

**Figure 3: Categorization of intangible values with the integration of the sustainability aspect**

Categories of intangibles	Economic value dimension in terms of the <i>shareholder approach</i>	Econ. value dimension in terms of the <i>stakeholder approach</i>	Ecological and social value dimension	Sustainability
	Innovation Capital			
	Human Capital			
	Customer Capital			
	Supplier Capital			
	Investor Capital			
	Process Capital			
	Location Capital			

### 3 INTANGIBLES IN THE CONTEXT OF MANAGEMENT CONTROL SYSTEMS

#### 3.1 GENERAL MANAGEMENT CONTROL SYSTEMS

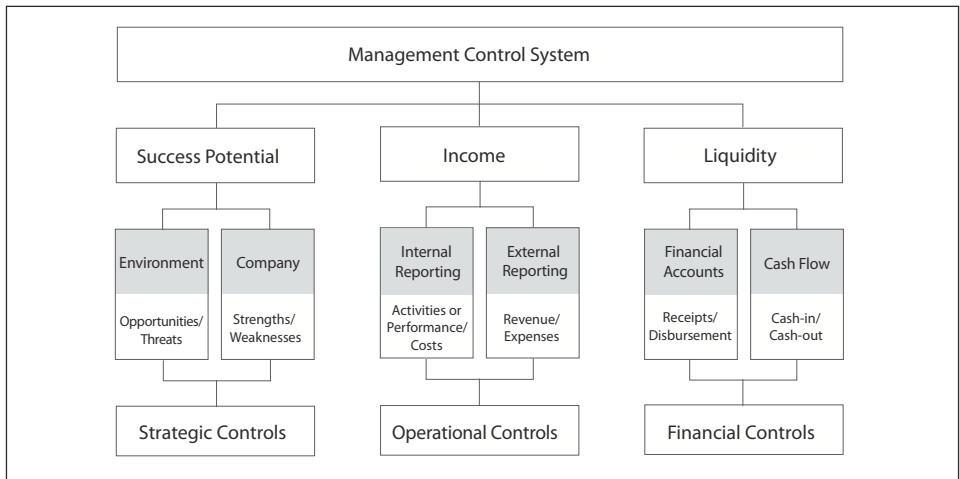
##### 3.1.1 TRADITIONAL VIEW OF MANAGEMENT CONTROL SYSTEMS

*Management control systems*<sup>6</sup> originated in the 15<sup>th</sup> century at the English royal court, where a “comptroller” was responsible for keeping records of the in- and outflows of cash and goods. The idea essentially took off and was continuously developed until the end of the 19<sup>th</sup> century, when the first companies started to employ staff especially for internal reporting and control (Jackson (1950, 17 et seq.)). In the 19<sup>th</sup> century management control consisted primary of instruments such as cost and activity accounting (Binder and Schäffer (2005, 605)). But this is not the case anymore. In the late 20<sup>th</sup> century a modern definition of management control systems emerged. It includes more than just the counting/calculation and monitoring of relevant financial values; it also comprises the control over strategic and operational objectives and the required company settings to achieve them (Coenenberg, Fischer, and Günther (2012, 33)).

6 In the following, we use the term “management control systems” as a synonym for other terms, such as management accounting or controlling that identify activities that are intended to provide management with useful information and instruments to make decisions within a company, and to plan and control corporate measures in such a way as to reach corporate objectives.

Figure 4 highlights that *operational* and *financial controls* are mainly concerned with a company's income and liquidity during a particular period of time. Safeguarding the economic efficiency of the processes of a company and its financial solvency is especially important, because both are regarded as the preconditions to successfully realize company objectives (Fischer, Möller, and Schultze (2012, 5)). Strategic controls deal with companies and their environments. These controls focus in depth on both the internal strengths and weaknesses of, and the external opportunities and threats to, a company. Thus, strategic controls aim at achieving company objectives, while operational management controls transform the strategic requirements into working tasks (Horváth (2011, 375); Coenberg, Fischer, and Günther (2012, 8 et seq.)).

**Figure 4: The levels and parameters of management control systems**



Source: adapted from Baum, Coenberg, and Günther (2007, 6)

Hence, management control systems are an essential element of *corporate governance*, the main purpose of which is to enable a company's management to make appropriate decisions that help the company to achieve its corporate objectives.

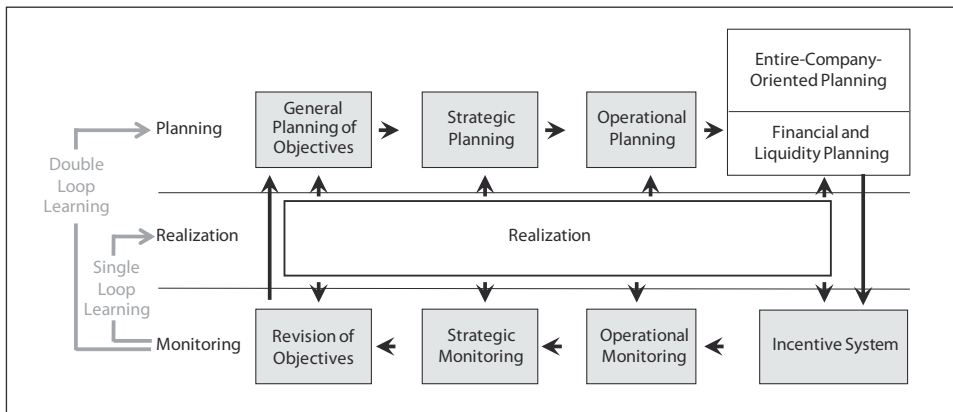
### 3.1.2 FUNCTIONS AND PROCESSES OF MANAGEMENT CONTROL SYSTEMS

According to the *cybernetic system theory* (Ulrich (1968, 104 et seq.)) a management control system encompasses three functions: Planning, realization and monitoring (these are illustrated in *figure 5*). Yet, management control, which continuously compares companies' actual and desired target-measures, is regarded as the main task, because it is essential to achieving the objectives defined by the top management of a company (Baum, Coenberg, and Günther (2007, 6 et seq.)).

For a management control system, to perform its main tasks successfully, *corporate objectives* (related to variables or indicators of success), which are predominantly set by companies' managers, are essential. Once management formulates these objectives, it then plans actions to meet them. Here, we differentiate two levels of planning. The first is *strategic planning*, which is oriented towards long-term goals. Strategic planning focuses on the best ways to fulfill a company's objectives by aligning them with the company's external opportunities and threats (*effectiveness*). The second is *operational planning*, which is oriented towards short-term optimizations such as more productive deployment of resources (*efficiency*) (Coenberg, Fischer, and Günther (2012, 37)).

The second main function of the management control system is *realization*. This function implements the actions that are indicated in the strategic and operational planning, while especially considering the influencing parameters of success (Coenberg, Fischer, and Günther (2012, 37)). These success factors can be driven either by external conditions, such as the impact of changing market conditions, or by internal aspects, such as the influence of a company's human resource management on the organization of responsibilities.

**Figure 5: The three main functions and process stages of the cybernetic management control system**



Source: Günther (1997, 69); wording is adapted from AK "Langfristige Unternehmensplanung" (1977, 2 et seq.)

After actions to achieve objectives have been applied, management must constantly check the accomplished results. This task is carried out by the third function of the management control system, *monitoring*. The monitoring applies a company's information system (that contains – apart from other information – various measurement figures) to evaluate if the strategic and operational plans have been successfully realized. The comparison of actual results with planned objectives (variables/indicators) is known as *single-loop learning*. If a company's objectives are modified accordingly, it is called *double loop learning* (Günther (1991, 50 et seq.); Hahn and Hungenberg (2001, 46); Horváth (2011, 94 et seq.)). The monitoring function also incorporates the design of incentive systems, since management uses these systems

to motivate managers and employees to reach the targeted outcomes (Fischer, Huber, and Sawczyn (2010, 228); Coenenberg, Fischer, and Günther (2012, 38 et seq.)).

### 3.1.3 MAJOR ATTRIBUTES OF OPERATIONAL AND STRATEGIC MANAGEMENT CONTROL SYSTEMS

Table 1 illustrates that strategic management control systems focus on a company's future-oriented course, which acknowledges its tangibles as well as intangibles (Fischer and Beckmann (2009, 25); Horváth (2011, 162 et seq.)). In contrast to the *operational management control systems*, which are company systems that are internally and financially oriented, the *strategic management control systems* also incorporate external, qualitative, and dynamic information as well as innovative activities/duties (Fischer, Möller, and Schultze (2012, 5 et seq.)). The main task of strategic management control systems concerning intangibles is to supply decision-useful information to management and to coordinate various intangibles-relevant subsystems of a company, including, among others, incentive systems. This focus can be attributed to the fact that such actions provide for going concern, and thus sustain a company's existence (adapted from Baum, Coenenberg, and Günther (2007, 9)).

**Table 1: Attributes of operational and strategic management control systems**

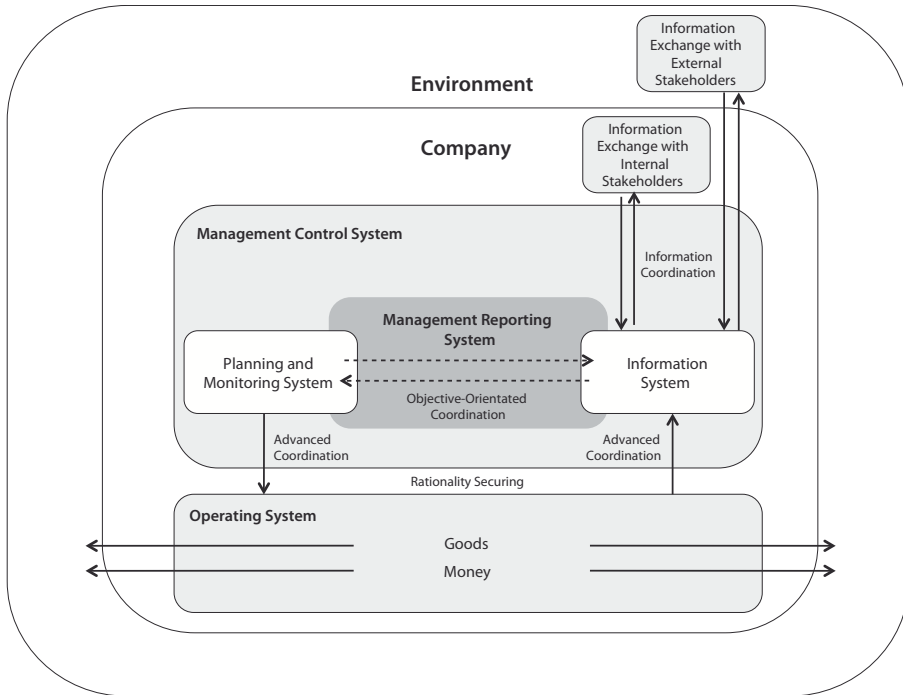
Attributes	Operational management control system	Strategic management control system
Objectives	<ul style="list-style-type: none"> <li>■ Profit of a period</li> <li>■ Liquidity</li> </ul>	<ul style="list-style-type: none"> <li>■ Going concern</li> <li>■ Success potentials, especially intangibles and sustainability</li> <li>■ Corporate value</li> </ul>
Subsystem	<ul style="list-style-type: none"> <li>■ Financial reports/internal reports</li> <li>■ Finance status and cash flow statements</li> </ul>	<ul style="list-style-type: none"> <li>■ Environment</li> <li>■ Organization</li> </ul>
Reference time	<ul style="list-style-type: none"> <li>■ Present</li> <li>■ Near future</li> <li>■ Reference date</li> </ul>	Near and remote future
Predominant orientation	Internal	External
Framework of requirements	Stable environment	Complex, dynamic and discontinued environment
Reliability of information	Largely reliable information	Weak signals, soft facts
Kind of information	Quantitative/ Monetary	Qualitative
Kind of duties	Routine activities	Innovative activities

Source: adapted from Günther (1991, 38)

### 3.1.4 THE ELEMENTS OF A MANAGEMENT CONTROL SYSTEM

The basic purpose of a management control system is to support a company in running its organization. This purpose requires management to fully align the system with the individual processes of a company's management and performance systems (Fischer, Möller, and Schultze (2012, 82 et seq.)).

**Figure 6: The management control system as an element of a company's organization**



Source: adapted from Horváth (2011, 96)

Figure 6 shows that a corporate *management control system* involves three principal elements. The first is the *planning and monitoring system*. This system ensures the realization of objectives and their evaluation based on real results (see above chapter 3.1.2). To effectively and efficiently do so, the planning and monitoring system requires inputs from a second element, the *information system* that exchanges information with internal stakeholders such as employees, and external stakeholders such as suppliers, customers, investors, and creditors. The information system supplies corporate management with the relevant company- and environment-related data that helps it conducting its main management control tasks. The third principal element is the *management reporting system*, which connects and assembles the other two management system elements. This

system prepares the data received from the information system and uses it for planning, realization, and monitoring. Thus, it executes an *objective-oriented coordination function* (*objective-oriented concept*) (Horváth (2011, 62 et seq., 95 et seq., and 295 et seq.)). Ultimately, this framework provides a company with a complete decision support system. For example, if the company's objective is to enlarge its long-term value, then by using all the available relevant information, the objective-oriented concept aligns all decisions that are aimed to enlarge the likelihood of an achieved value maximization (Alter (2011, 14); Horváth (2011, 100 and 124)). These decisions may also relate to the company's input materials, production process, or products, i.e., the entire value chain, either at the forecasting, operationalizing, or follow-up stage.

In the forefront of the diagram of *figure 6* is the *operating system*, which focuses on the successful performance of both internal and external activities, such as the production of goods, the provision of services, or both, via the rationality securing actions (Fischer, Huber, and Sawczyn (2010, 223 et seq.)). The operating system also supplies and exchanges information with the management control system. Thus, the operating system controls the information that is transferred to the management control system and consequently, it has a major influence on the *objective-oriented coordination function*.

To make well-founded decisions, a company's internal and external stakeholders, i.e., its *information receivers*, require relevant information about the company. The identification, collection, and preparation of, as well as the access to, such decision-useful information is the central task of the management control system as an information-oriented concept (Berthel (1975, 67); Thommen and Achleitner (2009, 558); Weber and Schäffer (2011, 20 et seq. and 43)). The information supply focuses on two central efforts: information acquisition (Berthel (1975, 55 et seq.); Shannon and Weaver (1976, 16)); and information processing and usage (Kuß and Tomczak (2000, 25 et seq.); Nieschlag, Dichtl, and Hörschgen (2002, 600 et seq.)). To achieve sustainable value growth, the information-oriented concept is responsible for obtaining, assembling, and providing all information that is required to best support the company's value-maximizing decisions. Information that advocates decisions could, for instance, be collected from customers concerning their product preferences, suppliers about input prices, or employees relating to continuous improvement suggestions. The company may also implement a weekly or monthly reporting system, requiring each plant and/or department to provide, for example, operations-related data such as bid, order, production, backlog, inventory, or shipment variables, sales revenues, costs, contribution, and return on assets that can be aggregated into a decision-supporting corporate performance review (Anthony and Govindarajan (2007, 26)).

The interweaving of the management control system and the operating system, as well as the interconnectedness of their individual elements, is also a central task of management control (Müller (1974, 687); Horváth (1978, 197); Horváth (2011, 98 et seq.); Coenberg, Fischer, and Günther (2012, 39)). Although the coordination between the information supply and the planning and monitoring is especially important to the objective-oriented concept, coordination is also required for other subsidiary elements of the management control system, for example, the functional and process-driven aspects.

Consequently, an advanced concept of the management control system, the *coordination-orientated concept*, emerges. This concept comprises two important components: a *system development* component that focuses on the emergence of coordination instruments and on a catalog of rules to effectively handle the coordination function (Schneider (1997, 314 et seq.)); and a *system interconnection* component that aligns all coordination activities (Tuominen (1969, 208 et seq.); Uphus (1972, 41); Horváth (2011, 104 et seq.)). For example, to improve the company value, the coordination-oriented concept may assume the responsibility for implementing organizational structures such as a new information technology (IT)-based documentation system (Horváth (2011, 109 et seq.)) that can collect and combine the various inputs from the diverse elements of a company's organization. For instance, such a data system can contribute to the future company value by identifying, e.g., potential issues at an early stage (Horváth (2011, 120 et seq.)) or by creating organizational harmony due to a reconciliation between internal and external reporting (Anthony and Govindarajan (2007, 5)). Furthermore, the coordination-oriented concept should motivate employees to achieve the desired level of performance, which is one of the objectives of the operating system (Weber and Schäffer (2011, 25)), and to make improvement suggestions, which is one of the objectives of the internal knowledge exchange, while providing the appropriate measures for evaluation that are necessary for monitoring (Fischer, Möller, and Schultze (2012)).

A more recent concept of management control systems, the *rationality-securing concept*, aims at minimizing rationality deficiencies that relate to human actions either in organizational or human resource management systems. Such shortfalls arise especially from limited competencies, i.e., inadequate individual resources and/or capabilities to serve a predefined purpose, and the actions of individual participants in accordance with their aims and demands, i.e., an individual's intent and goal setting. To ensure efficiency and effectiveness in an organization, the rationality-securing management control function devotes effort to, for instance, recognizing issues and abridging or even eliminating them before they cause negative impacts. A good example of a rationality-securing activity that supports the value-maximization goal is the implementation of an incentive system that aligns the goals of managers with the high sustainable value objectives of an organization. Another potential rationality-securing action is promoting the awareness and the distinct separation, combination, and/or balance of ethics and economic results, because if a company engages in morally wrong behavior, doing so can diminish profit maximization potentials via, for example, bad publicity. Thus, instruments such as behavioral standards for a management or effective communications on the corporate culture can contribute positively to improved rationality (Weber and Schäffer (2011, 35 et seq.)).

Hence, we can conclude that a management control system is an important financially, operationally, and strategically objective oriented, subelement of a company's organization (Fischer, Huber, and Sawzycyn (2010, 224); Küpper (2008, 28 et seq.)), and the mainstay of corporate governance. Management control systems support management by collecting, evaluating, and applying information that is relevant for various units of a company's structure, as well as for specific or regular corporate processes (Fischer and Beckmann (2009, 22); Coenenberg, Fischer, and Günther (2012, 34 et seq.)). Therefore, we can argue that management control systems are an essential prerequisite to meeting

corporate objectives and the expectations of the people who determine these objectives. The overall importance of an effective and efficient management control system is consequently independent of the applied management approach (whether it is the shareholder or the stakeholder approach; see chapter 2.1).

## 3.2 INTANGIBLES IN THE MANAGEMENT CONTROL SYSTEM

### 3.2.1 DIFFERENT LAYERS OF MANAGEMENT CONTROL SYSTEMS OF INTANGIBLES

The *principal tasks of management control systems of intangibles* are the planning, realization, and monitoring of intangibles and their related activities. In particular monitoring, i.e., the evaluation of outcomes that support corporate objectives and the target revision related to intangibles, is a central concern of the management control system. Yet, to accurately perform these tasks, management must have access to decision-relevant or supporting information about intangibles (according to the concept of an *information-orientated management control system*). The *operational management control system of intangibles* supplies the information necessary to monitor the *inventories of intangibles*. Such inventories include both the company's current stock of intangibles and changes to the stock compared to those at predefined reference dates (Fischer and Becker (2005, 125)). For example, *employees' satisfaction* may indicate the level of employer branding, while high *customer satisfaction* can be used to communicate an admirable brand reputation. Yet, in this context those receiving the information often adjust it according to their specific demands (Fischer, Huber, and Sawczyn (2010, 228 et seq.)). Consequently, it is important to evaluate the quality of information on intangibles against the background of the information suppliers and receivers, and the communication media. In addition, management should consider both the general quality and the extent of information (Shannon and Weaver (1976, 16); Fischer and Beckmann (2009, 23)). The *strategic management control system of intangibles* makes intensive use of intangibles-oriented information to deal with continuous improvements. For example, these improvements might address the systematic success-potential-oriented planning, development, use, coordination, and monitoring of intangibles (*management control via information use*). Yet again, to accomplish these improvements, appropriate information on intangibles is indispensable.

Furthermore, a system that interconnects coordination must also be in place to implement intangibles-specific management control instruments and/or systems. In addition, rules are required in the management control system to efficiently handle intangibles. Such a catalogue should primarily deal with three aspects. First is the *rules of communication* that govern the knowledge exchange between information suppliers and receivers. This aspect is especially necessary during the planning and implementation of an intangibles-oriented strategy. Second, management must put in place *principles of intangibles-driven decision making* for equal authorization levels and for differing hierarchies. Third, there must also be *guidelines* for the management control of *intangibles-based decision implementations*, which should be followed later by whatever adjustments are appropriate (Tuominen (1969, 208 et seq.); Uphus (1972, 41); Schneider (1997, 314 et seq.); Horváth (2011, 106 et seq.)).



The rationality-securing concept addresses human perceptions of intangibles-related issues and their influence on both the forecasting potential of intangibles and the evaluation of intangibles-based decision alternatives (Weber and Schäffer (2011, 35 et seq.)). Hence, the concept of rationality-securing management control systems strengthens a company, for example, by aligning intangibles-driven objectives with their corresponding incentive systems. Thus, managers are rewarded in line with improved employee satisfaction or increased firm reputation.

Moreover, the success factors that influence intangibles, and thus positively or negatively impact long-lasting future success, should be reflected by the management control system (Ricardis (ed.) (2006, 126)). For instance, the influencing factor of *human capital* (such as *competencies of employees*) determines the way in which the workforce is able to perform its tasks in the long run. We can also say that *internal quality specifications* typically have a positive impact on customer satisfaction and company reputation. Consequently, it is important to evaluate such significant success-influencing factors by using *key performance indicators* that quantify the impact of intangibles on future corporate performance (e.g., Deutsche Gesellschaft für Personalführung e.V. (ed.) (2005, 11)). Indicators are also especially useful for capturing both the internal strengths and weaknesses and the external opportunities and threats of individual intangibles, which are critical for success. As a result, the importance of individual intangibles can also be determined (BMW i (ed.) (2007, 11 and 25)).

### 3.2.2 KEY TASKS OF MANAGEMENT CONTROL OF INTANGIBLES

A management control system of intangibles depends not only on the available information and organizational implementation, but also on the human actions related to intangibles. Further, it is important to also consider the company's external environment and the integration of stakeholders' objectives in successfully performing management reporting of intangibles (Baum, Coenenberg, and Günther (2007, 259)).

The *key tasks of management control of intangibles* that we explain further in the following are (adapted from Bischof (2008) and Schwaiger et. al. (2010, 89 et seq.))

- a) *Identification and planning of intangibles;*
  - b) *Measurement and valuation of intangibles;*
  - c) *Evaluation and monitoring;*
  - d) *System development, system interconnection, and advanced coordination.*
- a) *Identification and planning of intangibles*

This key task includes the determination of strategic and operational objectives for existing as well as future needed or required intangibles. The objective of identifying both the importance and the values of intangibles is part of *strategic planning*, the goal of which is to optimize future corporate actions relating to intangibles. The *implementation* of the strategy, i.e., the development and extension of intangibles based on objective-oriented guidance, belongs to the *operation planning* and the *realization* function of a management

control system (see chapter 3.1.2). The *integration* of newly developed or extended intangibles into existing resources and capabilities, their use within the entire corporate system, and the *transfer* of recently gained leverage are also elements of *realization*. However, we should consider that realization not only bases its actions on the parameters required by the strategic and operational planning, it also incorporates the success factors of intangibles that influence the realization of objectives.

*b) Measurement and valuation of intangibles*

This key task of the management control of intangibles comprises the maintenance of an inventory that documents the specifications of intangibles while especially noting the success factors of intangibles, i.e., central drivers. It also embraces the identification of industry- and company-specific indicators such as nonfinancial and key performance indicators (Deutsche Gesellschaft für Personalführung e.V. (2005, 11)) and the *development* and application of intangibles-specific methods of measurement and valuation.

*c) Evaluation and monitoring*

Management must, based on indicators, analyze and interpret the management control instruments and the results of implemented intangibles-oriented actions. Doing so enables management to identify the *cause-and-effect relationships* and the impact of intangibles (in performing an ex-ante- and/or an ex-post-control) and learning loops.

To ensure that management reporting of intangibles leads to long-term success and an increase in corporate value, it is essential that there is a continuous ex ante *monitoring* before the individual actions are established, during their implementation, and thereafter. The *operation monitoring*, which collects information about the efficiency and economic feasibility of intangibles-oriented actions, must provide the management reporting of intangibles with inputs on the realized results. *Strategic monitoring* processes this data vis-à-vis the company's objectives. Additionally, this task must also investigate the reasons for or causes of the differences between the actual results and the planned objectives (single loop learning) and to revise objectives accordingly (double loop learning) (see chapter 3.1.2).

*d) System development, system interconnection, and advanced coordination*

To cover all of these tasks, it is essential to implement and maintain systems at various organizational levels that plan intangibles, perform related actions, and monitor the realization.

### 3.2.3 NECESSITY OF CONSIDERING INTANGIBLES IN MANAGEMENT CONTROL

As mentioned in chapter 2.1, the economic and cultural changes in our society have caused intangibles to have a dominant role in corporate success. It is now widely understood that intangibles drive both present and future corporate value. Therefore, to achieve the intended effectiveness of the reporting system and related corporate objectives, it is

necessary to incorporate intangibles in the design of corporate management reporting systems. Intangibles should be considered, generated, and/or sustained if a company is to succeed in the long run. The incorporation in management reporting of intangibles that are relevant for the company can provide decision-useful information. To make appropriate decisions, management needs to know the various impacts of intangibles on the corporate value. At the same time, management should also be able to assess the impact of its decisions on intangibles and consequences of those decisions on liquidity, profit and corporate value.

For example, in a consumer products company, the decision to extend the product line must consider the impact on liquidity (through the reduction of cash flow and liquid funds by the marketing campaign), on profit (i.e., the cost of the campaign compared to the potential additional income out of the line extension) and on shareholder value (the decrease or increase of the brand equity of the current brand). A pharmaceutical company that is investing in research and development to develop a new application field certainly needs to know what level of liquidity is needed for the new research stream, what the impact on annual net income might be (taking into account capitalizing or expensing R&D), and whether, based on a discounted cash flow (DCF) calculation, the net present value of this strategy is significantly positive.

This knowledge on the impacts of intangibles on corporate value is very often missing in corporate practice. One of the reasons is that managements tend to have a converged accounting system (a concept that is called “*harmonization of financial and managerial accounting*”) instead of having one system for external reporting and one for internal decision-making purposes. This concept of a converged accounting system is true for all types of companies, because it helps to reduce costs and the complexity of their reporting systems, and also enables management to see the corporate figures through the eyes of its investors. This phenomenon leads to a dominance of financial accounting, which is heavily regulated to achieve a sufficient level of objectivity, on management accounting. This dominance causes intangibles to be reflected in management reporting in much the same way as in financial accounting. Therefore, in accordance with financial accounting rules, acquired intangibles need to be recognized, but those that are self-generated are rarely recognized in financial or management reporting, apart from the fact that their related cash outflows are immediately expensed. The same is true for the valuation concepts of intangibles that are dominated by historical cost. This *restricted recognition of intangibles* might be justified for financial accounting purposes that require a high level of objectivity, reliability, and comparability of the information provided, due to the particular functions of financial reporting, but it is not at all helpful for the functions of management reporting of planning and monitoring (see above at chapter 3.1.4).

This unfavorable situation might be regarded as acceptable from a cost perspective because it keeps reporting costs down. However, this cost-based reasoning means that management is often unaware of the existence of intangibles or their impact on corporate success. To be better informed, management should install a management reporting system that gathers appropriate and relevant data *about the existence of intangibles and about their impacts*. This reporting system should go far beyond the data that is required to be collected for financial

reporting purposes. Since data gathering is costly, management must weigh the costs and benefits and consider which quantity and quality of information on intangibles can be justified by the efficiency of the reporting system.

Management and other users must consider whether the benefit of the additional information on intangibles exceeds the cost of data collection and processing. For example, management might ask whether the benefit of the information obtained on customer satisfaction and its causes is great enough to justify a customer survey and additional market research, or whether it might be more fruitful to explore the usability of existing patents and expertise in other applications, companies, or industries. If so, then are the costs of the analysis higher than the potential additional license income? These are the type of questions that have to be asked and answered when installing a management reporting system that considers intangibles. They reflect the *trade-off between efficiency* (and simplicity and communicability) *and reasonable management support for decision making about intangibles*. The costs of a more complex management control function must be compared with the benefits of better decision making and coordination. This *cost/benefit consideration* should be made in the light of the specific situation of every company and industry. This consideration cannot be generalized.

When making the *cost/benefit consideration*, management should be aware that the appraisal of the value-creating role of intangibles, and the attempt to measure it, is relevant not only for management control purposes but also for various different occasions such as *mergers and acquisitions* (ex ante, to identify and appraise the intangibles that might be acquired, and ex post, to allocate values to the acquired intangibles in the process of representing the business combination in the financial statements, e.g., according to IFRS 3; see WGARI (2009)), *impairment* of intangible assets recognized on the balance sheet (e.g., according to IAS 36), assessment of the adequacy of *transfer prices* of intangible assets for tax purposes, launches or re-launches or abandoning of *brands* or models (see, e.g., the business case of Henkel in chapter 6.1), and/or the determination of license rates etc. (for the occasions that require the consideration of intangibles in management decision making, see chapter 5.1). With an adequately installed management control system for intangibles, the management's decisions made for these types of occasions are more likely to be more effective and more efficient.

One way to keep the data collecting and processing costs on an acceptable level is to *restrict the reporting system to the major, most important, types of intangibles* for the company, which are usually influenced by the industry the company is in and its business model. So the *materiality decision* is important, and one that management must make when identifying intangibles and assessing their impacts on the corporate success (see chapter 5.3.4).

The following example, which is taken from actual corporate practice, demonstrates in a simplified way the *relevance of measuring and valuing intangibles* for managerial decision making (thus further developing the previous example presented in Günther (2001) and Günther (2009)).

*Example:*

A porcelain manufacturer in the high-end market, which has used elements of value-based management for some years, intends to grow its product line by expanding into a new business segment, “hotel dinnerware“. So far, the manufacturer has not served this business, since it has followed a strategy aimed exclusively at the luxury market. Thus, the company will add to the current business unit “luxury porcelain” the new business unit “hotel dinnerware“. The company plans to create an innovative design for the new product line and to build up a new production line for manufacturing. Due to the relative short-term market and technology cycles in this industry, the management expects the production line and the design to be outdated after five years. The following business plan was developed based on a two years preparation phase (years 1 and 2) and a succeeding five year market cycle considering different scenarios (with the simplifying assumption that all payments happen at the end of the specific year, values in €M) (table 2):

**Table 2: Business plan for the project “hotel dinnerware”**

Year	1	2	3	4	5	6	7
Operating cash flow before interests after taxes	-5	-30	+25	+35	+45	+40	+20
Investment in fixed assets		-30	-20	-5	-5	-5	0
Investment in working capital			-10	-10	-2	-2	0
= Free cash flow gross (before interests, after taxes)	-5	-60	-5	+20	+38	+33	+20

Considering cost of capital (weighted average cost of capital, WACC) of 10%, the value contribution of the new business unit as a net present value of all gross free cash flows following the entity approach for January 1<sup>st</sup>, year 01 is € 8.26M:

$$\begin{aligned}
 \text{Value contribution} &= \frac{-5}{1.1} + \frac{-60}{1.1^2} + \frac{-5}{1.1^3} + \frac{+20}{1.1^4} + \frac{+38}{1.1^5} + \frac{+33}{1.1^6} + \frac{+20}{1.1^7} \\
 &= € 8.26M > 0.
 \end{aligned}$$

Since the company expects that the technology and product design will be outdated in five years, management does not take into account a residual or terminal value at the end of the planning horizon. Management considers the existing fixed and current assets as worthless at the end of the planning horizon. As the value contribution is positive, the project is regarded as value creating and thus is promoted by management.

However, management should consider that the project starts with an additional invisible (i.e., not recognized) intangible asset. The new business unit is certainly profiting from the excellent brand name of the luxury porcelain, a name that has been built up over decades. Thus, the calculation implicitly assumes sustaining the existing value of the invisible asset brand "luxury porcelain".

By choosing a simplified brand valuation approach without growth (following the procedure of Kriegbaum (2001, 173 et seq.)), we can see that in its existing luxury product line the company earns an average price of € 2,500 per setting and a price premium of 50% from its excellent brand name (for an overview on brand valuation methods Wiedemann (2005)). Using a conjoint measurement analysis, the company's management could show that in relation to competitors, the company can achieve, in addition to the price premium, additional sales of 10,000 settings per year. The additional costs for managing the brand name amount to € 3.5M per year and for additional production and material costs for the high quality products to € 1.5M. Using a simplifying perpetuity approach (keeping all parameters constant over time) the brand value of the luxury porcelain business of the company can be estimated as:

$$\text{Brand value} = \frac{\text{Brand driven additional sales} - \text{Brand driven additional costs}}{\text{WACC}}$$

$$\frac{0.50 \cdot 2,500 \cdot 10,000 - 5,000,000}{0.1} = \text{€ } 75\text{M} > 0.$$

This result means that the annual brand driven cash flow is € 7.5M, which is the numerator in the above formula for the brand value. Thus, assuming a perpetuity model, we can derive a brand value of € 75M using a discount rate of 10%.

If we assume that the price premium in the existing luxury segment has to be decreased to 30% with still increasing additional sales of 12,000 settings and an increased average price of € 3,000 by the end of the planning horizon driven by the entry in the „mass market“ by the hotel dinnerware business, then we get a brand value of € 48M if additional brand driven costs (which are also driven by inflation) now amount to € 4M for advertising and € 2M for higher material and production costs of the brand products:

$$\text{Brand value} = \frac{0.3 \cdot 3,000 \cdot 12,000 - 6,000,000}{0.1} = \text{€ } 48\text{M}$$

Again, we get a brand-driven cash flow of € 4.8M (again, the numerator in the above brand-equity formula) at the end of the planning horizon. If we now assume that the brand-driven cash flow for the "old" luxury porcelain business deteriorates constantly over the life cycle of the new "hotel dinnerware" business, then we get the following development of the brand driven cash flow for the "old" business:

**Table 3: Impact of new business on brand-driven cash flow of “luxury porcelain”**

Year	1	2	3	4	5	6	7
Brand driven cash flow <i>with</i> new project	+ 7.50	+ 7.05	+ 6.60	+ 6.15	+ 5.70	+ 5.25	+ 4.80
Brand driven cash flow <i>without</i> new project	+ 7.50	+ 7.50	+ 7.50	+ 7.50	+ 7.50	+ 7.50	+ 7.50
= Difference in brand driven cash flow	0	- 0.45	- 0.90	- 1.35	- 1.80	- 2.25	- 2.70

Thus, the brand value for the “old” brand luxury porcelain decreases through the line extension to “hotel dinnerware” by € 19.60M.

*Change of brand driven cashflows =*

$$\frac{0}{1.1} + \frac{-0.45}{1.1^2} + \frac{-0.90}{1.1^3} + \frac{-1.35}{1.1^4} + \frac{-1.80}{1.1^5} + \frac{-2.25}{1.1^6} + \frac{-2.70}{1.1^7} + \frac{-2.70}{0.1} \cdot \frac{1}{1.1^7}$$

$$= -€ 19.60M$$

Despite a positive value contribution of the new business unit, the entire project is negative, as the existing brand is eroding in favour of the new business unit:

Value contribution of business unit “hotel dinnerware”	+ € 8.26M
Change in value of intangible resource, brand “luxury porcelain”	- € 19.60M
<b>Total value contribution of entire project</b>	<b>- € 11.34M</b>

The example shows that to assure reasonable economic decisions, existing intangible resources should be integrated into decision models. However, driven by the strong orientation of management reporting on financial accounting, the dilemma arises that despite the justified harmonization and efficiency in accounting, a separate calculation for management control purposes is necessary. In the preceding example, the value destruction of the brand does not show up when the management reporting system is referring to financial accounting figures, because self-created brands may never be recognized in financial statements, neither according to IFRS, U.S. GAAP, nor local GAAP (as for Germany Art. 248 para. 2 HGB). The same fact holds true for other types of intangibles, such as *human capital*, self-created research (*innovation capital*) know-how or customer relations (*customer capital*, see above at chapter 2.2).



### 3.3 ORGANIZATIONAL ASPECTS OF IMPLEMENTING MANAGEMENT CONTROL SYSTEMS OF INTANGIBLES

#### 3.3.1 FUNCTIONAL ALLOCATION TO ACCOUNTING AND/OR CONTROLLING FUNCTIONS

It is almost impossible to determine the scope of a management control system in the organizational hierarchy of a specific company. It is especially difficult to allocate the different elements of the management control system to specific departments (e.g., departments titled "Corporate Controlling" or "Corporate Accounting") within a company. Thus, in general, there is no specific department that is in charge of all dimensions of a management control system. However, as long as all of the elements (see chapter 3.1.4) exist and work together efficiently, having a specific department responsible for all aspects of management control system does not seem to be necessary.

The core departments in corporate practice that cover the elements of management control systems in general are the accounting department(s) and the controlling department(s)<sup>7</sup> – therefore, organizationally, these departments are often combined into one department (Kerkhoff and Diehm (2007)). Not only in a company that runs a combined system of internal and external reporting, but also in companies in which these departments are differentiated, according to the function they have to deal with, accounting and controlling departments have numerous interfaces. This fact may lead to a situation in which the task of planning and forecasting in a group that is part of the planning and monitoring system is given to the controlling department. However, in some circumstances (e.g., depending on specific projects) it depends on the accounting department, because the specific knowledge concerning future outcomes of certain projects is only available there. Such may be the case in forecasting the specific results that management expects to be realized in M&A transactions, both on the acquisition and the disposal sides of such transactions. Especially in acquisitions (*business combinations*), IFRS require the identification and, if appropriate, separate capitalization of intangible assets, which can be forecasted during the negotiations and before management signs such a transaction (so-called pre-deal PPA; see WGARI (2009, 6)). Also, impairment testing of goodwill, or intangible assets that are exclusively covered by an annual impairment test (e.g., according to IAS 36) is often performed within the accounting department of a group and then used within forecasting to highlight specific risks as early as possible.

Additionally, the basic work for reporting internally, at least in an combined financial and management accounting environment, is done by preparing external reporting, as this has to comply with externally given rules (e.g. IFRS, U.S. GAAP, German GAAP). While the preparation of this information typically is based in the accounting department, the

7 The expression "controlling" is used in German accounting and corporate organizations to denote the corporate function of management control and reporting. Although it sounds English, it is a word that has been developed in German business language. See Messner et al. (2008) about the specific German "controlling" approach to management accounting and its peculiarities in corporate practice and research.



design and specific scope of the internally required information is often covered by the controlling department.

Ultimately, it is not possible to separate one department from the other, as both share the same basis. Therefore, in corporate practice, the organizational lines between the planning and monitoring system and the information system, both of which comprise the management reporting system, are very narrow – if indeed they exist at all.

### 3.3.2 BASIS OF MANAGEMENT CONTROL SYSTEMS: DATA-PROVIDING SYSTEMS FOR FINANCIAL ACCOUNTING AND MANAGEMENT REPORTING

In companies where internal (management) and external (financial) reporting is combined, it makes no sense to run two (or even more) financial IT-tools and/or data-providing systems that are not integrated. Therefore, since external reporting to capital markets and other external stakeholders is often governed by specific rules such as IFRS, U.S. GAAP, and German GAAP, the design process of data-providing systems that cover the information necessary within the management reporting system often starts with the needs to comply with external reporting requirements.

Once a company is sure that this goal has been reached for external reporting purposes, additional functions to this data-providing system that are not legally required and that serve purely internal purposes can be designed and incorporated. However, incorporating such additional functions is not ultimately necessary in all cases; it depends on the circumstances of the specific situation. This fact applies especially to the way in which management reports intangibles. Management likely defines internally the information needs on its intangibles that exceed the scope and requirements of external reporting requirements. Therefore, it is possible to distinguish GAAP-related data-providing systems and non-GAAP-related data-providing systems:

- *GAAP-related data-providing systems* typically cover all information that is governed by external (legal) requirements. Due to these external requirements, it makes sense to standardize these systems over a whole group. These data-providing systems cover both quantitative and qualitative information about intangibles, as required by the external (legal) sources.
- *Non-GAAP-related data-providing systems* typically cover all other information needs about intangibles. In contrast to GAAP-related data-providing systems, there is a high degree of individuality concerning the scope, detail, content, etc., of such systems. Each company can define the non-GAAP-related data-providing systems in a way that is appropriate for its particular purposes.
- Of course, both approaches can be combined: data-providing systems may be designed internally in the spirit of non-GAAP-related systems, but simultaneously serve as a kind of subsystem of the GAAP-related systems, to provide, among all internal information needs, the information needs of the GAAP-related data-providing systems. This combined approach at least applies for intangibles for which external (legal) rules require that companies publish some information.

Thus, both types of data-providing systems have different leading principles for their respective design: while GAAP-related data-providing systems should be based on the leading principle of complying with external (legal) rules ("compliance"), non-GAAP-related information systems have more room to use individuality and diversity, since the guidelines for designing them are the internally defined information needs.

One important type of these non-GAAP-covered information needs, one that has increasingly been expressed by shareholders and other stakeholders, relates to the so called "*nonfinancial value drivers*". These are all major factors that have a material direct or indirect influence on the appraisal of corporate value. In this context the expression "*key performance indicators*" (*KPI*) is often used. These indicators or value-related factors may comprise different sorts of components. The traditional components are pure economically oriented parameters, such as market shares, increase in order volumes, number of patents, quality levels of products, and risk positions. Recently, *noneconomic indicators* have become more and more important as a consequence of the incorporation of the sustainability concept in corporate strategy development. This new dimension of strategic development has been triggered by the societal appreciation and assessment of the ecological and social effects of corporate activities and the material (economic) consequences they are able to have on the future prospects and risk exposures of a company (see chapter 2.1).

Due to this increasing importance of the sustainability concept for the corporate value appraisal, corporate performance is more and more seen as being a *triple bottom line performance* that embraces both ecological and social measures as well as economic ones (see also Chapter 2.1). The indicators of the ecological and social performance dimensions are often also referred to as *ESG indicators*, meaning ecological, social and governmental indicators (GRI (2009); EFFAS/DVFA (2010)). More and more often, stakeholders (including both individual and professional investors) demand that companies disclose information about their performance regarding these indicators (PRI (2012a)). Because stakeholders see the ecological and social performance as a material driver of the reputational and brand value of a company, and consequently as a considerable determinant of future cash flows and shareholder value, these factors are now increasingly included as non-GAAP measures in the management control system, and in particular in a company's external reporting.

So far, these ESG or sustainability-related indicators and measures have mostly been controlled and reported in a system that is separate from the financial accounting system. Also, the internal organizational responsibilities have been separated. While the reporting and control of the financial and economic related factors has been part of the financial reporting and/or control function, the reporting of the ecological and social indicators mostly has been the responsibility of the public relations function or of a separate sustainability unit directly connected to the board of directors. Quite recently, the concept of *integrated reporting* has been discussed in management literature and some companies have started to introduce it into corporate practice (IIRC

(2012)). The main idea of this reporting concept is the integration of information that traditionally has been disclosed in different reports (in particular financial report and sustainability or social responsibility reports) in *one report* (which is the title of a book written by Eccles and Krzus (2010)). The idea is to increase the efficiency of corporate reporting and to show the interdependencies of different factors and indicators for the corporate (triple bottom line) performance. This concept also implies the integration of internal data collection and the development of measures and the external reporting of those measures. Two other positive effects are expected from an implementation of integrated reporting. One is the concentration on the material decision-useful data in the provided report, and consequently a volume reduction of the disclosed information (IIRC (2011); Haller and Zellner (2011)).

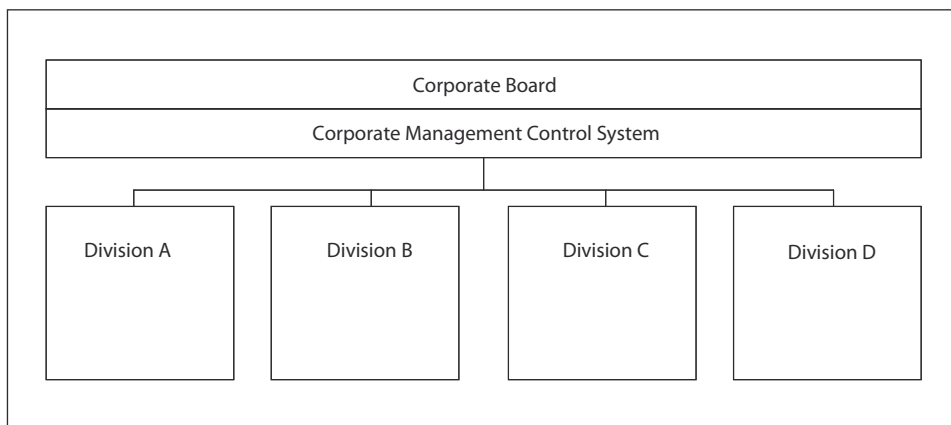
Thus, this concept of integrated reporting tries to consolidate the GAAP and non-GAAP related control and reporting systems of a company. It also integrates nonfinancial ecological and social information with financial and economic disclosure into one set of data. Hence, it can provide decision-useful and value-relevant information regardless of whether the decisions are made by applying the shareholder approach or the stakeholder approach (see chapter 2.1).

Consequently, the application of the concept of integrated reporting in a company can be seen as an appropriate measure to install a management control system for intangibles, because, as noted in chapter 2.2, the performance factors for the sustainability concept may be regarded as intangibles that can be allocated to all the other categories of intangibles that have direct implications for the financial performance of a company.

### 3.3.3 MANAGEMENT CONTROL SYSTEMS IN A COMPANY'S ORGANIZATION AND HIERARCHY

Although we refer in this publication to the management control system of a group, it has to be noted that in corporate practice it may happen that there are different management control systems within one company or group. Usually, a group, but also larger single entities, are composed of several organizational units below the (corporate) group level, e.g., divisions, regional units, cash generating units, etc. Usually the lowest level in a group hierarchy is an individual company. On all of the hierarchical levels within a group, it is both possible and likely that (particular) management control systems are implemented.

The ultimate management control system is the one that reports to the corporate board of a group (corporate management control system), since the board is the chief operating decision maker. Looking at a group's organization chart, this highest reporting structure may be illustrated as in *figure 7* (on p. 32).

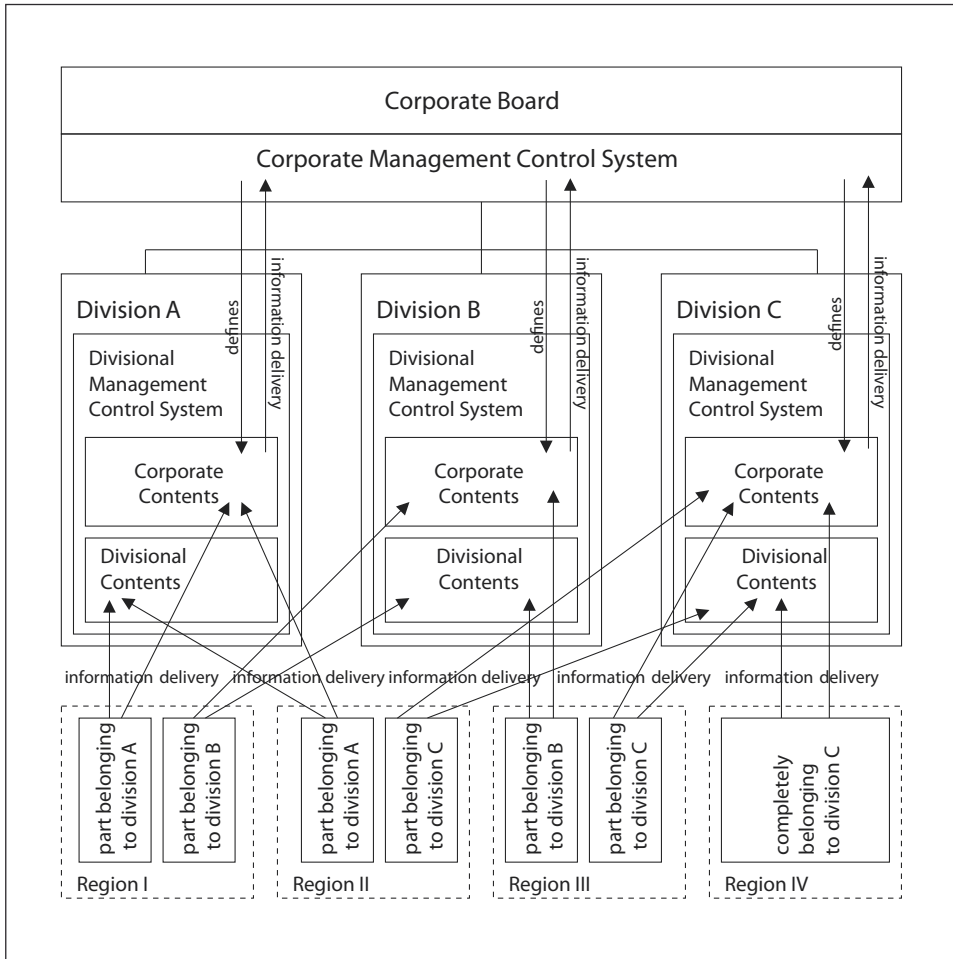
**Figure 7: Organizational incorporation of a management control system**

However, it might also be the case that each of the group's divisions runs its own management control system for divisional management purposes, which may be one level below the chief operating decision maker (*divisional management control system*). In this case, both levels of management control systems are usually linked in an integrated bottom-up and top-down approach (for an actual business case, see the example of Henkel in chapter 6.1.2.1):

- The *corporate management control system* defines the corporate needs and the corporate scope of information (*top-down approach*). From the beginning, divisional management control systems should be designed in a way to comply with these requirements.
- In being designed that way, *divisional management control systems* deliver a huge part of information necessary on corporate level, such as planning assumptions and variation analyses (*bottom-up approach*).
- In some cases, to meet defined targets, corporate management control systems may not only define information needs, but also provide the tools such as IT-information systems, to do so. In such a scenario, it is obviously not necessary for a divisional management control system to cover those information needs, since they can be dealt with outside of the divisional management control system.
- Divisional management control systems may be much more detailed than corporate management control systems. This may be the case when a group consists of different divisions, and the business models of those divisions are so different that *division-specific key performance indicators* must be reported up to divisional level. However, the corporate level does not need the details of these specific indicators.

We illustrate this much more complicated, sophisticated management control system in *figure 8*.

**Figure 8: Divisional management control system**



Considering the categories of intangibles as defined by WGARI (see chapter 2.2), it becomes obvious that it is not only possible, but even necessary, to extend the complexity of such an organizational chart. In the case that it is desired to show the dimension of *corporate social responsibility (CSR)* in these organizational flowcharts it is necessary to look outside the finance departments of a group. So far, we find that most of the companies have not yet implemented issues related to integrated reporting into the traditional (financial) internal and external reporting workflow. Thus *figure 7* and *figure 8* must be adjusted by additional management control systems, as defined by the corporate board (or whoever is in charge of reporting on corporate social responsibility/integrated reporting). Depending on what a group decides to report on CSR, such a CSR management control

system may use the traditional management control systems as a kind of source system. If a group decides to run a fully integrated reporting system that includes integrated financial reports and CSR reports, then there is the challenge of harmonizing all the data that is necessary to do this, especially concerning timeliness and availability of such data. This necessity of an integrated data collection is mainly due to the fact that deadlines for publishing financial data are set by legal rules, but publishing data on CSR is not yet bound to legal rules (see for a partly integrated example the business case of Deutsche Post DHL in chapter 6.5).

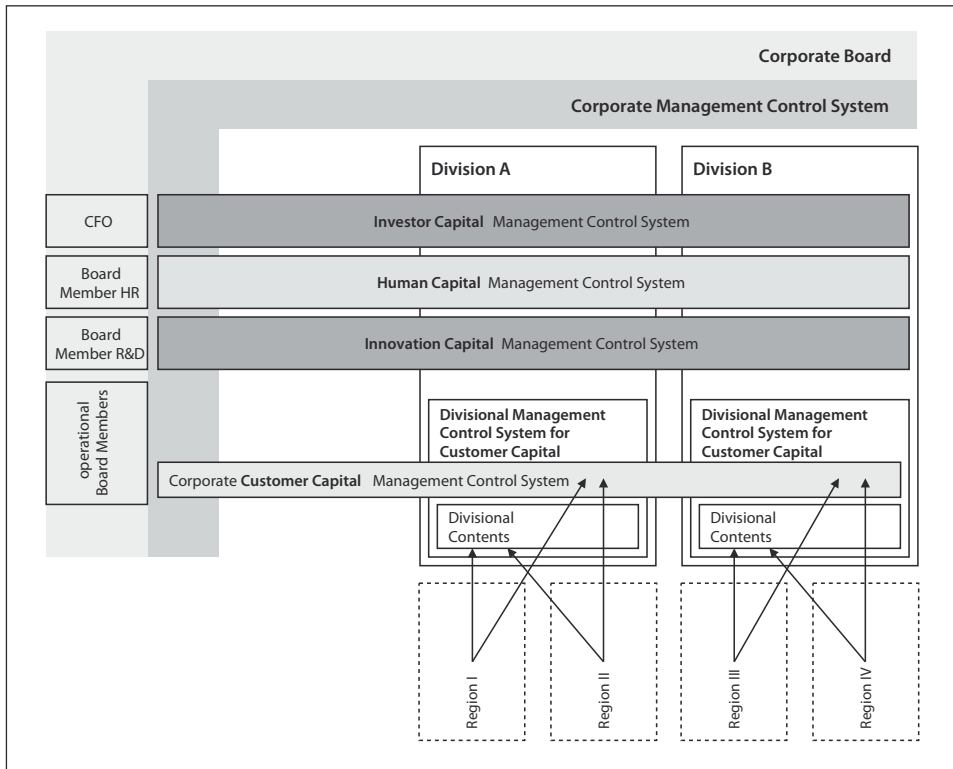
At first, it is somewhat possible to allocate certain categories of intangibles to the corporate level and allocate other categories of intangibles to divisional levels. This may be the case for the category *human capital*, which can be allocated to the corporate board member responsible for human resources. Or, if a certain board member is responsible for research and development in the whole group, a specific management control system for the category *innovation capital* could be expected. Additionally, the category *investor capital* normally can be allocated to the chief financial officer of a company/group.

Second, and in contrast to these categories of intangibles, which, depending on a company's organization, are attributable to certain members of the corporate board and therefore, to certain chapters of the corporate management control system, the category *customer capital* may be dependent on the business model and the resulting customer structure of each division. Since products of the divisions are different and sold under different brand names, such a divisional perspective on *customer capital* may be adequate. Therefore, performance indicators such as customer satisfaction, market shares, and brand names must be defined and reported differently in each division.

The design of such management control systems for both tangibles and intangibles can become even more complex. As shown above it may in principle be possible to assign certain categories of intangibles to specific positions in the corporate board. For example, a management control system for the category *human capital* can be allocated to the board member who is in charge of human resources. However, this functional allocation to a specific board member does not mean that the content of the human capital control system, as integrated in the corporate management control system, is the only control system for human capital in a wide-spread group. Each division might have specific performance indicators that it needs to know, even if such specific information is not included in the corporate management control system (see in more detail the business case of Metro in chapter 6.2).

Figure 9 illustrates this situation of a multi-level management control system for a company that has defined a centralized human capital control system on corporate level, an innovation capital control system on corporate level, an investor capital control system on corporate level, and a divisional specific control system for customer capital that also has to comply with corporate needs.

**Figure 9: Multi-level management control system**



As already mentioned such an interconnected setting of a management control system for intangibles most probably does not yet exist in corporate practice. The reason for this is mainly the lack of a widely shared understanding or general acceptance on which intangibles to report (which, we note, is also not necessary and even does not make sense, since it is highly dependent on a specific company or group and the interests of the respective stakeholders). However, some corporate groups have installed effective management control systems for certain intangibles (or subsaspects of certain intangibles) that are very different concerning their sophistication and level of integration into the overall management control systems (e.g., as shown case-by-case in chapter 6). The main challenges to implementing a fully integrated set-up for a management control system for intangibles are the complex organizational structures of groups that are working internationally. In such groups, too many divergent interests on too many organizational levels make it impossible to run a fully integrated management control system. Additionally, in corporate practice the categories of intangibles identified in chapter 2.2 are way beyond the typical working scope of a finance organization – assuming that such an integrated

management control system would even be functionally allocated to the finance organization of a group. The case studies in chapter 6 that cover company specific incorporations of different intangibles in the management control systems provide good examples for the various possibilities for structuring and implementing the control of intangibles in corporate organizations (see chapter 6).

#### 4 MEASUREMENT AND VALUATION OF INTANGIBLES

Having clarified the need to incorporate intangibles in corporate management control and the key tasks to do so, we now focus on the measurement issue that is the dominant precondition for corporate planning and monitoring. Particularly for intangibles it is vital to differentiate between "measurement" and "valuation". Measurement looks at quantifiable impacts of intangibles that can be scaled in metric terms, such as a customer satisfaction index, the number of filed patents, or the percentage of employees with a college degree; valuation studies only the monetary impacts, such as the value added per person in a specific branch of a retail chain, the income from licensing a filed patent, or the human capital return on investment (HCROI) of a particular group of employees (see the business case in chapter 6.2) (Günther and Neumann (2004)). Since monetary values are always expressed on a metric scale, valuation can always be seen as measurement, but the opposite is not true. Therefore, in this publication we use the terms "measurement" and "valuation" differently from the way in which these terms are used in financial accounting, where (e.g., in the IFRS) both terms are used as synonyms. As mentioned below (see chapter 4.1), one of the major characteristics of most intangibles is that an appropriate valuation is difficult or even impossible, especially for those intangible resources that are not generally dealt with in the IFRS, such as human capital, knowledge, structural capital, and networks. These difficulties cause major challenges for consideration of such intangibles in management control. However, unlike in financial accounting, where valuation is an important prerequisite for capturing items in the reporting system, measurement is perceived as sufficient for management control purposes in most cases. There are many management control tools that are based on nonmonetary data. However, these tools, such as the balanced scorecard, rely on quantitative measures (Kaplan and Norton (1996b)) (see later for other tools).

To reach the desired level of measurability, qualitative aspects that are often connected with intangibles are usually related to quantified measures by using valid, reliable measurement tools such as customer scores or employee satisfaction indexes. Thus, information that was originally qualitative, ordinal information is converted in quantitative, metric information. Sometimes nominal information is also used for measurement when, for example, certain milestones are met in new product development or in change management.



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