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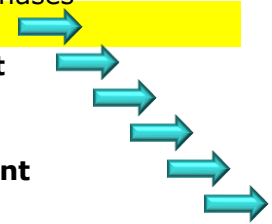
EBU5608 Product Development and Marketing

Topic 6 - Product Planning

A Generic Product Development Process

- Product development **starts** with planning and **concludes** with product launch
- A generic product development process can be used as an example
- The process has six distinct phases
  - 0. **Planning**
  - 1. **Concept development**
  - 2. **System-level design**
  - 3. **Detail design**
  - 4. **Testing and refinement**
  - 5. **Production ramp-up**



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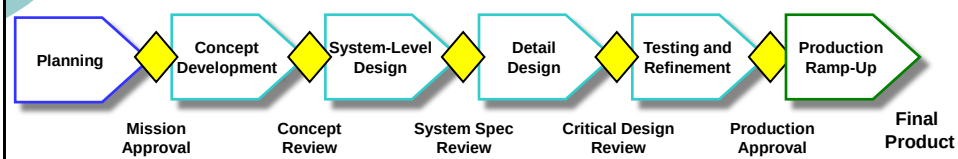
A Generic Product Development Process (cont.)

- At the end of each phase, there is an outcome



Source: Product Design and Development, Karl T Ulrich and Steven D Eppinger, International Edition (3rd) McGraw-Hill, 2012, page 14

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Agenda

- Phase 0 - The 5-steps of Product Planning Process
  - Step 1 – Identify Opportunities
  - Step 2 – Evaluate and prioritise projects
  - Step 3 – Allocate resources and plan timing
  - Step 4 – Complete pre-project planning
  - Step 5 – Reflect on the results and the process

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Xerox Lakes Project Example

Xerox Corporation is a global enterprise offering a wide array of document-related products, services, and business solutions.

Its mission is to be the leader in the global document market, providing document solutions that enhance business productivity.

A key element of Xerox's competitive strategy is to exploit technological innovation in a rapidly changing market.

Source: Product Design and Development, Karl T Ulrich and Steven D Eppinger, International Edition (3rd) McGraw-Hill, 2012, page 54

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Xerox Lakes Project Example

Xerox Document Centre 265

Source: Product Design and Development, Karl T Ulrich and Steven D Eppinger, International Edition (3rd), McGraw-Hill, 2012, page 54

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Phase 0 - Product Planning

- This phase takes place **before** a product **development** project is formally **approved**
- It takes place **before** substantial **resources** are applied
- It takes place **before** the larger development **team** is formed
- Product **planning** is an activity that
  - considers the **portfolio of projects** that an organisation might pursue. i.e. what mix of new **products** and **markets** to develop, if they focus is on basic or applied research or diversification projects and
  - determines what **subset** of these projects will be **pursued** over what time **period**

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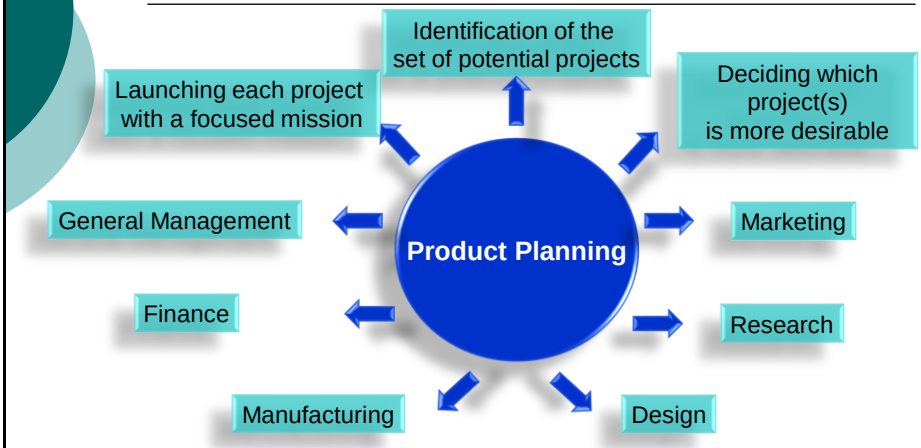
During the Product Planning phase



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Phase 0 - Product Planning Problems

Mentimeter

Organisations which do not plan carefully have the following **problems**

- Inadequate **coverage** of target **markets** with competitive products
- Poor **timing** of market **introductions** of products
- **Mismatches** between aggregate development **capacity** and the **number** of projects pursued
- Poor **distribution** of resources, with some projects **overstaffed** and others **understaffed**
- Initiation and subsequent cancellation **of ill-conceived** projects
- Frequent **changes** in the directions of projects

Phase 0 - Product Planning – Types of projects

It is useful to understand that there are **four types** of Product Development Projects

1. **Fundamentally new products**
   - **New** product or production technology for new and **unfamiliar** markets
2. **New Product *Platforms***
   - ***New*** *products for* ***familiar*** *markets and product categories*
3. **Derivatives of existing product *platforms***
   - Projects extend an **existing** product platform to better addresses **familiar** markets with one or two more products
4. ***Incremental improvements to existing products***
   - May only involve **adding** or **modifying** some features of **existing** products to keep the product line **current** and **competitive**

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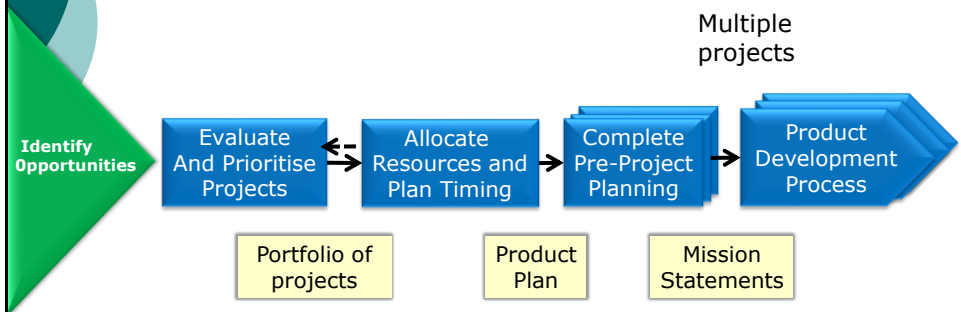
Phase 0 - The 5-step product planning process

- The **process**
  - Ulrich and Eppinger identify a **five-step** planning process for Product planning [1]
  - These 5 stages, enable the organisation to identify the **Product Plan** and **Mission Statements**
    - (i.e. the outputs of this phase)

Phase 0 - The 5-step product planning process



Source: Product Design and Development, Karl T Ulrich and Steven D Eppinger, International Edition (3rd) McGraw-Hill, 2012, page 56

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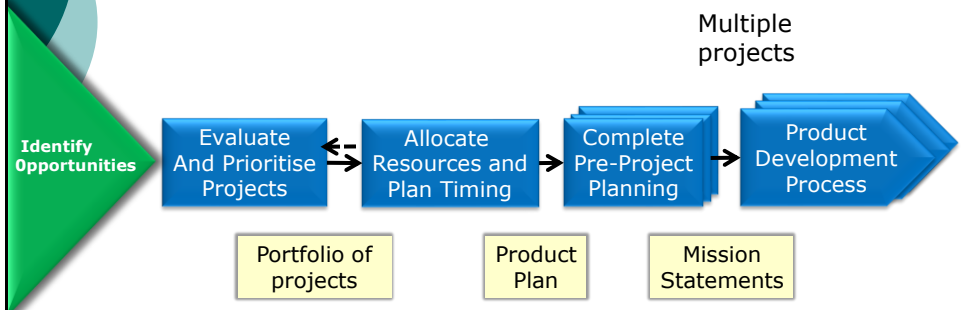
Step 1 – Identify Opportunities



Source: Product Design and Development, Karl T Ulrich and Steven D Eppinger, International Edition (3rd) McGraw-Hill, 2012, page 56

Step 1 – Identify Opportunities
(cont.)

- The **first stage** of the planning process is to identify product **development opportunities**
- Lecture notes – **Topic 3** provides a process for generating, recognising, and evaluating opportunities.
- Each of the ideas should be expanded into a **short description** – including the potential business opportunity
- These ideas can then be **stored** and revisited later
- Each of the ideas should have a '**champion**' who is responsible for supporting the idea through the process

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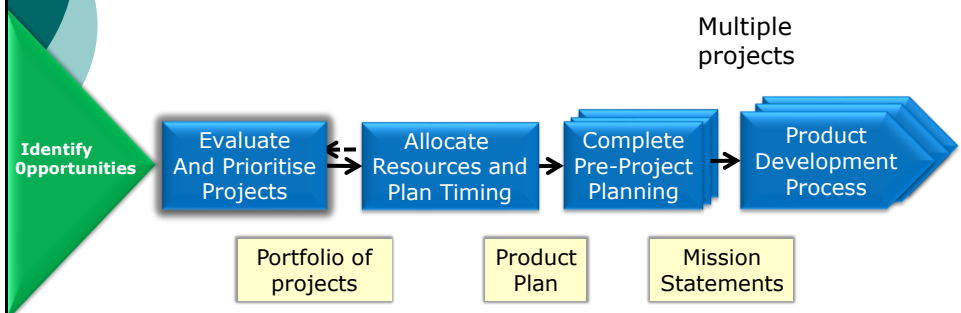
Step 2 – Evaluate and Prioritise Projects



Source: Product Design and Development, Karl T Ulrich and Steven D Eppinger, International Edition (3rd) McGraw-Hill, 2012, page 56

Step 2 – Evaluate and Prioritise Projects

- In this step, the organisation is looking to decide **which** of the projects to pursue
- There are **four perspectives** that can be used to assist in the evaluation and analysis of each of the projects
  - Competitive strategy
  - Market segmentation
  - Technological trajectories
  - Product platforms

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Step 2 – Evaluate and Prioritise Projects

Ulrich and Eppinger identify four potential **competitive strategies** that an organisation could follow

1. **Technology Leadership**
   - A focus on basic research and development of new technologies
2. **Cost leadership**
   - Competitive focus on production efficiency
3. **Customer focus**
   - The organisation works closely with customers to assess changing needs and preferences
4. **Imitative (market follower)**
   - When a clear opportunity has been identified and has been successful, the organisation launches a competitive version.

Step 2 – Evaluate and Prioritise Projects

- **Market Segmentation**
  - Divide the market into segments in order to be more focused on the customer and competitors

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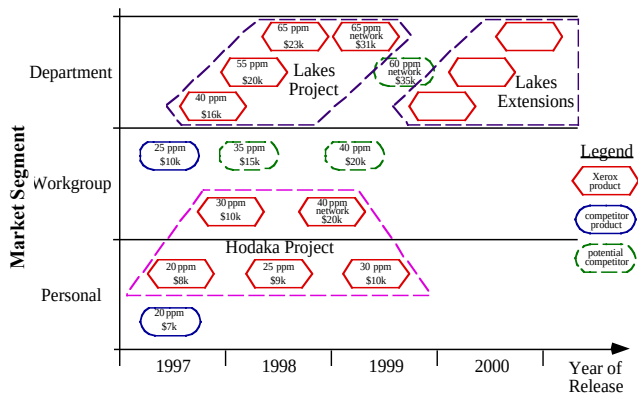
Example of Product Segment Map for Xerox products



Source: Product Design and Development, Karl T Ulrich and Steven D Eppinger, International Edition (3rd) McGraw-Hill, 2012, page 59

Step 2 – Evaluate and Prioritise Projects

Mentimeter

- **Technological Trajectories**
  - i.e. when to adopt a new technology
  - When to shift to implementation of the new technology as part of the core product range
    - e.g. Kodak – 35mm → APS → Digital
  - When to retire old technologies?

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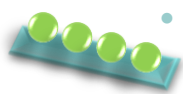
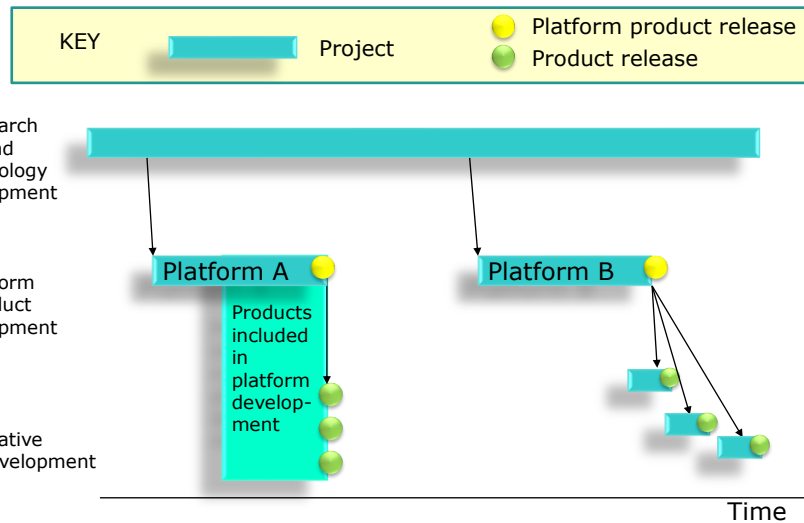
Step 2 – Evaluate and Prioritise Projects

- **Product Platform Planning**
  - The product platform is the set of assets **shared** across a **set** of products
  - An effective platform can allow a variety of **derivative products** to be created more **rapidly** and **easily**
  - Each product can then provide features and functions desired by a particular **market segment**
  - Platform development projects can take from **2–10 times** as much **time** and **money** as a **derivative** product and therefore the number of this type of project is **low**
  - An **example** of a product platform is Microsoft Windows



Example of Product Platform Planning



Source: Product Design and Development, Karl T Ulrich and Steven D Eppinger, International Edition (3rd) McGraw-Hill, 2012, page 61

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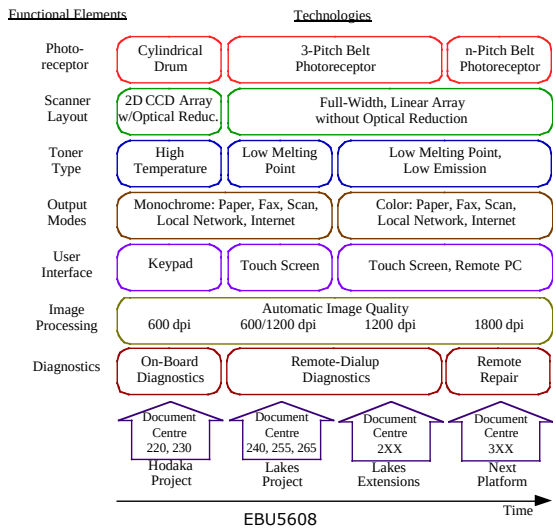
Technology Roadmap



Phase 0 - Step 2 – evaluate and prioritise projects

- When considering opportunities in either **new markets** or fundamentally **new technologies**, the following **evaluation** criteria can be used:
  - Market **size** (units/year x 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**

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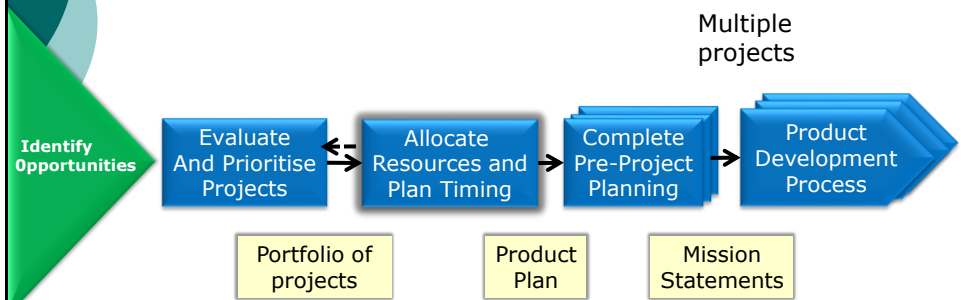
Step 2 – Evaluate and Prioritise Projects

evaluation criteria (contd.)

- Depth of the firm's **existing knowledge** of the **technology**
- Fit with the firm's **capabilities**
- Fit with the firm's **other products**
- Potential for **patents**, trade secrets or other barriers to competition
- Existence of a **product champion** within the firm

Step 3 – Allocate Resources and Planning



Source: Product Design and Development, Karl T Ulrich and Steven D Eppinger, International Edition (3rd) McGraw-Hill, 2012, page 56

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Step 3 – Allocate Resources and Planning

- It is very **unlikely** that an organisation would be able to invest in **every** product **development** opportunity that arose or even that was demanded
- **Constraints** such as human and physical **resources** exist which determine the **number** and **type** of projects that can be committed to
- There are two aspects of this step in the Process
  - Resource **Allocation**
  - Project **Timing**

Step 3 – Allocate Resources and Planning

- **Resource Allocation**
  - **Over commitment** of resources will inevitably lead to a **drop** in productivity
  - An **example** of over commitment would be allocating engineers and managers to more than one project (where they are already at full capacity working on one)

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Step 3 – Allocate Resources and Planning

- **Aggregate Planning**
  - Pursuing **only** those projects that can reasonably be **completed** with the **budgeted** resources
  - This leads to a more efficient **utilisation** of the **limited** resources
- The **primary resource** for a project is the human resources, i.e. the engineers and developers
  - The management of these resources is usually expressed in **person-hours** or person-months

Step 3 – Allocate Resources and Planning

- This concept is used to assess **how long** each piece of the development will take and therefore:
  - how many **human resources** will be required
  - how long they will be **committed** to this activity (and therefore not available for **alternative** activities)
- **Other** critical resources include
  - development equipment
  - test equipment
  - manufacturing capacity
  - availability of raw materials and components etc

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Step 3 – Allocate Resources and Planning

- **Project Timing**
  - Determining the **timing** and **sequence** of projects, sometimes called **pipeline management**, must consider a number of factors
    1. Timing of product introductions - Time to Market (TTM)
    2. Technology readiness
    3. Market readiness
    4. Competition

Step 3 – Allocate Resources and Planning

- **The Product Plan**
  - This is the set of projects **approved** by the planning process
  - These are **sequenced** in time
  - The plan may include a **mix** of fundamentally **new** products, **platform** projects and **derivative** projects
  - The **updating** of these plans is usually undertaken on a periodic basis e.g. quarterly or annually
    - "Planning round"

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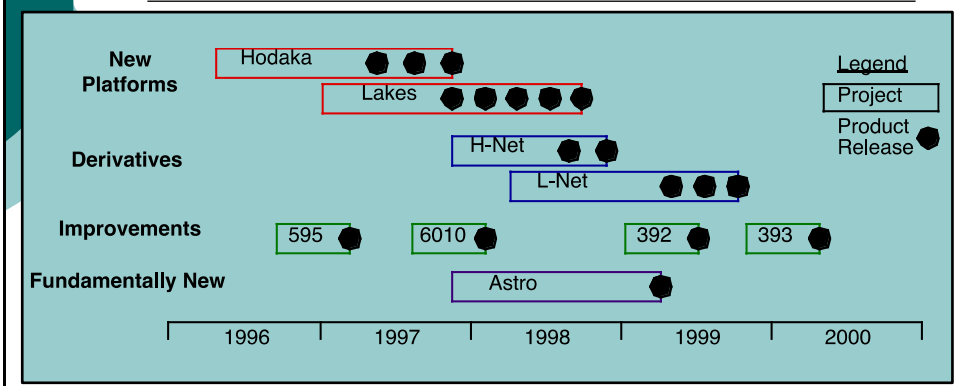
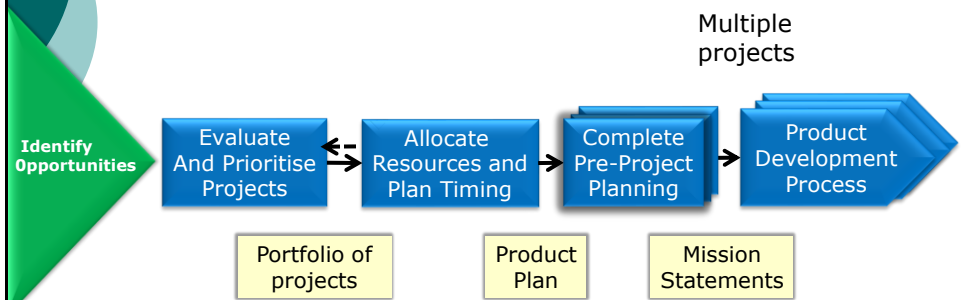
Example of a Product Plan for Xerox



Source: Product Design and Development, Karl T Ulrich and Steven D Eppinger, International Edition (3rd) McGraw-Hill, 2012, page 55

Step 4 – Complete Pre-Project Planning



Source: Product Design and Development, Karl T Ulrich and Steven D Eppinger, International Edition (3rd) McGraw-Hill, 2012, page 56

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Step 4 – Complete Pre-Project Planning

- **After** project approval, but **before** the commitment of resources, a pre-project **planning** activity takes place
- This activity involves a small, cross-functional team – the **Core Team**

Step 4 – Complete Pre-Project Planning

- During this step, the **Mission statement** is created
- This document provides clear **guidance** for the product development organisation
- **Included** in the Mission Statement are:
  - A brief **description** of the product
    - This is one sentence only
    - Typically includes the key **customer benefit** of the product
    - **Avoids** implying a specific product concept
    - It could be the **product vision** statement

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Step 4 – Complete Pre-Project Planning

- Key **business goals**
  - The goals which support the corporate **strategy**
  - The goals for
    - **Time** e.g. timing for product introduction
    - **Cost** e.g. desired financial performance
    - **Quality**
- **Target market** for the product
  - Primary and secondary markets that should be considered in the development effort

Step 4 – Complete Pre-Project Planning

- **Assumptions** and constraints that guide the development effort
- **Stakeholders**
  - List all of the product's stakeholders to ensure that many of the **subtle** development issues are addressed
  - The list of stakeholders serves as a **reminder** for the team to consider the **needs** of **everyone** who will be influenced by the product

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Lakes Project Mission Statement

Product Description
- Networkable, digital machine with copy, print, fax, and scan functions

Key Business Goals
- Support Xerox strategy of leadership in digital office equipment
- Serve as platform for all future B&W digital products and solutions
- Capture 50% of digital product sales in primary market
- Environmentally friendly
- First product introduction 4thQ 1997

Primary Market
- Office departments, mid-volume (40-65 ppm, above 42,000 avg. copies/mo.)

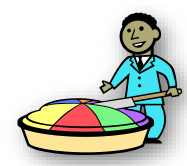
Secondary Markets
- Quick-print market
- Small 'satellite' operations

Assumptions and Constraints
- New product platform
- Digital imaging technology
- Compatible with CentreWare software
- Input devices manufactured in Canada
- Output devices manufactured in Brazil
- Image processing engine manufactured in both USA and Europe

Stakeholders
- Purchasers and Users
- Manufacturing Operations
- Service Operations
- Distributors and Resellers

Step 4 – Complete Pre-Project Planning

- The pre-project planning activity also addresses project **staffing** and **leadership**
  - This may involve having **key** development staff "**sign up**" for a new project,
    - i.e. to agree to commit to leading the development of the project or a critical element of it
- **Budgets** are also established during pre-project planning



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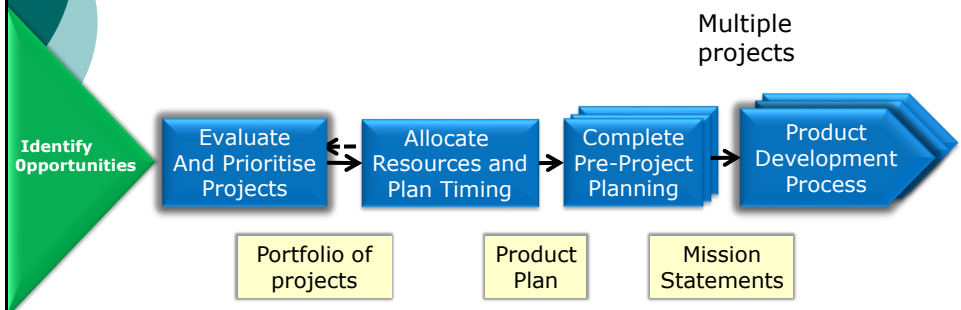
Step 5 – Reflect on the Results and the Process



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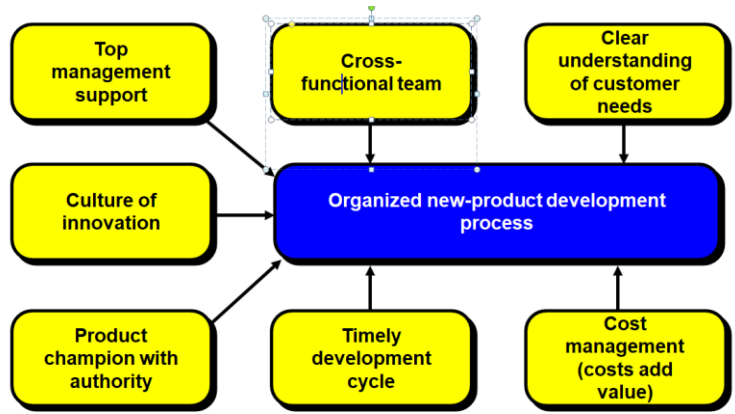
Summary (1 of 2) – Product Planning; A Total Company Effort



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Summary (2 of 2) – Product Planning; A Total Company Effort

External Forces

1. ***Markets***: Prime determinants of product success.
2. ***Competition***: Always present and threatening.
3. ***Channels***: Dealer support a vital factor.
4. ***Technology***: Continuously involved during
5. **Product Life-Cycle.**
6. ***The Economy***: Creating opportunities and threats revealed by economic indicators.
7. ***Government***: Positive or negative actions.
8. ***Ecology***: Problem of pollution.

Internal Forces

1. ***Financial Resources***: Needs of Earnings and Cash- flow affecting Product Decisions.
2. ***Technological Ability*** to develop products and keep them upto date.
3. ***Supply of Raw Materials and Parts*** to ensure smooth production planning and scheduling.
4. ***Marketing***: the most critical internal aspect of product success.
5. ***Production***: second in importance to marketing to cope with expanding and competitive markets.
6. ***Human Resources***: Personnel abilities in product planning management and implementation.

Step 5 – Reflect on the Results and the Process

- At this step, **reflection** is carried out to assess both the quality of the **process** and the **results**
- Some of the **questions** that should be asked are [5]:
  - Is the opportunity funnel collecting an **exciting** and **diverse** set of product opportunities?
  - Does the product plan support the **competitive strategy** of the firm?
  - Does the product plan address the most important **current opportunities** facing the firm?
  - Are the **total resources** allocated to product development sufficient to pursue the firms competitive strategy?

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Step 5 – Reflect on the Results and the Process

- Have **creative** ways of leveraging **finite resources** been considered, such as
  - the use of product platforms
  - joint ventures
  - partnerships with suppliers?
- Does the **core team** accept the challenges of the resulting **mission statement**?
- Are the **elements** of the mission statement **consistent**?

Step 5 – Reflect on the Results and the Process

- Are the **assumptions** listed in the mission statement really **necessary** or is the project over **constrained**?
  - Will the development team have the **freedom** to develop the **best** possible product?
- How can the product planning **process** be **improved**?

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Step 5 – Reflect on the Results and the Process

- The answers to these questions give the project team the opportunity to have a "**reality check**"
- If the team is **happy** with the output so far, it can proceed with the **next stage** of the process
  - Phase 2 – Concept Development

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Reading

- **Core Textbook** (Ulrich & Eppinger, 7th Edition)
  - Chapter 4. Product Planning
    pages 55 - 76