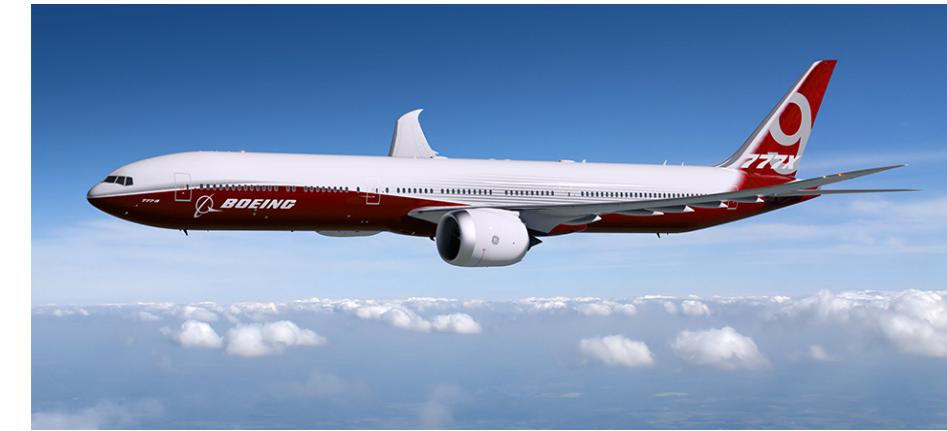
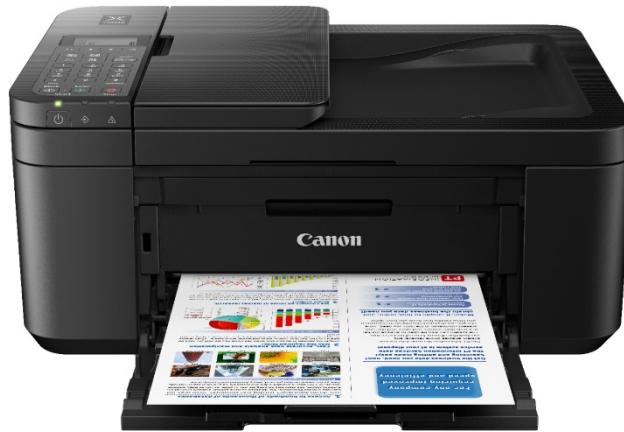


PRODUCT: is something sold by an enterprise to its customers.



PRODUCT DEVELOPMENT: is the set of activities beginning with the perception of a market opportunity and ending in the production, sale and delivery of a product.

- Focus is on engineered product.

Characteristics of a Successful Product Development.

Five specific dimensions, which relate to profit, are commonly used to assess the performance of a product development effort.

1. Product quality
2. Product cost
3. Development time
4. Development cost
5. Development capability

1. Product quality:
 - Does it satisfy customer needs.
 - Robust
 - Reliable
 - Reflected in market share
 - Reflected in price the customer is willing to pay



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Inbox (356) - bsjagati@git.edu X ET parle g news: 82-year-old Parle X Times Of India X +

https://economictimes.indiatimes.com/industry/cons-products/fmcg/82-year-old-parle-g-books-best-sal Take me back to the Mobile Version

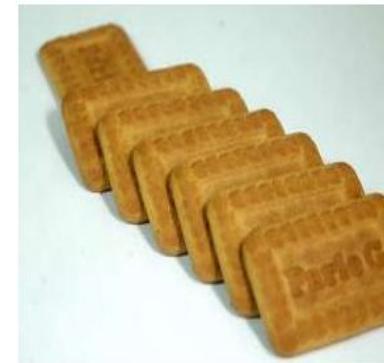
82-year-old Parle-G books 'best sales' in Covid times

By Shailesh Menon, ET Bureau • Last Updated: Jun 09, 2020, 04:06 PM IST

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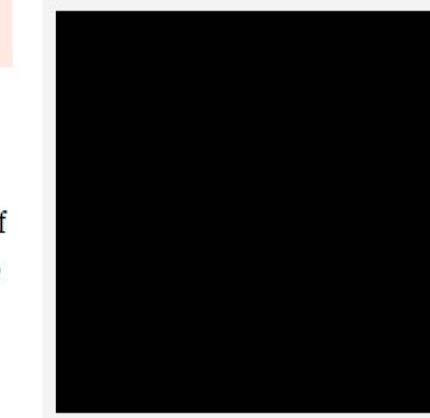
Synopsis

Parle's 5-rupees-a-pack cookie came handy for many migrants who walked back home.

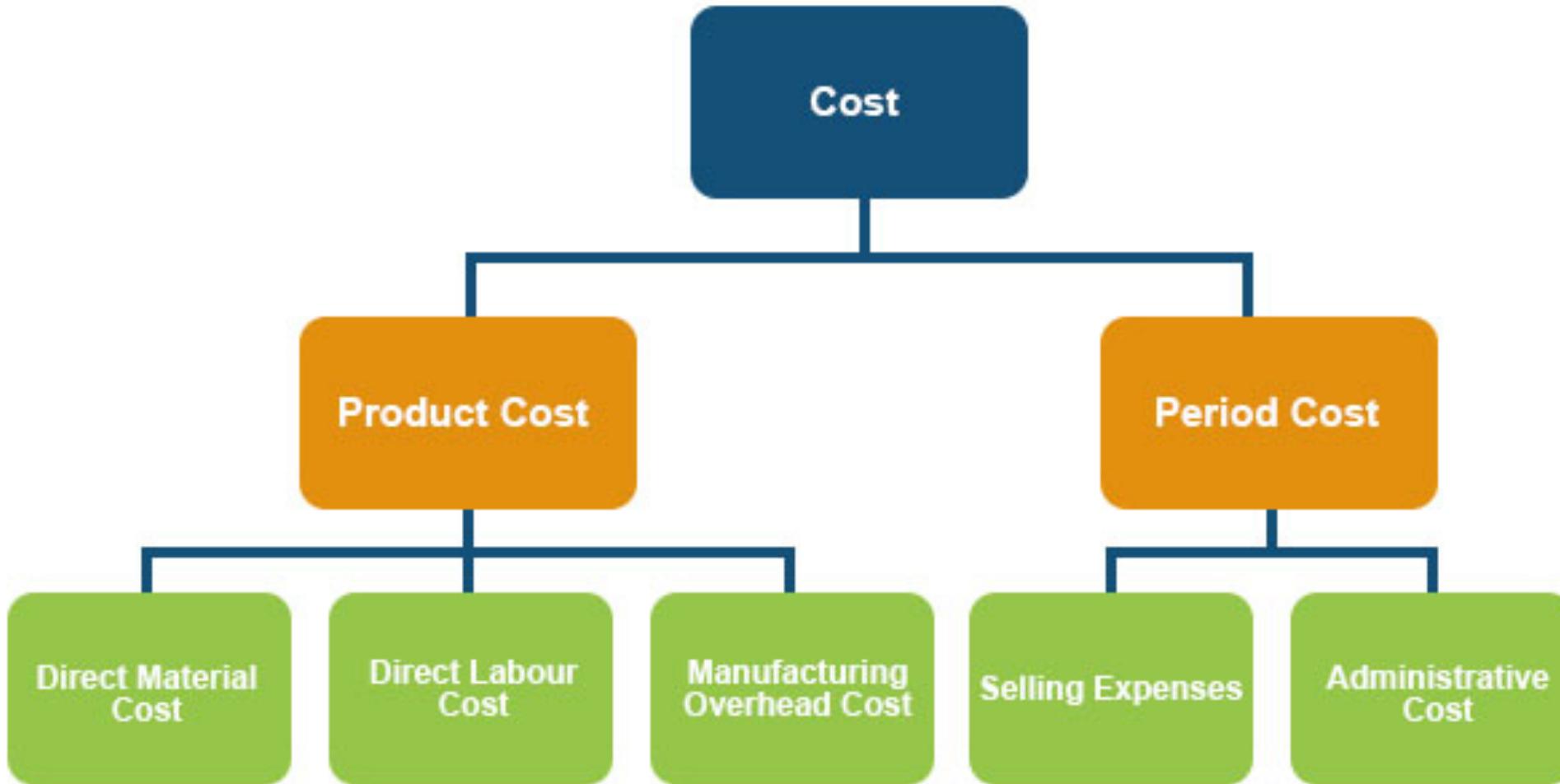


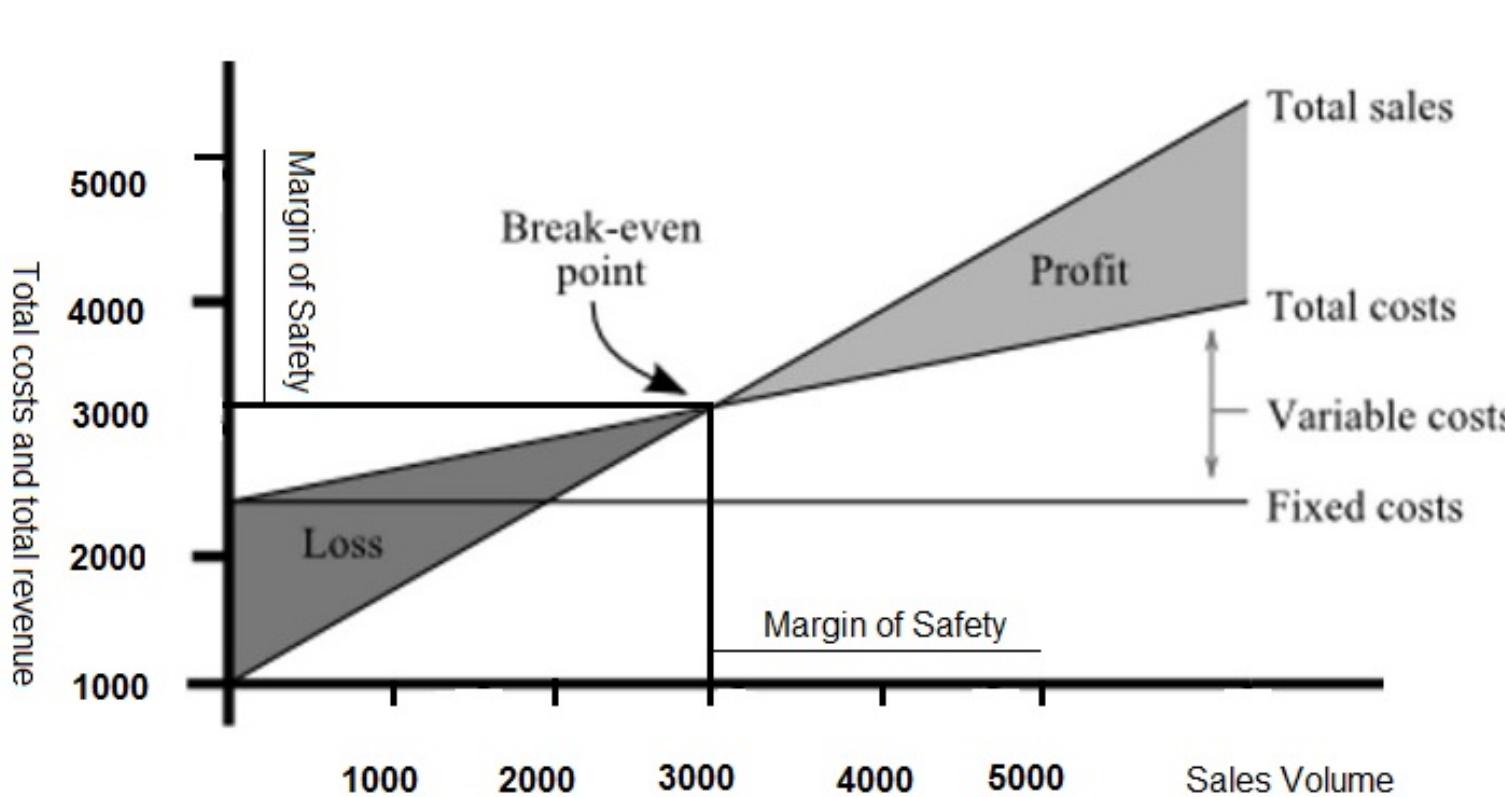
MUMBAI: An old pastime of dunking Parle-G biscuits in a steaming cuppa, and deftly biting off the tea-soaked half before it crumbled over itself may have soothed the nerves of many suffering from lockdown blues. This 5-rupees-a-pack cookie came handy for many migrants who trekked hundreds of kilometers to get back home. While

many stocked their kitchen cabinets with Parle-Gs, the do-gooders distributed them in sackful to the needy.



2. Product cost: - Manufacturing cost of the product includes spending on capital equipment, tooling, incremental cost of producing each unit of the product.
 - Determines how much profit accrues to the firm for a particular sales volume and a particular sales price





CVP Formula

$$Sx = VCx + FC + P$$

- S = Selling Price
- X = Sales Volume
- VC = Variable Cost per unit
- FC = Fixed Cost
- P = Profit
- Very powerful equation
- If all else fails just work the equation

3. Development time: -How quickly the team completes the product development effort.
 - Responsiveness of the firm to competitive forces and technological developments.
 - How quickly the firm receives the economic returns from the team's efforts.



Product packaging for "asianpaints Viroprotek 200". The packaging features a blue bottle with a white pump dispenser. The label includes the product name, a shield logo with a red cross, and the claim "Rinse-free hand sanitizer Safe on skin Fortified with clove oil". Below the main bottle is a smaller bottle. The background shows a kitchen sink. Text at the bottom right says: "Your family's safety is now in your hands". A small "Expert Advisory" section at the bottom left states: "Regular use of sanitizers protects you from germs, infection and viruses."

Changing Track

► April 1, 2020

Deadline to adopt BS-VI standards on emission

► **BS-IV vehicles** produced before April 1 , 2020 could be registered until June 30 that year

► **The govt** has sought comments on the draft rules until the third week of this month

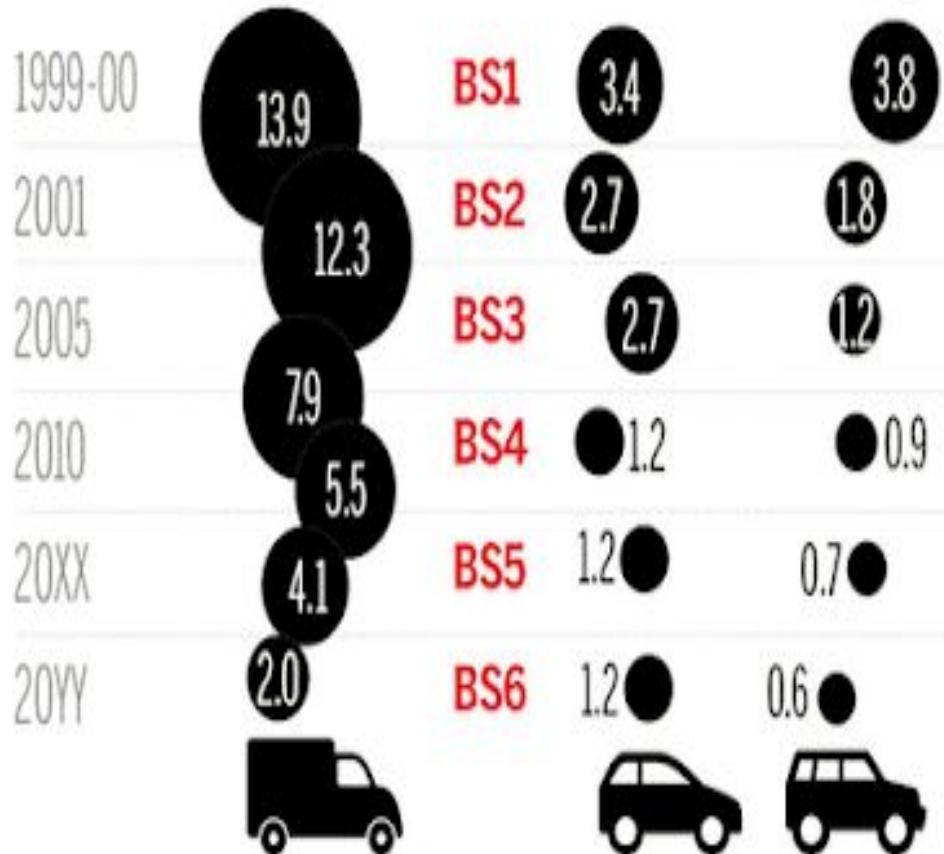
Trucks and buses could get time until Sept 30, 2020



WHY BS VI?

Can bring down emission levels by 51%; thereby reducing PM 2.5 and PM 10 levels

REDUCTION OF AGGREGATE POLLUTANTS SINCE 1999 (4 WHEELERS)



7 MARUTI CARS WITH INCREDIBLE **BS VI** TECHNOLOGY!



DZIRE



WAGONR



ERTIGA



ALTO



XL6



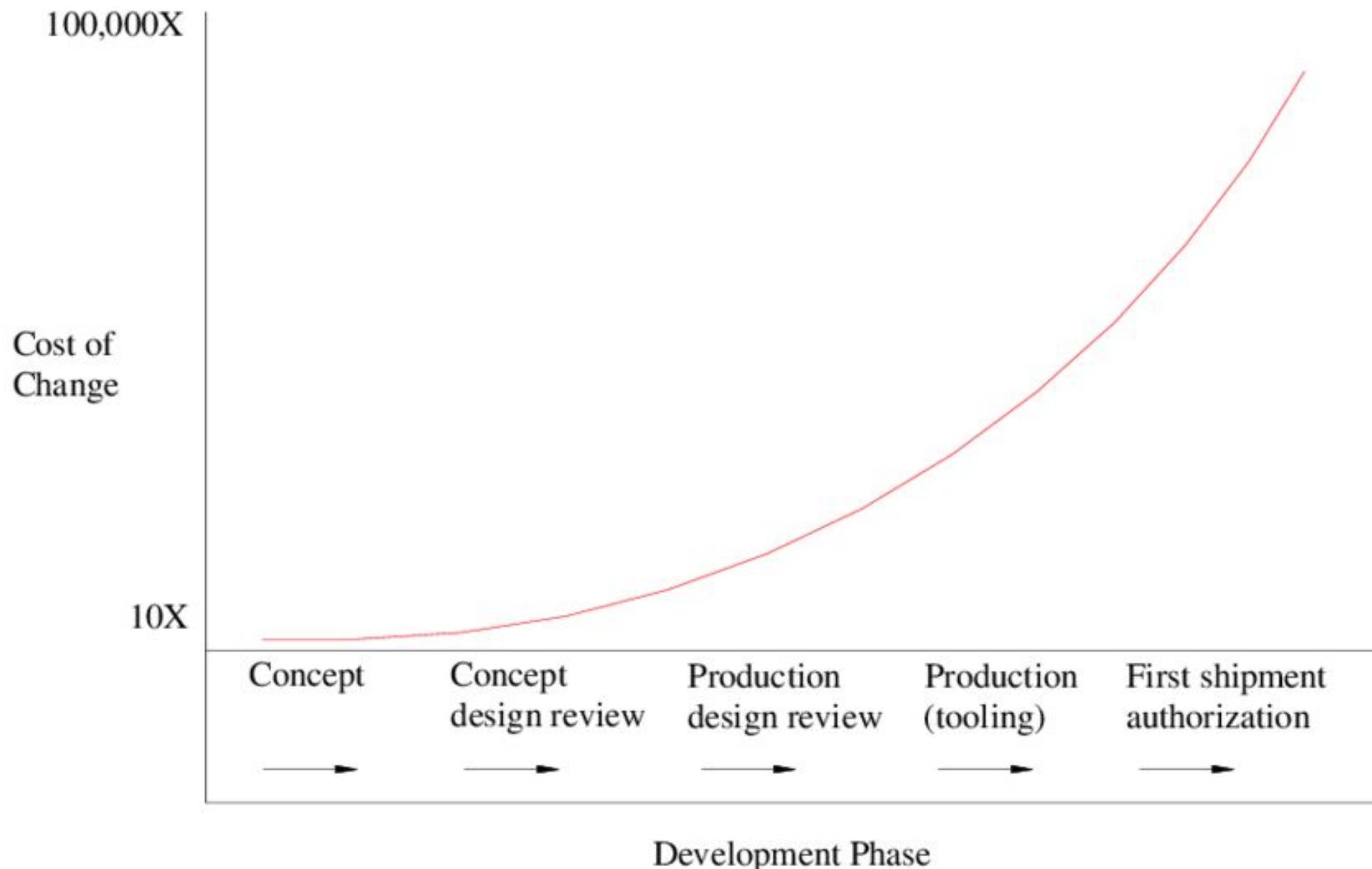
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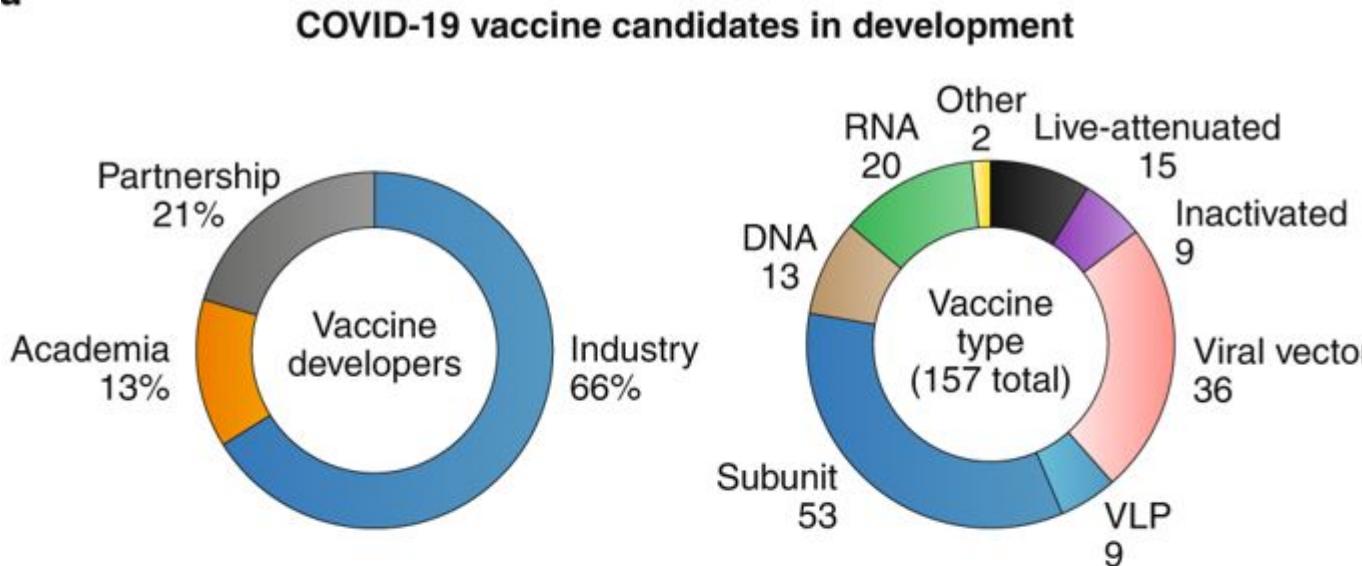
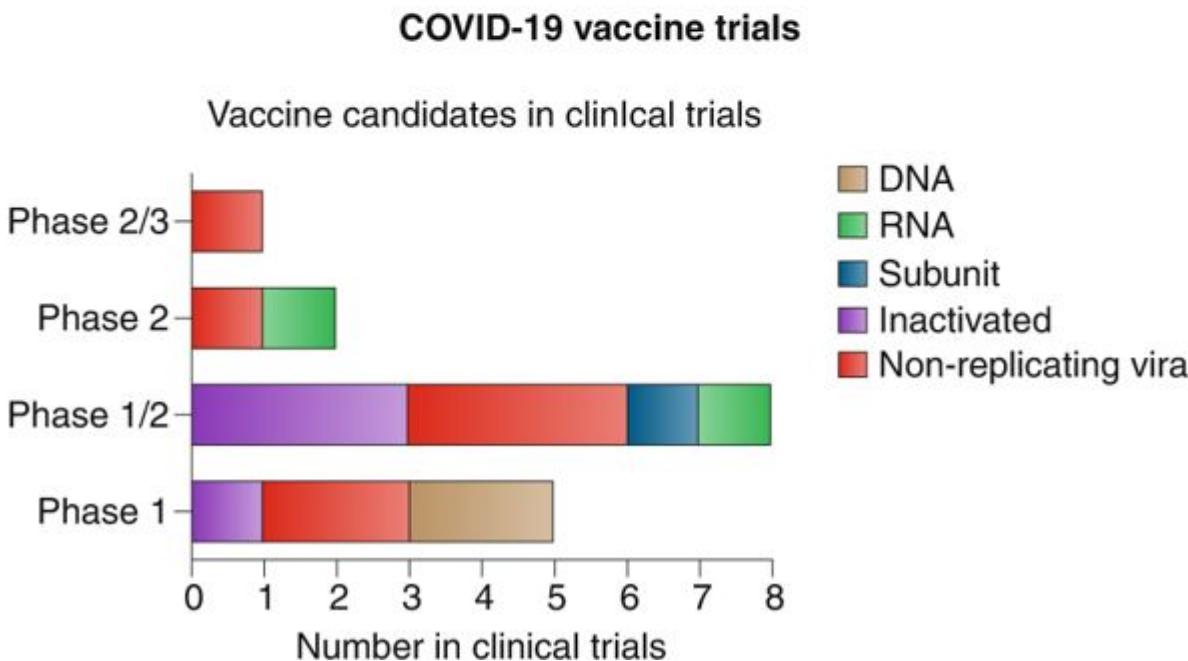


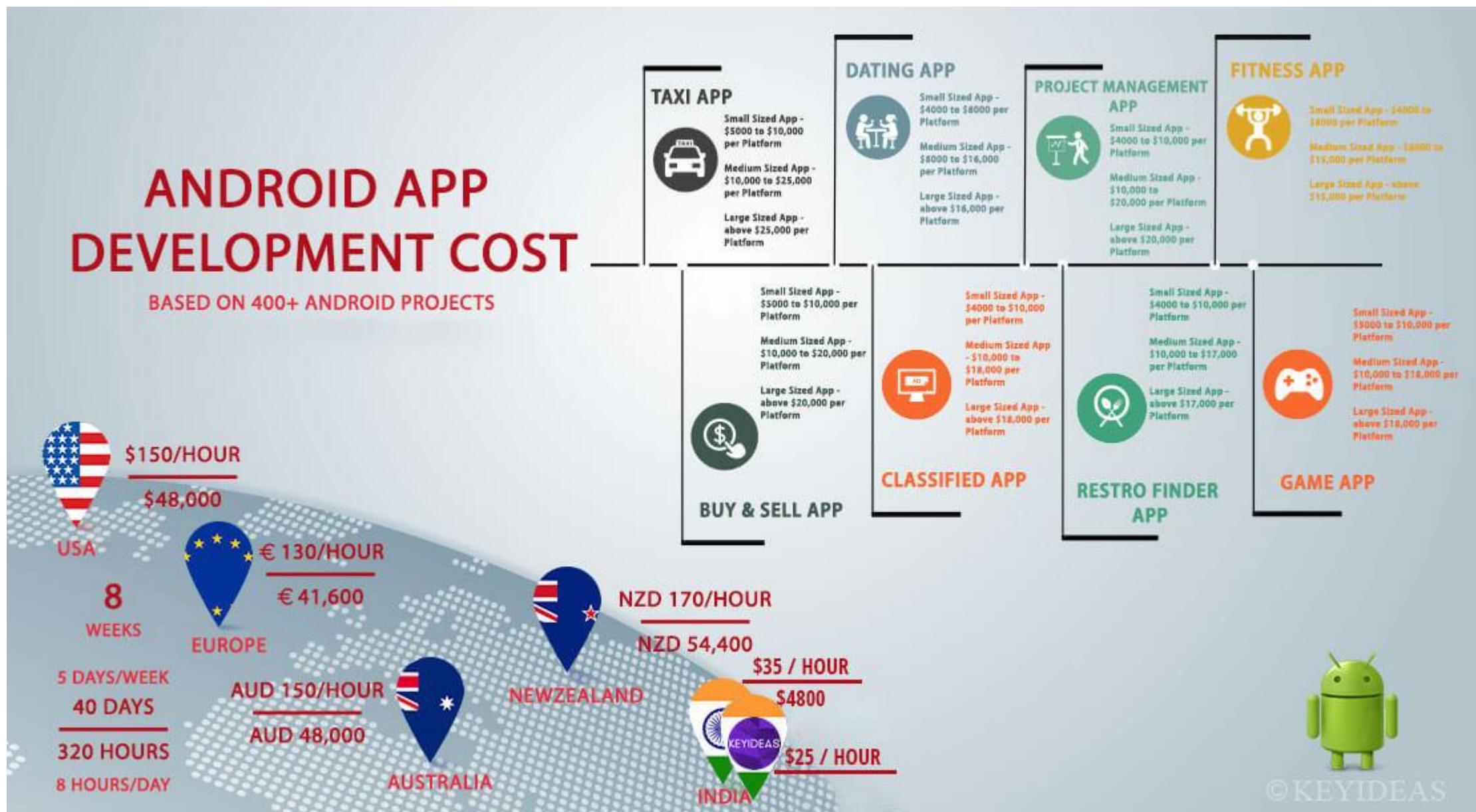
SWIFT

Development Cost: - Firm's spending on development of product.

- Significant fraction of the investment required to achieve the profits.
- **Development costs** are the **costs** a business incurs from researching, growing and introducing a new product or service.
- **Development costs** are commonly referred to as **research and development costs**.
- These **costs** can include a host of **expenses**, such as marketing analysis, developmental engineering and customer surveying.



a**b**



5. Development capability: - is an asset the firm can use to develop products more efficiently and economically in the future.

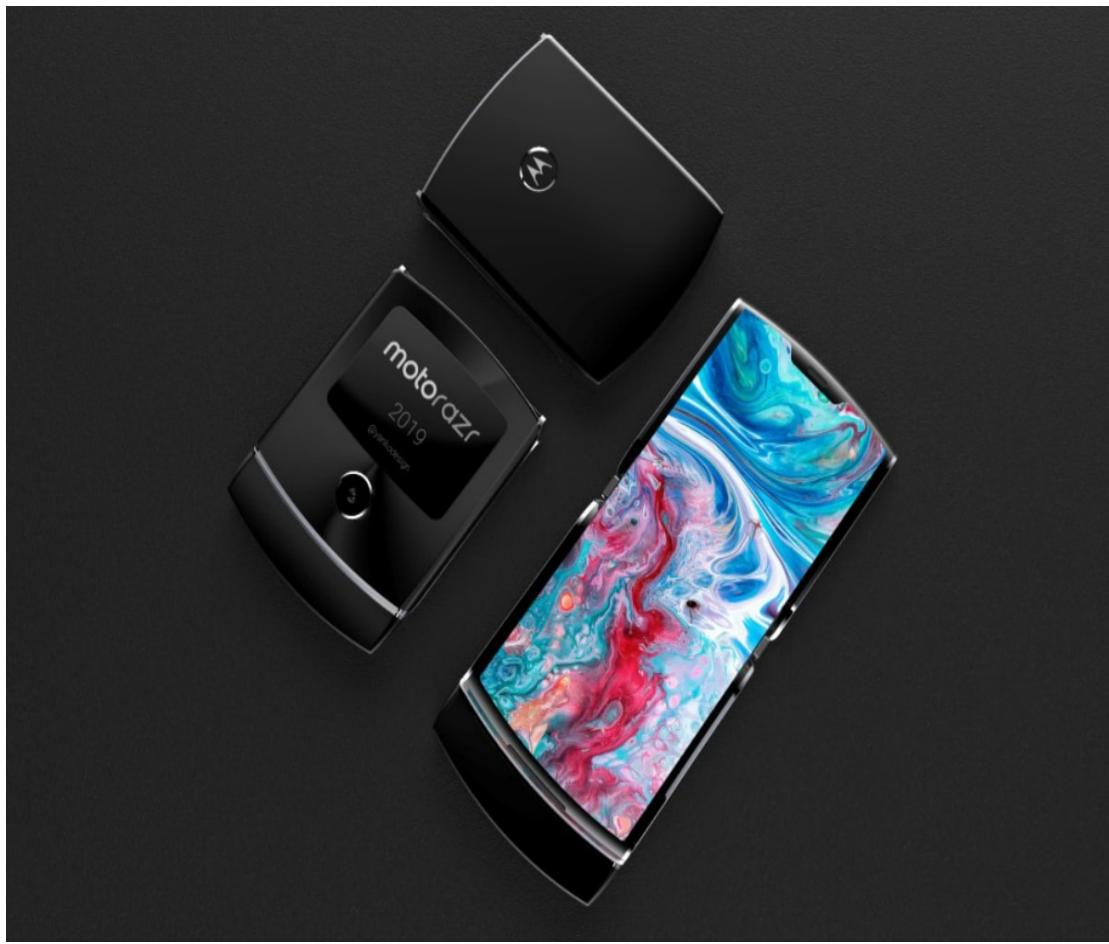
Firefox OS



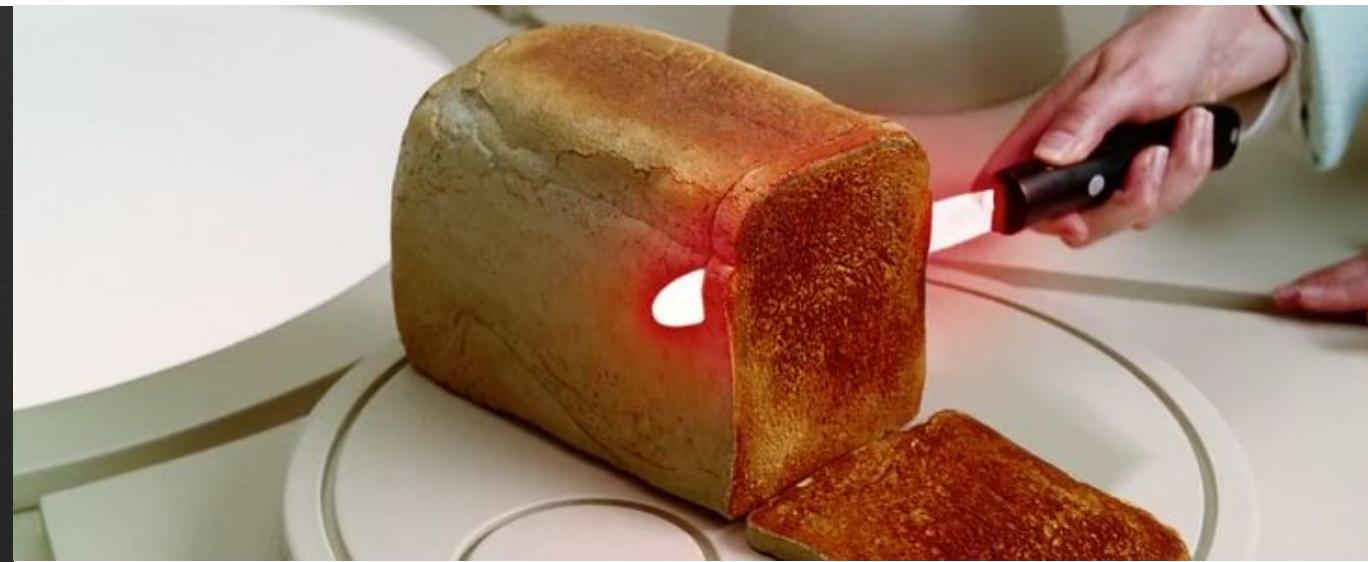
Google Glass



Foldable smartphone



Portable toaster



- High performance along these five dimensions should lead to economic success.

DESIGN AND DEVELOPMENT OF PRODUCTS(Who Designs and Develops Products)

- ✓ Product development is an interdisciplinary activity.
- ✓ Requires contribution from all functions of firm.
- ✓ Three functions which are central to a product development project are
 1. Marketing
 2. Design
 3. Manufacturing

1. Marketing:

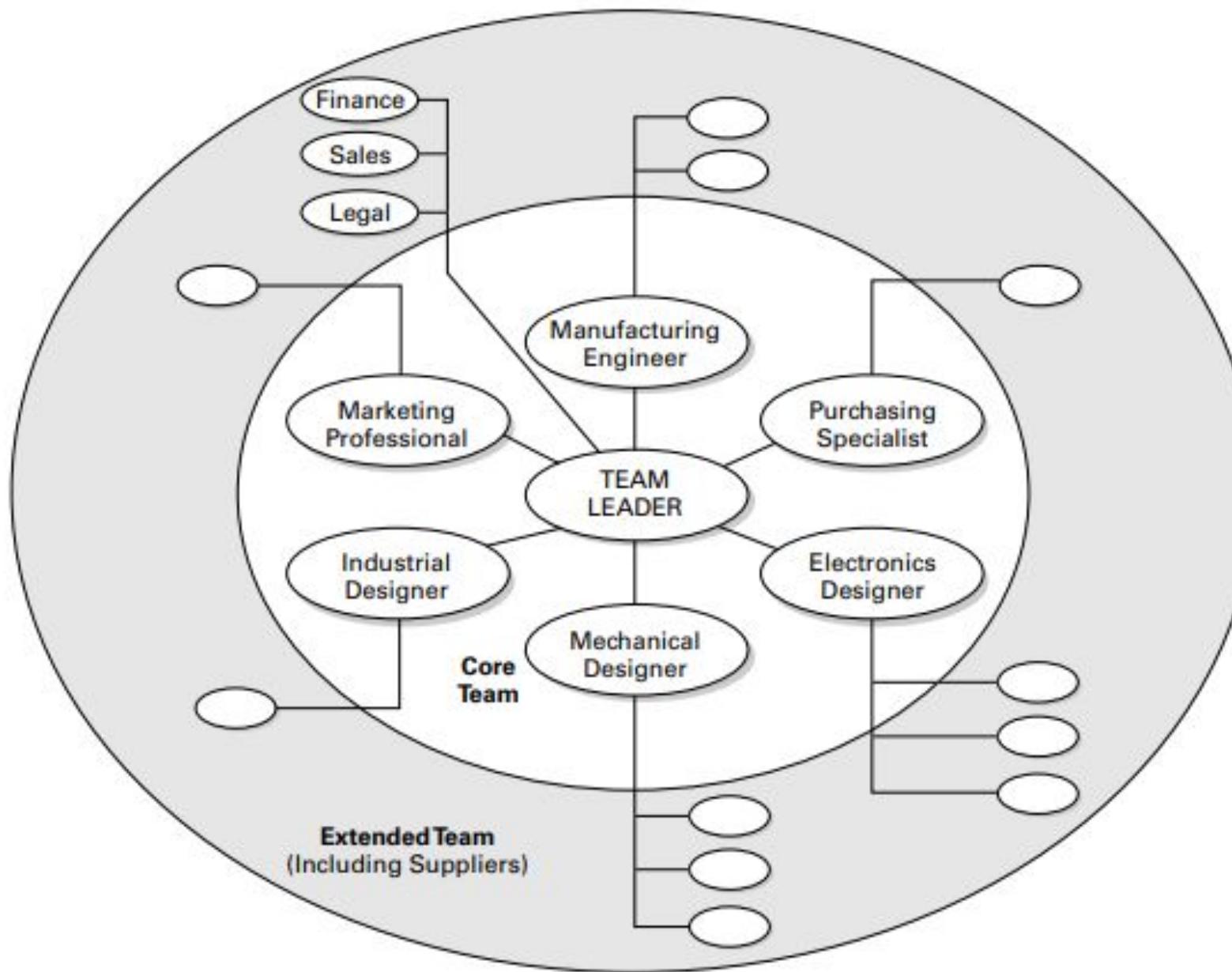
- Mediates the interactions between the firm and its customers.
- Facilitates the identification of product opportunities, the definition of market segments, and the identification of customer needs.
- Arranges for communication between the firm and its customers, sets target prices and oversees the launch and promotion of the product.

2. Design:

- Lead role in defining the physical form of the product to best meet customer needs.
- Design function includes engineering design (mechanical, electrical, software, etc.) and industrial design (aesthetics, ergonomics, user interfaces).

3. Manufacturing:

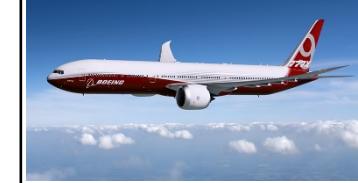
- Primarily responsible for designing, operating, and/or coordinating the production system to manufacture the product.
- Broadly, manufacturing function includes purchasing, distribution and installation.
- This collection of activities ----- *supply chain*.



Ex: Product development team for an electromechanical product.

- Core team (meet in conference room)
- Extended team (dozens, hundreds and thousands of other members)

Duration and Cost of Product Development

					
Annual Production volume-units per year	100000	50000	200000	50000	50
Sales lifetime years	45	3	2	6	30
Sales price Rs	25	500	8000	1500000	15000000
No of unique parts	3	20	150	8000	80000
Development time years	1	2	2	4	6
Internal development team -people	3	5	80	500	4800
External development team	3	10	80	500	5000
Development cost Rs	160000	750000	5000000	30000000	200000000
Production investment Rs	500000	750000	2500000	40000000	200000000

Attributes of five products and their associated development efforts

The challenges of Product Development:

Characteristics that make product development challenging are-

1. Trade-offs
2. Dynamics
3. Details
4. Time pressure
5. Economics
6. Creation
7. Satisfaction of societal and individual needs
8. Team diversity
9. Team spirit

1. **Trade-offs:** - maximizes the success of the product.
 - Ex: lighter aeroplane increases manufacturing cost.
2. **Dynamics:** - change/improve in technologies
 - customer preference evolve
 - competitors introduce new products
 - macroeconomic environment shifts
 - Decision making in an environment of constant change
3. **Details:** - choice between using screws or snap-fits on enclosure of a computer has economic implications if lakhs of rupees.
4. **Time pressure:** - Product development decisions usually be made quickly and without complete information
5. **Economics:** - Developing, producing and marketing a new product requires a large investment.
 - ROI(return on investment), relatively inexpensive to produce, product must be appealing to customer

6. Creation:- Product development process- Idea generation –to-production of physical artefact- is intensively creative.

7. Satisfaction of societal and individual needs: Need of the customer, Need of time, etc.,

8. Team Diversity: Team should have people with different skills, talents, training, experience, perspectives and personalities.

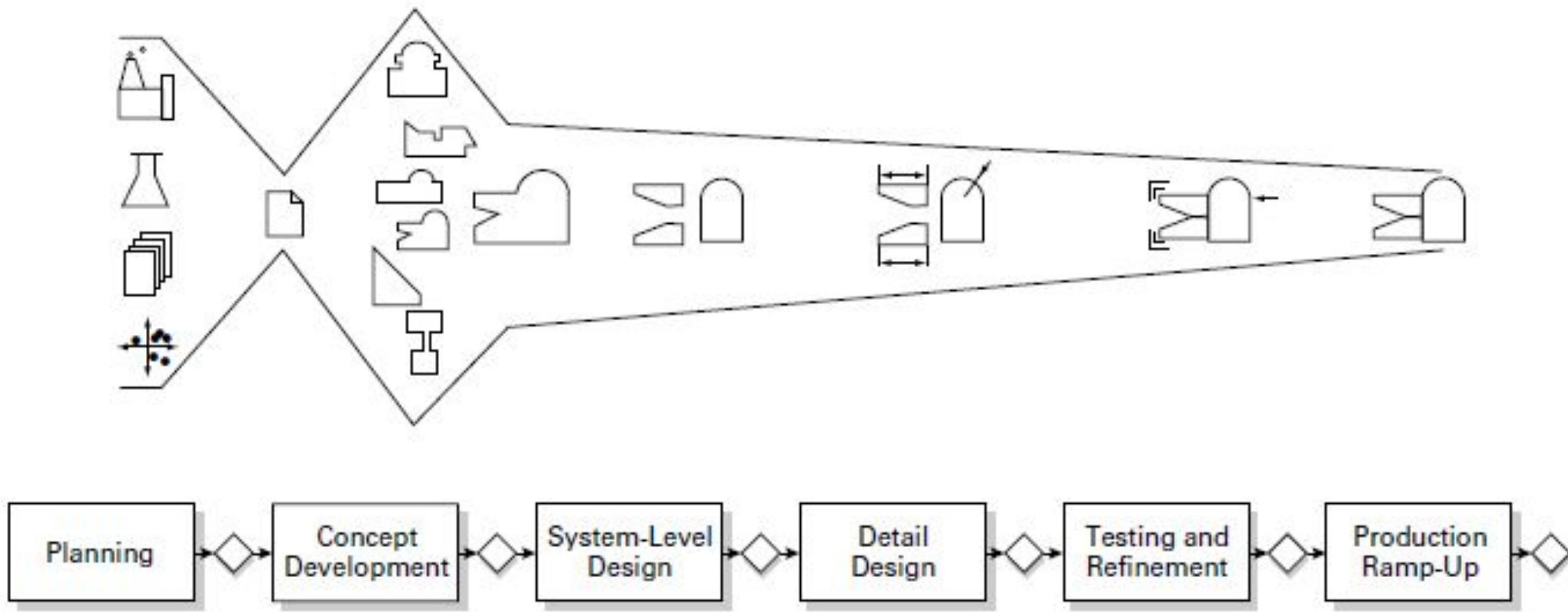
9. Team spirit: Product development teams should be highly motivated, cooperative groups, focus on collective energy in creating a product.

The Product Development Process: is the sequence of steps or activities that an enterprise employs to conceive, design and commercialize a product. Many of the steps and activities are intellectual and organisational rather than physical.

A well-defined development process is useful for the following reasons.

- Quality assurance
- Coordination
- Planning
- Management
- Improvement

Six Phases of Generic Product Development Process:



0. Planning:

- It precedes the project approval and launch of the actual product development process.
- Phase begins with opportunity identification guided by corporate strategy and includes assessment of technology developments and market objectives.
- The output of the planning phase is the project mission statement, which specifies the target market for the product, business goals, key assumptions, and constraints.

1. Concept Development:

The needs of the target market are identified, alternative product concepts are generated and evaluated, and one or more concepts are selected for further development and testing.

2. System-level design:

Includes the definition of the product architecture, decomposition of the product into subsystems and components, and preliminary design of key components.

3. Detail design:

Includes the complete specification of the geometry, materials, tolerances of all of the unique parts in the product and the identification of all of the standard parts to be purchased from suppliers.

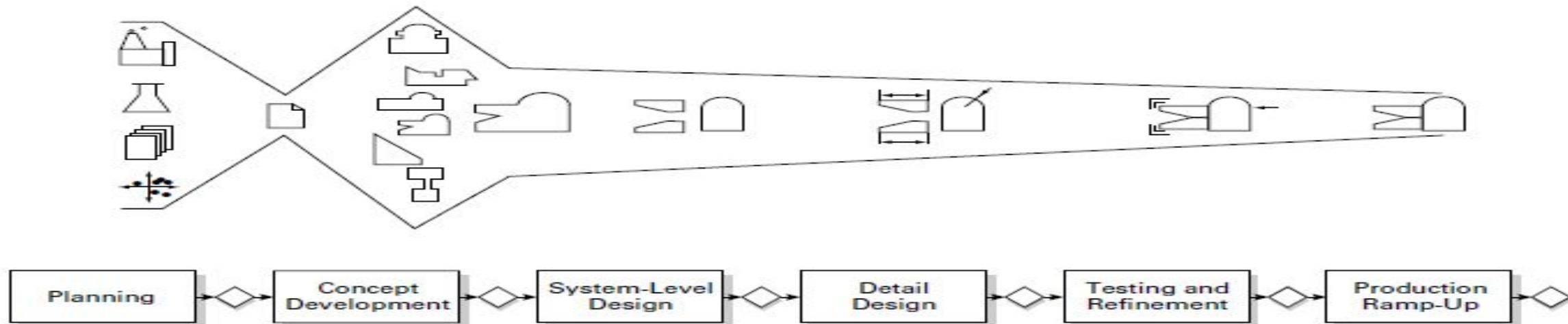
4. Testing and refinement:

Involves the construction and evaluation of multiple preproduction versions of the product and early prototypes are usually built with *production-intent* parts.

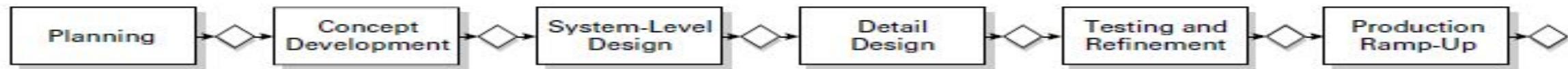
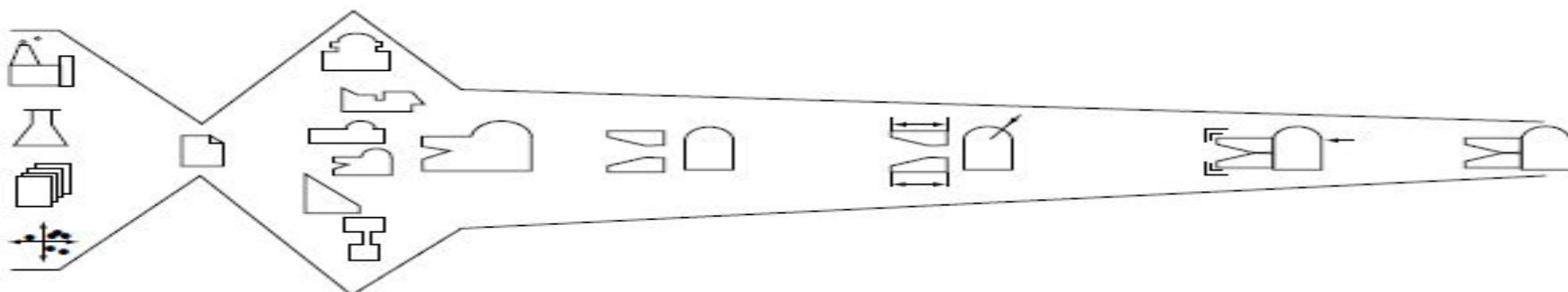
5. Production ramp-up:

The product is made using the intended production system, and workforce is trained

and to work out any remaining problems in the production processes.

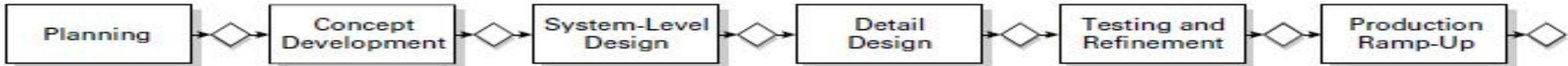
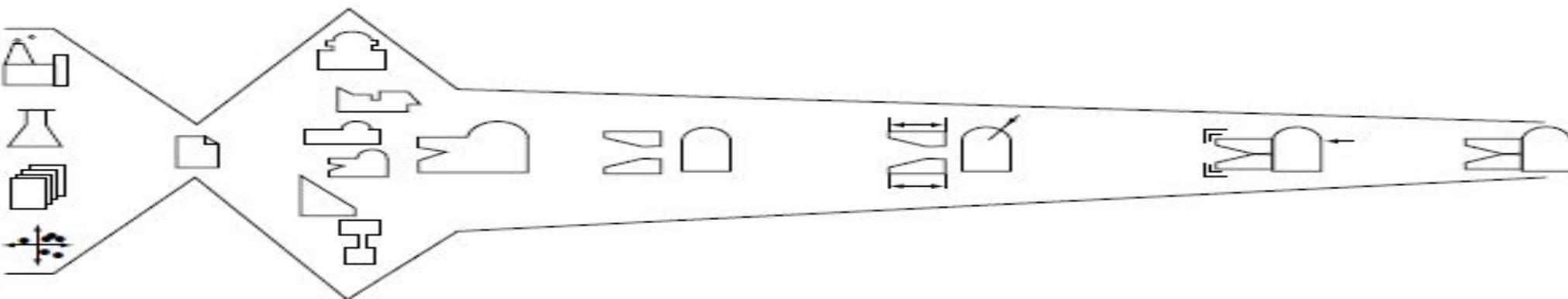
**Marketing**

- | | | | | | |
|----------------------------------|---------------------------|---|---------------------------|---|--|
| • Articulate market opportunity. | • Collect customer needs. | • Develop plan for product options and extended product family. | • Develop marketing plan. | • Develop promotion and launch materials. | • Place early production with key customers. |
| • Define market segments. | • Identify lead users. | • Identify competitive products. | | • Facilitate field testing. | |



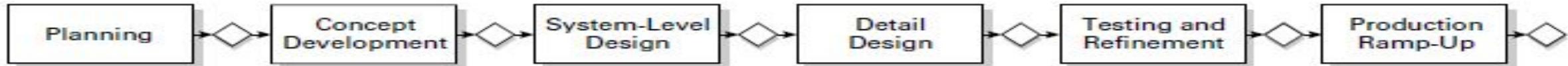
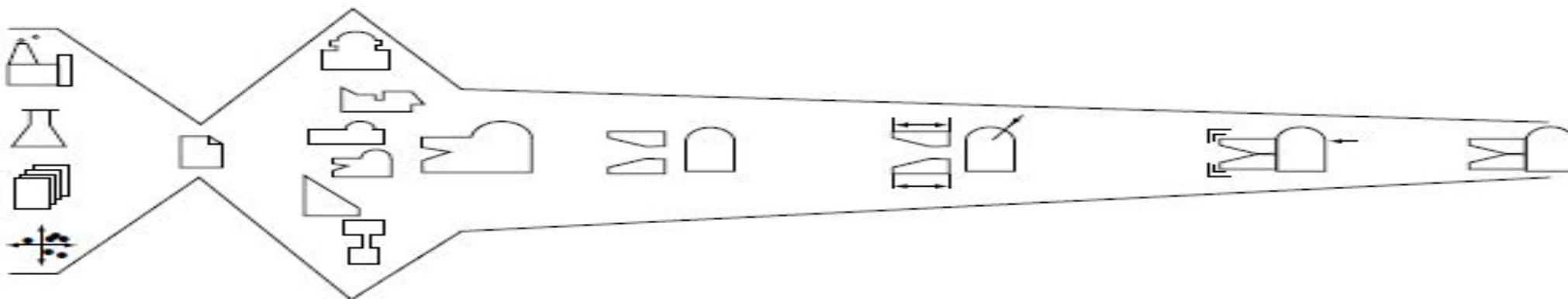
Design

- Consider product platform and architecture.
- Assess new technologies.
- Investigate feasibility of product concepts.
- Develop industrial design concepts.
- Build and test experimental prototypes.
- Develop product architecture.
- Define major sub-systems and interfaces.
- Refine industrial design.
- Preliminary component engineering.
- Define part geometry.
- Choose materials.
- Assign tolerances.
- Complete industrial design control documentation.
- Test overall performance, reliability, and durability.
- Obtain regulatory approvals.
- Assess environmental impact.
- Implement design changes.
- Evaluate early production output.



Manufacturing

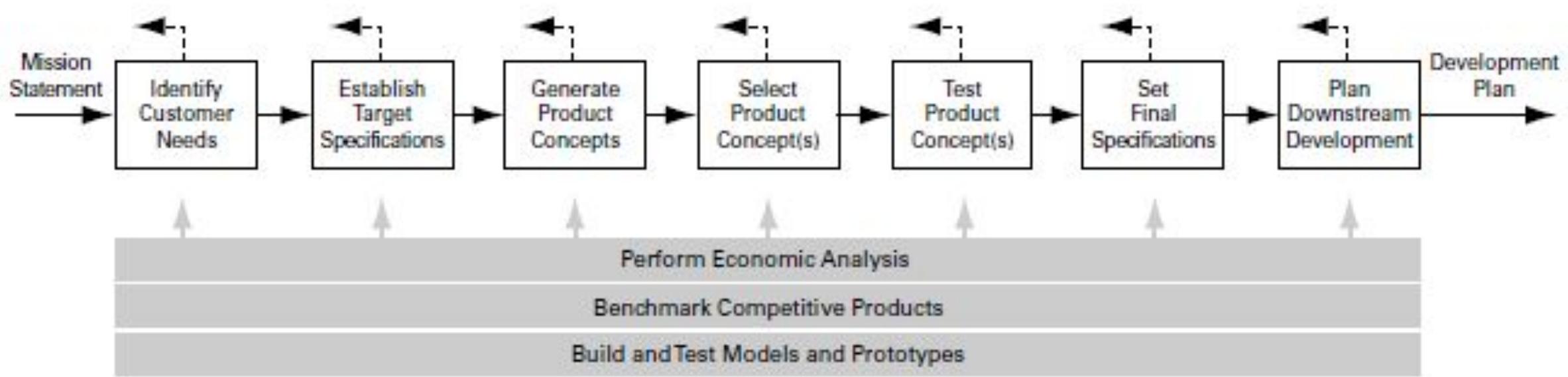
- Identify production constraints.
- Set supply chain strategy.
- Estimate manufacturing cost.
- Assess production feasibility.
- Identify suppliers for key components.
- Perform make-buy analysis.
- Define final assembly scheme.
- Define piece-part production processes.
- Design tooling.
- Define quality assurance processes.
- Begin procurement of long-lead tooling.
- Facilitate supplier ramp-up.
- Refine fabrication and assembly processes.
- Train workforce.
- Refine quality assurance processes.
- Begin full operation of production system.



Other Functions

- Research: Demonstrate available technologies.
- Finance: Provide planning goals.
- General Management: Allocate project resources.
- Finance: Facilitate economic analysis.
- Legal: Investigate patent issues.
- Finance: Facilitate make-buy analysis.
- Service: Identify service issues.
- Sales: Develop sales plan.
- General Management: Conduct postproject review.

Concept Development: The Front-End Process

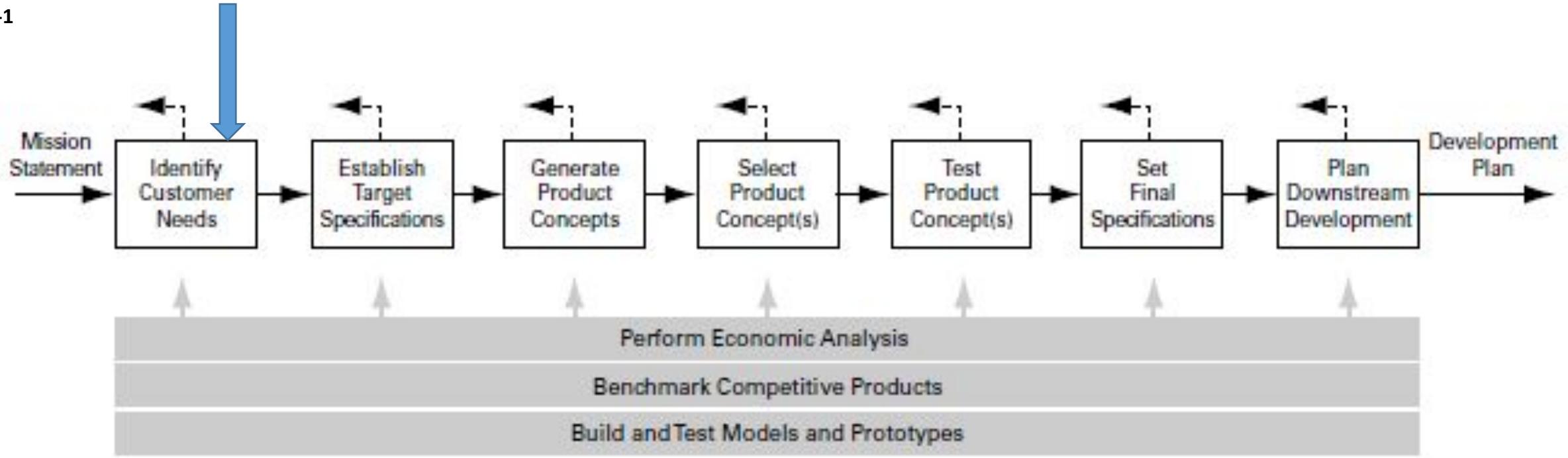


- Rarely does the entire process proceed in purely sequential fashion, completing each activity before beginning the next.
- In practice, the front-end activities may be overlapped in time and iteration is often necessary.
- Dashed arrows reflect the uncertain nature of the progress in product development.
- At any stage, new information may be available or results learned that can cause the team to step back to repeat an earlier activity before proceeding.

The Concept Development Process includes the following activities

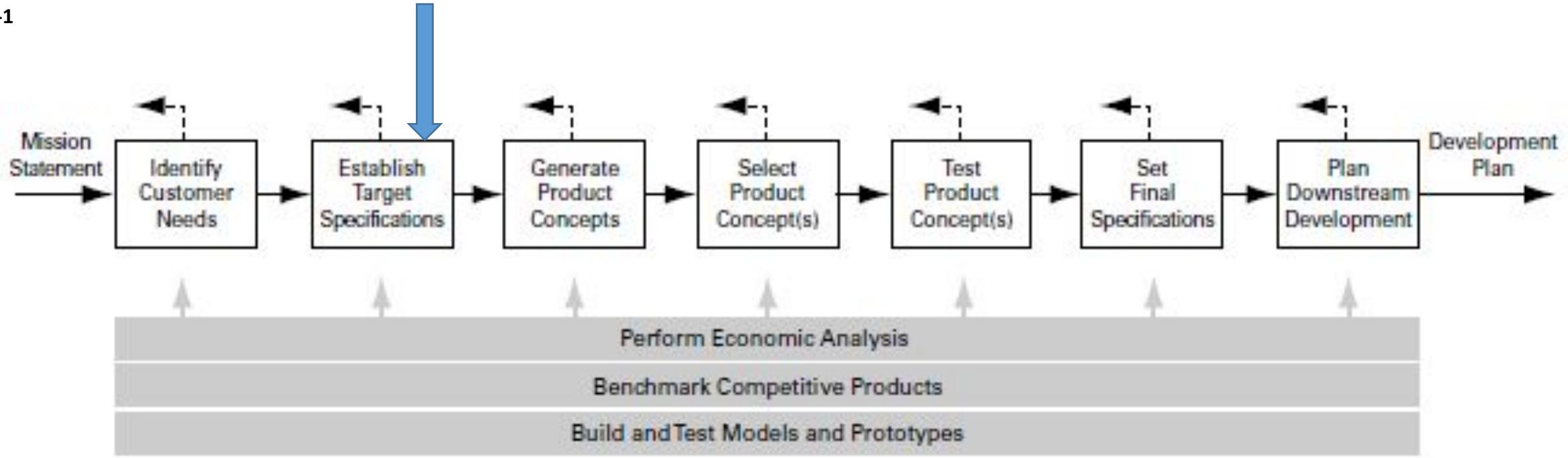
1. Identifying customer needs.
 2. Establishing target Specifications.
 3. Concept generation.
 4. Concept selection.
 5. Concept Testing.
 6. Setting final specifications.
 7. Project Planning.
-

- a) Economic analysis
- b) Benchmarking of competitive products
- c) Modeling and prototyping



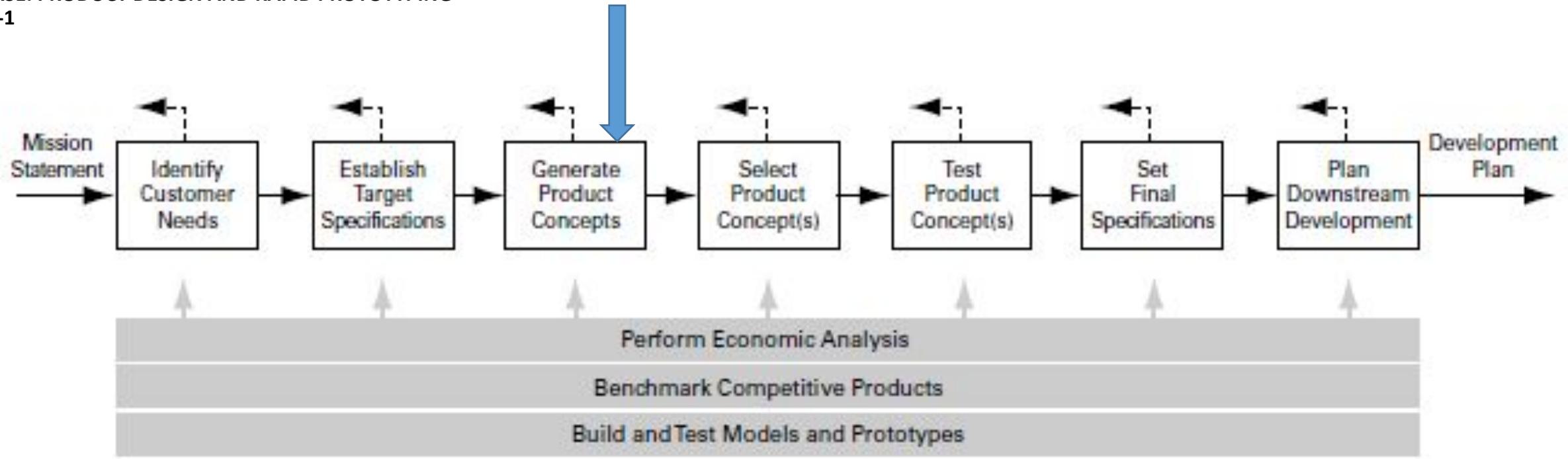
1. Identifying customer needs:

- Goal of activity- is to identify customer needs and to effectively communicate them to development team.
- Output of this step--- set of carefully constructed customer need statements.
 - organised in hierarchical list.
 - Importance weightings for many or all of the needs.



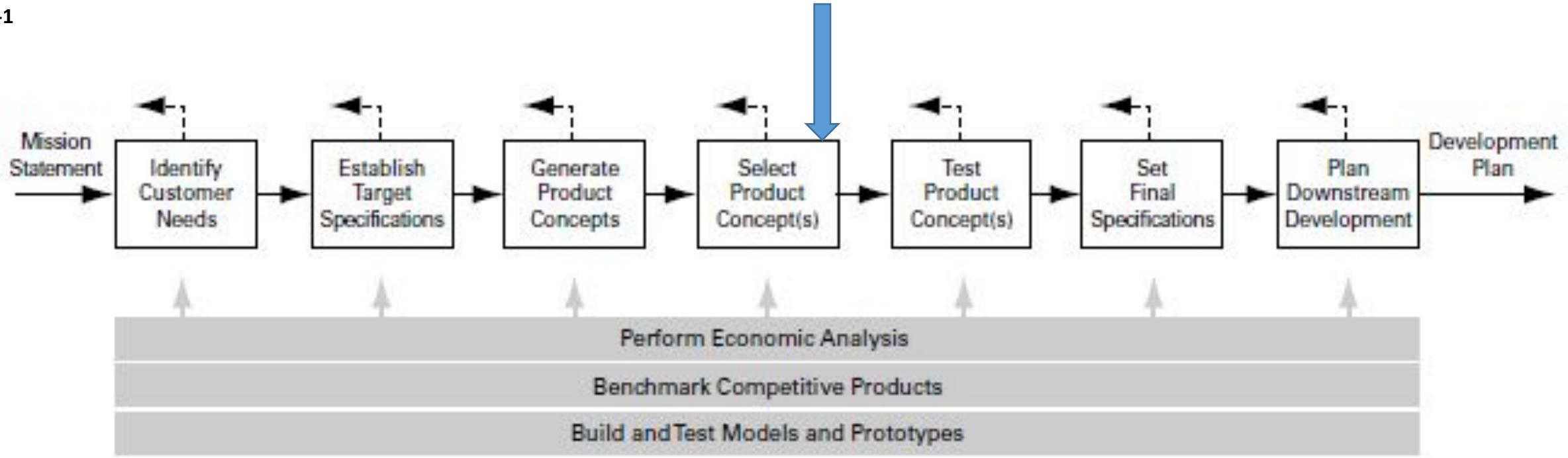
2. Establishing target specifications:

- Specifications --- precise description of what a product has to do.
- Translation of customer needs into technical terms.
- Specification targets— are set early in the process and represent the hopes of the development team.
- Output of this stage --- list of target specifications.



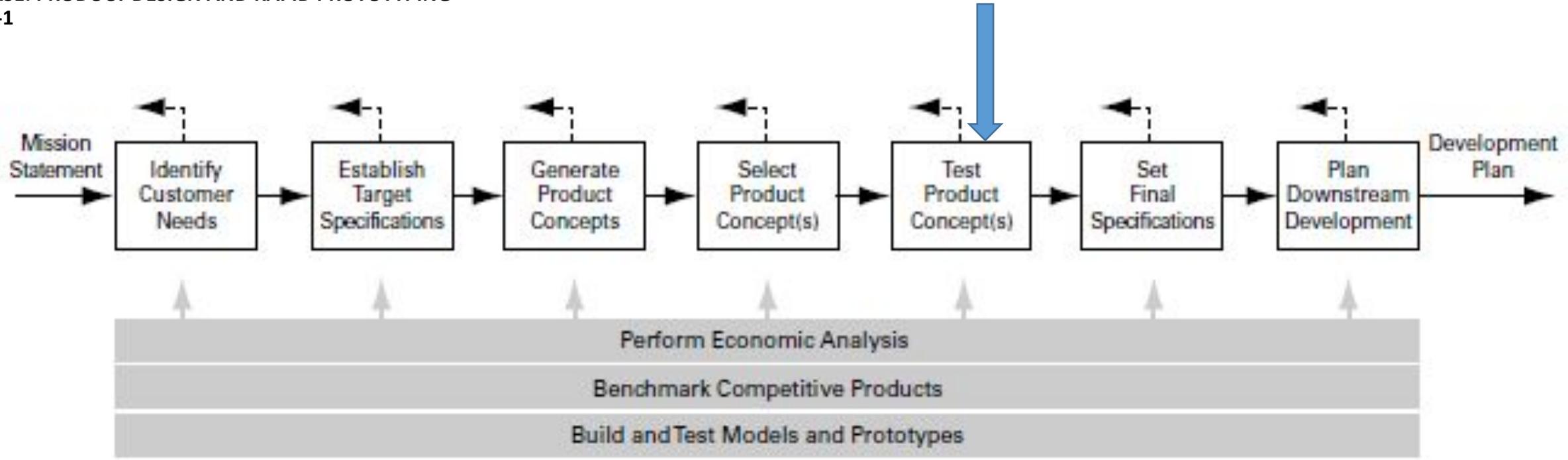
3. Concept generation:

- Goal--- thoroughly explore the space of product concepts that may address the customer needs.
- Includes a mix of external search, creative problem solving within the team, systematic exploration of the various solution fragments the team generates.
- Result--- a set of 10 to 20 concepts— each represented by a sketch and brief description.



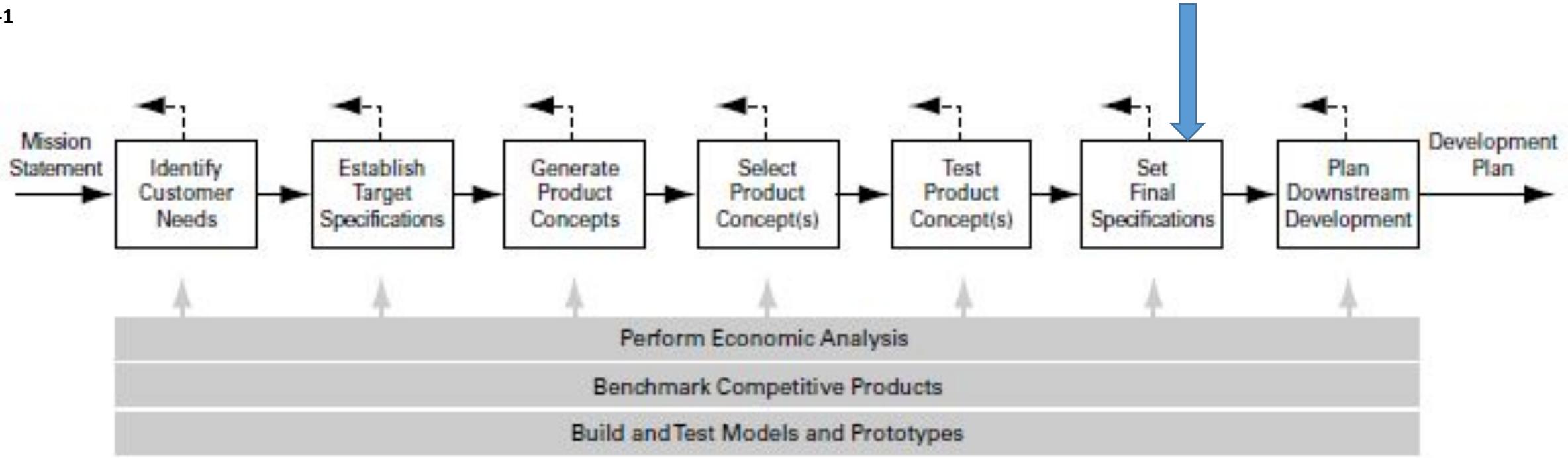
4. Concept selection :

- Various product concepts are analysed and sequentially eliminated to identify the most promising concept(s).
- Several iterations used— may initiate additional concept generation and refinement.



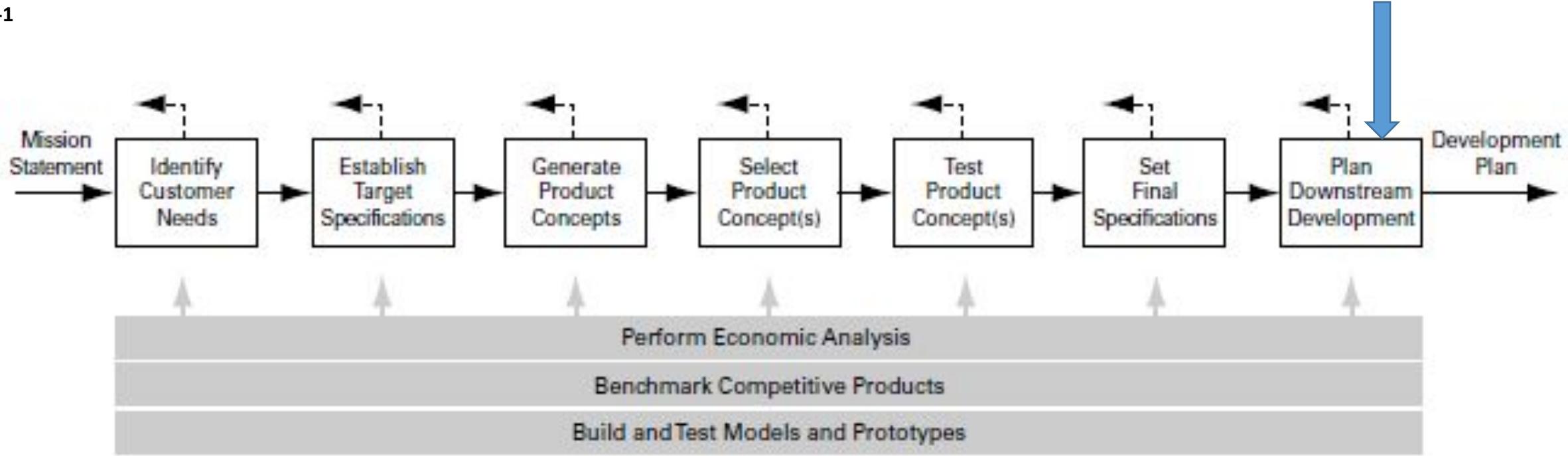
5. Concept testing :

- One or most concepts are tested to verify that the customer needs have met, assess market potential of the product, identify any shortcomings that must be remedied during further development.
- If customer response is poor---- project may be terminated.



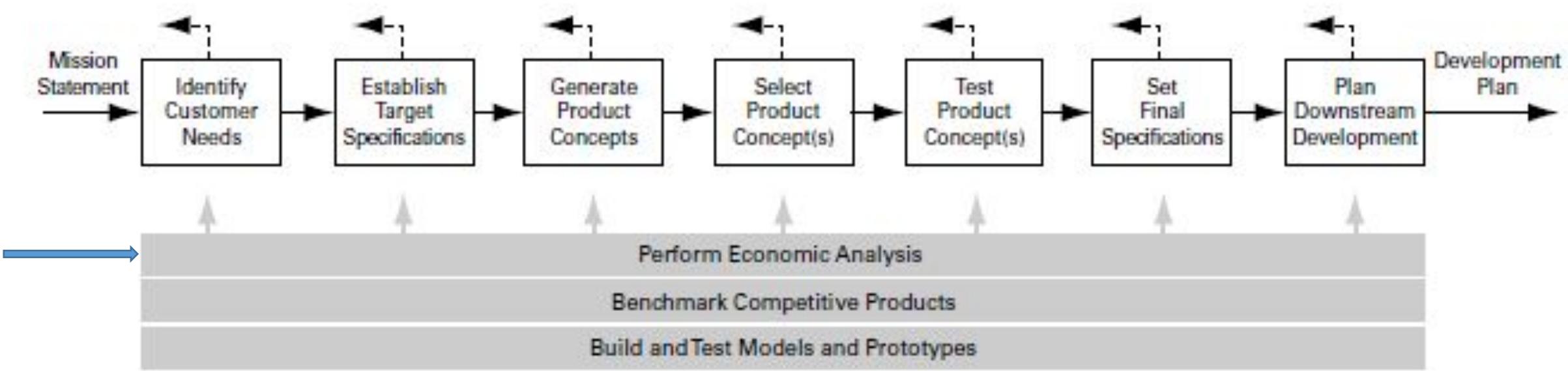
6. Setting final specifications :

- Target specifications set earlier are revisited after a concept has been selected and tested.
- Team must commit to specific values of the metrics, constraints are reflected, limitations identified through technical modelling and trade-offs between cost and performance.



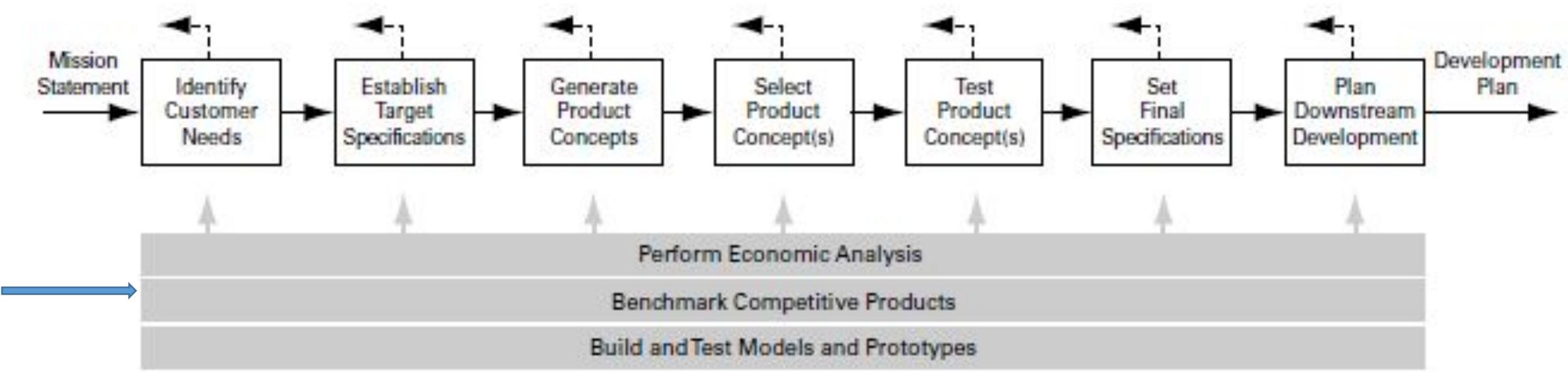
7. Project planning :

- Team creates detailed development schedule, devises a strategy to minimize development time and identifies the resources required to complete the project.
- Result of front-end activities—contract book—contains mission statement, the customer needs, details of the selected concept, the product specifications, the economic analysis of the product, the development schedule, the project staffing, and the budget.
- Contract book—contract between the team and senior management of the enterprise.



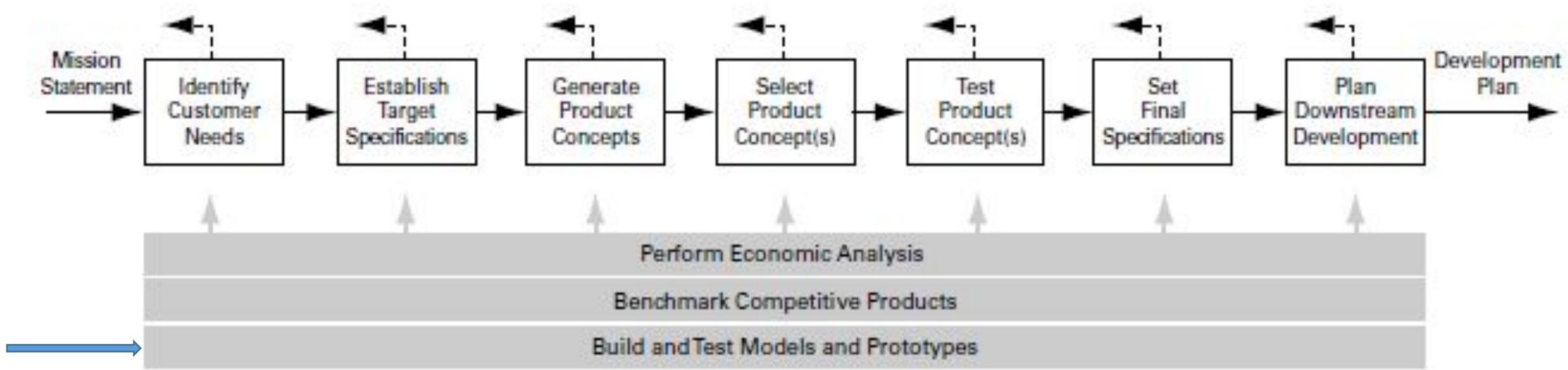
Economic analysis :

- Team supported by a financial analyst.
- Builds economic model of the product.
- Resolve specific trade-offs.



Benchmarking of competitive products :

- Understanding of the competitive products is critical to successful positioning of a new product and can provide a rich source of ideas for the product and production process design.



Modeling and prototyping :

- Every stage involves various forms of models and prototypes.
- Proof-of-concept models, form-only models- for ergonomics and style, spread sheet models-for technical trade-offs, experimental test models –for design performance and robust performance.



Adapting the Generic Product Development Process:

- The generic process is most like the process used in a market-pull situation: a firm begins product development with a market opportunity and then uses whatever available technologies are required to satisfy the market need.

Summary of variants of generic product development process.

Process Type	Description	Distinct Features	Examples
Generic (Market-Pull) Products	The team begins with a market opportunity and selects appropriate technologies to meet customer needs.	Process generally includes distinct planning, concept development, system-level design, detail design, testing and refinement, and production ramp-up phases.	Sporting goods, furniture, tools.
Technology-Push Products	The team begins with a new technology, then finds an appropriate market.	Planning phase involves matching technology and market. Concept development assumes a given technology.	Gore-Tex rainwear, Tyvek envelopes.
Platform Products	The team assumes that the new product will be built around an established technological subsystem.	Concept development assumes a proven technology platform.	Consumer electronics, computers, printers.

Process-Intensive Products	Characteristics of the product are highly constrained by the production process.	Either an existing production process must be specified from the start, or both product and process must be developed together from the start.	Snack foods, breakfast cereals, chemicals, semiconductors.
Customized Products	New products are slight variations of existing configurations.	Similarity of projects allows for a streamlined and highly structured development process.	Motors, switches, batteries, containers.
High-Risk Products	Technical or market uncertainties create high risks of failure.	Risks are identified early and tracked throughout the process. Analysis and testing activities take place as early as possible.	Pharmaceuticals, space systems.

**Quick-Build
Products**

Rapid modeling and prototyping enables many design-build-test cycles.

Detail design and testing phases are repeated a number of times until the product is completed or time/budget runs out.

Software, cellular phones.

**Complex
Systems**

System must be decomposed into several subsystems and many components.

Subsystems and components are developed by many teams working in parallel, followed by system integration and validation.

Airplanes, jet engines, automobiles.

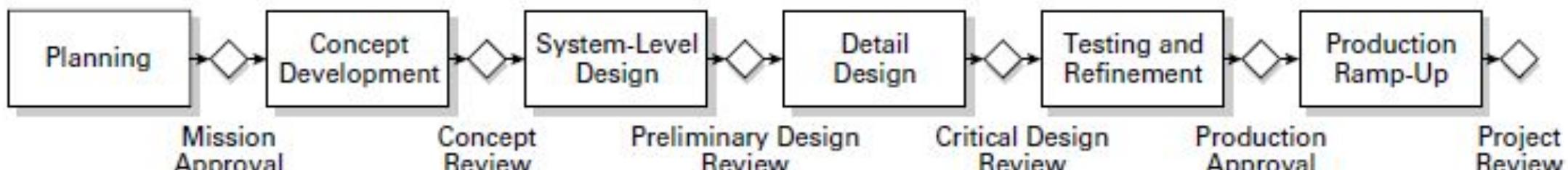
Exercises

1. Estimate what fraction of the price of a pocket calculator is required to cover the cost of developing the product. To do this you might start by estimating the information needed to fill out Exhibit 1-3 for the pocket calculator.
2. Create a set of scatter charts by plotting each of the rows in Exhibit 1-3 against the development cost row. For each one, explain why there is or is not any correlation. (For example, you would first plot “annual production volume” versus “development cost” and explain why there seems to be no correlation. Then repeat for each of the remaining rows.)

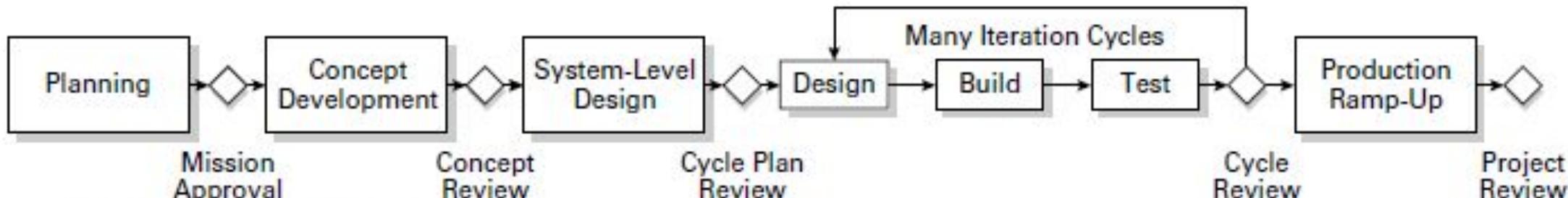
Exercises

1. Diagram a process for planning and cooking a family dinner. Does your process resemble the generic product development process? Is cooking dinner analogous to a market-pull, technology-push, platform, process-intensive, customization, high-risk, quick-build, or complex system process?
2. Define a process for finding a job. For what types of endeavor does a well-defined process enhance performance?
3. What type of development process would you expect to find in an established company successful at developing residential air-conditioning units? How about for a small company that is trying to break into the market for racing wheelchairs?
4. Sketch the organization (in some appropriate graphical representation) of a consulting firm that develops new products for clients on a project-by-project basis. Assume that the individuals in the firm represent all of the different functions required to develop a new product. Would this organization most likely be aligned with functions, be aligned by projects, or be a hybrid?

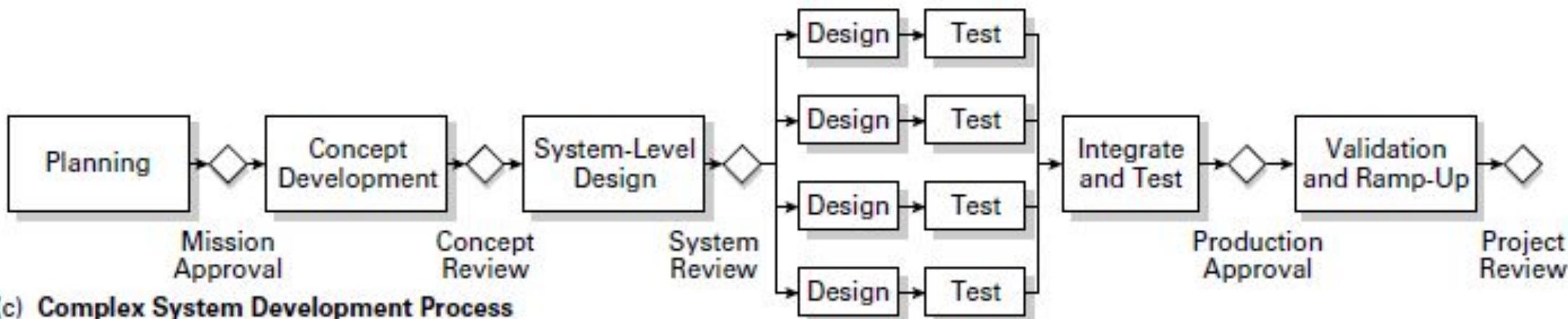
PRODUCT DEVELOPMENT PROCESS FLOWS



(a) Generic Product Development Process

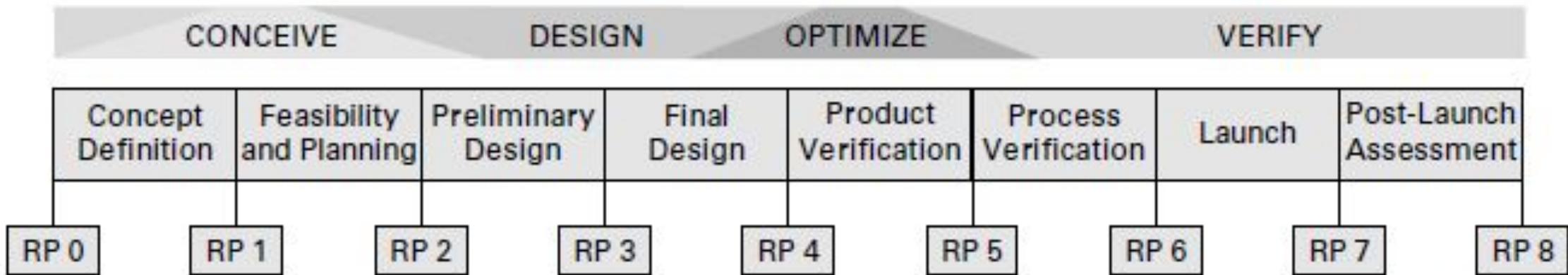


(b) Spiral Product Development Process



(c) Complex System Development Process

THE TYCO PRODUCT DEVELOPMENT PROCESS



Courtesy of Tyco International

EXHIBIT 2-6 Tyco's Rally Point product development process includes nine distinct phases and review gates.

COURSE: PRODUCT DESIGN AND RAPID PROTOTYPING

UNIT-1

Rally Point Phase	0. Project Registration	1. Concept Definition	2. Feasibility and Planning	3. Preliminary Design	4. Final Design	5. Product Verification	6. Process Verification	7. Launch	8. Post-Launch Assessment
Primary Goal	Define project and business unit needs	Develop project concept and charter	Create product description	Create preliminary detailed design	Detail and optimize design	Demonstrate product performance	Demonstrate process performance	Launch product	Identify lessons learned
Marketing and Sales	Identify customers and market size	Capture voice of the customer	Develop marketing and sales plans	Review concepts with customers		Initialize field trials	Complete field trials	Finalize pricing and sales forecasts	Solicit customer feedback and satisfaction ratings Measure sales vs. forecast Complete phase-in and phase-out
	Describe competitive features and benefits Identify target cost and price	Analyze customer needs Document customer needs	Create phase-in and phase-out plans				Finalize training plans	Complete sales and service training	
Engineering	Identify project risks	Identify critical-to-quality specs Develop and select concepts	Create functional specification and performance metrics Review concept selection	Conduct a preliminary design review	Freeze hardware and software design	Finalize design documentation	Obtain regulatory approvals	Finalize product metrics	
	Update project risks	Define product architecture Assess technical failures modes	Assess product failure modes	Build and test alpha prototypes	Complete engineering documentation	Complete beta prototype and field testing Apply for regulatory approvals			
				Draft technical documentation Secure beta prototypes					
Quality Assurance		Create preliminary test plan		Test beta prototypes for robustness	Complete quality assurance testing	Conduct process verification testing			
Manufacturing			Begin manufacturing process development	Finalize bill of materials (BOM)	Update manufacturing control plans	Run manufacturing pilots			Register obsolete and scrap products
			Conduct a preliminary manufacturing process review	Develop manufacturing control plans		Finalize manufacturing control plans			
Purchasing			Create a supplier participation matrix Assess suppliers for certification	Identify long lead-time items		Verify supply chain readiness			
Legal		Search patents	Identify trade compliance issues	Identify potential patents	Prepare patent applications	Assure trade compliance			
Financial	Prepare preliminary business case	Refine business case	Complete financial package						Monitor return on investment
Project Management	Identify project timing, resources, and capital Prepare RP0 checklist & submit for approval	Assess team capabilities/skills Identify development team members Select a Rally Point process variant Prepare RP1 checklist & submit for approval	Plan integrated product development schedule Assign a project manager Update RP1 deliverables Prepare RP2 checklist & submit for approval	Update RP1-2 deliverables Prepare RP3 checklist & submit for approval	Update RP1-3 deliverables Prepare RP4 checklist & submit for approval	Update RP1-4 deliverables Prepare RP5 checklist & submit for approval	Update RP1-5 deliverables Prepare RP6 checklist & submit for approval	Finalize all deliverables Finalize launch plans and documentation Update RP1-6 deliverables Prepare RP7 checklist & submit for approval	Document best practices Prepare RP8 checklist & submit for approval

Courtesy of Tyco International

EXHIBIT 2-7 Key activities and the responsible functions comprising the Tyco Rally Point product development process.

PRODUCT DEVELOPMENT ORGANISATIONS

Organisations are formed by establishing links among individuals

- Reporting relationships
- Financial arrangements
- Physical layouts
- Organisational links may be aligned with functions, projects or both.

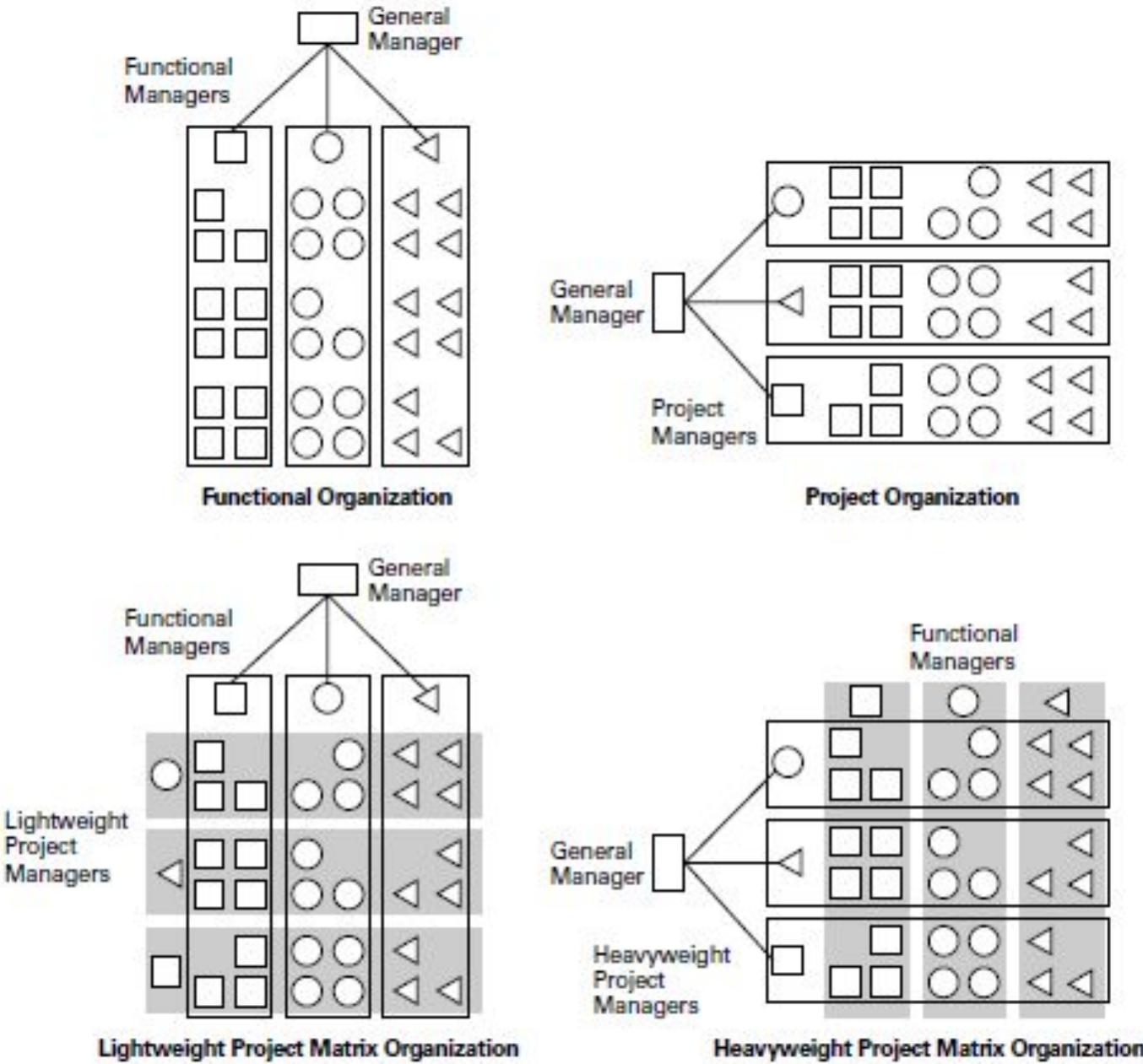


EXHIBIT 2-8 Various product development organizations. For simplicity, three functions and three projects are shown.

Adapted from Hayes et al., 1988

Choosing an Organisational Structure:

- How important is cross functional integration ?
- How critical is cutting-edge functional expertise to business success ?
- Can individuals from each function be fully utilized for most of the duration of a project ?
- How important is the product development speed?

	Matrix Organization			
	Functional Organization	Lightweight Project Organization	Heavyweight Project Organization	Project Organization
Strengths	Fosters development of deep specialization and expertise.	Coordination and administration of projects is explicitly assigned to a single project manager. Maintains development of specialization and expertise.	Provides integration and speed benefits of the project organization. Some of the specialization of a functional organization is retained.	Resources can be optimally allocated within the project team. Technical and market trade-offs can be evaluated quickly.
Weaknesses	Coordination across different functional groups can be slow and bureaucratic.	Requires more managers and administrators than a non-matrix organization.	Requires more managers and administrators than a non-matrix organization.	Individuals may have difficulty maintaining cutting-edge functional capabilities.
Typical Examples	Customized products, where development involves slight variations to a standard design (e.g., motors, bearings, packaging).	Derivative products in many automobile, electronics, and aerospace companies.	New technology or platform projects in automobile, electronics, and aerospace companies.	Start-up companies. "Tiger teams" and "skunkworks" intended to achieve breakthroughs. Firms competing in highly dynamic markets.
Major Issues	How to integrate different functions (e.g., marketing and design) to achieve business goals.	How to balance functions and projects. How to simultaneously evaluate project and functional performance.		How to maintain functional expertise over time. How to share learning from one project to another.

EXHIBIT 2-9 Characteristics of different organizational structures.

Distributed Product development teams:

Reasons to utilize product development team members located at multiple sites may include the following:

- Access to information about regional markets.
- Availability of technical expertise.
- Location of Manufacturing facilities and suppliers.
- Cost saving through lower wages.
- Outsourcing to increase product development capacity.

Product Planning

- The *product planning process* takes place before a product development project is formally approved, before substantial resources are applied, and before the larger development team is formed.

The Product Planning Process:

- The product plan identifies the portfolio of products to be developed by the organisation and the timing of their introduction to the market.
- The planning process considers product development opportunities identified by many sources, including suggestions from marketing, research, customers, current product development teams, and benchmarking of competitors.
- Product plans are developed with the company's goals capabilities, constraints, and competitive environment in mind.

Four types of Product Development Projects :

1. New Product Platform: This type of project involves a major development effort to create a new family of products based on a new, common platform. Ex: iOS platform, Android platform.,
2. Derivatives of existing product platforms: These products extend an existing product platform to better address familiar markets with one or more new products.
3. Incremental improvements to existing products: These projects may only involve adding or modifying some features of existing products in order to keep the product line current and competitive.
4. Fundamentally new products: These Projects involve radically different Product or Production technologies and may help to address new and unfamiliar markets. Such projects inherently involve more risks.

New Platforms**Legend**

Project

Product Release

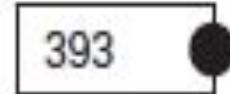
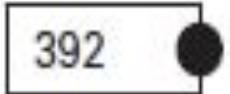
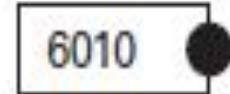
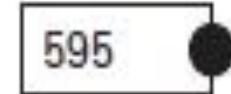
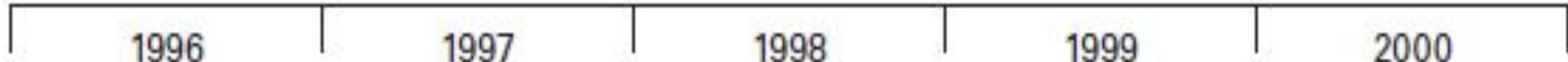
Derivatives**Improvements****Fundamentally New**

EXHIBIT 4-2 The product plan identifies the portfolio of projects to be pursued by the development organization. This plan divides projects into four categories: new platforms, derivatives of existing platforms, product improvements, and fundamentally new products.

	Devices	# updates
iOS 1.x	iPhone; iPodT 1	8
iOS 2.x	iPhone, 3G; iPodT 1, 2	5
iOS 3.x	iPhone, 3G, 3GS; iPodT 1, 2, 3; iPad	4 (2 for iPad)
iOS 4.x	iPhone 3G, 3GS, 4; iPodT 2, 3, 4; iPad, 2; AppleTV 2	16 (3 for AppleTV 2)
iOS 5.x	iPhone 3GS, 4, 4S; iPodT 3, 4; iPad, 2; AppleTV 2	3 (7 for AppleTV 2)
iOS 6.x	iPhone 3GS, 4, 4S, 5; iPodT 4, 5; iPad 2, retina, mini; AppleTV 2	7 (4 for AppleTV 2)
iOS 7.x (beta)	iPhone 4, 4S, 5; iPodT 5; iPad 2, retina, mini; AppleTV 2	

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ANDROID VERSIONS LIST: A COMPLETE HISTORY & FEATURES



Cupcake
1.5



Donut
1.6



Eclair
2.0/2.1



Froyo
2.2



Gingerbread
2.3



Honeycomb
3.0/3.1



Ice Cream Sandwich
4.0



Jelly Bean
4.1/4.2/4.3



KitKat
4.4



Lollipop
5.0



Marshmallow
6.0



Nougat
7.0



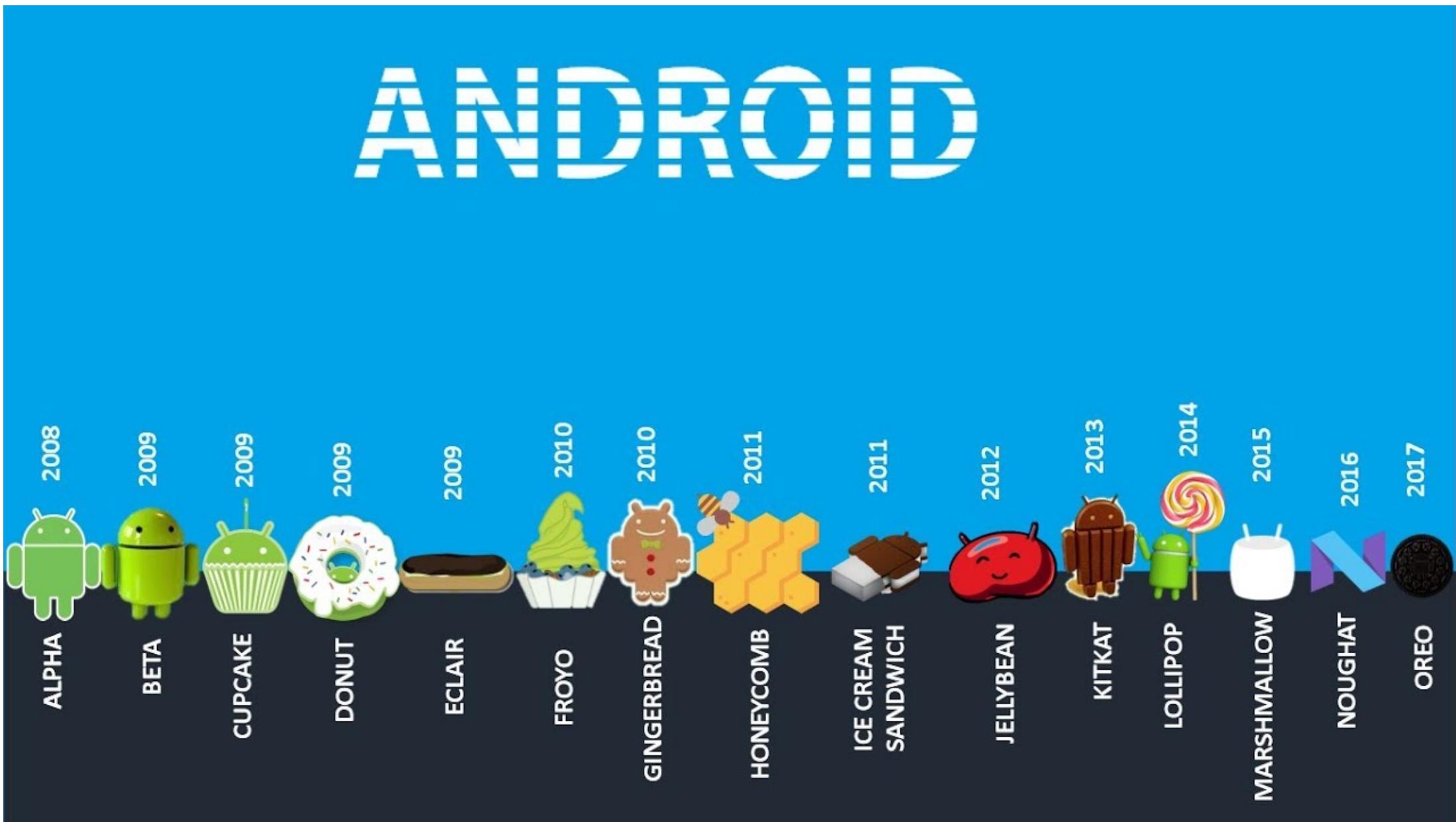
Oreo
8.0



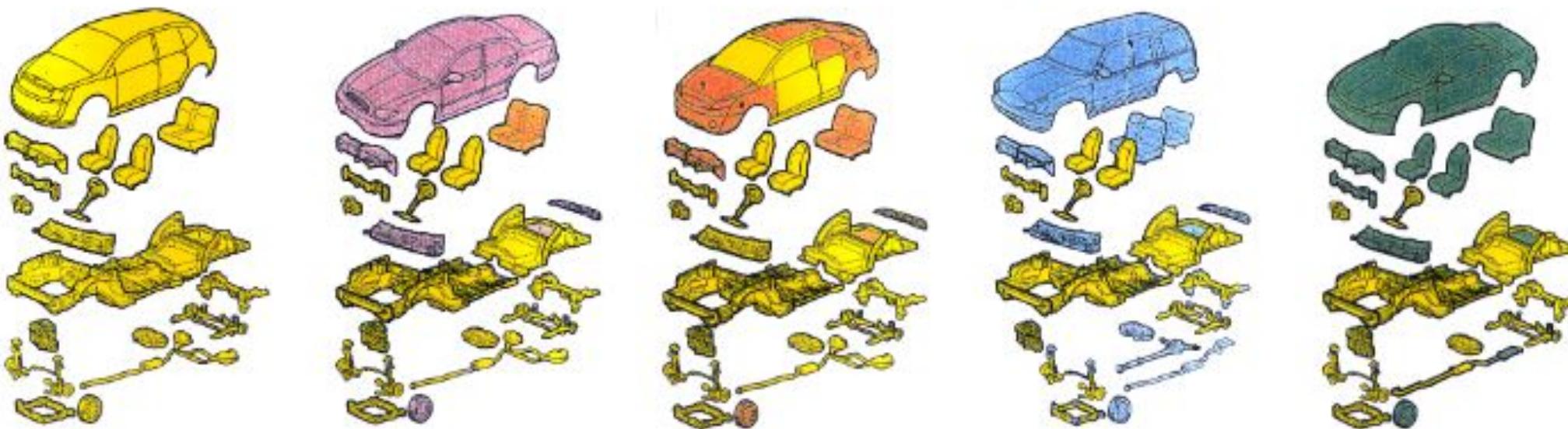
Pie
9.0



android



- At Ford, an automobile platform includes:
 - A common architecture (e.g., assembly sequence, joint configuration, system interfaces, etc.)
 - Definition of subsystem and module interfaces
 - A set of common hardpoints used by the range of products that share the platform and the manufacturing processes



- Ford defines a platform as a set of subsystems and interfaces that form a common structure from which a stream of derivative

Apple iPhone







Redmi Note 8 Pro

Redmi Note 8

Redmi 8

Redmi 8A













The Product Planning Process:

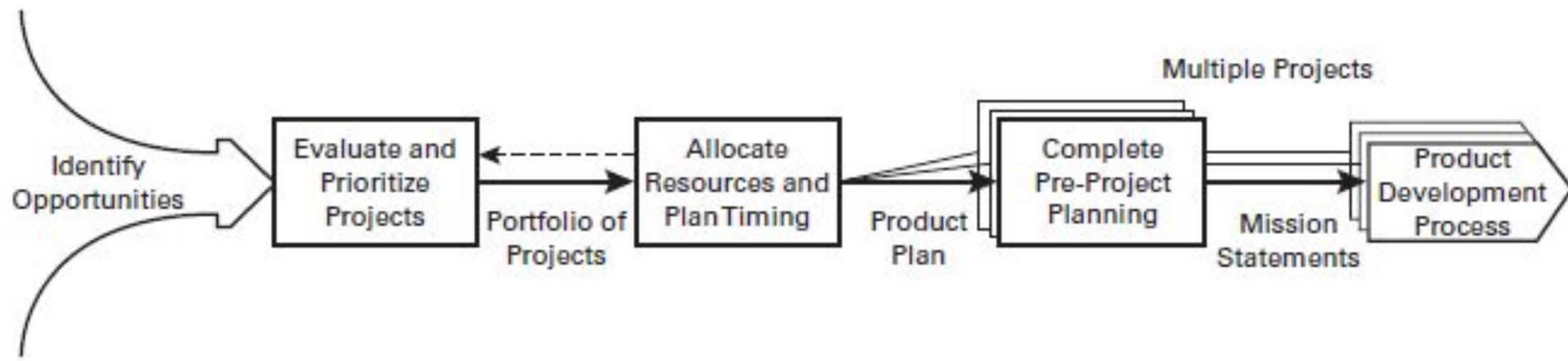


EXHIBIT 4-3 The product planning process. These activities address a portfolio of product development projects, resulting in a product plan and, for each selected project, a mission statement.

To develop a product plan and project mission statements, a five-step process is used:

1. Identify opportunities.
2. Evaluate and prioritize projects.
3. Allocate resources and plan timing.
4. Complete pre-project planning.
5. Reflect on the result and the process.

Step 1. Identify Opportunities:

- Opportunities may involve any of the four types of projects defined above.
- This step can be thought of as the opportunity funnel because it brings together inputs from across the enterprise.
- Funnel collects ideas continuously, and new product opportunities may arise at any time.
- Each promising opportunity be described in a short, coherent statement and that this information be collected in a database.

Ex: Develop a new colour, digital, networkable, document center platform for the office market, including scanning, storage, fax, distribution, and printing capabilities.

Step 2: Evaluate and Prioritize Projects:

- The second step in product planning process is to select the most promising projects to pursue out of too many opportunities.
 - Four basic perspectives are useful in evaluating and prioritizing opportunities for new products in existing product categories.
- A. Competitive strategy
B. Market segmentation
C. Technological trajectories
D. Product platforms.

A. Competitive strategy: An organisation's competitive strategy defines a basic approach to markets and products with respect to competitors. Several strategies are possible-

- Technology leadership – To implement this strategy, firm places great emphasis on basic research and development of new technologies.
- Cost leadership- This strategy requires the firm to compete on production efficiency, either through economies of scale, use of superior manufacturing methods, low cost labour, or better management of the production system.
- Customer focus- To follow this strategy, the firm works closely with new and existing customers to assess their changing needs and preferences.
- Imitative- This strategy involves closely following the trends in the market, allowing competitors to explore which new products are successful for each segment.
Firm quickly launches new products to imitate the successful competitors.

B. Market Segmentation:

- Dividing market into segments allows the firm to consider the actions of competitors and the strength of the firm's existing products with respect to each well defined group of customers.
- Mapping competitors products and firm's own products – weakness can be assessed.

C. Technological trajectories:

- When to adopt a new basic technology in a product line.
- The technology S- curve displays the performance of the products in a product category overtime.

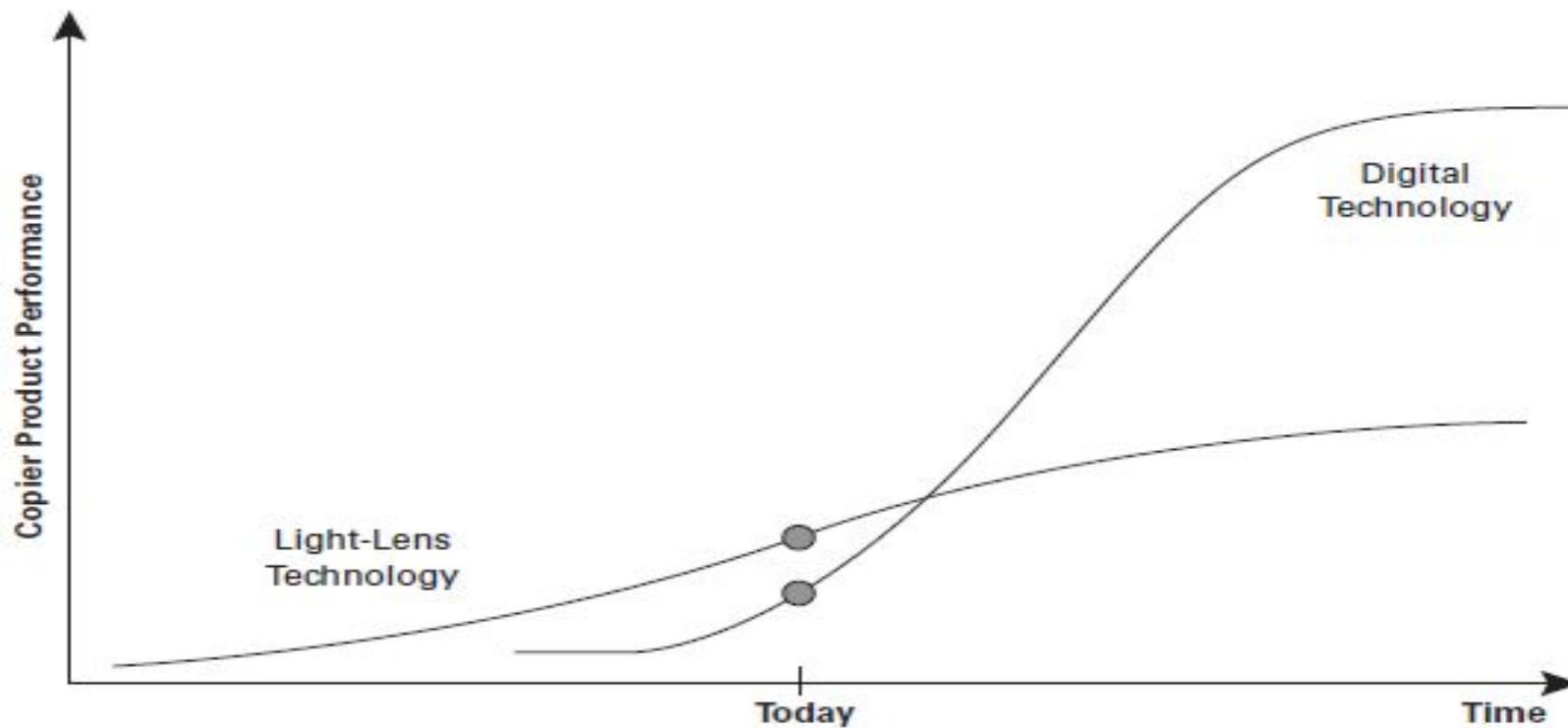
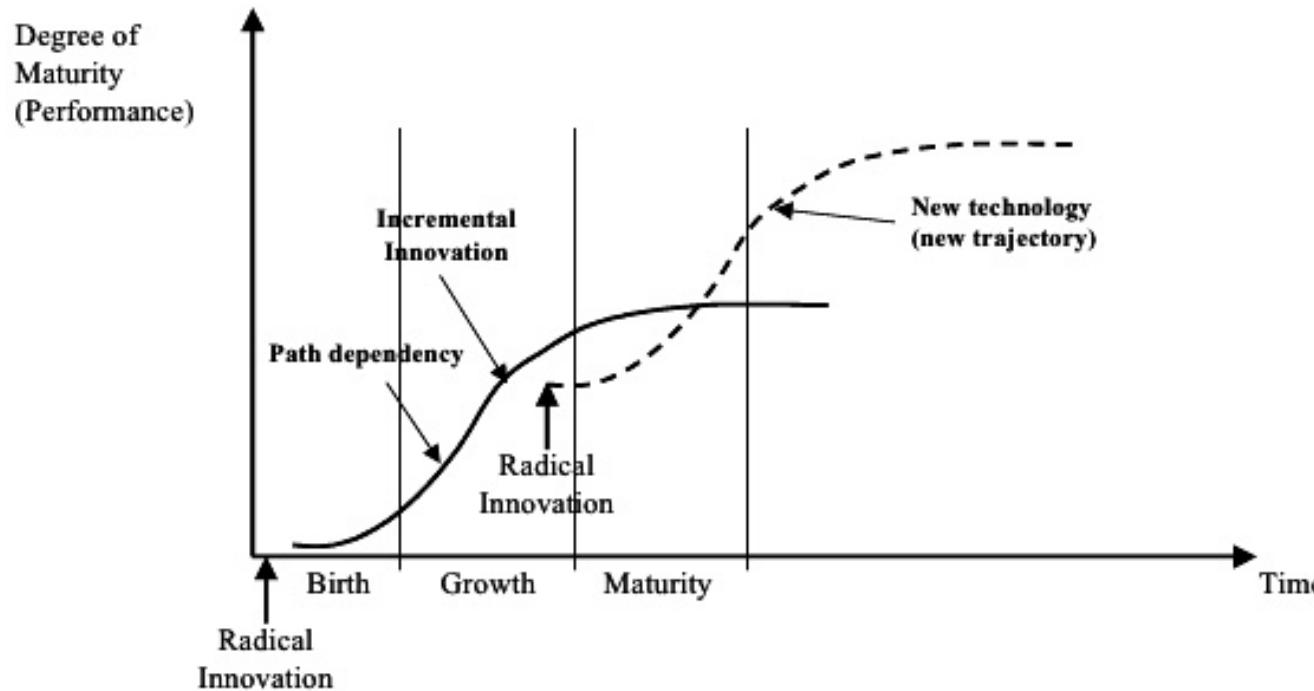


EXHIBIT 4-5 This technology S-curve illustrates that Xerox believed digital copier technologies were just emerging and would improve product performance in the coming years. Xerox believed that it could develop a full-featured digital copier in the near future with performance exceeding that of light-lens copiers.



Evolution of a Technology

(A technological Trajectory)



Technological trajectory: industry sticks to a given trajectory (technology path) as long as incremental innovation are favoured to prevent sunk costs from changing the basic technology

D. Product Platforms:

- The product platform is the set of assets shared across a set of products.
- Components and sub assemblies are often the most important of these assets.

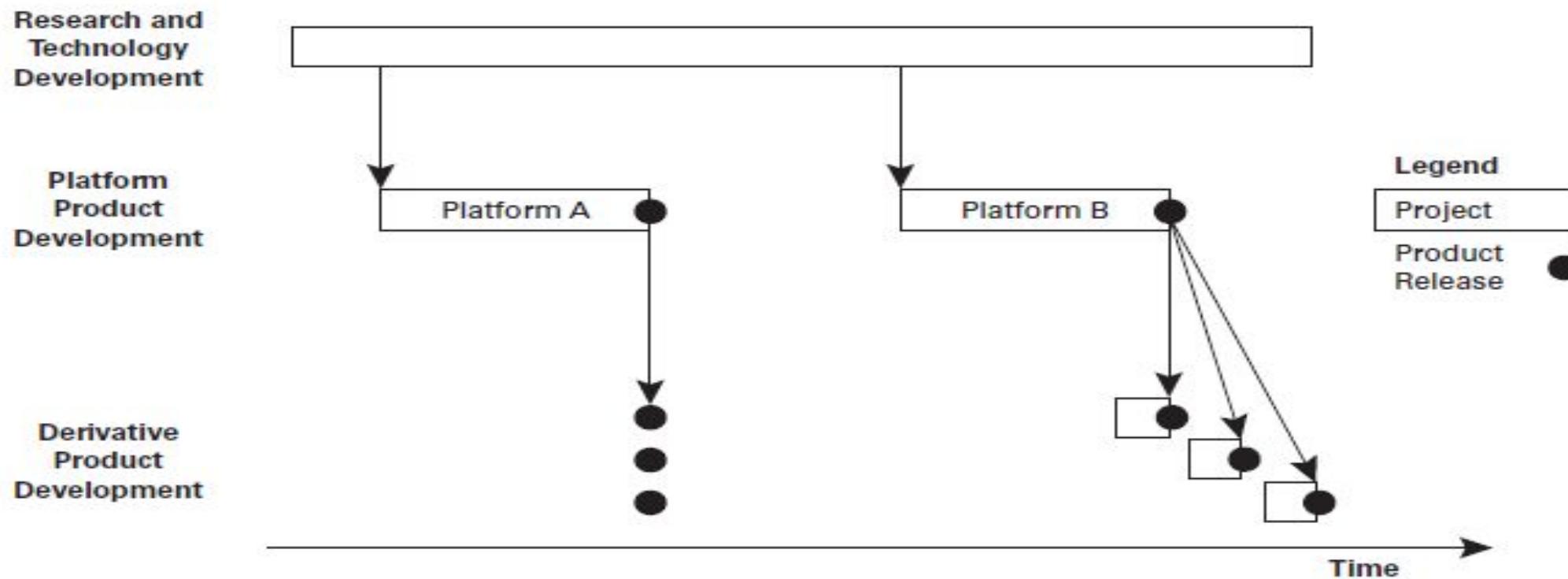


EXHIBIT 4-6 A platform development project creates the architecture of a family of products. Derivative products may be included in the initial platform development effort (Platform A) or derivative products may follow thereafter (Platform B).

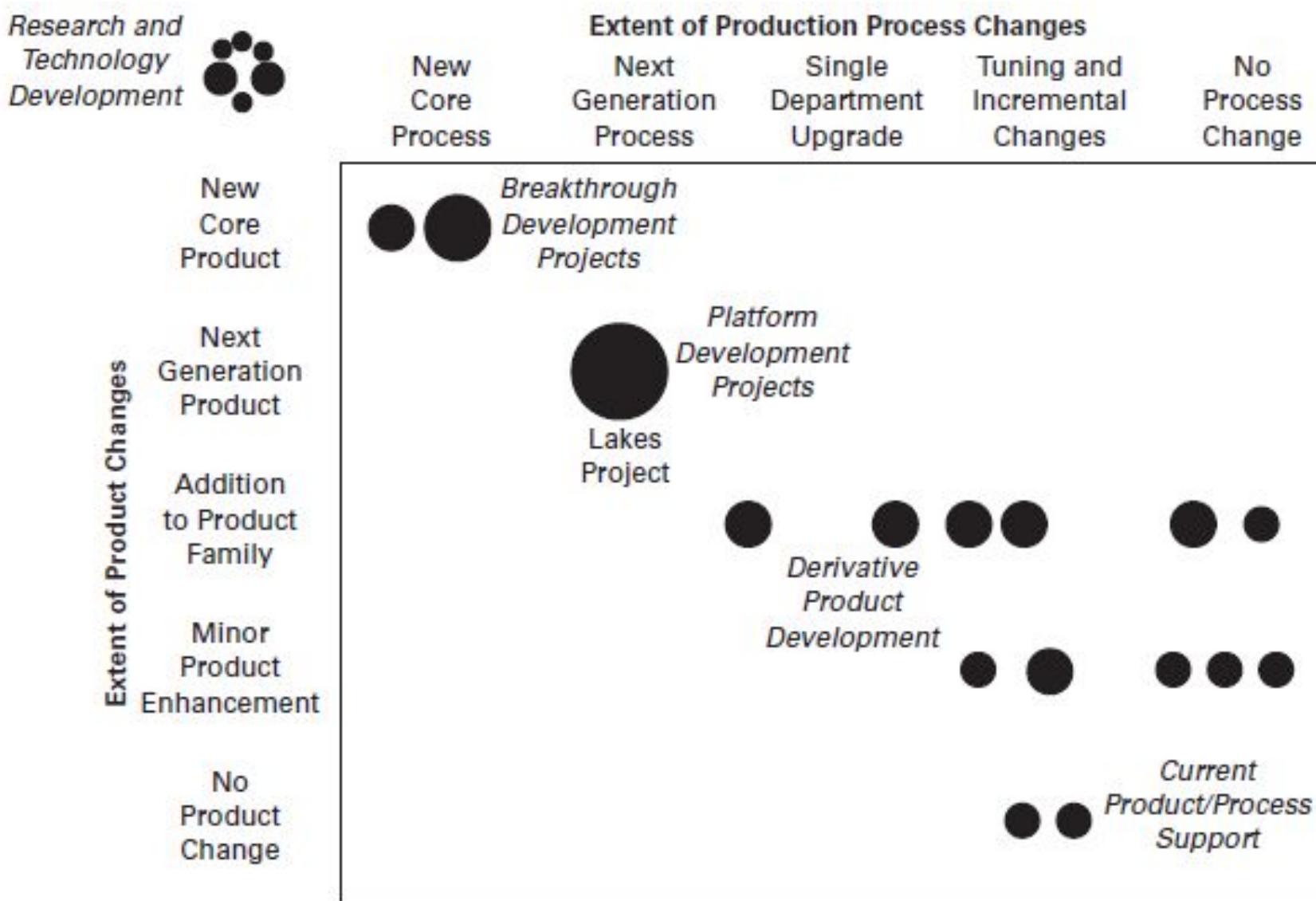
Evaluating Fundamentally New Product Opportunities

Some criteria for evaluating fundamentally new product opportunities include:

- Market size (units/year × average price).
- Market growth rate (percent per year).
- Competitive intensity (number of competitors and their strengths).
- Depth of the firm's existing knowledge of the market.
- Depth of the firm's existing knowledge of the technology.
- Fit with the firm's other products.
- Fit with the firm's capabilities.
- Potential for patents, trade secrets, or other barriers to competition.
- Existence of a product champion within the firm.

Balancing the Portfolio

- This perspective can be useful to illuminate imbalances in the portfolio of projects under consideration and in assessing the consistency between a portfolio of projects and the competitive strategy.
- *product-process change matrix*



Adapted from Wheelright and Clark, 1992

EXHIBIT 4-8 Product-process change matrix. The size of the circles indicates the relative cost of the development projects.





Aō Air introduced at CES its a wearable air purifier designed to be a high-tech face covering to block pollution. (Photo: Aō Air)



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Samsung tops consumer-focused brands in India list

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Synopsis

Samsung, Tata Motors, Apple, Hero MotoCorp and Nike are the top-five consumer-focused brands in the country, according to a study by TRA.



Geographic

Based on a customer's home location

EXAMPLE

Locals vs. tourists

Demographic

Based on age, income, occupation, family size

EXAMPLE

Families vs. couples vs. business diners

Behavioral

Based on a customer's purchasing habits

EXAMPLE

High-Spenders vs. Low-Spenders

Psychological

Based on a customer's beliefs and values

EXAMPLE

"Here for Instagram" vs. "Here for the freebies"

Step 3: Allocate Resources and Plan Timing:

- It is likely that the firm cannot afford to invest in every product development opportunity in its desired balanced portfolio of projects.
- As timing and resource allocation are determined for the most promising projects, too many projects will invariably compete for too few resources.
- Many organizations take on too many projects without regard for the limited availability of development resources.
- As a result, skilled engineers and managers are assigned to more and more projects, productivity drops off dramatically, projects take longer to complete, products become late to the market, and profits are lower.
- *Aggregate planning* helps an organization make efficient use of its resources by pursuing only those projects that can reasonably be completed with the budgeted resources.

Project Timing:

- Determining the timing and sequence of projects, sometimes called *pipeline management*
- ***Timing of product introductions:*** Generally the sooner a product is brought to market the better. However, launching a product before it is of adequate quality can damage the reputation of the firm.
- ***Technology readiness:*** The robustness of the underlying technologies plays a critical role in the planning process. A proven, robust technology can be integrated into products much more quickly and reliably.
- ***Market readiness:*** The sequence of product introductions determines whether early adopters buy the low-end product and may trade up or whether they buy the high-end product offered at a high initial price. Releasing improvements too quickly can frustrate customers who want to keep up; on the other hand, releasing new products too slowly risks lagging behind competitors.
- ***Competition:*** The anticipated release of competing products may accelerate the timing of development projects.

Step 4: Complete Pre-Project Planning:

- Once the project has been approved, but before substantial resources are applied, a pre-project planning activity takes place.
- This activity involves a small, cross-functional team of people, often known as the *core team*.
- At this point, the earlier opportunity statement may be rewritten as a *product vision statement*.

Develop a networked, mid-range, digital platform for imaging, marking, and finishing.

Mission Statements:

The mission statement may include some or all of the following information:

- *Brief (one-sentence) description of the product*
- *Benefit proposition*
- *Key business goals*
- *Target market(s) for the product*
- *Assumptions and constraints that guide the development effort*
- *Stakeholders*

Assumptions and Constraints:

- **Manufacturing**
- **Service**
- **Environment**

Staffing and Other Pre-Project Planning Activities

Step 5: Reflect on the Results and the Process

The team should ask several questions to assess the quality of both the process and the results.