

Every organization employs a process that is different from that of every other organization; in fact, the same organization may follow different processes for different product groups.

Our generic product development process consists of six phases, as illustrated in Exhibit 3.1. The process begins with a planning phase, which is the link to advanced research and technology development activities. The output of the planning phase is the project's mission statement, which is the input required to begin the concept development phase and serves as a guide to the development team. The conclusion of the product development process is the product launch, at which time the product becomes available for purchase in the marketplace. Exhibit 3.1 identifies the key activities and responsibilities of the different functions of the firm during each development phase. Because of their continuous involvement in the process, we articulate the roles of marketing, design, and manufacturing. Representatives from other functions, such as research, finance, field service, and sales, also play key roles at points in the process.

Exhibit 3.1

The Generic Product Development Process. Six phases are shown, including the tasks and responsibilities of the key functions of the organization for each phase.

Phase 0: Planning	Phase 1: Concept Development	Phase 2: System-Level Design	Phase 3: Detail Design	Phase 4: Testing and Refinement	Phase 5: Production Ramp-Up
Marketing					
<ul style="list-style-type: none"> • Articulate market opportunity. • Define market segments. 	<ul style="list-style-type: none"> • Collect customer needs. • Identify lead users. • Identify competitive products. 	<ul style="list-style-type: none"> • Develop plan for product options and extended product family. • Set target sales price point(s). 	<ul style="list-style-type: none"> • Develop marketing plan. 	<ul style="list-style-type: none"> • Develop promotion and launch materials. • Facilitate field testing. 	<ul style="list-style-type: none"> • Place early production with key customers.
Design					
<ul style="list-style-type: none"> • Consider product platform and architecture. • Assess new technologies. 	<ul style="list-style-type: none"> • Investigate feasibility of product concepts. • Develop industrial design concepts. • Build and test experimental prototypes. 	<ul style="list-style-type: none"> • Generate alternative product architectures. • Define major subsystems and interfaces. • Refine industrial design. 	<ul style="list-style-type: none"> • Define part geometry. • Choose materials. • Assign tolerances. • Complete industrial design control documentation. 	<ul style="list-style-type: none"> • Test performance, life, and reliability. • Obtain regulatory approvals. • Implement design changes. 	<ul style="list-style-type: none"> • Evaluate early production output.
Manufacturing					
<ul style="list-style-type: none"> • Identify production constraints. • Set supply chain strategy. 	<ul style="list-style-type: none"> • Estimate manufacturing cost. • Assess production feasibility. 	<ul style="list-style-type: none"> • Identify suppliers for key components. • Perform make–buy analysis. • Define final assembly scheme. • Set target costs. 	<ul style="list-style-type: none"> • Define piece-part production processes. • Design tooling. • Define quality assurance processes. • Begin procurement of long-lead tooling. 	<ul style="list-style-type: none"> • Facilitate supplier ramp-up. • Refine fabrication and assembly processes. • Train workforce. • Refine quality assurance processes. 	<ul style="list-style-type: none"> • Begin operation of entire production system.
Other Functions					
<ul style="list-style-type: none"> • Research: Demonstrate available technologies. • Finance: Provide planning goals. • General Management: Allocate project resources. 	<ul style="list-style-type: none"> • Finance: Facilitate economic analysis. • Legal: Investigate patent issues. 	<ul style="list-style-type: none"> • Finance: Facilitate make–buy analysis. • Service: Identify service issues. 		<ul style="list-style-type: none"> • Sales: Develop sales plan. 	