovation processes offer revenue growth and enhanced margins.

- 1) Products that are first to market either command a price premium or generate sales growth, faster than industry.
- 2) Innovation is less often associated with productivity and cost reduction. May have a goal to lower cost of maintenance, support, recycling and disposal.



Objective	Measure
Offer enhanced product/service functionality to customers	Specific performance attributes of ne product/services
First to market	Lead time relative to competitors
	No. of New products/services to market
	% product Launches on time
Extend product/services to new segments	No. of new applications from platform products
	Revenue from new markets and segments



Objective	Measure
Return on R&D	Return on spending on technology
First to market	Actual Vs Target Breakeven Time (BET)
	Royalty & licensing from patents
Revenue growth from Existing customers	Revenue and margins from products released
	% growth in sales
Revenue growth from New customers	Revenue and margins from products released
Managing Life-Cycle Costs	Maintenance costs % total manufacturing costs
	Disposal costs % total manufacturing costs



## **Human and Information Capital:**

- Need deep expertise and competency.
- Need integration of several disciplines.
- Ability to interact with stakeholders outside of R&D.
- Need Information Technology.

## **Organisation Capital:**

- Teamwork (inside and outside)
- Innovation Culture



Objective	Measure
Achieve Deep functional Expertise	Skill coverage
Develop effective interdisciplinary and cross functional teams	% staff work effectively in teams
	% effective staff capable of leadership & management
Employ IT technology	% staff skilled in IT
Use of Technology for Rapid Launch	% products based on
Capture leading knowledge from scientific and technical community	No. of new ideas from external sources
	Peer review of current scientific and technological capabilities
Foster a culture of Innovation	No. of suggestions for new products and capabilities
	Employee culture survey for innovation and change.



# Creativity & Innovation



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# Appendix



Main Types of Systemic Qualities:

Type of Quality	Description
<b>Manifest</b>	Support end user needs. In most cases they are objectively measurable and have impact at specific release points.
<b>Operational</b>	Impacts those stakeholders that run, operate, monitor or manage the system.
<b>Developmental</b>	Describes desirable qualities of the system from the standpoint of those who will build it.
<b>Evolutionary</b>	Describes future goals of the system to meet the organisation's strategy.

Each type impacts the architecture, across its tiers and layers,  
Now and into the future.

## 4 Types of Systemic Qualities by Who, When and How



Type Of Quality	Who	When	How
Manifest	End user and business stakeholders	After initial release, production.	Test, customer satisfaction, business objectives, analytics.
Operational	IT Operations, IT Service Management, IT Security, Business Security, Maintenance and Support.	Development operations, release-time, after release	Test, customer satisfaction, operational metrics.
Developmental	Developers, Dev-Ops, PMs, Architects.	During and throughout development and delivery.	Productivity metrics, Velocity, delivery frequency.
Evolutionary	Developers, business stakeholders	After initial release	Strategy and Business Performance

# Specific List of 30 Qualities by Type



Manifest	Performance
	Availability
	Usability
	Reliability
	Accessibility
	Mobility
Developmental	Buildability
	Testability
	Understandability
	Code Quality Measurability
	Conceptual Integrity
	Budgetability
	Planability
	Traceability
	Development Distributability
	Modularity / Packagability

Operational	Throughput
	Security
	Manageability
	Maintainability
	Serviceability
	Deployability
Evolutionary	Reproducibility
	Scalability / Elasticity
	Variability
	Flexibility
	Extensibility
	Reusability
	Portability
	Interoperability

\*Definitions in separate document



# Other Processes



**The Front End of Innovation** ‘Stage’ is also sometimes described as the “Fuzzy Front End”, “Phase 0”, “Stage 0” or “Pre-Project Activities”.

Where:

- Opportunities are identified;
- Ideas emerge, ideation;
- Concepts are developed;
- Where exciting creative breakthroughs are created.

Koen distinguishes five different front-end elements

- Opportunity identification
- Opportunity analysis
- Idea genesis
- Idea selection
- Concept & Technology development

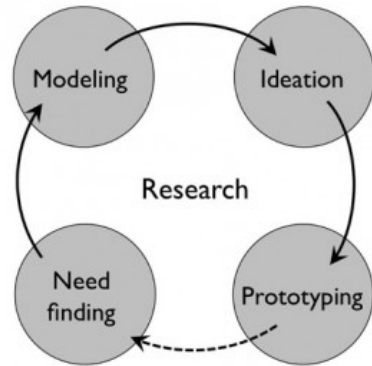
# The Front End Innovation 'Process' – Not Fuzzy



- **Front End Innovation is not a standard linear process**, it is not fuzzy..
- It has five categorically distinct efforts which allows for discovery, creativity, and concept validation. These are:
  - Preliminary Analysis
  - Portfolio Analysis and Triage
  - Technology Discovery and Development
  - Transitional Research and Prototype Build
  - Demand Refinement
- **These steps are not sequential, and is an iterative process**
- During this process, new input results in analysis that triggers re-evaluation of prior assumptions – an outcome of discovery and inspiration.
- All steps must be completed until all assumptions are tested and modified.
- All stakeholders must be jointly satisfied they have reached an optimal result.



“Many people assume that creating new ideas is the beginning of the innovation process, but actually that’s not true. Ideation occurs in the middle of the disciplined innovation process”



From: <http://www.innovationmanagement.se/2013/08/08/how-to-innovate-the-innovation-process/>





Langdon Morris has proposed this process:

- **Step 1 is Strategic Thinking** - create strategic advantage in the marketplace;
- **Step 2 is Portfolio Management & Metrics** - manage innovation portfolios aggressively to balance the inherent risks of the unknown with the targeted rewards of success, and balancing our pursuit of the ideal with the realities of learning, risking, failing in order to ultimately succeed.
- **Step 3 is Research** - the right mixture of short and long term projects across all four types of innovation
- **Step 4 is Insight** – ideation, eureka moments.
- **Step 5 is Innovation Development**- the process of design, engineering, prototyping, and testing that results in finished product, service, and business designs. Manufacturing, distribution, branding, marketing, and sales are also designed at this step in an integrated, multi-disciplinary process
- **Step 6 is Market Development** - business planning process that begins with brand identification and development
- **Step 7 is Selling**
- “Managing a process of this scope and complexity is of course a challenge for all organizations”



Robert G. Coopers Stage Gate Process, 6 steps:

1. Ideation or Discovery
2. Scoping
3. Building the Business Case
4. Development
5. Testing and validation
6. Full Launch

After each Step is a “Gate” based on Go/Kill or investment criteria.

- In a *closed innovation model*, inputs come from internal and some external sources— customer inputs, marketing ideas, marketplace information or strategic planning inputs. Then, the R&D organization proceeds with the task of inventing, evolving and perfecting technologies for further development.
- In open innovation, *companies look inside-out and outside-in, across all three aspects of the innovation process*, including ideation, development, and commercialization

\* (Registered Trade Mark)



DMADV, compared to DMAIC, is a 6 Sigma process used when there is no existing product, and used to research and design a specific product or process. It is a very abstract process description and requires specialisation for an organisation or project.

- **Unlike the prior processes it is focused on a single project, single idea.**
- **It is NOT for a portfolio or running R&D across a number of projects.**

**The DMADV steps are:**

- Define,
- Measure,
- Analyze,
- Design,
- Verify

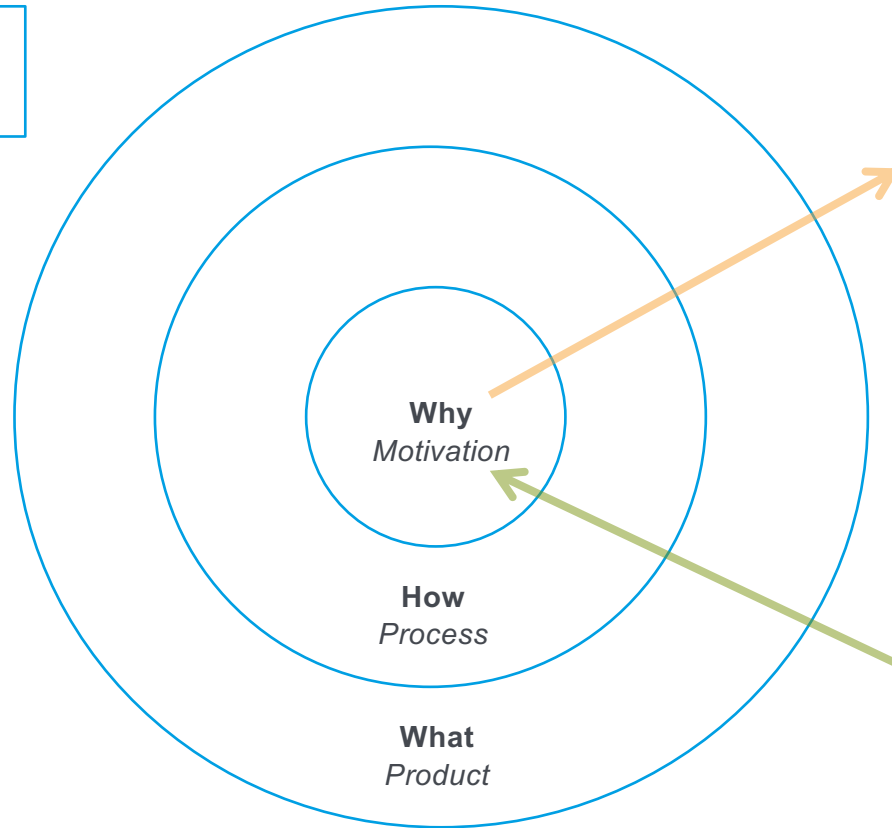


- Design Thinking
- Mindjet
- Leankit
- Strategiser
- Collaboration Canvas
- Lean Start Up
- Test and Learn
- TDP - Toyota Design Process (Includes Concurrent Engineering)

# Golden Circle (Simon Sinek)



- Why we exist
- How we do it
- What we do



## Inside to Out:

- First you need to know 'why', not 'how' not 'what'
- **Breakthrough**

## Outside to In:

- Conventional