

This chapter constitutes the first part of the theoretical framework for the investigation at hand. It describes theories and views from the field of knowledge management which consider personal and organizational soft skills for the process of knowledge transfer or knowledge exchange. The selected theoretical approaches will be described in greater detail to illustrate the interplay of components within the framework.

The following section begins with an explanation of the key terms within knowledge management: data, information and knowledge. It goes on to provide an understanding of the different characteristics and builds the basis for investigation of soft skills within knowledge management and, referring to the next chapter, of soft skills within customer knowledge management.

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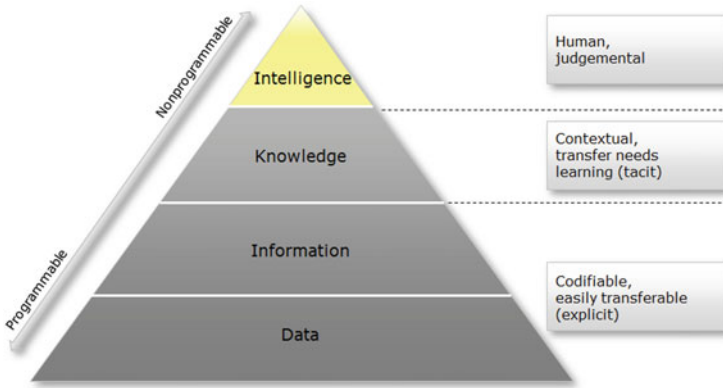
## 2.1 Knowledge Hierarchy

What constitutes knowledge? This question was controversially discussed in the 1990s when the topic of knowledge management came more strongly into focus. An accepted and widely used model is the knowledge hierarchy developed by Skyrme in 1999. Over the years, this pyramid was adapted and modified by several scientists. Basically, it distinguishes between ‘data’, ‘information’, ‘knowledge’ and ‘wisdom’ (DIKW model; in some models, ‘wisdom’ is called ‘intelligence’).<sup>1</sup> Vandergriff, for instance, differed between wisdom and intelligence and expanded the model by the component ‘measurement’. This is how the IWKIDM model (intelligence, wisdom, knowledge, information, data, measurement) came into being.<sup>2</sup> Nevertheless, in practice there are some problems in identifying which ‘component’ belongs to which level (Fig. 2.1).

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<sup>1</sup> Cf. Cheong and Tsui (2010), p. 205; Lambe (2011), p. 187; Rennolls and Al-Shawabkeh (2008), p. 150; Saulais and Ermine (2012), p. 3; Taylor (2007), p. 14.

<sup>2</sup> Cf. Vandergriff (2008), p. 432.



**Fig. 2.1** Knowledge hierarchy (Cf. Montano 2005, p. 303; Taylor 2007, p. 15; Skyrme 1999, n. p.)

It is important to examine the definitions of the components ‘data’, ‘information’ and ‘knowledge’ (DIK) because they serve different purposes. In addition, each component is used differently in various business processes. The clear allocation of data, information or knowledge helps develop and manage these components pro-actively. It is therefore important to know which of the three components one is dealing with.<sup>3</sup>

### 2.1.1 Data

Business processes are based on information that is available in many different formats, e.g. oral discussions. Therefore, it is often difficult to identify what is ‘data’ and what is ‘information’. Whether it is worthwhile distinguishing between the two notions is also questionable. Nevertheless, it can be said that, in terms of volume, the information existing or accessible inside a company is larger than the relevant set of data (records).<sup>4</sup> Some scientists like Amidon describe the data level as ‘facts and figures’,<sup>5</sup> while Davenport and Prusak describe it as ‘a set of discrete, objective facts about events’ normally found in companies as structured records of transactions.<sup>6</sup>

<sup>3</sup> Cf. Boisot and Canals (2004), p. 43; Cheng (2005), p. 605; van den Hoven (2002), p. 89; Taylor (2007), p. 16; Zeleny (2006), p. 751.

<sup>4</sup> Cf. Hicks et al. (2006), p. 19.

<sup>5</sup> Cf. Taylor (2007), p. 14.

<sup>6</sup> Cf. Davenport and Prusak (2000), p. 2.

### 2.1.2 Information

Nonaka defined information as a “flow of messages”.<sup>7</sup> In many companies, the transfer of facts and figures constitutes a message. People use their knowledge to interpret the meaning of the given message in a certain environment.<sup>8</sup> Information comes from different sources, is used for different activities in business processes and has different context in which it was generated. Furthermore, it is necessary to know:

- Whether the information is as accurate as it needs to be<sup>9</sup>
- How long the information will remain up-to-date<sup>10</sup>
- How frequently it is updated and who or what triggers the update,<sup>11</sup> and last but not least
- If the information comes from appropriate sources<sup>12</sup>

### 2.1.3 Knowledge

Davenport and Prusak describe knowledge as “a fluid mix of framed experience, values, contextual information, and expert insight that provides a framework for evaluating and incorporating new experiences and information. It originates and is applied in the minds of knowers. In organizations, it often becomes embedded not only in documents or repositories, but also in organizational routines, processes, practices and norms”.<sup>13</sup> Jennex, on the other hand, defines knowledge as contextualized information. Furthermore, he says that “knowledge is a human capability that can be acquired and expanded through learning”.<sup>14</sup>

### 2.1.4 Characteristics of Data, Information, Knowledge

Different characteristics can be attributed to each level of the knowledge hierarchy.<sup>15</sup> The following table helps determine which level the individual is dealing

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<sup>7</sup> Nonaka and Takeuchi (1995), p. 58.

<sup>8</sup> Cf. Melkas and Harmaakorpi (2008), p. 108; Nonaka and Takeuchi (1995), p. 58; White (2005), p. 12.

<sup>9</sup> Cf. Hammami and Triki (2011), p. 299.

<sup>10</sup> Cf. Chatti (2012), p. 833; Wild and Griggs (2008), p. 492.

<sup>11</sup> Cf. Franco and Mariano (2007), p. 440.

<sup>12</sup> Cf. Hult et al. (2004), p. 241; Mithas et al. (2011), p. 237; Taylor (2007), p. 14.

<sup>13</sup> Davenport and Prusak (2000), p. 5.

<sup>14</sup> Jennex (2008), p. 59.

<sup>15</sup> Cf. Liyanage et al. (2009), p. 119; Pun and Nathai-Balkissoon (2011), p. 205.

**Table 2.1** Characteristics of data, information and knowledge

Characteristics	Data (records)	Information	Knowledge
Availability (creation and existence)	Once created, exists regardless of changes in the environment. Destruction usually altered once a document becomes a record. Available to all who are able to access and interpret this data	Once created, content exists regardless of changes in the environment. Available to all who are able to access and interpret the information. If updated, it is usually a specific activity	Selectively communicated, often as a consequence of a specific set of impulses. Consequently, availability may be time-bound
Accessibility (make use of it)	Access usually controlled by means of physical/electronic security. Knowledge of structure may be required to interpret meaning accurately	Access usually controlled by means of physical/electronic security. Knowledge of structure may be required to interpret meaning accurately	Accessible to those who are able to 'receive' and understand (may depend on tacit knowledge held)
Stability	Stable, management usually defined at an organizational level by policies	Relatively stable, purposely created and destroyed, but while in existence, the format and content will be stable unless purposely changed	Consciously created, but can be unstable, temporary, volatile, withdrawn, flowing between existing and shared. Can also be consciously withheld
Specificity to an environment	Expected content normally defined for each record type. Similar record types are usually a consistent format across an organization. Can be sensitive to changes in the environment	Relevance dependent on specific situation. As environment changes, likely to require knowledge to determine what is still relevant	Usually highly relevant at the time it is shared, as something in the environment could trigger knowledge to be processed, for example, shared or created
Content	Often predefined at a corporate level, provides an audit trail or record of transactions being undertaken	Needs to be seen in context in which it was created in order to ensure the content remains relevant to those who access the information. Format and structure need to be consciously altered	Context usually understood in its specific environment. Structure, format and means of communication may be difficult to determine due to change and individualism

Cf. Taylor (2007), p. 17

with in a given situation while the explanation of intelligence (wisdom) will get a special focus in the next sub-section (Table 2.1).

The following table provides examples of data, information and knowledge so as to illustrate the differences in practical use (Table 2.2).

**Table 2.2** Examples of data, information and knowledge

	Data (what a machine can assess)	Information (what an individual with no domain knowledge can assess)	Knowledge (what an expert can assess)
Content What is it?	File type, data type	Content type (e.g. whitepapers), language, title	Subject area, topic, ontology concept, theme, summary, keyword
Quantity/ value How much is in it?	Byte size, # of records, # of files	Completeness (w.r.t. templates), number of diagrams and examples, domain and range of information	Current value to company, potential value, contribution to prior projects, authority and ownership of subject area
Quality How good is it?	Checksum, format, font, resolution	Matches template, grammatical correctness, clarity, contrast	Quality rating, reviews, comments, popularity, frequency of use
Goal/ purpose What is it meant for? Why is it there?	For viewing on handheld, for printing	To calculate taxes, for ID card, for a graduate course	Intended purpose, target audience, people and team goals
Applicability How do we use it?	Mapping to application, to zip, to encrypt, to protect via password	For review, not for critical applications, not for export, need-to-know basis, reference only	Constraints on application, assumptions made, ease of generalization or specialization, self-containedness, extra-functional requirements

Cf. Srikantaiah and Koenig (2008), p. 61

To sum up, data is regarded as facts that can be structured to become information.<sup>16</sup> Information is data endowed with meaning and purpose.<sup>17</sup> Knowledge occurs when information is interpreted or put into context, i.e. connected in relationships.<sup>18</sup> Intelligence is the understanding of why and how to use knowledge<sup>19</sup> and will be explained in the following sub-section.

### 2.1.5 Intelligence (Wisdom)

Intelligence (wisdom) is the level of understanding. The same as with knowledge, intelligence operates within us.<sup>20</sup> When sharing our experience with others,

<sup>16</sup> Cf. Lundvall and Nielsen (2007), p. 210; Schlegelmilch and Penz (2002), p. 7; Styhre (2003), p. 33.

<sup>17</sup> Cf. Kumar and Thondikulam (2005/2006), p. 178; Williams (2006), p. 83.

<sup>18</sup> Cf. Gordon and Grant (2005), p. 27; Jakubik (2007), p. 6; Lambooy (2009), p. 878; Wilde (2011), p. 33.

<sup>19</sup> Cf. Baars and Kemper (2008), p. 135; Montano (2005), p. 303.

<sup>20</sup> Cf. Christopher and Tanwar (2012), p. 62.

building blocks of intelligence will be created that need to be communicated with even more understanding of contexts.<sup>21</sup> So, when the value of (contextualized) knowledge is extended through insights into upstream and downstream consequences of applying that knowledge, knowledge will become intelligence.<sup>22</sup> In literature, intelligence is for example defined as the ability to make the right use of knowledge which has a significant impact on a company's success and is more than just maximizing and sharing knowledge.<sup>23</sup>

Recently, scientists have stated that intelligence:

- Combines experiences and cognitive skills, which allows good decision making<sup>24</sup>
- That intelligence is the ability to judge correctly in special situations so as to make life better<sup>25</sup>
- That wisdom is a person's basic sense of self<sup>26</sup>
- That wisdom involves cognitive, emotional and motivational characteristics<sup>27</sup>

From this it can be concluded that intelligence is essential for companies to make 'right judgments'.<sup>28</sup>

In recent publications, intelligence is described as knowledge that has been processed in meaningful ways and is the only level of the DIKW model that considers the future.<sup>29</sup> Further statements are that intelligence is:

- Related to tacit knowledge<sup>30</sup>
- Related to the phenomenon of consciousness<sup>31</sup>
- Linked to the complexity of human nature<sup>32</sup>
- Context-sensitive<sup>33</sup>
- Situation-dependent<sup>34</sup> and
- Appears to deal with the cognitive, emotional, personal and social aspects of life<sup>35</sup>

<sup>21</sup> Cf. Boder (2006), p. 83; Senapathi (2011), p. 87.

<sup>22</sup> Cf. Walker and Christenson (2005), p. 278.

<sup>23</sup> Cf. Rowley (2006a)), p. 1246.

<sup>24</sup> Cf. Small (2011), p. 838.

<sup>25</sup> Cf. Goede (2011), p. 36; Small (2004), p. 751.

<sup>26</sup> Cf. Lamb and Sutherland (2010), p. 303; Perrin et al. (2012), p. 177.

<sup>27</sup> Cf. Goyal and Akhilesh (2007), p. 206; Holian (2006), p. 1122.

<sup>28</sup> Cf. Rowley (2006a), p. 1246.

<sup>29</sup> Cf. Faucher et al. (2008), p. 5.

<sup>30</sup> Cf. Wang et al. (2009), p. 102.

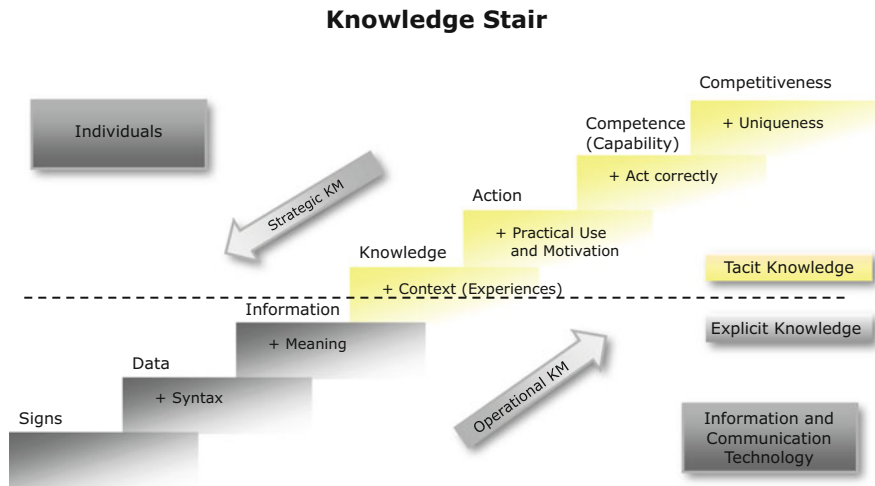
<sup>31</sup> Cf. Laszlo and Laszlo (2002), p. 404.

<sup>32</sup> Cf. Budd (2011), p. 58.

<sup>33</sup> Cf. Lang (2001), p. 45.

<sup>34</sup> Cf. Rowley (2006b), p. 251.

<sup>35</sup> Cf. Bennet and Bennet (2008b), p. 7.



**Fig. 2.2** Knowledge stair (according to North (2011), p. 36)

To sum up: Intelligence (wisdom) is making the best use of knowledge to achieve the company's goals, and this is the key to organizational survival.<sup>36</sup> Knowledge management approaches that neglect wisdom may result in blind actions without the necessary insight.<sup>37</sup>

The next section builds on the above mentioned elements data, information and knowledge.

## 2.2 Knowledge Stair

The ultimate aim of companies is profit maximization. This can be achieved by converting information into knowledge which is then used for gaining sustainable competitive edge.<sup>38</sup> This process is described by North in the Knowledge Stair. His model also describes the requirements to be met before reaching the next step (Fig. 2.2).

The explanations in the following sub-sections focus on the upper part of the stair, the 'Individuals', and their sharing of tacit knowledge. The lower part of the stair, 'Information and Communication Technology' (sharing of explicit knowledge), has already been described in detail in Sect. 2.1 Knowledge Hierarchy.

<sup>36</sup> Cf. Walker and Christenson (2005), p. 278.

<sup>37</sup> Cf. Rowley (2006a), p. 1247.

<sup>38</sup> Cf. Easterby-Smith and Prieto (2008), p. 235; North (2011), p. 35; Tsoukasw and Mylonopoulosw (2004), p. S1.

### 2.2.1 Knowledge and Experience

Knowledge develops when information is put into context.<sup>39</sup> The interpretation of information and the conversion of information into knowledge is a complex process that depends on the individual's experience and expectations.<sup>40</sup> This means that information can be perceived as useful and therefore successfully processed by some individuals, while other individuals will not or differently perceive the same information.<sup>41</sup>

### 2.2.2 Practical Use and Motivation

Knowledge is only of value if it is converted into competence—in other words: when knowledge is used for action. It is not sufficient for employees to simply acquire knowledge in different training courses if they do not put what they have learned into practice. It is therefore crucial to transfer knowledge into skills (competence) through practical use. It is the action (or performance) of an individual or company as a whole that delivers measurable results.<sup>42</sup>

Apart from the practical use of knowledge, motivation also plays a vital role in dealing with customers. A 2008 research paper by Ringberg and Reihlen on a socio-cognitive approach to knowledge transfer found that the creation of meaningful knowledge depends, among other factors, on the individual's volition.<sup>43</sup> If employees are not motivated and willing to share their knowledge, no new knowledge can be generated unless employees are stimulated by rewards or punishment (see also Sect. 2.3.5). In their 2009 study, Nonaka and von Krogh complemented these research results by finding that punishment/rewards and employee motivation are critical factors for running a business efficiently.<sup>44</sup>

It was also found that the private and cultural background of employees (e.g. behavioral patterns) has a great impact on the willingness to share knowledge. The soft skill 'motivation' has been identified as a key factor in the transfer of knowledge.<sup>45</sup>

According to Foss et al. and numerous other researchers, three types of motivation can be distinguished: intrinsic, extrinsic and introjected motivation.<sup>46</sup> These different types of motivation are based on individual characteristics, may lead to

<sup>39</sup> Cf. Diakoulakis et al. (2004), p. 32; Hicks et al. (2007), p. 7; Wilde (2011), p. 33.

<sup>40</sup> Cf. Hanisch et al. (2009), p. 148.

<sup>41</sup> Cf. Jantzen (2009), p. 20; Rahe (2009), p. 111.

<sup>42</sup> Cf. North (2011), p. 38; Wilde (2011), p. 20.

<sup>43</sup> Cf. Ringberg and Reihlen (2008), p. 912.

<sup>44</sup> Cf. Nonaka and von Krogh (2009), p. 635.

<sup>45</sup> Cf. Argote et al. (2003), p. 571; Foss et al. (2009), p. 871; Foss et al. (2010), p. 455; Menon and Pfeffer (2003), p. 497.

<sup>46</sup> Cf. Foss et al. (2009), p. 874.



different work performance qualities and involve various interpersonal environments. Naturally, each motivation type also has an impact on the employee's knowledge sharing behavior. Each type is linked with different specific needs<sup>47</sup> and is explained hereinafter:

**Intrinsic Motivation** Intrinsic motivation involves doing a task in accordance with the individual's own interests and personal values. An intrinsically motivated person is free of pressure and tension,<sup>48</sup> has a positive relation towards knowledge sharing behavior<sup>49</sup> and derives pleasure from the task itself.<sup>50</sup>

**Extrinsic Motivation** "External motivation means that an individual engages in an activity to attain a positive or to avoid a negative external outcome".<sup>51</sup> An extrinsically motivated person is stimulated into action by external factors like rewards or the avoidance of punishment (feel pressured from outside). The outcome, i.e. the performance of the task, does not reflect the person's personal interests or wishes.<sup>52</sup>

**Introjected Motivation** This type of motivation is a hybrid between intrinsic and extrinsic motivation and occurs when an individual internalizes an external regulation but without accepting it. The individual's behavior is no longer guided by external rewards or punishments; instead, it is the individual him/herself that regulates his/her behavior.<sup>53</sup> An important motive for introjected motivation is to "promote feelings of worth"<sup>54</sup> and to improve or maintain the person's self-esteem.<sup>55</sup> Employees with introjected motivation share their knowledge in order to show off and to boost their image—irrespective of whether the knowledge is useful or not.<sup>56</sup>

Foss et al. have shown that job design—under the aspects of job autonomy, task identity and feedback—has a strong impact on the different types of motivation

<sup>47</sup> Cf. Deci and Ryan (2000), p. 227; Foss et al. (2009), p. 874; Gagne and Deci (2005), p. 341; Osterloh and Frey (2000), p. 538; Vansteenkiste et al. (2004), p. 246; Vansteenkiste et al. (2006), p. 19.

<sup>48</sup> Cf. Foss et al. (2009), p. 874; Gagne and Deci (2005), p. 341.

<sup>49</sup> Cf. Sosa (2011), p. 2.

<sup>50</sup> Cf. Sheldon et al. (2004), p. 475.

<sup>51</sup> Foss et al. (2009), p. 874.

<sup>52</sup> Cf. Bock et al. (2005), p. 87; Brachos et al. (2007), p. 35; Foss et al. (2009), p. 874; Lam and Lambermont-Ford (2010), p. 51; Milne (2007), p. 29.

<sup>53</sup> Cf. Foss et al. (2009), p. 874; Malhotra et al. (2008), p. 277; Perdomo-Ortiz et al. (2009), p. 1200; Stone et al. (2009), p. 79.

<sup>54</sup> Foss et al. (2009), p. 874.

<sup>55</sup> Cf. Ryan and Deci (2000), p. 62.

<sup>56</sup> Cf. Gagne (2009), p. 574.

and, ultimately, on the employee's willingness to share knowledge with other employees.<sup>57</sup>

Understanding motivational mechanisms helps facilitate knowledge transfer.<sup>58</sup> To sum up, leveraging knowledge transfer depends, among others, on employee motivation. A pro-motivational work environment actively promotes the sharing of knowledge.

### 2.2.3 Competencies and Correct Action

Competence is the total of an individual's or a company's knowledge, skills, results and track record. In a 2006 research study, Covey says that competence is part of leadership and is thus, besides character, a vital part of a company's success.<sup>59</sup> Competencies become real when knowledge is applied. North explains competence as the ability/disposition to act in accordance with the requirements of a particular situation.<sup>60</sup>

The competence of an employee allows him/her to act according to his/her own capabilities resp. expertise in different work situations.<sup>61</sup> The understanding of employees' competencies helps address competence development correctly.<sup>62</sup> There are several other definitions of competence by scholars, however, scientists largely agree that competence is an individual's characteristic set of knowledge, skills and motivations to perform a job.<sup>63</sup>

In the discussions on how to develop managerial competence, the personality traits of Emotional Intelligence (EQ) and Moral Intelligence (MQ) have gained more and more attention in modern companies.<sup>64</sup> Emotional and moral virtues have been found to be essential in the psychological process of decision making<sup>65</sup> or in relationships with customers.<sup>66</sup>

**Emotional Intelligence** EQ involves qualities that refer to the emotional side of an individual<sup>67</sup> and can be sub-divided into five components. These include self-awareness, self-regulation, motivation, empathy and social skills.<sup>68</sup> These

<sup>57</sup> Cf. Foss et al. (2009), p. 871.

<sup>58</sup> Cf. Foss et al. (2009), p. 871; Quigley et al. (2008), p. 71.

<sup>59</sup> Cf. Kosturiak (2010), p. 55.

<sup>60</sup> Cf. North (2011), p. 38.

<sup>61</sup> Cf. Lefebvre et al. (2005), p. 850.

<sup>62</sup> Cf. Pinnington (2011), p. 447.

<sup>63</sup> Cf. Moore et al. (2002), p. 314.

<sup>64</sup> Cf. Bolden (2005), p. 54.

<sup>65</sup> Cf. Surendra (2010), p. 7.

<sup>66</sup> Cf. Moberg and Seabright (2000), p. 845.

<sup>67</sup> Cf. Goleman (2004), p. 82.

<sup>68</sup> Cf. Rahim et al. (2002), p. 304.

components are linked with various characteristics like “intuition, relationship skills, . . . integrity and personal management”<sup>69</sup> which are essential for the successful management of working relationships with others.<sup>70</sup>

**Moral Intelligence** MQ means “the justice, honesty, courtesy, fulfilling promises, the sense for duty, fairness, fulfilling principles and defining the rules”.<sup>71</sup> Morality is generally described as the cognitive ability to make ethical decisions under consideration of the entire circumstances surrounding a given situation.<sup>72</sup> Ethical behavior plays a pivotal role in our today’s business society, especially in customer treatment and customer relationships, as confirmed by Gardner in 2007.<sup>73</sup>

In our modern knowledge-based society, employees need to be competent with respect to their productivity, right knowledge use and focus on customer satisfaction. These are necessary qualities if they want to compete successfully in changing business environments and relations with customers. A company is well-advised to match its current employee competencies with the company’s business strategy.<sup>74</sup>

The last step of the knowledge stair does not contain any relevant point to be considered as a soft skill within (customer) knowledge management. For the sake of completeness, however, it will be treated in the following sub-section.

### 2.2.4 Competitiveness and Uniqueness

In our knowledge-driven society, it is important for companies to distinguish themselves from competitors.<sup>75</sup> Competitive edge can be achieved, among others, by gaining a knowledge advantage. Being close to one’s customers and thus fulfilling their needs requires an in-house learning process.<sup>76</sup> Especially in this age of globalization where developing countries try to compete with developed countries, it is essential to foster a human knowledge base.<sup>77</sup> “The knowledge [basis] is . . . the human resource of an organization”.<sup>78</sup> It is therefore essential to invest not only into knowledge systems but also into the human resource of a company. The integration of a knowledge framework (considering both humans

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<sup>69</sup> Smith (2005a), p. 16.

<sup>70</sup> Cf. Chiva and Alegre (2008), p. 680; Hess and Bacigalupo (2010), p. 222.

<sup>71</sup> Kosturiak (2010), p. 55.

<sup>72</sup> Cf. Jeffries (2011), p. 200.

<sup>73</sup> Cf. Gardner (2007), p. 51.

<sup>74</sup> Cf. McHenry and Stronen (2008), p. 114.

<sup>75</sup> Cf. Kalpic and Bernus (2006), p. 41; Manning (2010), p. 91.

<sup>76</sup> Cf. Halawi et al. (2006), p. 384; Maqsood et al. (2007), p. 123.

<sup>77</sup> Cf. Mrinalini and Nath (2008), p. 38.

<sup>78</sup> Mrinalini and Nath (2008), p. 52.

and technology) into corporate culture is a crucial step that can help a company grow in terms of knowledge competitiveness.<sup>79</sup>

It must be said that the Knowledge Stair is an effective process of acquiring knowledge with special focus on the learning organization and the company's resp. individual's capabilities.<sup>80</sup> The effectiveness of a company's business activities depends on its capabilities.<sup>81</sup> It is therefore vital to establish and anchor a process of organizational learning inside the company. Specific demands on learning and knowledge processes are made that are complex but also necessary in order to increase a company's efficiency.<sup>82</sup>

After having discussed in the aforementioned the requirement of skills within knowledge management processes, the following section reveals the interplay of these KM processes by further consideration of soft skills.

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## 2.3 Holistic Framework of Knowledge Management

Holistic knowledge management is more than just implementing a data warehouse. It is a holistic way of interaction among individuals, groups and organizations to improve business processes.<sup>83</sup> First of all, the exchange of knowledge needs to be triggered to ensure optimum use of the currently available knowledge.<sup>84</sup> From a corporate perspective, one of the goals is to successfully serve customers with products and services and to optimize processes in the future. KM is therefore an instrument to enhance the company's operating profits.<sup>85</sup> While a data warehouse fulfills the purpose of storing information,<sup>86</sup> the process of knowledge transfer needs to be stimulated so that knowledge and experience can freely flow.<sup>87</sup> Knowledge problems occur when the circulation of knowledge is disturbed<sup>88</sup> or when core processes like developing, storing and distributing knowledge are not sufficiently managed.<sup>89</sup> Each individual step in these processes is interlinked and should therefore not be considered separately.<sup>90</sup>

In order to manage knowledge in an organization, it is helpful to use a framework. Probst et al. describe such a concept of knowledge management. It is divided

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<sup>79</sup> Cf. Rai (2011), p. 779.

<sup>80</sup> Cf. Jeschke et al. (2011), p. 293.

<sup>81</sup> Cf. Park and Kim (2005), p. 43.

<sup>82</sup> Cf. Jeschke et al. (2011), p. 293.

<sup>83</sup> Cf. Adamides and Karacapilidis (2006), p. 572.

<sup>84</sup> Cf. Rasmussen and Nielsen (2011), p. 479.

<sup>85</sup> Cf. Parida and Baksi (2011), p. 66.

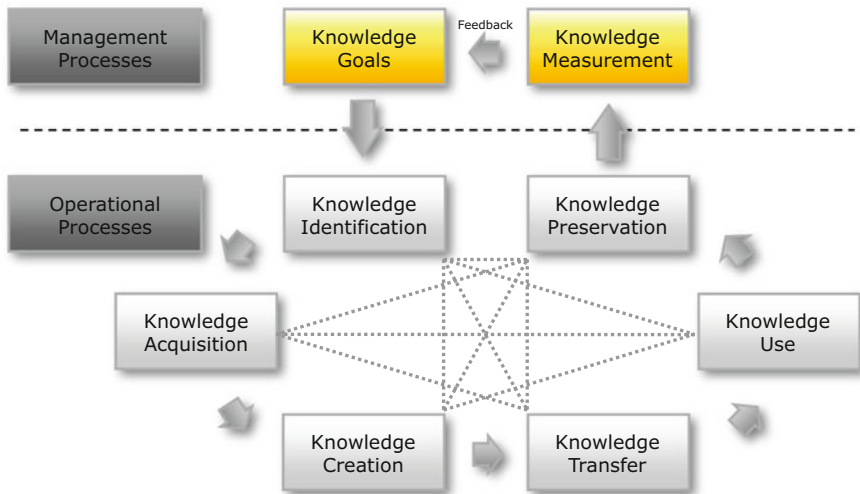
<sup>86</sup> Cf. Greiner et al. (2007), p. 10.

<sup>87</sup> Cf. Chang and Ahn (2005), p. 118; de Pablos (2004), p. 105.

<sup>88</sup> Cf. Häussler (2010), p. 300.

<sup>89</sup> Cf. Bodendorf (2006), p. 133.

<sup>90</sup> Cf. Bodendorf (2006), p. 133.



**Fig. 2.3** Holistic framework of knowledge management (Cf. Probst et al. 2006, p. 32)

into management processes and operational processes as the figure above shows (Fig. 2.3).

The operational area contains the core processes. The inclusion of ‘knowledge goals’ and ‘knowledge measurement’ from the management area extends this concept into a holistic framework which enables the management to implement different activities on each level. Each building block is vital for the whole framework.<sup>91</sup> For each knowledge aspect, there is one core question that needs to be verified to make this concept viable. These core questions will be described in the following sub-sections.

### 2.3.1 Knowledge Goals

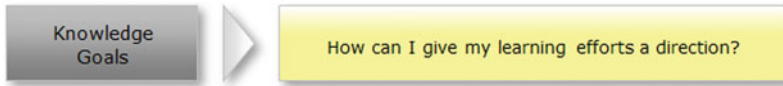
“A general goal of KM is to improve the systematic handling of knowledge and potential knowledge within an organization”.<sup>92</sup> The core question related to the realization of knowledge goals is shown in Fig. 2.4.

Knowledge has to be aligned to corporate goals in order to achieve better corporate results.<sup>93</sup> In their research on ‘implementation gaps for knowledge management systems’ in 2005, Lin and Tseng found there is a gap between the knowledge required to enhance a company’s competitiveness as perceived by its

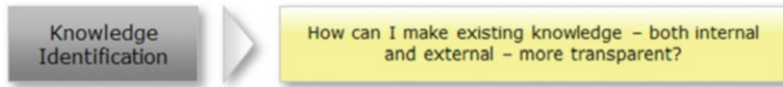
<sup>91</sup> Cf. Probst et al. (2006), p. 3.

<sup>92</sup> Heisig (2009), p. 5.

<sup>93</sup> Cf. Anantamula (2010), p. 239; Fink and Ploder (2009), p. 37; Kalling (2003), p. 67; Wilde (2011), p. 20.



**Fig. 2.4** Core question of knowledge goals (Cf. Elsner 2002, p. 52)



**Fig. 2.5** Core question of knowledge identification (Cf. Elsner 2002, p. 52)

managers and the plan of KM in general. It is therefore crucial to define clear knowledge goals.<sup>94</sup> Knowledge-oriented goals can be divided into normative goals (corporate vision/culture), long-term strategic goals (develop/structure corporate core knowledge) and operational goals (implement normative and strategic goals, e.g. by ensuring the availability of documents).<sup>95</sup>

### 2.3.2 Knowledge Identification

The identification of existing knowledge and the search for new ideas ensures the company's direct and fast access to relevant or critical knowledge.<sup>96</sup> It also facilitates the work of (new) employees within the company. The evolved knowledge (internally and externally accessible) needs to be made transparent so that it can be effectively applied.<sup>97</sup> Bearing this in mind, the question formulated in Fig. 2.5 arises.

Probably the most important point is the communication of best practice knowledge concerning success and failure factors—knowledge that was collected e.g. by project teams and/or business units.<sup>98</sup> By comparing this knowledge with the defined goals, the current knowledge gap can be filled in the next step of 'knowledge acquisition'.<sup>99</sup> Sharing best practices is an important step in the organizational learning process and reflects the company's ability to learn. It is therefore further discussed in Sect. 2.4.3.

<sup>94</sup> Cf. Lin and Tseng (2005), p. 210.

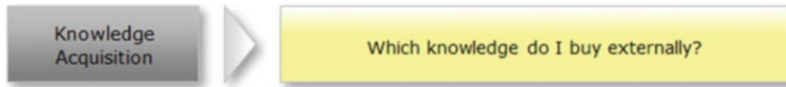
<sup>95</sup> Cf. Bodendorf (2006), p. 134.

<sup>96</sup> Cf. Evanschitzky et al. (2007), p. 272; Wang and Ahmed (2005), p. 322.

<sup>97</sup> Cf. Egbu et al. (2005), p. 7; Elsner (2002), p. 52; Harorimana (2009), p. 12; Seleim and Khalil (2011), p. 590; Supyuenyong et al. (2009), p. 63.

<sup>98</sup> Cf. Elsner (2002), p. 52; Goh (2005), p. 6; Harorimana (2009), p. 12.

<sup>99</sup> Cf. Borredon and Ingham (2005), p. 493; Broßmann and Mödinger (2011), p. 355; Hoe (2008), p. 18; Kalkan (2008), p. 390.



**Fig. 2.6** Core question of knowledge acquisition (Cf. Elsner 2002, p. 52)

### 2.3.3 Knowledge Acquisition

Companies should focus on reducing the cost and effort of knowledge acquisition and transfer through inter-organizational knowledge exchange.<sup>100</sup> This leads to the above-stated core question (Fig. 2.6).

Grafting knowledge is faster than acquiring it through experience and more complete than acquiring it through imitation.<sup>101</sup> Especially in knowledge-driven industries, companies acquire knowledge in order to gain new knowledge.<sup>102</sup> Innovative companies cannot solely draw knowledge from external sources: they need to run their own R&D departments to create new knowledge. This is described in the next building block.<sup>103</sup>

### 2.3.4 Knowledge Creation

The importance of developing organizational and (inter)personal skills, including the creation of knowledge for developing new products/services (innovation) and gaining sustainable competitive edge, is a well-known fact.<sup>104</sup> Based on this fact, companies need to address the question in Fig. 2.7.

New knowledge can be created e.g. through knowledge-based cooperation between companies and employees to improve core competencies and competitive edge.<sup>105</sup> The existing knowledge stock of a company can also be used to generate new knowledge by well-coordinated exchange processes.<sup>106</sup> To achieve this goal, two preconditions must be fulfilled: flexible distribution of information and experiences<sup>107</sup> (e.g. teamwork of experts from different departments or CK

<sup>100</sup> Cf. López-Sáez et al. (2010), p. 703; McCall et al. (2008), p. 67; Pacharapha and Vathanophas (2012), n. p.; Ryu et al. (2005), p. 245.

<sup>101</sup> Cf. Bergman et al. (2004), p. 63.

<sup>102</sup> Cf. Amiryany et al. (2012), p. 178.

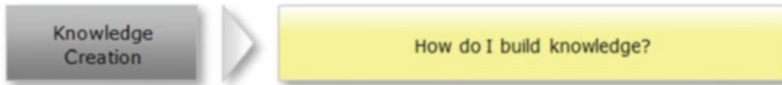
<sup>103</sup> Cf. Palekar (2006), p. 29.

<sup>104</sup> Cf. Nielsen (2006), p. 59; Paiva et al. (2012), p. 302; Pfister and Eppler (2012), p. 372.

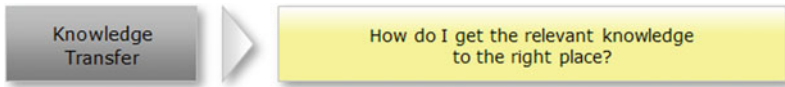
<sup>105</sup> Cf. Eliufoo (2008), p. 322; Michailova and Nielsen (2006), p. 44; Sharkie (2003), p. 20; Siakas et al. (2010), p. 376.

<sup>106</sup> Cf. Akbar (2003), p. 1997; Li and Kettinger (2006), p. 593; Nonaka and von Krogh (2009), p. 635; Smith et al. (2005), p. 346.

<sup>107</sup> Cf. Salmador and Bueno (2007), p. 367; Seshadri and Shapira (2003), p. 1099.



**Fig. 2.7** Core question of knowledge creation (Cf. Elsner 2002, p. 52)



**Fig. 2.8** Core question of knowledge transfer (Cf. Elsner 2002, p. 52)

exchange through sales staff) and improved organizational performance to eliminate uncertainties, e.g. in negotiations with customers.<sup>108</sup>

### 2.3.5 Knowledge Transfer

‘If we had had the necessary information, we could have ...’. An often-heard argument that clearly shows the dilemma. To make sure this does not happen, companies and their employees must answer the question in Fig. 2.8.

Information, experience and know-how need to be continuously exchanged within the company and beyond its boundaries.<sup>109</sup> A central task of knowledge transfer is the multiplication of knowledge so that fast knowledge dissemination to large groups can be realized.<sup>110</sup> Take, for example, the knowledge exchange among the sales reps of different industries. Barriers to knowledge flow, e.g. deliberate withholding of relevant knowledge due to opportunistic behavior, need to be eliminated.<sup>111</sup> Each knowledge transfer is an opportunity for an organization to learn<sup>112</sup> and an essential precondition for ensuring the successful application<sup>113</sup>—regardless of the direction of transfer (in- or outbound)—and may contribute to improving the company’s learning curve.<sup>114</sup>

<sup>108</sup> Cf. Ramirez et al. (2012), n. p.

<sup>109</sup> Cf. Ambos and Schlegelmilch (2009), p. 491; Bennet and Bennet (2008c), p. 21; Davis et al. (2005), p. 101; Guzman and Wilson (2005), p. 59; Kimmerle et al. (2008), p. 381; Mohamed (2007), p. 100; Wilde (2011), p. 33.

<sup>110</sup> Cf. Choi et al. (2010), p. 855; Ingram and Simons (2002), p. 1517; Lindkvist (2005), p. 1189; Zhen et al. (2011), p. 2959.

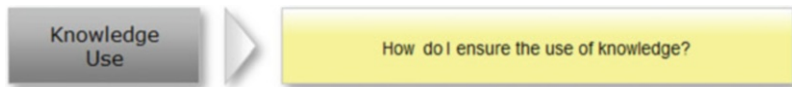
<sup>111</sup> Cf. Broßmann and Mödinger (2011), p. 137; Lin et al. (2012), p. 10; Martini and Pellegrini (2005), p. 670; Monteiro et al. (2004), p. B1; Riege (2007), p. 48; Sun and Scott (2005), p. 75.

<sup>112</sup> Cf. Chawla and Joshi (2011), p. 501; Chen et al. (2012), p. 109; Kumar and Ganesh (2011), p. 224; Massingham and Diment (2009), p. 125; Tukul et al. (2008), p. 179; Wilkesmann and Wilkesmann (2011), p. 96.

<sup>113</sup> Cf. Jasimuddin and Zhang (2011), p. 84.

<sup>114</sup> Cf. Kutvonen (2011), p. 468.





**Fig. 2.9** Core question of knowledge use (Cf. Elsner 2002, p. 52)

The transfer of knowledge thus depends on individual (absorptive capacity) and organizational capabilities (systems, processes) and, even more important, on the employees' motivation to share knowledge. If there is no desire to exchange knowledge, the transfer of knowledge will quickly grind to a halt (see Sect. 2.2.2).

### 2.3.6 Knowledge Use

To ensure that newly acquired knowledge does not erode, it must be actively used.<sup>115</sup> It is the task of managers to assure that existing and newly created knowledge is employed for the benefit of the company (Fig. 2.9).<sup>116</sup>

KM systems should mainly store application-oriented and usable knowledge.<sup>117</sup> Knowledge sharing across different departments and hierarchical levels supports the use of available knowledge and transfers best practices.<sup>118</sup> Through discussions, mutual criticism and constructive suggestions from different departments and individuals—for example engineers, sales people and project teams, the quality of knowledge can be improved and knowledge re-combined for future use,<sup>119</sup> especially for meeting customer needs. This interaction contributes to ensuring a higher quality of products and services (externally) and to improving innovation and other processes (internally).<sup>120</sup>

As described above, the use of knowledge depends on both an individual's intelligence and competence. Therefore, the soft skill 'intelligence' has already been discussed in detail in Sect. 2.1.5, while Sect. 2.2.3 has been focused on the soft skill 'competence'.

<sup>115</sup> Cf. Amalia and Nugroho (2011), p. 71; Jantunen (2005), p. 336; Rejeb-Khachloul et al. (2011), p. 278.

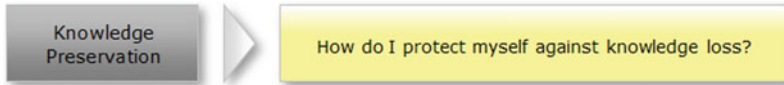
<sup>116</sup> Cf. Andreeva and Kianto (2012), p. 617; Danskin et al. (2005), p. 91.

<sup>117</sup> Cf. Edwards et al. (2005), p. 113; Grace (2009), p. 64; Iske and Boersma (2005), p. 126; Teoh and Pan (2009), p. 4; Wang and Wang (2008), p. 622.

<sup>118</sup> Cf. Andreeva and Kianto (2011), p. 1018; Ghobadi and D'Ambra (2012), p. 285; Han and Anantatmula (2007), p. 421; Ho et al. (2009), p. 1211; Marouf (2007), p. 122; Smith (2005b), p. 563.

<sup>119</sup> Cf. Gavrilova and Andreeva (2012), p. 523; Mariotti (2011), p. 875; Rusly et al. (2012), p. 346.

<sup>120</sup> Cf. Claycomb et al. (2002), p. 649; Gao et al. (2008), p. 3; Lee et al. (2001), p. 691; Yoo et al. (2011), p. 329; Zboralski (2009), p. 90.



**Fig. 2.10** Core question of knowledge preservation (Cf. Elsner 2002, p. 52)

### 2.3.7 Knowledge Preservation

As described in the previous sub-sections, the effort spent on acquiring, newly creating or ensuring the exchange of knowledge is enormous.<sup>121</sup> For this reason, it is crucial for companies to protect their knowledge investments (Fig. 2.10).

Through the continuous transfer of experience and know-how, tacit knowledge is made explicit and remains in the company<sup>122</sup> even if the knowledge carrier leaves the company, e.g. when reaching retirement age.<sup>123</sup> Knowledge needs to be shared, but also multiplied to secure the organization's knowledge basis. Different knowledge types require different but secure solutions. Securing knowledge also requires that only a well-selected, limited number of employees have access to crucial information and not the total number of individuals working for a company.<sup>124</sup> This applies in particular to sensitive information like innovations and customer data that ensure the company's competitiveness.<sup>125</sup>

As the avoidance of knowledge loss is essential for both organizations and individuals, this issue will be tackled in Sect. 2.5.

### 2.3.8 Knowledge Measurement

The KM-related effort made by an organization is linked to certain expectations of success. In this respect, the expected return on investment (ROI) plays a vital role (Fig. 2.11).<sup>126</sup>

Knowledge measurement in customer-oriented processes includes inputs like marketing, sales and service costs as well as outputs like customer revenue, profit and value.<sup>127</sup> KM activities must be effective, and their effectiveness must be

<sup>121</sup> Cf. Richter et al. (2004), p. 3; Richtner and Ahlström (2010), p. 1006; van Beveren (2002), p. 18; Zellmer-Bruhn (2003), p. 514.

<sup>122</sup> Cf. Boder (2006), p. 81; Disterer (2002), p. 512; Hall (2006), p. 117; Perez and de Pablos (2003), p. 82; Takahashi and Vandenbrink (2004), p. 64.

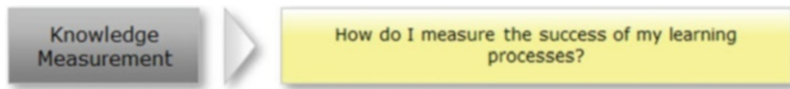
<sup>123</sup> Cf. Bennet and Bennet (2008a), p. 414; Leseure and Brookes (2004), p. 103.

<sup>124</sup> Cf. Andrews and Delahaye (2000), p. 797; Majchrzak and Jarvenpaa (2004), p. 40; Randeree (2006), p. 145.

<sup>125</sup> Cf. Erickson et al. (2003), p. 152; Kauffeld-Monz (2009), p. 41; Lamming et al. (2004), p. 291; Menon and Sarkar (2007), p. 101.

<sup>126</sup> Cf. Bose (2004), p. 457; Cohen (2006), p. 28; Elliott et al. (2009), p. 657; Kannan and Aulbur (2004), p. 389.

<sup>127</sup> Cf. Gebert et al. (2003), p. 108.



**Fig. 2.11** Core question of knowledge measurement (Cf. Elsner 2002, p. 52)

measurable.<sup>128</sup> Knowledge is a dynamic parameter; hence it is difficult to measure a company's knowledge assets.<sup>129</sup> Nevertheless, "a complete measurement system needs to be developed to evaluate whether the KM activities will enable the enterprise to enhance its competitiveness".<sup>130</sup> Up to now, however, no generally applicable matrix of key performance indicators (KPIs) has been defined for CKM.

The interaction of processes with relevant soft skills has been made clear in Sects. 2.2 and 2.3. Therefore, the next section focuses on soft skills necessary for the creation of added value within knowledge management.

## 2.4 Knowledge Value Chain

Despite some overlaps of the knowledge value chain (KVC) with the holistic framework of KM (described in Sect. 2.3), there are further soft skills which are relevant within KM as yet not discussed within this book.

The concept of a KVC is based on the value chain first described by Michael Porter.<sup>131</sup> A value chain bundles a company's assets (resource-based view). However, it is not enough to have these resources: they must be effectively managed to develop unique strengths, thus gaining competitive advantage and creating value. Furthermore, a value chain helps identify and evaluate a company's value adding process. The result can be used to implement appropriate measures for building and enhancing competitive edge.<sup>132</sup>

Based on Porter's value chain from 1985, many knowledge value chains have been developed over the years.<sup>133</sup> Most important for the identification of soft skills in a knowledge management process is, however, the following model by Wang and Ahmed.

Wang and Ahmed proposed a KVC in 2005 which includes five infrastructure elements, so-called 'KM enablers', and eight 'KM processes'. Furthermore, their model considers 'organizational capabilities' as well as a 'performance margin'.

<sup>128</sup> Cf. Aujiरणongpan et al. (2010), p. 192.

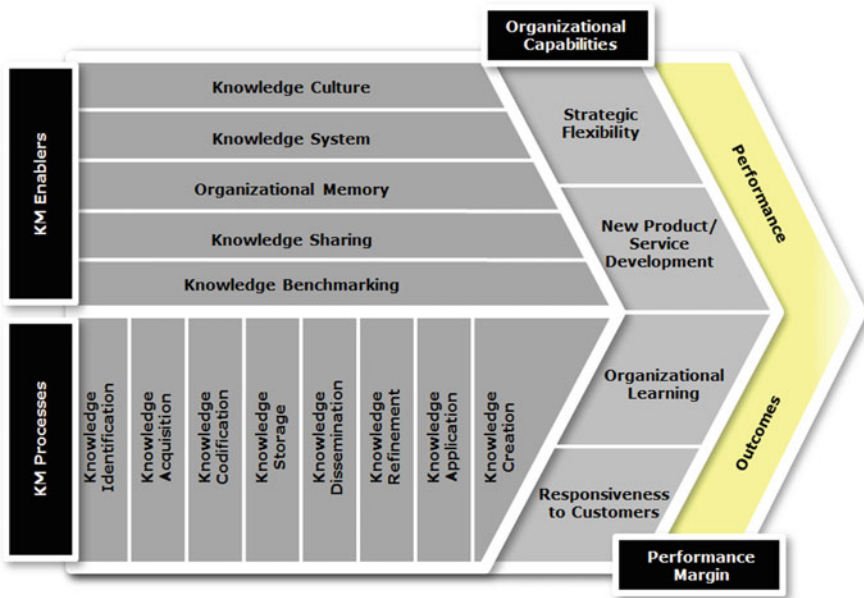
<sup>129</sup> Cf. Housel and Nelson (2005), p. 545; Lerro et al. (2012), p. 563; Rodgers (2003), p. 181.

<sup>130</sup> Lin et al. (2005), p. 42.

<sup>131</sup> Cf. Porter (1998), p. 33.

<sup>132</sup> Cf. Adams and Lamont (2003), p. 142; Barber (2008), p. 687; Shankar et al. (2003), p. 191; Swafford et al. (2006), p. 118; Wang and Ahmed (2005), p. 322.

<sup>133</sup> Cf. Carlucci et al. (2004), p. 580; Eustace (2003), p. 591; Xu and Bernard (2010), p. 957.



**Fig. 2.12** Knowledge value chain (Cf. Wang and Ahmed 2005, p. 322)

This KVC was developed to capture the essence of a company's knowledge economy (see Fig. 2.12).<sup>134</sup>

By combining a company's knowledge resources (knowledge enablers and processes), a company builds its knowledge capability.<sup>135</sup> The contribution of each resource to the overall organizational performance is the company's "unique makeup that enables benefits such as competitive edge and improved performance".<sup>136</sup>

The following sections will take a closer look at components of the KVC in order to elucidate the interplay of the individual components.

## 2.4.1 Knowledge Management Processes

It is essential for a company's expertise and performance that knowledge management processes become organizational routines,<sup>137</sup> for example facilitating the creation of new knowledge or the application of existing knowledge.<sup>138</sup> The

<sup>134</sup> Cf. Wang and Ahmed (2005), p. 321.

<sup>135</sup> Cf. Gera (2012), p. 255; Wu (2008), p. 248.

<sup>136</sup> Mills and Smith (2011), p. 157.

<sup>137</sup> Cf. Claver-Cortes et al. (2007), p. 54; Li et al. (2012), p. 398; Sun (2010), p. 507.

<sup>138</sup> Cf. Beesley and Cooper (2008), p. 58; Jakubik (2011), p. 375.

**Table 2.3** Knowledge management processes

Knowledge management processes	
Knowledge identification	Searching for new ideas, information and knowledge which are relevant for the company. Facilitating knowledge identification processes through a guidance or for example by visual ontologies
Knowledge acquisition	Acquiring identified relevant knowledge and absorbing this knowledge in specific organizational contexts. Using company's resources for increasing the knowledge inventory of the organization to fill knowledge gaps
Knowledge codification	Codifying tacit knowledge and categorizing acquired knowledge. Facilitate embedding new knowledge by investing into a company's capabilities (routines)
Knowledge storage	Recording, retaining and maintaining knowledge and clearly labeling the knowledge directory to enhance the productivity and quality. Stabilize the organizational culture to enhance the knowledge storage capabilities
Knowledge dissemination	Retrieving of stored knowledge and making it available for knowledge users. Pay special attention to interaction conditions so that dissemination enhance the company's performance
Knowledge refinement	Improving, transferring and adapting existing knowledge in changed situations or using in a new way (means in a new context)
Knowledge application	Putting knowledge into action and utilizing knowledge to realize organizational outcomes. Application is vital for development of corporate knowledge assets
Knowledge creation	Development and raising new ideas to generate new knowledge that leads to Innovation. Strengthening the knowledge sharing/distribution process

Cf. Bera et al. (2011), p. 883; Chen et al. (2010b), p. 28; Cricelli and Grimaldi (2010), p. 355; Edvardsson and Oskarsson (2011), p. 7; Hawass (2010), p. 409; Hsiao et al. (2011), p. 645; Ribeiro (2008), p. 272; Wang and Ahmed (2005), p. 322

organizational competencies (business processes) reflect the company's efficiency and effectiveness (Table 2.3).<sup>139</sup>

KM processes are dynamic<sup>140</sup> and part of the knowledge value adding process.<sup>141</sup> But the assimilation and integration of newly generated knowledge into organizational routines makes high demands on the company's capabilities. This process depends on the industry, the nature of the company and its strategy.<sup>142</sup>

### 2.4.2 Knowledge Management Enablers

KM enablers form the infrastructure that influences the KM processes. Wang and Ahmed identified five KM enablers, namely Knowledge System, Knowledge

<sup>139</sup> Cf. Dimitriadis (2005), p. 316; Moustaghfir (2008), p. 20.

<sup>140</sup> Cf. Anantatmula (2009), p. 219; Karim et al. (2012), p. 779.

<sup>141</sup> Cf. Wong and Wong (2011), p. 940.

<sup>142</sup> Cf. Wang and Ahmed (2005), p. 322.

Culture, Organizational Memory, Knowledge Sharing and Knowledge Benchmarking, which will be briefly explained in this section.

**Managing the Knowledge System** Any KM approach cannot only be human-oriented; it must also be technology-oriented. Besides individuals, also technical systems serve as enablers for knowledge management<sup>143</sup> which enables the general knowledge process.<sup>144</sup> The important thing is that access to relevant data is given. Depending on the company's nature, the effort invested into developing knowledge management systems (KMSs) differs considerably. Innovation-driven companies, for instance, invest a lot into their creation processes of tacit knowledge. By contrast, companies with a low innovation output support the storage and retrieval processes by exploiting explicit knowledge.<sup>145</sup> To conclude, KMSs are fundamental in supporting and facilitating KM processes and thus improving the company's capabilities.<sup>146</sup>

**Fostering the Knowledge Culture** A company's knowledge culture depends on the personal commitment of its employees. If employee commitment is strong, it has a direct effect on the knowledge culture and consequently on KM practices (indirect effect).<sup>147</sup> Furthermore, knowledge culture has a positive and direct effect on training courses (practical knowledge sharing processes), as confirmed by a study recently published by Cardoso et al. in 2012.<sup>148</sup> The considerable impact of culture on KM processes and a company's capabilities was also reconfirmed by a recently published study (2012) by Lee et al.<sup>149</sup>

A well-established knowledge culture facilitates the creation of personal and organizational knowledge. Employees need encouragement to first identify their own work procedures and then share best practices with colleagues for future use in the whole company.<sup>150</sup> A study by Akhavan et al. in 2006 reveals that analyzing the key success factors (KSF) enriches organizational knowledge and creates respected culture.<sup>151</sup>

**Developing Organizational Memory** Experienced workers are recognized as significant repositories of organizational memory<sup>152</sup> and are also perceived as 'go to' people for valuable advice.<sup>153</sup> Consequently, they play a fundamental role with

<sup>143</sup> Cf. Abdullah et al. (2006), p. 137; Wilde (2011), p. 26.

<sup>144</sup> Cf. Barber et al. (2006), p. 1002; Goodman and Schieman (2010), p. 112.

<sup>145</sup> Cf. Massa and Testa (2011), p. 499.

<sup>146</sup> Cf. Chen et al. (2007), p. 136; Ju et al. (2006), p. 855.

<sup>147</sup> Cf. Machuca and Costa (2012), p. 29; Walczak (2005), p. 330.

<sup>148</sup> Cf. Cardoso et al. (2012), n. p.

<sup>149</sup> Cf. Lee et al. (2012), n. p.

<sup>150</sup> Cf. Fong and Choi (2009), p. 123; Wilde (2011), p. 38.

<sup>151</sup> Cf. Akhavan et al. (2006), p. 97.

<sup>152</sup> Cf. Ebrahimi et al. (2008), p. 124; Kuyken (2012), p. 369; Slagter (2007), p. 82.

<sup>153</sup> Cf. Dunham and Burt (2011), p. 865.

respect to knowledge sharing.<sup>154</sup> The corporate memory, where all of a company's data, information and knowledge are accumulated and stored for future use, plays an important role in improving organizational learning and decision making.<sup>155</sup> An organizational memory is the basis for KM processes, hence must be integrated.<sup>156</sup> Lessons learned as well as experiences need to be secured within the company to facilitate its future learning processes. A company needs to remember what succeeded and what failed.<sup>157</sup>

The organizational performance is closely linked to employee knowledge, skills and competencies.<sup>158</sup> The company's knowledge capital (among others human knowledge) is crucial for its success.<sup>159</sup> It is important to sustain well-established routines and best practices and to capture knowledge in organizational memory for future use.<sup>160</sup>

**Promoting Knowledge Sharing** Knowledge sharing in general, and especially the way of sharing knowledge implies that adequate competencies of those employees who take part in the knowledge sharing process are a prerequisite for efficient knowledge sharing.<sup>161</sup> This includes, among others, methodological, social, intercultural, professional and personal competencies, cooperation and communication.<sup>162</sup> In order to improve the efficiency of KM processes, it is necessary to enable knowledge sharing by simplifying bureaucratic procedures.<sup>163</sup> A study by Matzler et al. in 2011 demonstrated that personality traits like agreeableness and conscientiousness play a significant role in the knowledge sharing process. While an employee's agreeableness influences the person's commitment to the company, conscientiousness determines the documentation of knowledge.<sup>164</sup> Furthermore, companies need to invest into social capital to facilitate the knowledge flow. Mutual trust e.g. is required to efficiently share the knowledge.<sup>165</sup>

**Knowledge Benchmarking** A study by Anantatmula and Kanungo (2010) has shown that Knowledge Measurement (benchmarking) is another enabler in

<sup>154</sup> Cf. Groves (2007), p. 239; Harvey (2012), p. 400; Liebowitz et al. (2007), p. 1128.

<sup>155</sup> Cf. Lopez et al. (2005), p. 229.

<sup>156</sup> Cf. Bengoa et al. (2012), p. 336; Jimenez-Jimenez and Sanz-Valle (2013), n. p.

<sup>157</sup> Cf. Abel (2008), p. 15; Labeledz et al. (2011), p. 551; Perez-Bustamante (1999), p. 11.

<sup>158</sup> Cf. Ho (2008), p. 1234; Kuo (2011), p. 581; Molina and Callahan (2009), p. 388; Ozcelik et al. (2008), p. 186; Anantatmula (2007), p. 133.

<sup>159</sup> Cf. Cezair (2008), p. 29; Keogh et al. (2005), p. 76.

<sup>160</sup> Cf. Abel (2008), p. 15.

<sup>161</sup> Cf. Jeong et al. (2006), p. 74; Mueller (2012), p. 435; Rompho and Siengthai (2012), p. 494; Wilde (2011), p. 33.

<sup>162</sup> Cf. Szabo and Csepregi (2011), p. 41.

<sup>163</sup> Cf. Pinho et al. (2012), p. 24.

<sup>164</sup> Cf. Matzler et al. (2011), p. 296.

<sup>165</sup> Cf. Casimir et al. (2012), p. 742; Kontinen and Ojala (2012), p. 39; Mu et al. (2008), p. 95.

achieving the desired outcomes of KM. For two reasons: On the one hand, it is important to reach the company's KM goals, but on the other hand it is also essential to assess their contribution to the business performance.<sup>166</sup> Sustainable competitive edge is important, not only in times of fierce competition.<sup>167</sup> Knowledge-based strategic management information systems are used for the purpose of strategic and competitive benchmarking.<sup>168</sup> Benchmarking is necessary to measure the performance resp. knowledge assets of a company in comparison with its competitors. In doing so, knowledge gaps but also best practices can be identified to improve the company's capabilities.<sup>169</sup>

All components in the KM process are closely connected. The enablers are the factors of performance or efficiency that enable a company to achieve its targets.<sup>170</sup>

### 2.4.3 Organizational Capabilities and Performance

KM processes are the primary activities which are supported by the knowledge value chain activities (infrastructure).<sup>171</sup> Although the processes of the knowledge value chain are linked with organizational performance, they do not automatically lead to performance improvement.<sup>172</sup> KM efforts have to be directed to strengthen the company's capabilities as for example strategic flexibility, product development, organizational learning and responsiveness to customers.<sup>173</sup> All KM processes have to be interlinked and need to be aligned for building improved capabilities.<sup>174</sup> Effective linking and alignment will finally result in the expected performance outcome.<sup>175</sup>

**Strategic Flexibility** A company's strategies need to be adjusted to environmental changes.<sup>176</sup> The adaptation of strategies, for example in Marketing & Sales, is necessary to develop the required competencies. Integrated strategic management systems (internal) must be flexible so as to match the organizational strategy with the dynamic environment (external).<sup>177</sup> This flexibility shows the company's ability

<sup>166</sup> Cf. Anantatmula and Kanungo (2010), p. 108.

<sup>167</sup> Cf. Lin and Chen (2008), p. 83; Matzler et al. (2010), p. 4.

<sup>168</sup> Cf. Marti (2004), p. 31.

<sup>169</sup> Cf. Helms and Nixon (2010), p. 215.

<sup>170</sup> Cf. Wang and Ahmed (2005), p. 322.

<sup>171</sup> Cf. Lee (2000), p. 785.

<sup>172</sup> Cf. Schiuma (2012), p. 516; Schiuma et al. (2012), p. 4; Wang and Ahmed (2005), p. 323.

<sup>173</sup> Cf. Wang and Ahmed (2005), p. 323.

<sup>174</sup> Cf. Kim and Lee (2010), p. 133; Levy et al. (2010), p. 125; Tseng (2010b), p. 827.

<sup>175</sup> Cf. Wang and Ahmed (2005), p. 323.

<sup>176</sup> Cf. López (2005), p. 661; O'Shannassy (2008), p. 168; Pearl (2007), p. 142.

<sup>177</sup> Cf. de Pablos and Lytras (2008), p. 48.



to respond to changing competitive conditions.<sup>178</sup> In addition, a company needs to consider that flexibility creates opportunities but at the same time also costs.<sup>179</sup>

**New Product Development** Companies need the ability to capture, reconfigure, apply and distribute knowledge for a successful new product/service development.<sup>180</sup> New business opportunities are significant for a company. Therefore, a company's KM processes must be timed to the pace of the changing environment and to the dynamic knowledge flux.<sup>181</sup> A knowledge strategy for product/service development must accommodate human and technical processes.<sup>182</sup> If necessary, structural changes in order to improve productive knowledge flows are inevitable.<sup>183</sup> A company's learning processes and abilities are vital for product/service development, too. This includes space for innovation.<sup>184</sup>

**Organizational Learning** KM depends, among others, on the soft skill 'employee learning'. This skill needs to be guided, facilitated and coordinated through the leadership of managers with the help of efficient and well-established processes, eventually resulting in an organization that learns. Thus, the learning organization is a direct result of organizational leadership.<sup>185</sup> "Organizational learning plays an important role for firms entering new international markets. Acquiring knowledge of a foreign market helps firms to decrease uncertainties, misunderstandings and risks, allowing them to plan and achieve project expectations more accurately".<sup>186</sup> As organizational learning is another key factor of competitiveness, it is the management's task but also challenge to manage the company's knowledge effectively.<sup>187</sup>

Effective knowledge management is interlinked with successful quality management of organizational learning, resulting from:

- Reward systems, based on actively involving employees in organizational learning processes and on their knowledge contribution quality<sup>188</sup>

<sup>178</sup> Cf. Combe et al. (2012), p. 1320; Javalgi et al. (2011), p. 171; Rylander and Peppard (2003), p. 321.

<sup>179</sup> Cf. Rundh (2011), p. 330.

<sup>180</sup> Cf. Bettiol et al. (2012), p. 559; Chen et al. (2010a), p. 851; Lawson and Potter (2012), p. 1232; Lettice et al. (2006), p. 217.

<sup>181</sup> Cf. Choy et al. (2006), p. 917.

<sup>182</sup> Cf. Storey and Hull (2010), p. 140.

<sup>183</sup> Cf. Pitt and MacVaugh (2008), p. 113.

<sup>184</sup> Cf. Goffin and Koners (2011), p. 300.

<sup>185</sup> Cf. Crawford (2005), p. 6; Singh (2011), p. 362.

<sup>186</sup> Javernick-Will (2009), p. 783.

<sup>187</sup> Cf. Rhodes et al. (2008), p. 245; Wilde (2011), p. 41.

<sup>188</sup> Cf. Yeo (2006), p. 34.

- The right allocation of knowledge resources (increase of relevance, accuracy and added value)<sup>189</sup>
- Ensuring effective methods for the distribution of knowledge to employees<sup>190</sup>
- Encouraging and promoting information exchange<sup>191</sup>
- Identification of core competencies and business knowledge for supporting these skills<sup>192</sup>
- Continuous removal of outdated, incorrect and/or unnecessary information and knowledge<sup>193</sup>
- Provision of a favorable working climate for open, free and constructive thinking<sup>194</sup>

**Responsiveness to Customers** Companies need to have core competencies to form the basis for customer benefits and strong customer relationships.<sup>195</sup> Customer relationship management requires different competencies, i.e. knowledge and skills. These include among others sales skills, understanding and anticipating of customer needs and wishes, customer compliant handling skills, customization skills with a given cost budget, creativity, problem-solving and analytical skills. Important to mention are also the ability to create added value for customers and their own company, customer information extraction skills, the ability to measure and manage customer loyalty and customer lifetime value, skills in relationship building, collaboration, effective learning and knowledge transfer.<sup>196</sup>

Customer-oriented processes need to be implemented and established in such a way that an organization achieves a high responsiveness to customers, finally delivering added value to customers.<sup>197</sup>

The knowledge value chain described above is a holistic framework, including fundamental value adding processes for KM, which requires infrastructural support (knowledge enablers).<sup>198</sup> “Furthermore, knowledge performance is not directly enacted but occurs through a mediated process of creating a certain set of capabilities or competences”.<sup>199</sup> Only through the interaction of KM enablers and KM processes can organizational capabilities be built to enhance the company’s performance outcome.

<sup>189</sup> Cf. Vrincianu et al. (2009), p. 473.

<sup>190</sup> Cf. Falconer (2006), p. 140.

<sup>191</sup> Cf. Swift and Hwang (2012), p. 1.

<sup>192</sup> Cf. Tseng (2010a), p. 269.

<sup>193</sup> Cf. Friedman (2004), p. 120; Mironova (2012), p. 128.

<sup>194</sup> Cf. Vrincianu et al. (2009), p. 473.

<sup>195</sup> Cf. Arnett and Badrinarayanan (2005), p. 329; Griesse et al. (2012), p. 468; Nobre (2011), p. 422.

<sup>196</sup> Cf. Liew (2008), p. 131.

<sup>197</sup> Cf. Sing and Koshy (2012), p. 69.

<sup>198</sup> Cf. Sandhawalia and Dalcher (2010), p. 313.

<sup>199</sup> Wang and Ahmed (2005), p. 326.

The previous four sections dealt with soft skills for KM when interacting with each other, within processes and for creating added value. If the management of knowledge runs smoothly, the company benefits. However, what happens when knowledge is lost? Therefore, the next section discusses soft skills and problems for knowledge retention respectively knowledge loss.

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## 2.5 Brain Gain versus Brain Drain

As early as in the late 1960s, companies were facing the problem of knowledge loss. The shortage of brainpower was, among others, due to a shortage of manpower as described by McClelland in his 1969 study 'Making Brainpower Effective'.<sup>200</sup> Currently, the same old problem is coming back to haunt us. We live in a rapidly changing world. This is reflected by the speed of product development, fast-changing market requirements and high staff turnover. The business environment calls for unique solutions, top service and innovative approaches to distinguish the company from its competitors.<sup>201</sup>

### 2.5.1 Increasing Staff Mobility

Nowadays, employees seldom stay with one company for many years. Long-term or even lifetime employment at one and the same employer has become an exception in today's business environment. Not surprisingly, business fluctuations and economic crises accelerate the brain drain.<sup>202</sup>

The increasing staff mobility requires the codification of knowledge so that tacit knowledge becomes explicit, remains in the company and can be shared, also with new employees joining the company.<sup>203</sup> Even in 'good times', some industries as for example the consultant and IT industry are confronted with high staff turnover and need to manage a dynamic workforce.<sup>204</sup> The ultimate aim of a company, independent of industry or current business circumstances, should therefore be to retain the company's individual and organizational knowledge. In brief: Permanent storage of the acquired knowledge.<sup>205</sup>

Today's 'up or out' policy may also be a reason for the high volatility of staff.<sup>206</sup> The increased staff turnover necessitates a greater awareness of the risk of

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<sup>200</sup> Cf. McClelland (1969), p. 147.

<sup>201</sup> Cf. Brandel (2008), p. 28; McNichols (2010), p. 29; Miler (2006), p. 28; Nazari et al. (2011), p. 224; Peet (2012), p. 48.

<sup>202</sup> Cf. Brough et al. (2011), p. 122; Elsner (2002), p. 15; Wilde (2011), p. 16.

<sup>203</sup> Cf. Desouza and Awazu (2006), p. 32; Durst and Wilhelm (2012), p. 637; van Grinsven and Visser (2011), p. 384.

<sup>204</sup> Cf. Cantner et al. (2009), p. 187; Mishra and Bhaskar (2011), p. 356.

<sup>205</sup> Cf. Amankwah-Amoah (2011), p. 360; Andersen (2012), p. 443; Ringel-Bickelmaier and Ringel (2010), p. 525; Swart and Harvey (2011), p. 703.

<sup>206</sup> Cf. Elsner (2002), p. 15.

**Table 2.4** Organizational knowledge loss

Organizational knowledge loss				
		Level of knowledge preservation		
		Individual	Collective	Electronical
Types of knowledge loss	Knowledge gets lost or is deleted due to:	Termination of contract, death spiral, amnesia, (early) retirement	Dissolution of well-established teams, reengineering, outsourcing of functions	Irreversible data loss caused by: viruses, hardware failure, system crashes, insufficient/ missing backups, hackers
	Access not possible	Temporary	Excessive workload, transfer of staff, illness, vacation, inadequate training, work-to-rule	Stigmatization of old routines and habits, collective sabotage
		Permanent	Permanent overload, no awareness of the importance of one's own knowledge, mental resignation	Disposal of business units, "brain drain" (migration of teams)
				Reversible data loss, temporary system overload, interface problems
				Permanent incompatibility of systems, permanent system overload, wrong codification

Cf. Lehner (2009), p. 77

knowledge loss and calls for a change in the company's knowledge management process.<sup>207</sup> When knowledge is lost, it is hard to replace.<sup>208</sup> By adequately training and promoting their employees, companies can prevent brain drain in the long run.<sup>209</sup>

### 2.5.2 Organizational Knowledge Loss

All organizations face the potential risk of knowledge loss. Therefore, "... it is necessary to understand the consequences of losing knowledge and the significance of retaining knowledge in organizations".<sup>210</sup> Moreover, it is vital for companies to identify the reasons of knowledge loss so they can actively prevent or counteract the process (Table 2.4).<sup>211</sup>

<sup>207</sup> Cf. Calo (2008), p. 403; Chan and Chao (2008), p. 83; Elsner (2002), p. 15; Haesli and Boxall (2005), p. 1955; Harris (2006), p. 30; Meister (2005), p. 58; Scalzo (2006), p. 60; Stover (2004), p. 168.

<sup>208</sup> Cf. Aiman-Smith et al. (2006), p. 15; Levy (2011), p. 583; Salopek (2005), p. 23; Sharma et al. (2012), p. 38; Xavier (2009), p. 40.

<sup>209</sup> Cf. Boyens (2008), p. 186; Bracci and Vagnoni (2011), p. 7; Chaitovsky (2011), p. 84; Upshur-Myles (2009), p. 18; Whelan and Carcary (2011), p. 680.

<sup>210</sup> Martins and Meyer (2012), p. 77.

<sup>211</sup> Cf. Jafari et al. (2011), p. 315; McQuade et al. (2007), p. 758; Mir et al. (2008), p. 203; O'Donoghue and Croasdell (2009), p. 298.

Organizational knowledge loss is a systemic problem, the causes of which are manifold and involve the entire employment life cycle.<sup>212</sup> Most problem solutions taken by companies are, according to Boath and Smith, ‘merely quick fixes’; they argue that comprehensive problems require comprehensive and integrated solutions.<sup>213</sup> These will be explained in the following sub-section.

### 2.5.3 Death Spiral of a Knowledge Base

The organizational knowledge base is the foundation from which a company-wide learning process can be launched.<sup>214</sup> But companies are confronted with the following dilemma. On the one hand, knowledge must be stored to prevent knowledge loss and have information available for re-use so that companies can survive with minimal effort in a competitive environment.<sup>215</sup> On the other hand, knowledge must be constantly updated to make it applicable.<sup>216</sup> This process includes a distinction between useful and useless knowledge. Selection criteria must be carefully chosen that help define whether knowledge is of value or not. In this constant selection and updating process, also future information needs have to be considered.<sup>217</sup>

To help managers and employees make the ‘right’ decisions in the daily business, it is necessary to have the relevant information at the right time, in the right place and with the right quality.<sup>218</sup> Since we are facing a flood of information these days, it can be concluded that the selection and updating of information is a complex process. If this process is not handled with care and expertise, knowledge systems are likely to end in a death spiral (Fig. 2.13).

The effective use of a knowledge database helps prevent the death spiral.<sup>219</sup> Knowledge needs to be managed—and this is where the company’s managers are called to action.<sup>220</sup>

<sup>212</sup> Cf. Boedker et al. (2004), p. 15; Cuganesan et al. (2007), p. 896; Gendron (2007), p. 2; Sitlington and Marshall (2011), p. 116; Wilde (2011), p. 16; Wong (2005), p. 266.

<sup>213</sup> Cf. Boath and Smith (2004), p. 7.

<sup>214</sup> Cf. Firestone and McElroy (2004), p. 177; Huang (2010), p. 454; Lehner (2009), p. 76; Rolland (2006), p. 896.

<sup>215</sup> Cf. Edvardsson (2008), p. 554; Khamseh and Jolly (2008), p. 41.

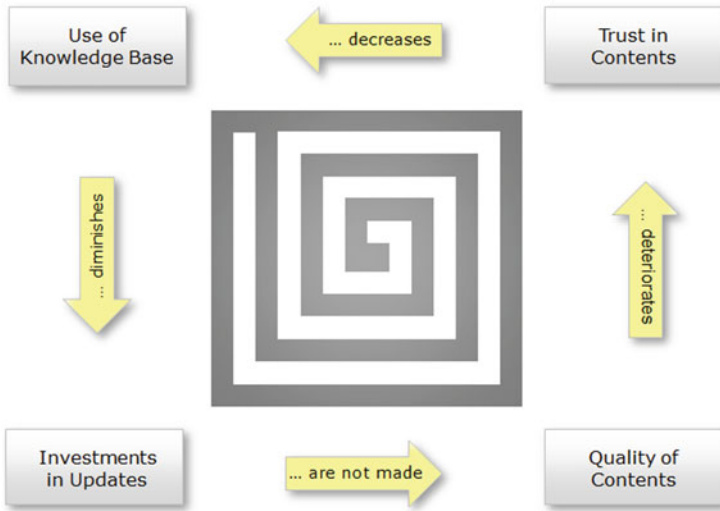
<sup>216</sup> Cf. Choy et al. (2003), p. 263; Herrero et al. (2010), p. 26; Seidler-de Alwis and Hartmann (2008), p. 139.

<sup>217</sup> Cf. Cockrell and Stone (2010), p. 841; Gehle (2006), p. 183.

<sup>218</sup> Cf. Call (2005), p. 23; Chilton and Bloodgood (2010), p. 1159.

<sup>219</sup> Cf. Darroch (2005), p. 111.

<sup>220</sup> Cf. Cader (2007), p. 46; Desouza and Awazu (2004), p. 1; Jones et al. (2003), p. 49; Lin (2011), p. 136; Thompson and Cavaleri (2010), p. 50.



**Fig. 2.13** Death spiral of a knowledge base (Cf. Probst et al. 2010, p. 212)

### 2.5.4 Activities for Avoiding Knowledge Loss

When employees leave the company, the loss of critical knowledge outweighs the concern about potential operational impact or possible cultural/social disruptions.<sup>221</sup> Nevertheless, an investigation conducted by Holtshouse in 2009 shows that many of the surveyed companies have no integrated knowledge retention strategies for retaining their knowledge.<sup>222</sup>

It is therefore vital for the company's human resources, but also for the systems and processes, to implement strategies for the preservation of knowledge.<sup>223</sup> The following table gives an overview of short- and long-term activities meant to retain expertise within the company and combat the risk of brain drain (Table 2.5).<sup>224</sup>

Companies need to minimize knowledge loss by embedding know-how (knowledge and expertise) into standard operating procedures.<sup>225</sup> Our today's business environment therefore calls for an integrated knowledge risk management (KRM).<sup>226</sup>

<sup>221</sup> Cf. Treleaven and Sykes (2005), p. 353.

<sup>222</sup> Cf. Holtshouse (2009), p. 1.

<sup>223</sup> Cf. Basly (2007), p. 154; Bishop (2005), p. 18; Bratianu and Orzea (2012), p. 7; Mutsuddi and Mutsuddi (2008), p. 73.

<sup>224</sup> Cf. Boath and Smith (2004), p. 7.

<sup>225</sup> Cf. Bloodgood (2012), p. 376; Freeze and Kulkarni (2007), p. 103; Hofer-Alfeis (2008), p. 44; Nunes et al. (2006), p. 101.

<sup>226</sup> Cf. Massingham (2010), p. 464.

**Table 2.5** Combating brain drain

Impact	Action
Short-term	Integration of mentoring programs
	Implementation of knowledge databases
	Hiring retirees as contractors
Long-term	Workforce planning and organizational design to ensure that structures and processes support career development (identification of vital personnel and succession planning)
	Workforce support and collaboration by using portal and company resource management solutions
	Learning design—focusing on anytime, anywhere learning and focusing on powerful solutions found in today’s performance simulation solutions

Cf. Boath and Smith (2004), p. 7

2.6 Summary

As a result of the extensive literature review in this chapter, it was possible to identify seven different factors that have a decisive influence on successful knowledge management. (i) Knowledge loss (brain drain) is a crucial factor that concerns both individuals and organizations. Hence, the resulting need for knowledge preservation is an important issue which the organization as a whole but also the employee in particular must face. The exchange of knowledge is clearly driven by the (ii) motivation of the company’s employees. The willingness to share knowledge is influenced by intrinsic, extrinsic and introjected motivation. The use and management of (customer) knowledge is also closely linked with the individual’s (iii) intelligence and (iv) competence. A certain degree of intelligence is required to exploit acquired (customer) knowledge for the company’s benefit, e.g. when developing marketing strategies or adapting products and services to the customer’s needs. Competence, on the other hand, is the ability to deal with customers and their knowledge in such a way as to acquire as much useful knowledge as possible. Other important factors that ensure successful knowledge management include (v) organizational learning and (vi) knowledge culture. Organizational learning, on the one hand, reflects the learning capabilities of a company. Knowledge culture, on the other hand, has a direct influence on the practical knowledge sharing processes. Finally, companies require a high (vii) responsiveness to customers if, for instance, the customer has problems and needs quick support or if knowledge gaps must be closed as fast as possible.

The following chapter deals with soft skills within customer knowledge management processes and emphasizes the importance of customer focus.

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