

Chapter 2

Characterisation of Capital Equipment

2.1 Overview of the Main Procurement Object Groups

To be able to classify capital equipment, we first present an overview of the goods to be procured in enterprises. According to Large (2009), five so-called main procurement object groups can be distinguished (Fig. 2.1):

- Production materials directly enter the goods to be produced and, depending on the degree of the manufacturing progress, they can be subdivided into raw materials, semi-finished and finished products. Another classification characteristic of production materials is their specificity. The following types of specificity can be distinguished:
- Buyer-specific production materials are individually developed and produced for the products of a buyer (e.g. drawing parts).
- Supplier-specific production materials can only be obtained from a specific supplier in a specified form, namely the buyer knows certain technical specifications but does not know any product information beyond this (e.g. catalogue parts).
- Relations-specific production materials are specified jointly by a buyer and a supplier and generally they can only be produced by this supplier (e.g. machine tools).
- Unspecific production materials are parts manufactured according to industry standards by a large number of suppliers and procured by a large number of buyers (e.g. standard screws).
- Consumables are necessary for carrying out value-added processes but do not enter the product to be produced. Examples of consumables are production resources, repair and maintenance materials, tangible energy carriers and other consumables, such as cleaning and office materials.
- Capital equipment as the focus of our publication can be defined as the tangible assets of a company's fixed assets.¹ It can also be classified based on the degree of production relevance.

¹ Cf. Large (2009, p. 12). Section 2.2 provides a detailed discussion of this term.

Main Procurement Object Groups	Structuring Main Procurement Object Groups				Explanation
Production material	Unspecific production material	Supplier-specific production material	Buyer-specific production material	Relations-specific production material	Enter into the goods to be produced (raw materials, semi-finished products, and finished products)
Consumables	Production resources	Repair and maintenance material	Tangible energy carriers	Other consumables	Necessary for carrying out the value added processes but do not enter into the product (e.g. coolants and lubricants)
Capital equipment	Production-specific capital equipment	Not production-specific capital equipment			Tangible assets of fixed assets
Services	Production-specific services	Not production-specific services			Service is provided by a person and cannot be stored; production and consumption take place simultaneously
Trade goods					Goods which are procured and resold without any processing steps having been performed

Fig. 2.1 Overview of the main procurement object groups. (Cf. Large 2009, p. 8)

- Services are provided by a natural or legal entity to meet a demand (e.g. project engineering services). They can be structured according to the degree of production relevance (e.g. maintenance/repair, logistics, facilities).
- Trade goods are procured and resold without any processing steps having been performed (e.g. tools for a machine).²

Capital equipment thus presents one of the five main procurement object groups and, accordingly, has a prominent place within the goods to be procured by enterprises.

2.2 Definition of Capital Equipment

Although the term capital equipment is widespread in theory and practice, no standard definition is available. A few relevant definitions are provided below to illustrate this situation:

² Cf. Large (2009, p. 8 et seq.); Töpfer (2007, p. 725 et seq.).

- Engelhardt and Günter (1981): “Capital equipment presents services which are provided by organisations (non-consumers) to either produce—with their application (use or consumption)—other goods to meet third-party demand or resell them, unchanged, to other organisations which will provide this service.”³
- Backhaus (1982): “Capital equipment presents services which are procured by organisations to provide other services not comprising the distribution to end consumers.”⁴
- Gabler Wirtschafts-Lexikon (2011):⁵
 - In a broader sense: “Services which are procured by non-consumers directly or indirectly for the provision of services to meet third-party demands (private and public enterprises) or, respectively, for collectively meeting own demands (public authorities). Procurement is generally connected with organisational buying/selling interactions.”
 - “Also narrower sense of the term, e.g. capital equipment as commercial durables (plants, machinery).”
- Large (2009): Capital equipment presents the tangible assets of fixed assets; thus the tangible items which are to permanently serve the business process.⁶
- Goede (2003): “Goods with a long useful life (e.g. machinery, factories, raw materials), which are not required in and of themselves but which are necessary for the manufacture of consumer goods and other capital equipment. They are not consumed in one accounting period and generally are depreciated over a number of years (also called: equipment goods, industrial goods, investment goods, producer goods).”⁷
- Steiner (2004): “Durable means of production are called capital equipment. During its useful life, it gives off a flow of different usages (e.g. plant equipment). In contrast, non-durable means of production are converted or depleted (e.g. raw materials, auxiliaries, and resources or consumables). For consumer goods as well, the distinction can be made between durable (commodity goods) and non-durable (consumption goods), usually statistically classified according to their life of either more than one year or less than one year.”⁸
- Swan et al. (2002): “Capital goods are assets used to support business operations. Examples include production lines for manufacturing, testing equipment used by a construction company. Capital goods are typically high-cost, infrequent purchases that require good up-front decision-making to minimize long-term costs.”⁹

³ Engelhardt/Günter (1981, p. 24).

⁴ Backhaus (1982, p. 3).

⁵ Gabler Wirtschafts-Lexikon (2011).

⁶ Cf. Large (2009, p. 12).

⁷ Goede (2003, p. 1579 et seq.).

⁸ Steiner (2004, p. 337).

⁹ Swan et al. (2002, p. 795).

- Leenders et al. (2006): “Capital assets are long-term assets that are not bought or sold in the regular course of business, have an ongoing effect on the organisation’s operations, have an expected use of more than one year, involve large sums of money, and generally are depreciated. Assets may be tangible or intangible.”¹⁰

Owing to the great variety of different applications of the term, a definition is presented at this point that will be used as the basis for further statements in this publication. According to the authors, capital equipment presents tangible and intangible goods that are procured by organisations and that present the technical prerequisites for the production of goods and services. Characteristic of capital equipment is the permanence of use with the possible inclusion of services of provision, maintenance and repair; also characteristic is the high value of an individual object compared with the material used. This definition comprises, for example, plants, buildings, real estate property and patents but excludes special tools used only once, training courses or solar systems procured by private actors.

2.3 Classification of Capital Equipment

At this point, we introduce our own classification so that the multitude of capital equipment definitions can be classified. Capital equipment should be classified along the following dimensions:

- Production-related—not production-related: Is capital equipment directly used for the production of other goods or is it not tied directly into the production process?
- Simple—complex: Does the capital equipment concern individual parts or an entire plant or machine?
- Standardised—individual: Is the same capital equipment manufactured and/or procured repeatedly or is it explicitly developed and produced or purchased for a specific customer?
- Tangible—intangible: Can the capital equipment be physically/legally presented or is it of an intangible character?

Table 2.1 presents this classification on the basis of the dimensions shown and provides examples for every class. In the case of intangible goods, the difference between simple and complex components is inapplicable since they generally have no components.

¹⁰ Leenders et al. (2006, p. 423).

Table 2.1 Classification of capital equipment with examples provided

		Standardised		Individual	
		Tangible	Intangible	Tangible	Intangible
Production-related	Simple (individual part)	Electric motor for a CNC machine	Standard software for production planning	Special tool for production	Individual software for production planning
	Complex (complete plant or machine)	CNC machine		Individual production plant	
Not production-related	Simple (individual part)	Truck engine; desk	Standard software for distribution/sales	Art object	Individual software for distribution/sales
	Complex (component)	Truck, PC, printer		Multi-storey parking garage, engine test stand	

2.4 Macroeconomic Importance of Capital Equipment

The capital equipment industry is of immense importance worldwide. Yet, because of these divergent definitions by the appropriate industrial sectors, the indicated values considerably differ in parts. According to a study by Datamonitor, the current worldwide volume of the capital equipment industry comes to about € 474 billion.¹¹ However, this only includes the manufacture of machines and electrical systems. By contrast, the *Statistische Bundesamt* (German Federal Bureau of Statistics) indicates for Germany alone sales by capital equipment producers of about € 550 billion in 2010.¹² That is equivalent to approx. 13% of the total production value in Germany.¹³ Germany's capital equipment industry is highly export-oriented; thus, export sales amount to approx. 56% of total sales.¹⁴ Moreover, with a workforce of about 2,195,000 people working in about 7,500 businesses, the capital equipment industry is of considerable importance for the labour market in Germany.¹⁵

The mentioned calculations by the *Statistische Bundesamt* include the following industrial sectors:¹⁶

- Manufacture of steam boilers (without central heating furnaces)
- Manufacture of data processing equipment and peripheral devices
- Manufacture of devices and equipment in telecommunications
- Manufacture of measuring, control, navigational and similar instruments and devices; manufacture of clocks and watches

¹¹ Cf. Datamonitor (2010, p. 9).

¹² Cf. Statistisches Bundesamt (2011a).

¹³ Cf. Statistisches Bundesamt (2011b).

¹⁴ Cf. Statistisches Bundesamt (2011a).

¹⁵ Cf. Statistisches Bundesamt (2011a).

¹⁶ Cf. European Union (2007, p. 3).

- Manufacture of radiation and electrical therapy equipment and medical electrical equipment
- Engineering
- Manufacture of motor vehicles and motor vehicle parts
- Shipbuilding and boat building
- Rail vehicle construction
- Aircraft and spacecraft industry
- Manufacture of military combat vehicles
- Manufacture of weapons and ammunition
- Manufacture of medical and dental apparatuses and materials
- Repair and installation of machinery and equipment

The great diversity of these industrial sectors shows that capital equipment purchasing is concerned with a broad range of products.

Capital Equipment Purchasing

Optimizing the Total Cost of CapEx Sourcing

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2012, XII, 124 p., Hardcover

ISBN: 978-3-642-25736-0