



Development Process



Well-defined development process

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

- **Quality Assurance,** A development process specifies the phases a development project will pass through and the checkpoints along the way. Following the development process is one way of assuring the quality of resulting products.



Well-defined development process

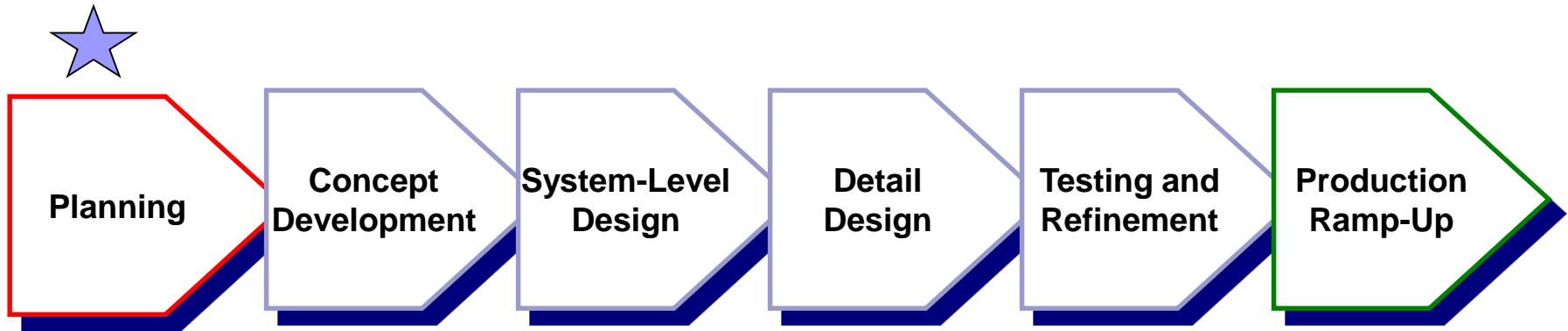
- **Coordination,** A clearly articulated development process acts as a master plan which defines the role of the players on the development team.
- **Planning,** A development process contains natural milestones corresponding to the completion of each phase. The timing of these milestones anchors the schedule of the overall development project.



Well-defined development process

- Management, By comparing the actual events to the established process, a manager can identify possible problem areas.
- Improvement, The careful documentation of an organization's development process often helps to identify opportunities for improvement.

Product Development Process





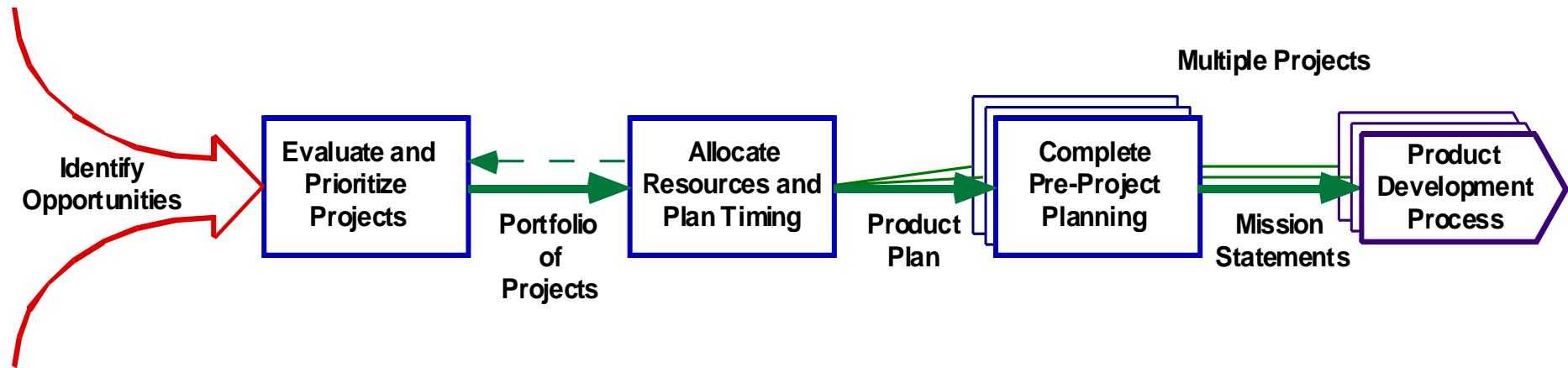
PLANNING



Planning

- This phase begins with 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

Planning



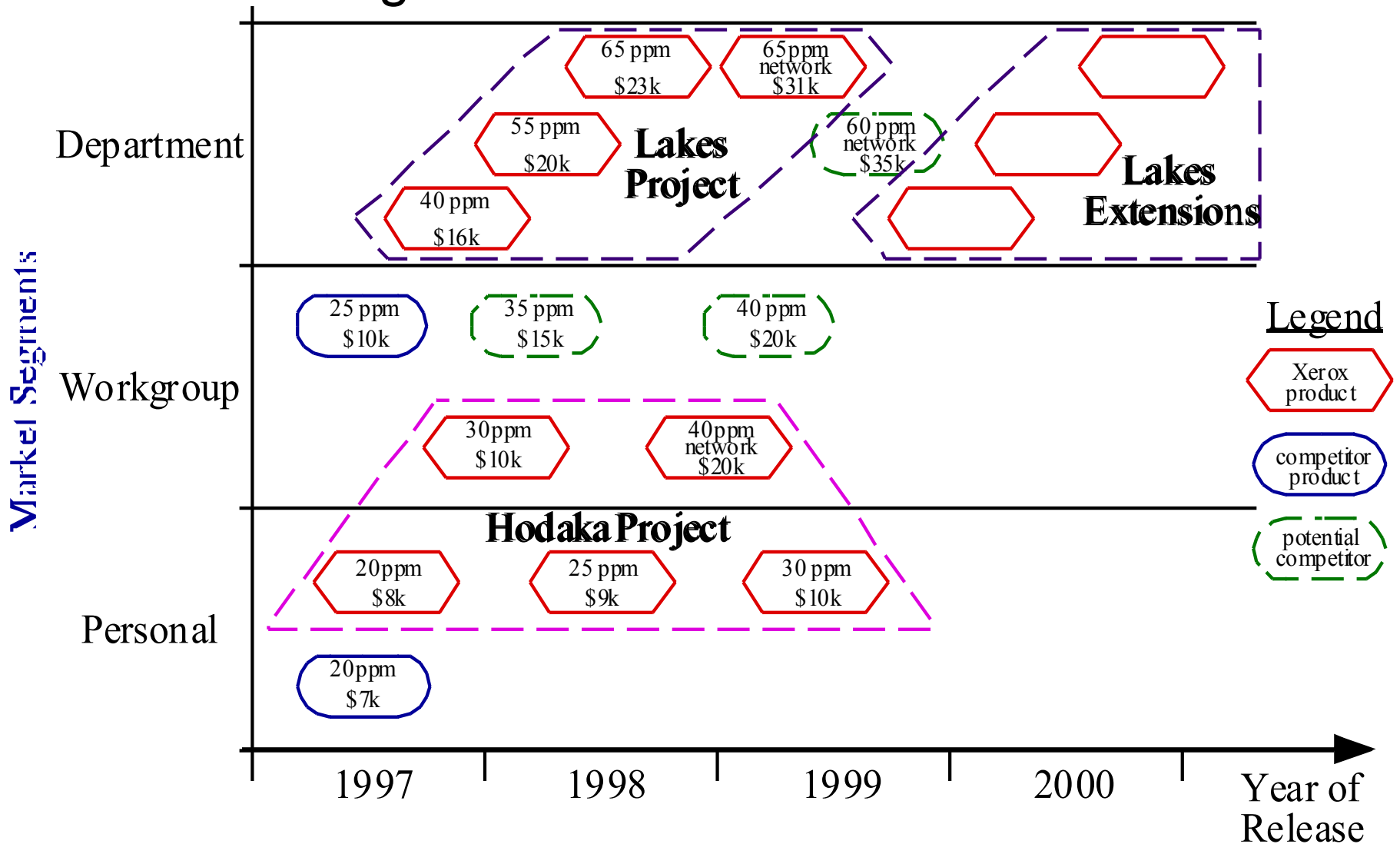


Planning

- Identify opportunities:
 - Marketing and sales personnel.
 - R & D
 - Current (or potential) customers
 - Suppliers, inventors, etc
- Evaluate and Prioritize projects:
 - Competitive strategy
 - Market segmentation
 - Technological trajectories
 - Product platform planning
 - Evaluating fundamentally New Product Opportunities
 - Balancing the portfolio

Evaluate and Prioritize Projects

Market segmentation



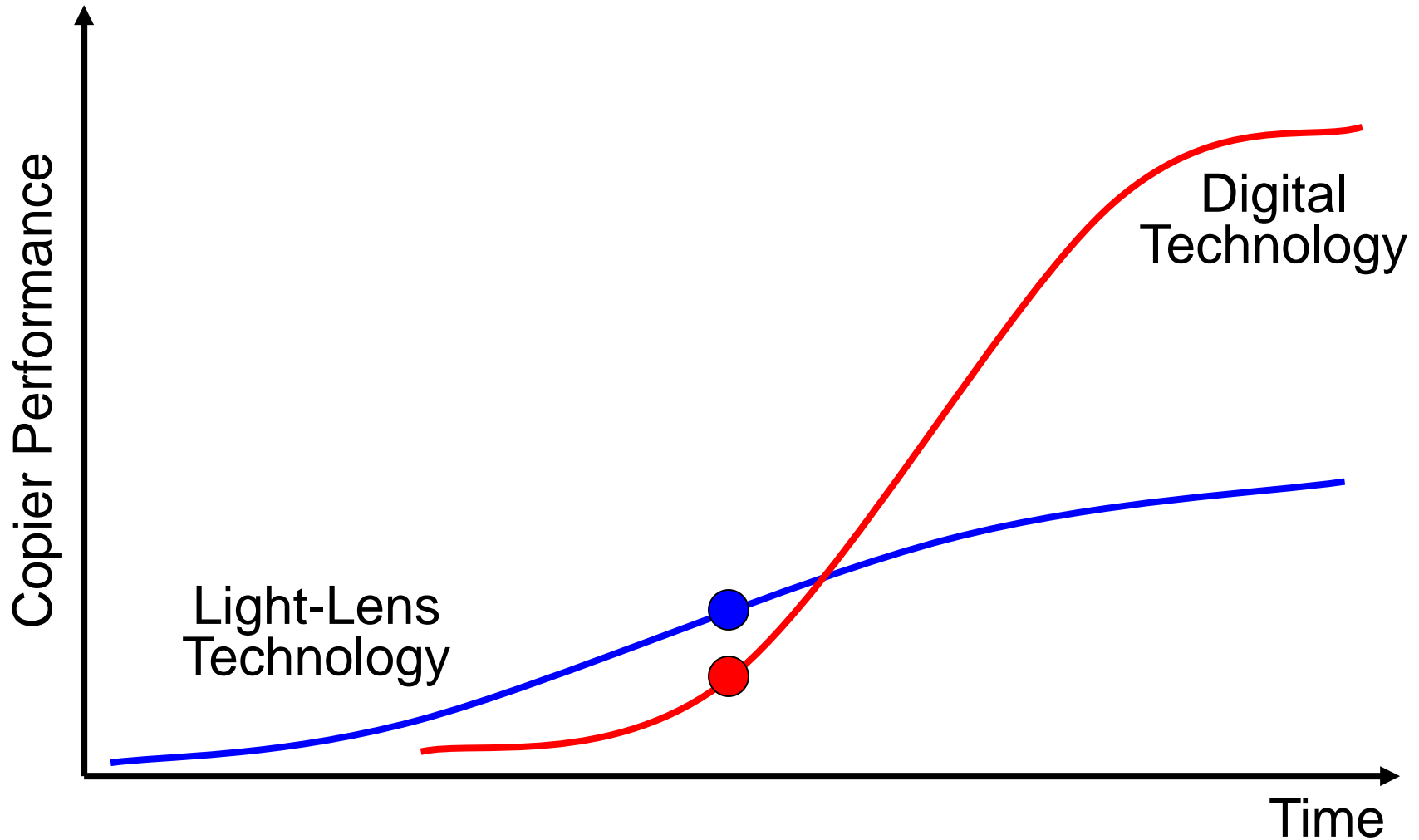


Evaluate and Prioritize Projects

- Technological Trajectories
- In technology-intensive business, a key product planning decision is when to adopt a new basic technology in a product line
- Technological S-curves : conceptual tool to help think about such decisions

Evaluate and Prioritize Projects

- Technological Trajectories



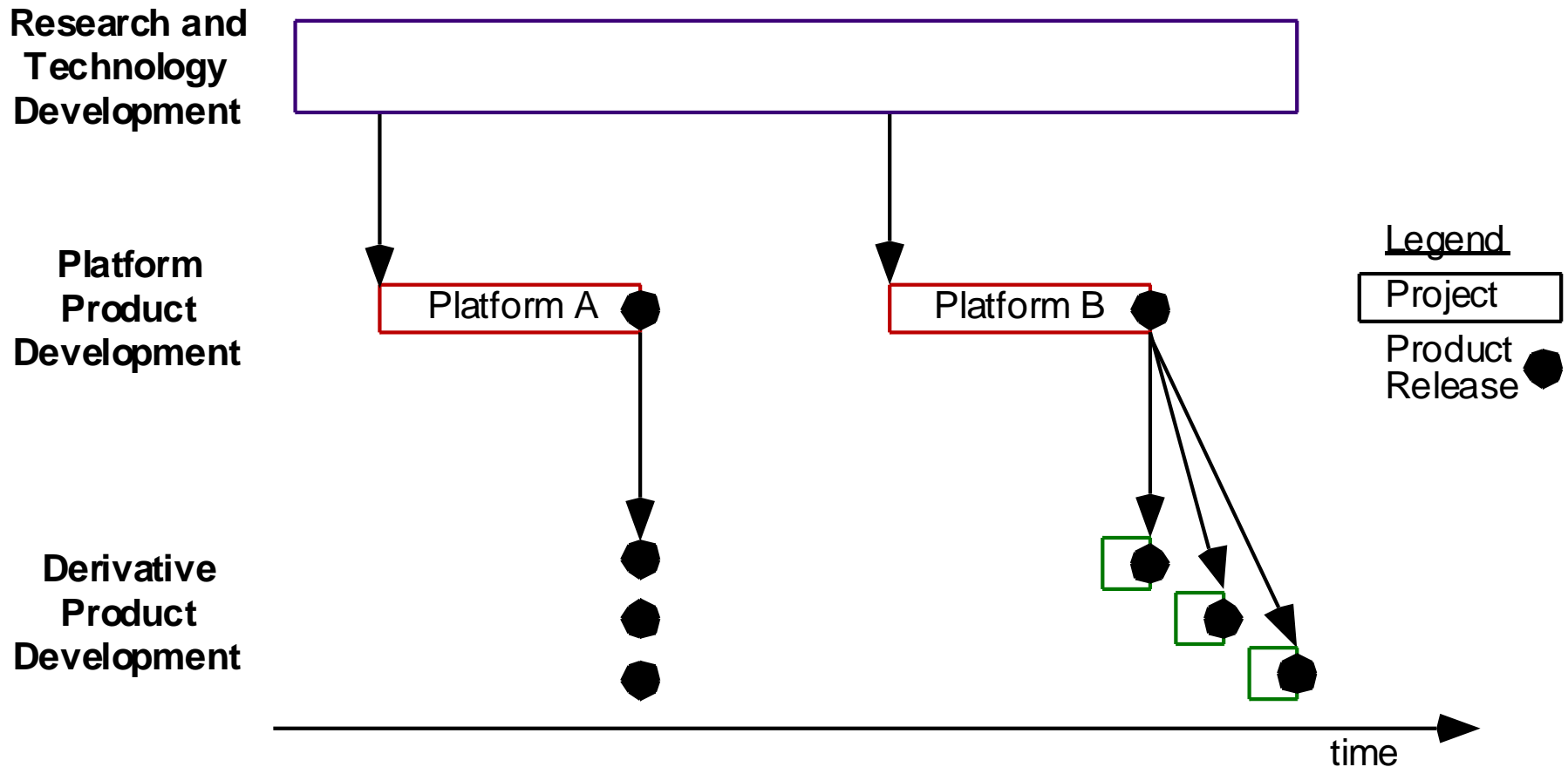


Technological Trajectories

- Telecommunication Technology

Evaluate and Prioritize Projects

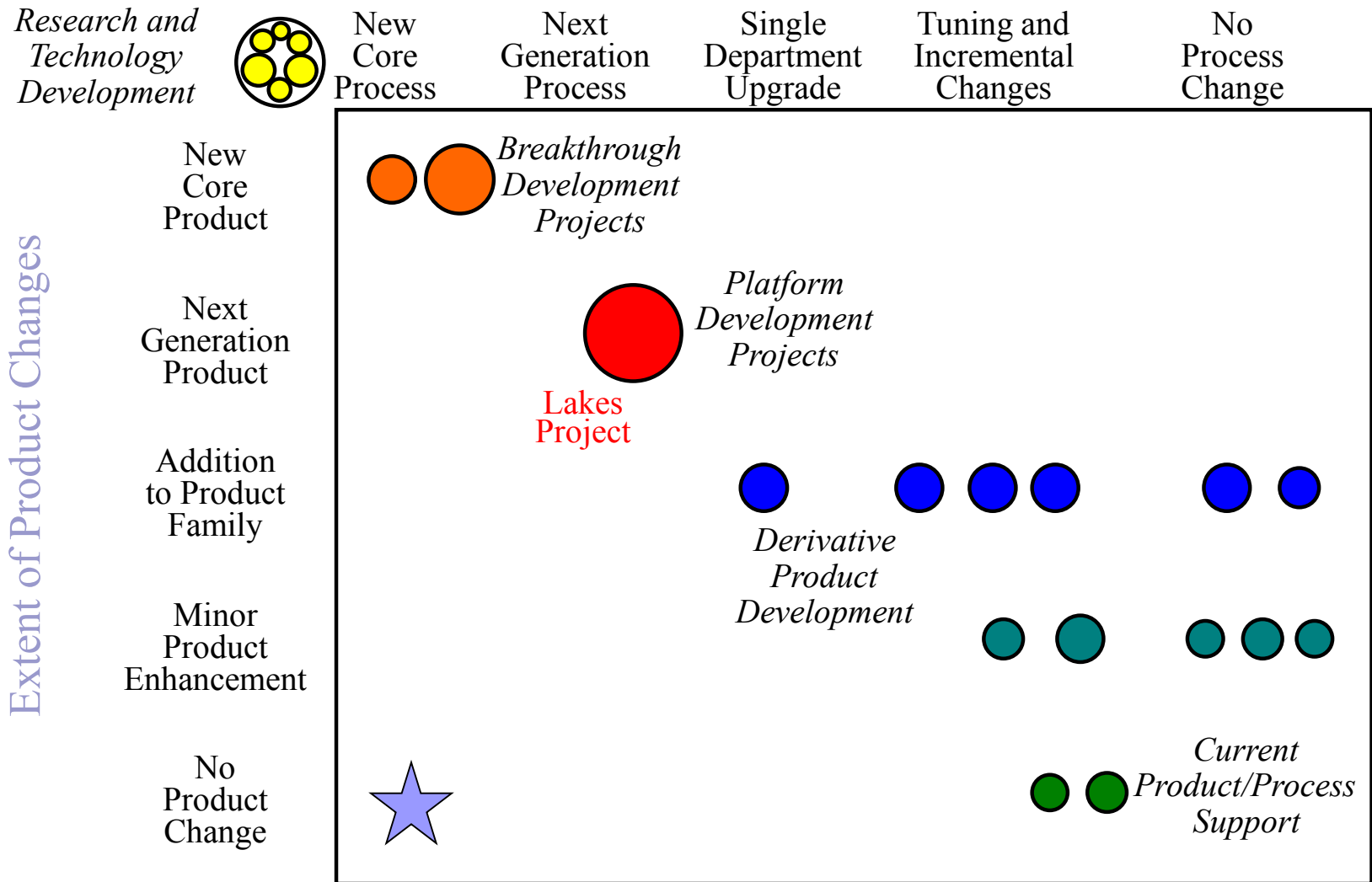
- Product Platform Planning
 - Platform: set of assets shared across a set of products



Evaluate and Prioritize Projects

- Balancing the portfolio

Extent of Production Process Changes



Complete Pre-Project Planning

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

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

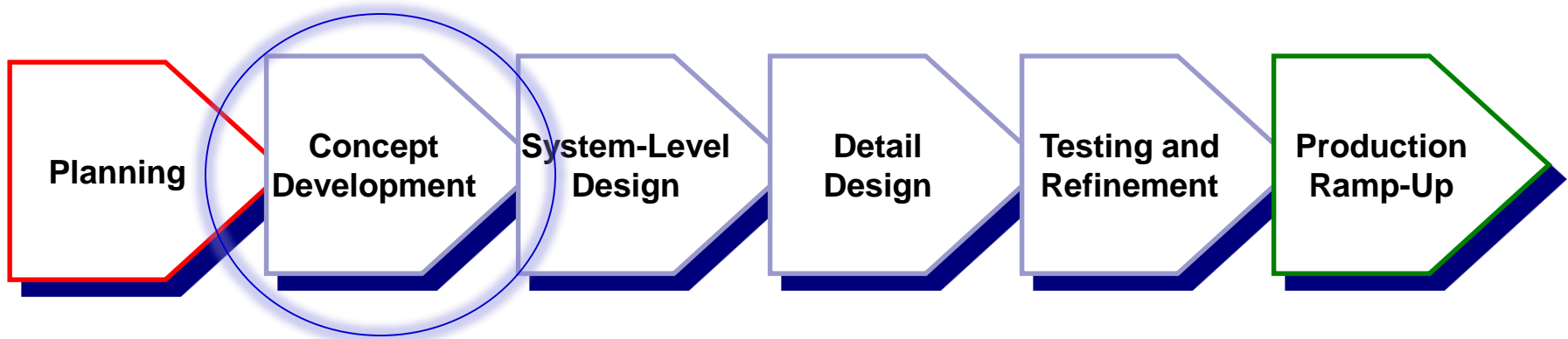
Stakeholders

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



CONCEPT DEVELOPMENT

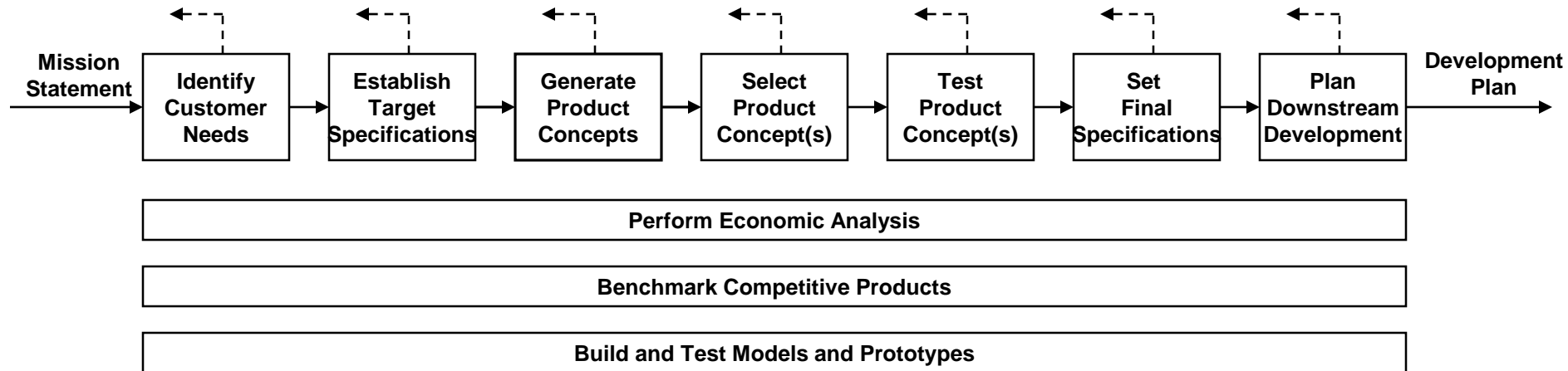
Product Development Process



Concept Development

- A concept is a description of the form, function, and features of a product and is usually accompanied by a set of specifications, an analysis of competitive products, and an economic justification of the project.
- In this phase, 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.

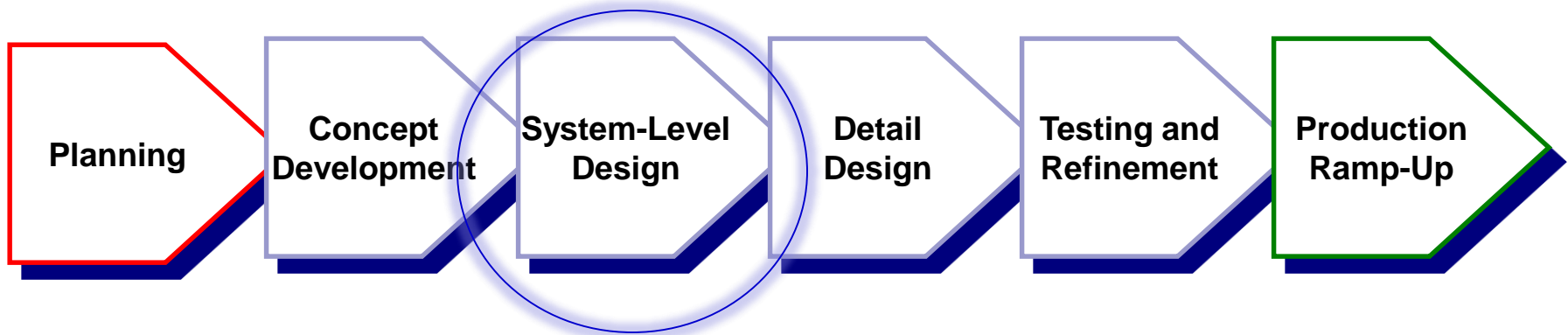
Concept Development





SYSTEM-LEVEL DESIGN

Product Development Process





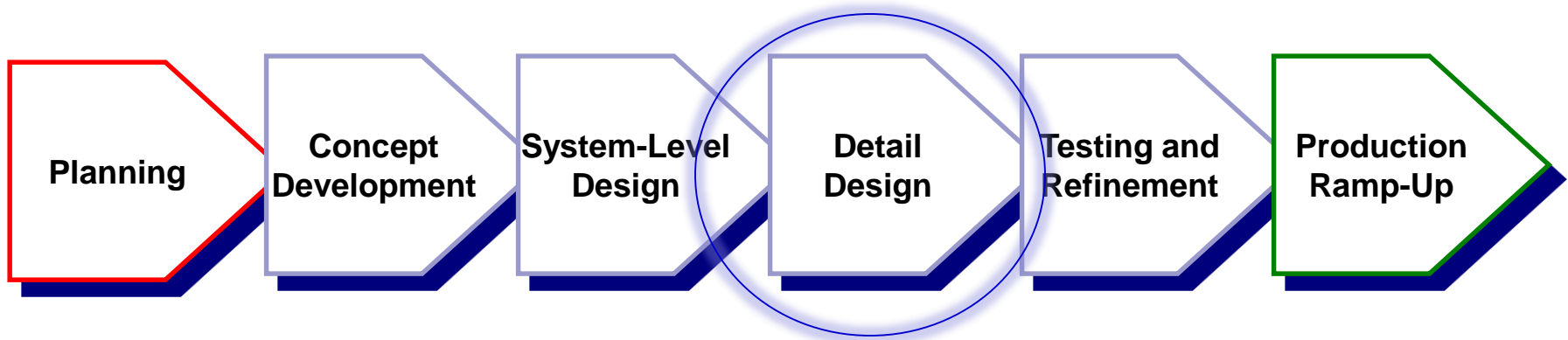
System-level Design

- Includes the definition of the product architecture and the decomposition of the product into subsystems and components.
- The output of this phase usually includes a geometric layout of the product, a functional specifications of each of the product subsystems, and a preliminary process flow diagram for the final assembly process



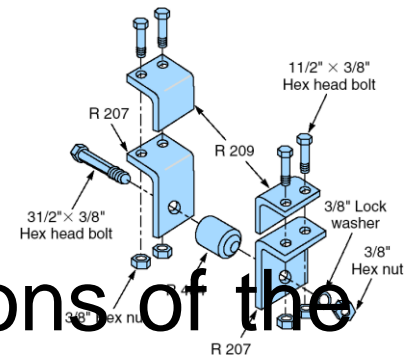
DETAIL DESIGN

Product Development Process



Detail design

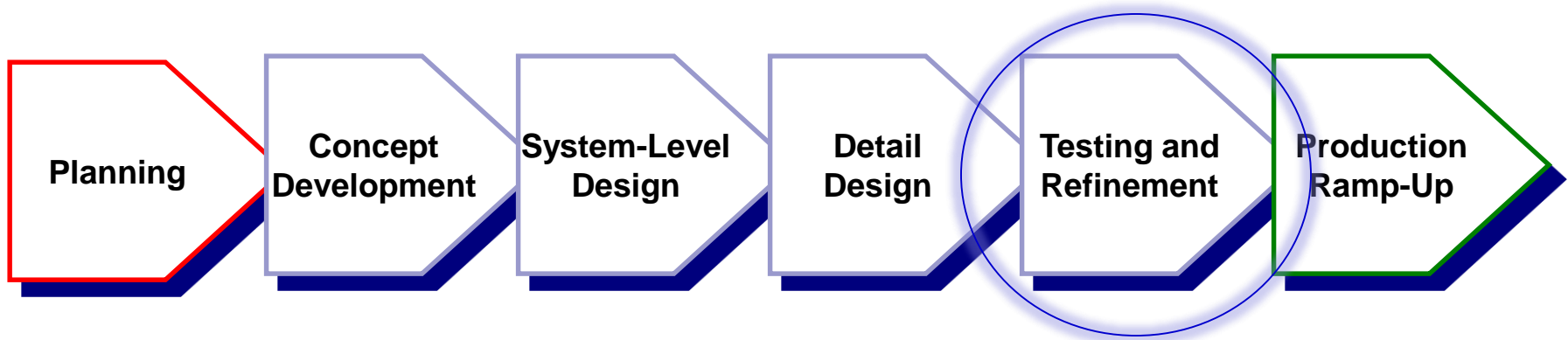
- Includes the complete specifications of the geometry, materials, and tolerance of all of the unique parts in the product
- The output of this phase is the control documentation for the product – the drawings or computer files describing the geometry of parts and tooling, the specifications of the purchased parts, and the process plans for the fabrication and assembly





TESTING AND REFINEMENT

Product Development Process





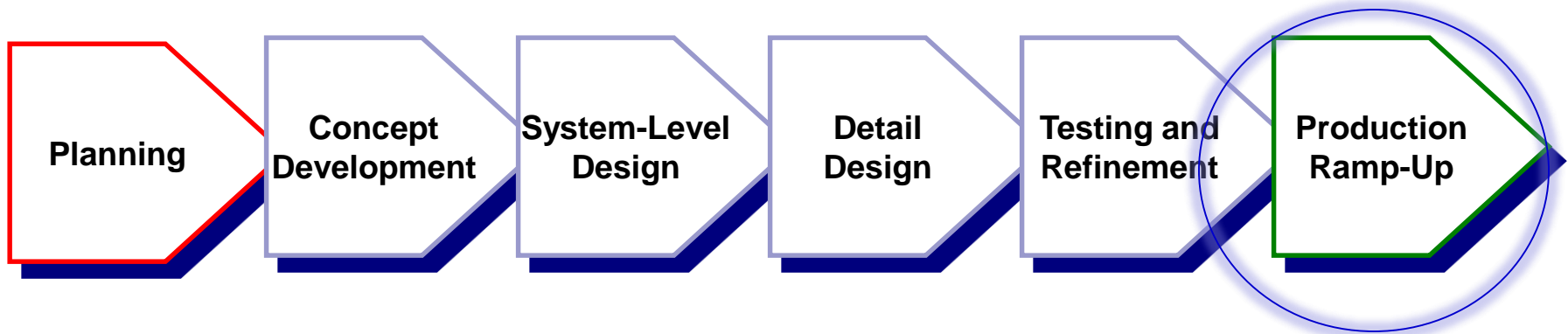
Testing and Refinement

- Involves the construction and evaluation of multiple preproduction versions of the products
- Prototypes



PRODUCTION RAMP-UP

Product Development Process





Production Ramp-up

- In this phase, the product is made using the intended production system.
- The purpose of the ramp-up is to train the work force and to work out any remaining problems in the production process
- Products produced during production ramp-up are sometimes supplied to preferred customers and are carefully evaluated to identify any remaining flaws



Adapting the Generic Product Development Process

- The process described is generic, and particular processes will differ in accordance with a firm's unique context.
- The generic process is most like the process in the market-pull situation : a firm begins product development with a market opportunity and uses whatever available technologies are required to satisfy the market needs



Adapting the Generic Product Development Process

- Technology-Push Products : begin with proprietary technology and look for an appropriate market in which to apply this technology



Type of Products

- Platform products
- Process-intensive Products
- Customized Products
- High-Risk Products
- Quick-Build Products
- Complex Systems