THE FRAMEWORK FOR PROCESS IMPROVEMENT

Experience shows that benchmarking’s potential to drive dramatic improvement lies squarely in making out-of-the-box comparisons and searching for insights not typically found within intra-industry paradigms. To enable this type of beneficial benchmarking, the APQC Process Classification Framework℠ (PCF) serves as a high-level, industry-neutral enterprise model that allows organizations to see their activities from a cross-industry process viewpoint.

Originally created in 1992 by APQC and a group of members, the framework has experienced more than a decade of creative use by hundreds of organizations worldwide. The PCF is supported by APQC’s Open Standards Benchmarking research and an advisory council of global industry leaders. The PCF will be continuously enhanced as APQC’s Open Standards Benchmarking team further develops definitions, processes, and measures related to process improvement. Please visit APQC’s Web site periodically for updates. The PCF is available for organizations of all industries and sizes at no charge by visiting www.apqc.org/pcf.

The PCF enables organizations to understand their inner workings from a horizontal process viewpoint, rather than a vertical functional viewpoint. The PCF does not list all processes within a specific organization, and every process listed in the framework is not present in every organization.

HISTORY

The Process Classification Framework was originally envisioned as a taxonomy of business processes. The initial design involved more than 80 organizations with a strong interest in advancing the use of benchmarking in the United States and worldwide. Since its inception, the PCF has been updated a number of times to reflect changes in the way organizations do business.

In response to feedback from users of the PCF, APQC engaged practitioners, consultants, and academics to develop definitions based on real-world experience with the processes. That collaborative effort resulted in this document: a listing of processes with definitions and selected key performance indicators. The definitions contained in this document are to be considered in conjunction with the PCF. The content in this document will be updated according to research performed by APQC and subsequent updates to the PCF. This document was created using PCF version 5.1.0.
2.0 Design and Develop Products and Services Definitions and Key Measures

<table>
<thead>
<tr>
<th>TABLE OF CONTENTS</th>
</tr>
</thead>
<tbody>
<tr>
<td>2.1 Manage product and service portfolio _________ 3</td>
</tr>
<tr>
<td>Key performance indicators for this process group typically include_________________________ 3</td>
</tr>
<tr>
<td>2.1.1 Evaluate performance of existing products/services against market opportunities _______ 3</td>
</tr>
<tr>
<td>2.1.2 Define product/service development requirements _________________________________ 3</td>
</tr>
<tr>
<td>2.1.3 Perform discovery research _______________ 4</td>
</tr>
<tr>
<td>2.1.4 Confirm alignment of product/service concepts with business strategy _____________ 4</td>
</tr>
<tr>
<td>2.1.5 Manage product and service life cycle ______ 4</td>
</tr>
<tr>
<td>2.2 Develop products and services____________________ 5</td>
</tr>
<tr>
<td>Key performance indicators for this process group typically include_________________________ 5</td>
</tr>
<tr>
<td>2.2.1 Design, build, and evaluate products and services_______________________________ 5</td>
</tr>
<tr>
<td>2.2.2 Test market for new or revised products and services____________________________ 6</td>
</tr>
<tr>
<td>2.2.3 Prepare for production _____________________ 6</td>
</tr>
</tbody>
</table>

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Please use the following text when reusing the PCF in external print or electronic content.

The PCF was developed by APQC and member companies as an open standard to facilitate improvement through process management and benchmarking regardless of industry, size, or geography. The PCF organizes operating and management processes into 12 enterprise-level categories, including process groups and over 1,500 processes and associated activities. The PCF and its associated measures and benchmarking surveys are available for download and completion at no charge at www.apqc.org.

About APQC
For over 30 years, APQC has been on the leading edge of improving performance and fostering innovation around the world. APQC works with organizations across all industries to find practical, cost-effective solutions to drive productivity and quality improvement. We are a member-based nonprofit currently serving more than 500 organizations in all sectors of business, education, and government.
This process group encompasses all processes associated with product and service portfolio management, including the analysis of the current portfolio compared to market opportunities and the definition of requirements for new/evolved products and services using that analysis. This group also includes activities related to the alignment of new additions to the portfolio with corporate business strategy as well as the management of the product or service lifecycle. Preliminary research and development falls in this group, under 2.1.3 Perform discovery research.

**Key performance indicators for this process group typically include:**

- Market segment share growth
- Revenue growth
- Quality
- Risk
- Average cycle time
- Break even time
- Net present value of the portfolio
- Return on investment
- Type of innovation
- Technical skill development
- Time to pass stage gates
- Cost reduction
- Number of patents and publications

Additionally, APQC’s Open Standards Benchmarking emphasizes measures such as:

- Total cost of the process *Generate new product/service ideas* per $1,000 revenue
- Number of FTEs for the process *Generate new product/service ideas* per $1 billion revenue

### 2.1.1 Evaluate performance of existing products/services against market opportunities

The *Evaluate performance of existing products/services against market opportunities* process is used to identify gaps between existing product/service capabilities or performance levels and the current market demand, available technologies, and customer requirements. This process culminates in the decision of whether or not to proceed with investments in the development of new deliverables. Input gathered from customers through exercises such as focus groups assess marketplace need. In addition, input can be gathered from internal or third-party service organizations to support the product/service evaluation.

**Process Insight**

Although the marketplace may look for new technologies or techniques to enhance existing products and services, customers may not be willing to pay more for them. Accordingly, remember that perfection can be the enemy of good enough. Find out exactly what customers are willing to pay for, and ensure that efforts do not exceed the parameters of the development business case. This is especially important for global products where cost and availability issues may be more apparent.

### 2.1.2 Define product/service development requirements

The *Define product/service development requirements* process encompasses the identification and capture of new product/service requirements or potential improvements to current products/services. This process entails collaboration with members of the supply chain to ensure the feasibility of what is being defined in the requirements. For example, a product with manufacturing requirements that supply chain cannot currently fulfill requires a corporate decision to either upgrade manufacturing capabilities or abandon the new product. Enterprise-level effects and needs must be considered.

**Process Insight**

Depending on the nature of the final product or service, these requirements are often defined as a set of abilities, such as availability or reliability, that influence product development decisions.
### 2.1.3 Perform discovery research

The *perform discovery research* process encompasses those tasks and decisions associated with early-stage research and development—when product/service assumptions are greater than knowledge. Based on the gap between current product/service characteristics and new/changing requirements (from the marketplace, customers, or other business forces), organizations use this process to identify and develop new technologies in support of a new product. This process also includes an assessment of how feasible it is to incorporate those new or potential technologies into products and services. This process guides the funding and documentation of preliminary research and development projects and ensures that any findings (related to feasibility of technology or other recommendations) carry over to stage-gate processes that drive overall product/service development.

**Process Insight**

Consider the ramifications of being too “bleeding-edge” (as opposed to being on the leading or cutting edge) with new products. Key stakeholders in the supply chain or marketplace may not be ready to adopt the latest and greatest technologies, increasing the risk that the product or service will not succeed or be adopted.

### 2.1.4 Confirm alignment of product/service concepts with business strategy

Having evaluated the market needs and specified the requirements for new product or services, the *confirm alignment of product/service concepts with business strategy* process is a reality check prior to significant investment by the organization. It ensures that the new product/service concepts are in line with overall business strategy. This process plans and develops the cost, quality, and risk targets for the new products/services. This process can also be used in the prioritization and timing of development activities if there are a number of concepts vying for funding or other scarce resources.

**Process Insight**

This process is most useful when the business strategy is current. If the strategy is outdated, this process may trigger a review of the corporate business direction and drivers.

### 2.1.5 Manage product and service life cycle

The *manage product and service life cycle* process describes how new products and services are conceived, introduced to the market, supported, and retired. This process also encompasses how new product performance in the marketplace is monitored and continuously improved.

**Process Insight**

Introduction of the new product/service may be timed to coincide with key marketing opportunities. Products and services should be retired when their marketplace or cost effectiveness begins to decline below a predetermined threshold. Once a product or service has reached marketplace maturity, its performance indicators should be continuously refined.
2.2 Develop products and services

This process group relates to the design, development, and in-service configuration control of products and services. It encompasses traditional design, build, and evaluation processes; configuration and change management; manufacturing and production process planning; final product validation and verification; as well as data management, control, and exchange inter- and intra-enterprise. This process is where most of the product or service risk is identified, controlled, and mitigated.

**Key performance indicators for this process group typically include:**

- Organizational effectiveness
- Part/Sub-assembly/Assembly/System development cycle time
- Engineering person hours
- Quality
- Risk
- Average cycle time
- Time to pass stage gates
- Cost reduction
- Number of patents and publications
- Data exchange cycle time
- Engineering change resolution

**Additionally, APQC’s Open Standards Benchmarking emphasizes measures such as:**

- Number of concepts (new products/services OR existing product/service improvements and extensions) per $1,000 revenue
- Percentage of projects (new products/services OR existing product/service improvements and extensions) launched on time
- Percentage of projects (new products/services OR existing product/service improvements and extensions) launched on budget

**Process Insight**

Typically, this process group consumes approximately 60 percent of all costs associated with bringing a new product or service to market.

**2.2.1 Design, build, and evaluate products and services**

The *Design, build, and evaluate product and services* process describes the core engineering design and development of any new product/service introduction or existing product/service upgrade. The process includes planning the development of the product/service and assigning resources to deliver the plan. Building on the research and development efforts carried out earlier in the development lifecycle, these process activities further define the engineering intent based on customer specifications and input from marketplace gap analysis. Further detailed specifications may be developed as part of this process to ensure compliance to original requirements. This process can also include collaboration with customers to review progress and ensure compliance, with suppliers to stay current on any changes in requirements; and, where applicable, with regulatory bodies for product or service certification.

**Process Insight**

Cross-functional collaboration, in parallel with the pure design definition, will enable the capture and honing of manufacturing, tooling, production, quality, inspection, and in-service requirements. With the design underway, organizations may chose to create physical or virtual prototypes of the products to aid with compliance certification. They may also conduct customer acceptance testing to eliminate, as early as possible, any quality or reliability problems.
2.2.2 Test market for new or revised products and services

The process Test market for new or revised products and services is a more detailed iteration of the marketplace analysis that took place earlier in the product development lifecycle. The results from this in-depth analysis will help the organization finalize product/service characteristics and technical requirements and also identify any needed changes in the manufacturing and delivery processes that support market delivery.

**Process Insight**

To prepare a detailed market study that accounts for any changes in the global environment, the organization may want to conduct a series of interviews, workshops, and focus groups with potential and existing customers.

2.2.3 Prepare for production

In the Prepare for production process, the organization develops and tests delivery processes through a prototyping cycle to ensure optimal production time and alignment with cost targets. This process also ensures that the production/assembly/manufacturing lines are suitably equipped to meet the demands of the new product. If they are not, new material and equipment can be designed, ordered, delivered, and deployed. With the prototype process successfully tested and production or assembly rates realized, the full-scale production process or methodology may be installed and validated.

**Process Insight**

Often the Prepare for production process is a key target for lean initiatives to ensure operational and cost efficiency.