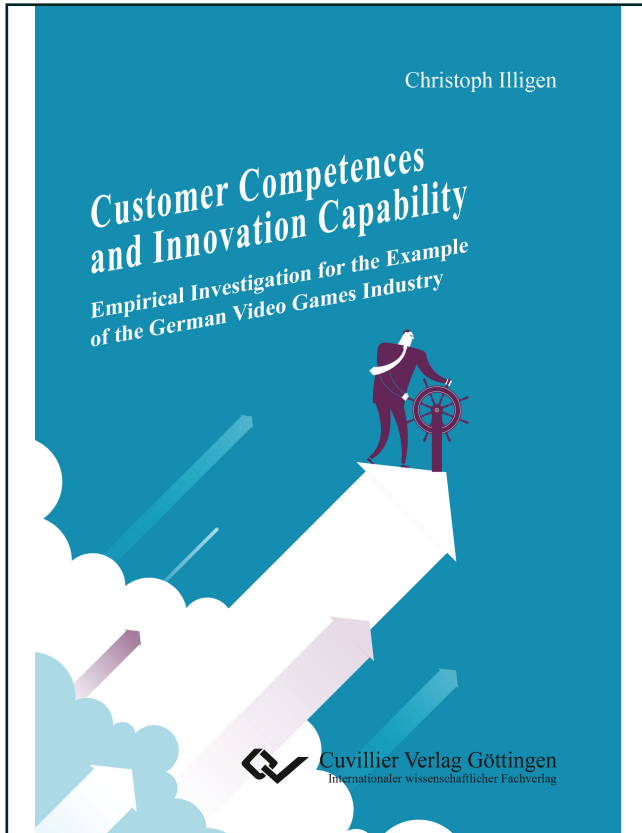




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**Customer Competences and Innovation Capability**  
Empirical Investigation for the Example of the German  
Video Games Industry



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# 1. Introduction

## 1.1. Motivation – Customer Competences as Potential Driver for Innovation Capability

Research in numerous empirical studies underlines a positive correlation between innovation activities and corporate success.<sup>1</sup> Innovations therewith constitute one essential success factor for the development, progress, and success of economies and companies.<sup>2</sup> Hence, an innovation-oriented alignment of corporate activities can support a company's performance. Moreover, focusing on innovations additionally enables a company to create and maintain long-lasting competitive advantages.<sup>3</sup> Nowadays, it is generally accepted that innovations have an essential meaning for the long-term survival and success of companies.<sup>4</sup> Besides, new challenges like shorter product life cycles or increasing product diversification for covering individual demands additionally emphasize the importance of innovative products and services in numerous markets.<sup>5</sup> This demands from companies not only to develop incremental improvements but also to design, produce, and implement highly innovative new products.<sup>6</sup>

In essence, the construct *innovation* seems to be a promising vehicle for companies to create competitive advantages. In order to completely understand and assess the con-

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<sup>1</sup> cf. e.g. CHANEY, DEVINNEY & WINER (1991), p. 607; ROTHWELL (1992), p. 223; GEROSKI, MACHIN & REENEN (1993), pp. 198; JEFFREY & SHAKER (1995), pp. 43; BALDWIN & JOHNSON (1996), p. 801; NEELY & HUI (1998), p. 45; ROBERTS (1999), pp. 665; FIGG (2000), pp. 14; HARMSSEN, GRUNERT & BOVE (2000), pp. 194; YOO (2001), p. 356; CALANTONE, CAVUSGIL & ZHAO (2002), p. 520; WEERAWARDENA (2003), p. 26.

<sup>2</sup> cf. BETHKE (2003), p. 16.

<sup>3</sup> cf. e.g. ABERNATHY (1978), p. 173; BOOZ ALLEN & HAMILTON (1982), p. 4; ALBACH (1989), pp. 1338; CHANEY ET AL. (1991), p. 607; NELSON (1991), p. 68; CAPON, FARLEY, LEHMANN & HULBERT (1992), p. 157; CRAIG & HART (1992), p. 3; FRITZ (1994), pp. 1047; SCHEWE (1994), p. 143; HIGGINS (1995), p. 33; NELSON (1995), p. 33, 79; GRANT (1996), p. 382; HINTERHUBER & STUHEC (1997), pp. 4; TEECE, PISANO & SHUEN (1997), p. 515; CHANDRASHEKARAN, MEHTA, CHANDRASHEKARAN & GREWAL (1999), p. 95; ROBERTS (1999), p. 655; SIVADAS & DWYER (2000), p. 31; DANNEELS (2002), p. 1095; SALAMAN & STOREY (2002), p. 147; CAPALDO, IANDOLI, RAFFA & ZOLLO (2003), p. 343; TIDD & BESSANT (2009), pp. 4.

<sup>4</sup> cf. DE VEN (1986), p. 590; CRAIG & HART (1992), p. 3; BROWN & EISENHARDT (1995), p. 343; SONG & PARRY (1997), p. 1; ERNST (2001), pp. 1; GEHRKE & LEGLER (2001), pp. 17; DANNEELS & KLEINSCHMIDT (2001), p. 357; KOUFTEROS, VONDEREMBESE & JAYARAM (2005), p. 98.

<sup>5</sup> cf. MARR (1993), p. 1796.

<sup>6</sup> cf. TUSHMAN (1997), p. 166; CHANDY & TELLIS (1998), p. 474; VERYZER (1998a), p. 305; DAMANPOUR & GOPALAKRISHNAN (1999), p. 76; STRINGER (2000), p. 87; DANNEELS & KLEINSCHMIDT (2001), p. 357; LEIFER, O'CONNOR & RICE (2001), p. 102; McDERMOTT & O'CONNOR (2002), p. 424; BILLING (2003), p. 2. A recent study depicting the situation of innovations in German small and medium-sized businesses also emphasizes the creation of 'original' innovations in order to create competitive advantages and employment. However, this study simultaneously tells that the number of companies creating 'real' innovations is declining (cf. FAZ (2006)).



struct *innovation*, this thesis preliminary follows the common and wide-spread definition of HAUSCHILDT (2004) and tailors it to the focus of this investigation:<sup>7</sup>

**Definition 1:** Innovation – preliminary

**Innovations** are qualitatively new products, which differ significantly from a preceding state and are successfully introduced in the targeted market.<sup>8</sup>

Contrary to the positive effects of innovation, innovation activities and related actions can also cause negative effects which lead to substantial risks for a company. According to COOPER & KLEINSCHMIDT (1987), 46% of innovation related resources used in product development and market launch are consumed in unsuccessful projects.<sup>9</sup> Additionally, SIVADAS & DWYER (2000) ascertain that 50% of all newly released products fail and often cause a high financial loss for the related company.<sup>10</sup> Consequently, high and by tendency increasing costs for innovations contain the risk of massive mis-allocation of resources.<sup>11</sup> Hence, innovations are not per se a guarantee for success. However, although innovations exhibit a certain risk potential, they potentially feature a high economic impact and additionally can be an enabler for a creation of competitive advantages. Consequently, major drivers for success and failure of innovations should be assessed in order to support a systematic and successful creation of innovations.

Correspondingly, the interest in innovations and major influencing factors is underlined by plenty of research in the field of innovations since the 1950s. Numerous determinants of innovations have already been identified (e.g. financial capacity, intellectual property, or cooperation with suppliers) in various theoretical and empirical studies, especially in the field of success factors.<sup>12</sup> However, critics say that investigations on the success factors of innovations lack a coherent and satisfying explanation towards the relevant influencing factors of innovations.<sup>13</sup> JENSEN & HARMSSEN (2001) demonstrate that this is due to a lack of proper operationalizations of the identified success factors. Additionally, they mention that an empirical implementation and evaluation of theoretical findings is

<sup>7</sup> For the term innovations, various definitions have been proposed (cf. e.g. HAUSCHILDT (1993), p. 319; MAIER (1995), pp. 23; GARCIA & CALANTONE (2002); HAUSCHILDT (2004), pp. 3; TROTT (2008), pp. 11). Additionally, researchers further divide the field *innovations* into subcategories. TROTT (2008) for example introduces seven different types of innovations: Product, process, organizational, management, production, commercial/marketing, and service innovations (cf. TROTT (2008), p. 16). Since this thesis investigates the effects of customer competences on a company's innovation capability and strives for deducing general findings, it applies a wide definition, combining plenty of existing definitions and focusing on products.

<sup>8</sup> See similar HAUSCHILDT (2004), p. 7.

<sup>9</sup> cf. COOPER & KLEINSCHMIDT (1987), p. 169.

<sup>10</sup> cf. SIVADAS & DWYER (2000), p. 31.

<sup>11</sup> cf. CRAWFORD (1987), pp. 20; LITTLE (1988), p. 113; CRAIG & HART (1992), pp. 3 ; KOTZBAUER (1992), p. 5; SIVADAS & DWYER (2000), p. 31; ERNST (2001), p. 2; GERPOTT (2005), pp. 9.

<sup>12</sup> See the meta-studies of e.g. ROTHWELL (1977), JOHNE & SNELSON (1988), HAUSCHILDT (1993), HUANG, SOUTAR & BROWN (2001), and GARCIA & CALANTONE (2002).

<sup>13</sup> cf. e.g. HAUSCHILDT (1993), pp. 319; WOLFE (1994), p. 405; SOUITARIS (1999), p. 288; JENSEN & HARMSSEN (2001), pp. 37.



often missing.<sup>14</sup> HAUSCHILDT (2004) further mentions that success factors research exhibits fundamental theoretic as well as methodological deficits.<sup>15</sup> Thus, a new perspective to explain effects on innovations should be applied in order to examine the reasons for success and failures of innovations.

One field that seems to be able to deliver promising insights into the concept of innovations is resource-theory.<sup>16</sup> Resource-theory intends to explain the reasons for a creation of sustainable competitive advantages of companies (e.g. innovations) and then strives to deduce recommendations about which actions to take in order to realize success.<sup>17</sup> Thereby, the company-individual resources and capabilities are in the focus of consideration.<sup>18</sup> Accordingly, there are hints that especially capabilities of a company exhibit a high relevance:<sup>19</sup>

*'We find that innovation's success is, above all, determined by the capabilities of innovative firms.'*<sup>20</sup>

These capabilities can be used to transform innovation input into innovation output and are called innovation capability.<sup>21</sup> Accordingly, KOSTOPOULOS, SPANOS & PRASTACOS (2002) consider the organizational capability to innovate as essential in order to create innovations.<sup>22</sup> Moreover, LAWSON & SAMSON (2001) stress the importance of innovation capability in order to further contribute to the field of innovation research, as they state that innovation capability features the potential to be developed to make a significant contribution to advance the state of the art in the management of innovation.<sup>23</sup> To sum up, innovation capability seems to be a promising construct in order to successfully create innovations as well as to assess influencing factors of innovations. Accordingly, in order to further examine to construct innovation capability, this thesis follows the preliminary and also resource-based definition of UN (2002):

**Definition 2:** Innovation capability – preliminary

**Innovation capability** is the ability to mobilize the knowledge embodied in its employees and combines it to create new knowledge resulting in product and/or process innovation. This capability is dynamic in that it involves the interaction between a firm's internal knowledge and the demands of the external market.<sup>24</sup>

<sup>14</sup> cf. JENSEN & HARMSSEN (2001), p. 39.

<sup>15</sup> cf. HAUSCHILDT (2004), pp. 35.

<sup>16</sup> cf. LINDMAN (1997), pp. 23; COOMBS & METCALFE (2000), p. 209; HELFAT & RAUBITSCHKE (2000), pp. 961; DANNEELS (2002), pp. 1095.

<sup>17</sup> cf. FREILING (2001), p. 5.

<sup>18</sup> cf. e.g. PRAHALAD & HAMEL (1990), pp. 79.

<sup>19</sup> cf. GRANT (1996), p. 382.

<sup>20</sup> SCHEWE (1994), p. 25.

<sup>21</sup> cf. MAIRESSE & MOHNEN (2002), pp. 226.

<sup>22</sup> cf. KOSTOPOULOS ET AL. (2002), pp. 12.

<sup>23</sup> cf. LAWSON & SAMSON (2001), p. 396.



Due to the potential of innovation capability towards a successful creation of innovations, companies should strive to systematically increase their innovation capability. There are several ways to increase innovation capability and respective research demonstrates, that – among others – the involvement of potential customers constitutes one central external source of relevant information in order to increase innovation capability.<sup>25</sup> Thereby, a customer is understood as follows:

**Definition 3:** Customer – preliminary

A **customer** is the recipient and consumer of a product, service, good, or idea, obtained from a vendor, seller, or supplier for a monetary or other valuable consideration.<sup>26</sup>

Through a close cooperation with potential customers, a company obtains insights into customer demands, expectations, and problems and generates therewith a 'source of information'.<sup>27</sup> Thereby, a company gains new ideas that can enrich innovation activities. In addition, it can succeed in collecting important information and knowledge about current and future customer demands. In conclusion, suchlike companies can align their innovation activities much closer to their customers and are thus enabled to develop new products that are also much closer linked to relevant customer needs.<sup>28</sup> Thus, companies which involve their customers can realize advantages like a shorter time-to-market, lower cost-to-market, an increased fit-to-market, as well as an improved new-to-market.<sup>29</sup> This minimizes uncertainties linked to the creation of innovations and thus can help to reduce failure rates of innovations as well.<sup>30</sup>

Accordingly, customer involvement can contribute to the innovation capability of a company, since new knowledge (from customers) is mobilized and created (within a company) and knowledge is leveraged with market demands.<sup>31</sup> This potentially positive effect through customer integration into innovation activities is also supported by other authors who state that a consequent alignment of new products to the needs of potential customers is beneficial in practice as well as in research science.<sup>32</sup> However, there is a significant discrepancy between the importance and the concrete implementation in

<sup>24</sup> UN (2002), p. E1.

<sup>25</sup> cf. e.g. AFUAH (1998), p. 72; COOPER (1999), p. 5; LI & CAVUSGIL (1999), p. 132; LILIEN, MORRISON, SEARLS, SONNACK & VON HIPPEL (2002), p. 1042; FRANKE & SCHREIER (2002), p. 6; THOMKE & VON HIPPEL (2002), pp. 76; FRANKE & SHAH (2003), p. 3; LÜTHJE & HERSTATT (2004), p. 553; TROTT (2008), pp. 4; BRETSCHNEIDER, LEIMEISTER & KRUMAR (2009), p. 1.

<sup>26</sup> STAHL (2004), p. 119.

<sup>27</sup> cf. GRIFFIN (1993), pp. 112.

<sup>28</sup> cf. COLLISON & PARCELL (2003), p. 16.

<sup>29</sup> cf. REICHWALD, MEYER, ENGELMANN & WALCHER (2007), p. 172.

<sup>30</sup> cf. GASSMANN, KAUSCH & ELLEN (2010), p. 44.

<sup>31</sup> See the definition of innovation capability. See also SAMMERL (2006), p. 202.

<sup>32</sup> cf. TROMMSDORFF & BINSACK (2000), pp. 113; LETTL & GEMÜNDEN (2005), p. 339; MASON & HARRIS (2005), p. 373.



practice<sup>33</sup> as well as in scientific research.<sup>34</sup> Furthermore, effects of customer integration into innovation activities are subject to even contradicting results.<sup>35</sup> Beside positive effects, customer integration can also entail negative side effects, like knowledge drain or dependence on customers, as growing experience on customer integration demonstrates.<sup>36</sup> Thus, companies need to integrate customers effectively in order to systematically and successfully increase their innovation capability.

Due to potential and even contradicting effects of customer integration on innovation capability, companies should not strive to generally integrate customers into their innovation activities or to randomly select them.<sup>37</sup> The reason is that different customers comprise different potential and therewith contribute in different ways to a company's innovation activities.<sup>38</sup> There are for example lead-users<sup>39</sup> or customers as co-developer or tester.<sup>40</sup> Lead-users are with regard to their potential impact very important customers, since they experience developments and trends earlier than other customers or companies. Therewith, they can contribute to completely new or already developed products.<sup>41</sup> Co-developer's skills are rather limited towards a support of innovative products, since they participate in later phases of product development and ensure a fit of a product's characteristics to customer needs. Finally, tester only feature a rather low potential to contribute to innovation activities: They are embedded in testing and support and these activities are mainly dealing with error fixing and establishing user friendly support and not with the core of product development itself.<sup>42</sup> BROCKHOFF (2003) mentions as different types of customers *demanding customers*, *launching customers*, *innovative customers*, *reference customers*, and *first buyer*. These customers feature different knowledge and characteristics.<sup>43</sup> In conclusion, a variety of customers featuring different characteristics exist causing potentially different effects on innovation capability. Hence, the more important customers (with regard to their potential contribution) should be systematically identified and their involvement prioritized, since they might contribute more to an increase of a company's innovation capability. Consequently, companies need to identify the 'right' customers for their specific circumstances in order to benefit most from their integration into their innovation activities.

<sup>33</sup> cf. EKSTRÖM & KARLSSON (2001), p. 24.

<sup>34</sup> cf. DANNEELS (2003), p. 575.

<sup>35</sup> See e.g. ENKEL, KAUSCH & GASSMANN (2005), pp. 203; ROHRBECK, STEINHOFF & PERDER (2010), pp. 119; HE & YU (2010), pp. 1308.

<sup>36</sup> cf. VERYZER (1998b), pp. 136; ENKEL ET AL. (2005), p. 203.

<sup>37</sup> cf. HE & YU (2010), pp. 1305.

<sup>38</sup> cf. VON HIPPEL (1988), pp. 106; HERSTATT, LÜTHJE & LETTL (2001), p.1; TROTT (2008), pp. 405.

<sup>39</sup> Following VON HIPPEL (1988), '(1) Lead users face needs that will be general in a marketplace, but they face them months or years before the bulk of that marketplace encounters them, and (2) Lead users are positioned to benefit significantly by obtaining a solution to those needs.' (VON HIPPEL (1988), p. 107).

<sup>40</sup> Co-developers are users involved in a wide range of design and development tasks whereas tester perform e.g. prototype or pre-release testing including related support (cf. TROTT (2008), p. 406).

<sup>41</sup> cf. VON HIPPEL (1988), p. 7.

<sup>42</sup> cf. TROTT (2008), p. 406.

<sup>43</sup> cf. BROCKHOFF (2003), pp. 464.



As all customers are different, companies need to approach these differences in order to identify the most promising customers for innovation activities. Companies have to select their customers carefully in order to benefit from their involvement into innovation activities.<sup>44</sup> In order to assess and compare different customers and therewith estimate their fit to be integrated into particular innovation activities, several authors mention that competences of these customers could be considered.<sup>45</sup>

Therefore, the idea of competences of an individual shall be applied, since competences integrate abilities, skills, and knowledge and are thus a wide construct respecting different facets of a customer.<sup>46</sup> Moreover, competences enable a customer to deal with formerly unknown situations. Thus, customers exhibiting appropriate competences can cope with complex and new situations<sup>47</sup> as innovation activities of companies usually are for customers: These activities cover a wide spectrum of different actions like idea generation, research and development, production, and implementation,<sup>48</sup> the outcome is ex-ante unknown, and processes throughout the development of an innovation are also partially new due to the newness of an innovation itself.<sup>49</sup> Thus, the competence construct seems to be promising in order to identify the most beneficial customers for a company's innovation activities. Correspondingly, the following definition of customer competences – representing the ultimate customer and therewith individual competences – shall be applied:

**Definition 4:** Customer competences – preliminary

**Customer competences** are a function of the knowledge and skills they possess, their willingness to learn and experiment, and their ability to engage in an active dialogue.<sup>50</sup>

With the concept of customer competences, companies might be enabled to identify the most beneficial customers for their innovation activities in order to increase their innovation capability. Accordingly, as a precondition for explaining potential effects between particular customer competences and the innovation capability of a company, the general existence of these effects has to be verified. This is required, since if there is no significant effect that can be revealed, the construct would be inappropriate to assess particular

<sup>44</sup> cf. HE & YU (2010), pp. 1305.

<sup>45</sup> e.g. cf. ROHRBECK, HÖLZLE & GEMÜNDEN (2009), pp. 420; GASSMANN ET AL. (2010), pp. 48; cf. HE & YU (2010), p. 1305.

<sup>46</sup> cf. MÜLLER-MARTINI (2008), pp. 215.

<sup>47</sup> cf. HÜLSMANN & MÜLLER-MARTINI (2006), pp. 382.

<sup>48</sup> cf. e.g. THOM & GROCHLA (1980), pp. 45; ALBERS & EGGERS (1991), p. 48; COOPER (1994), pp. 3; MAIER (1995), pp. 42; MILLSON & WILEMON (2002), p. 8; VERWORN & HERSTATT (2002), pp. 3; HAUSCHILD (2004), pp. 24; SCHMIDTHALS (2007), pp. 35.

<sup>49</sup> cf. e.g. BARNETT (1953), p. 7; SCHMOOKLER (1966), p. 1; ROGERS (1983), p. 11; DOSI (1988), p. 222.

<sup>50</sup> PRAHALAD & RAMASWAMY (2000), p. 2.



competences and their contribution to innovation capability. Consequently, the following central research question can be deduced:

### **Is a company's innovation capability affected by customer competences?**

After the research question of this investigation is formulated, it is important to demonstrate the relevance of this question. Accordingly, CHMIELEWICZ (1994) mentions that it is essential to demonstrate the relevance of the outlined problem from two perspectives: Theory and practice.<sup>51</sup> HÜLSMANN (2003) picks up this idea and divides the relevance of a research topic into a theoretical and a practical relevance. This multidimensional perspective allows to account for a systematic, inter-subjective, and comprehensive deduction of research aims for the underlying investigation.<sup>52</sup> Moreover, SCHNEIDER (1981) states that science can only be useful for practice, if it contains a fundamental theoretical basis in order to reliably deduce recommendations.<sup>53</sup> Accordingly, a demonstration of the theoretical as well as the practical relevance of this investigation is essential and thus presented next.

## **1.2. Research Gap – Missing Explanations about Effects of Customer Competences on Innovation Capability**

HÜLSMANN (2003) describes the **theoretical relevance** as a lack of relevant scientific explanations in form of missing causal interrelations for explaining and solving the related management problem.<sup>54</sup> Accordingly, existing literature has to be scanned for the existence of causal interrelations between customer competences and innovation capability. Correspondingly, a literature research is conducted and divided into two parts: A first **literature research covering the innovation capability perspective** is conducted in order to investigate whether the construct customer competences has been assessed in the context of innovation capability. Then, a second **literature research covering the customer competences perspective** is executed in order to analyze if the construct innovation capability has been examined in the context of customer competences. Therewith, the status quo of related literature can be checked from both relevant research perspectives in order to ensure that no relevant contributions are missing in this analysis. Next, the identified literature has to be assessed based on its contribution to this research. Therefore, requirements in order to answer the underlying research question have to be formulated and all identified research papers have to be tested against these requirements.

To begin with, FRITZ (1995) proposes that science should not only develop theoretic models but also test these models empirically (i.e. critically confront these constructs

<sup>51</sup> cf. CHMIELEWICZ (1994), p. 15.

<sup>52</sup> cf. HÜLSMANN (2003), pp. 17.

<sup>53</sup> cf. SCHNEIDER (1981), p. 7.

<sup>54</sup> cf. HÜLSMANN (2003), pp. 17.





with reality).<sup>55</sup> Thus, new knowledge can be created by eliminating wrong hypotheses.<sup>56</sup> This demands for theoretical as well as empirical considerations. Moreover, as the focus of this research is on the existence of effects between customer competences and innovation capability, at least general aspects of the central research objects (i.e. innovation capability and customer competences) should be addressed in the identified papers in order to deliver relevant contributions to this investigation. Accordingly, for the first literature research on the innovation capability perspective, the following three requirements can be deduced in order to identify research papers as being promising to deliver insights into this investigation's central research question:

- (1) a strong **theoretical foundation** should be used,
- (2) an **empirical evaluation** of the theoretically-deduced interrelations is required, and
- (3) general **aspects of customers** should be present.

Starting from these requirements, a literature research is conducted to identify the status quo of the research that reveals effects between customer competences and innovation capability. Thereby, first, the literature research is conducted from the **innovation capability perspective** in order to obtain general information on drivers of the innovation capability construct.<sup>57</sup> Accordingly, in total 1,228 papers are identified that address innovation capability:<sup>58</sup>

**Table 1.1:** No. of identified relevant research papers through the research on innovation capability

Search term	Total hits / hits relevant to this research*
innovation capability	732 / 9
innovation capabilities	257 / 4
innovative capability	135 / 3
innovative capabilities	103 / 4
additional papers**	- / 36
<b>total</b>	<b>1,228 / 56</b>

Numbers before slash represent no. of papers that are identified in total. Numbers after slash represent no. of papers that are relevant to this investigation.

\*: Papers are relevant, if they contain any information about the construct *innovation capability*, its elements, setup, or nomological network.

\*\* : Additional papers are those listed in the references of the 1,228 identified papers through the innovation capability research and considered as being promising for delivering further contributions due to their title. Thus, they are also analyzed towards their contribution.

<sup>55</sup> cf. FRITZ (1995), p. 93.

<sup>56</sup> cf. POPPER (1993), p. 95.

<sup>57</sup> The literature is scanned for innovation capability and synonym terms that are frequently applied in literature. These are innovation capabilities, innovative capability, and innovative capabilities.

<sup>58</sup> All details on the conducted literature research can be found in appendix D.



The next table depicts research papers that focus on the construct innovation capability with regard to the three developed criteria (1) *theoretical foundation*, (2) *empirical evaluation*, and (3) *aspects of customers*. Additionally, information on resource-based frameworks are presented, as these frameworks are identified as being promising towards delivering insights into the construct of innovation capability:



**Table 1.2:** Identified literature through the research on innovation capability – detailed table

No.	Author	Theoretical foundation	Empirical evaluation	Aspects of customers	Resource-based framework
1	Adler & Shenhar (1990)	-	-	not addressed	no
2	Akman & Yilmaz (2008)	o	o	addressed	no
3	Burgelman et al. (1988)	+	-	not addressed	no
<b>4</b>	<b>Calantone et al. (2002)</b>	<b>+</b>	<b>+</b>	<b>addressed</b>	<b>no</b>
5	Capaldo et al. (2003)	o	-	not addressed	RBV
6	Cavusgil et al. (2003)	o	o	not addressed	KBV
7	Chen & Wang (2008)	-	o	not addressed	no
8	Christensen (1995)	-	-	not addressed	no
9	Coates & McDermott (2002)	+	-	not addressed	RBV
10	Danneels (2002)	+	-	addressed	RBV
11	Day (1994)	+	-	not addressed	CV
12	Fan (2006)	-	o	not addressed	no
13	Franke & von Hippel (2003)	-	-	not addressed	no
14	Greiling (1998)	o	o	not addressed	no
15	Guan & Ma (2003)	o	o	not addressed	RBV
16	Hagedoorn & Duysters (2002)	-	o	not addressed	RBV
17	Huang et al. (2001)	-	o	not addressed	no
18	Iansiti & Clark (1994)	o	-	addressed	DCV
19	Jensen & Harmsen (2001)	o	-	not addressed	RBV and KBV
20	Keskin (2006)	o	+	not addressed	no
21	Kostopoulos et al. (2002)	+	-	not addressed	RBV and KBV
22	Kusunoki et al. (1998)	o	o	not addressed	RBV and KBV
23	Lawson & Samson (2001)	o	-	addressed	RBV and DCV
24	Leiponen (2000)	+	o	not addressed	DCV
25	Leonard-Bartoon (1992)	+	-	not addressed	RBV and KBV
<b>26</b>	<b>Li &amp; Calantone (1998)</b>	<b>+</b>	<b>+</b>	<b>addressed</b>	<b>RBV</b>
<b>27</b>	<b>Li &amp; Cavusgil (1999)</b>	<b>+</b>	<b>+</b>	<b>addressed</b>	<b>RBV</b>
28	Liao et al. (2007)	o	o	not addressed	no
29	Lin (2007)	o	o	not addressed	no
30	Lin et al. (2010)	-	o	addressed	no
31	Marsh & Stock (2003)	o	-	not addressed	KBV
32	Müller-Philips Sohn (1976)	o	o	not addressed	no
33	Neely & Hii (1998)	o	-	addressed	RBV
34	Neely & Hii (1999)	o	-	addressed	RBV
35	Pavitt (1991)	o	-	addressed	RBV
36	Prencipe (2001)	+	-	not addressed	RBV
<b>37</b>	<b>Riiter &amp; Gemünden (2003)</b>	<b>+</b>	<b>+</b>	<b>not addressed</b>	<b>RBV</b>
38	Romijn & Albaladejo (2000)	-	o	addressed	no
39	Romijn & Albaladejo (2002)	o	o	addressed	no
<b>40</b>	<b>Sammerl (2006)</b>	<b>+</b>	<b>+</b>	<b>addressed</b>	<b>DCV</b>
41	Schewe (1994)	o	+	not addressed	no
42	Sen & Egelhoff (2000)	o	-	not addressed	RBV
<b>43</b>	<b>Sher &amp; Yang (2005)</b>	-	<b>o</b>	<b>not addressed</b>	<b>RBV</b>
44	Sivadas & Dwyer (2000)	+	+	not addressed	no
45	Souitaris (2002)	o	o	not addressed	RBV
<b>46</b>	<b>Subramaniam &amp; Venkatraman (2001)</b>	<b>+</b>	<b>o</b>	<b>not addressed</b>	<b>RBV and KBV</b>
<b>47</b>	<b>Subramaniam &amp; Youndt (2005)</b>	<b>+</b>	<b>+</b>	<b>not addressed</b>	<b>no</b>
48	Tatikonda & Montoya-Weiss (2001)	+	+	not addressed	RBV
<b>49</b>	<b>Tyler (2001)</b>	<b>+</b>	-	<b>not addressed</b>	<b>RBV and KBV</b>
50	Vázquez et al. (2001)	+	+	not addressed	no
51	Verona (1999)	+	-	not addressed	RBV
52	Verona & Ravasi (2003)	o	-	not addressed	DCV
53	Weerawardena & O'Cass (2004)	o	o	not addressed	no
<b>54</b>	<b>Yam et al. (2004)</b>	-	<b>o</b>	<b>not addressed</b>	<b>no</b>
55	Yang et al. (2009)	+	+	not addressed	RBV
56	Zahra & George (2002)	+	-	not addressed	RBV
<b>Papers featuring theoretical foundation/empirical evaluation/aspects of customers/resource-based framework</b>		<b>22</b>	<b>12</b>	<b>14</b>	<b>33</b>
<b>Papers featuring strong theoretical foundation AND empirical evaluation</b>		<b>10</b>			
<b>Papers featuring theoretical foundation AND empirical evaluation AND aspects of customers</b>		<b>4</b>			

CBV: Competence-based view; CV: Capability-based view; DCV: Dynamic capabilities-based view; KBV: Knowledge-based view; RBV: Resource-based view; +: strong; o: moderate; -: weak. text in bold = customer is mentioned in the context of innovation capability.



Regarding the requirement strong **(1) theoretical foundation**, 22 papers are identified that exhibit a strong theoretical foundation.<sup>59</sup> 17 of them rest upon a resource-oriented approach like the resource-based view,<sup>60</sup> or the (dynamic) capabilities approach,<sup>61</sup> and 5 are based on other theoretical frameworks, e.g. organization theory.<sup>62</sup> The remaining papers do not exhibit a proper theoretical basis and are thus excluded from a further assessment, since they do not match criterion one presented before.

Out of these 22 papers with a strong theoretical foundation, 10 papers also feature an **(2) empirical evaluation** of their results – these are marked bold in table 1.2.<sup>63</sup> Thus, only these papers shall be analyzed in more detail towards their contribution to this investigation, since only papers that apply an empirical evaluation in order to assess well-founded theoretical considerations are supposed to deliver reliable and valid results.<sup>64</sup>

LI & CALANTONE (1998) and LI & CAVUSGIL (1999)<sup>65</sup> examine the influence of market knowledge competence on a new product from a customer perspective. Therefore, they conceptualize market knowledge competence in the context of new product development and integrate customers as one factor influencing it. They state a co-relation between increased customer integration, a thus increased market competence, and finally an improved innovation success. The way they address customers as one factor to enhance innovation success might be interesting for this thesis. However, they fail to address concrete details about how to integrate customers into innovation activities or even concrete recommendations for customer integration. Furthermore, customers are not considered as individuals having competences but as a general source of information and interrelations between these customers and innovation capability are not addressed as well.<sup>66</sup> Consequently, their findings are of rather low interest for this thesis.

SIVADAS & DWYER (2000) develop a concept for organizational cooperation abilities. They consider internal and external factors during their empirical data collection and validate their findings with an confirmatory factor analysis. They discover a signifi-

<sup>59</sup> Strong theoretical foundation means that the framework is comprehensively defined with its assumptions and used later on to deduce and explain the investigation's findings.

<sup>60</sup> The resource-based assumes that firms are bundles of unique and strategically relevant resources (cf. BARNEY (1991), p. 112). Identified investigations based on the resource-based view are: LEONARD-BARTON (1992); LI & CALANTONE (1998); LI & CAVUSGIL (1999); VERONA (1999); PRENCIPE (2001); SUBRAMANIAM & VENKATRAMAN (2001); TATIKONDA & MONTOYA-WEISS (2001); TYLER (2001); COATES & McDERMOTT (2002); DANNEELS (2002); ZAHRA & GEORGE (2002); RITTER & GEMÜNDEN (2003); CHEN & WANG (2008); YANG, MARLOW & LU (2009).

<sup>61</sup> TEECE ET AL. (1997) define dynamic capabilities as the capability to '*(...) shape, re- shape, configure and reconfigure the firm's asset base so as to respond to changing technologies and markets.*' (TEECE ET AL. (1997), p. 516). Identified investigations based on the dynamic-capabilities approach are: DAY (1994); LEIPONEN (2000); SAMMERL (2006).

<sup>62</sup> Organization theory strives for an explanation and understanding of an organization – its becoming, existence, and operations (cf. FRESE (2004), pp. 1008). Identified investigations based on other frameworks are: BURGELMAN, KOSNIK & VAN DEN POEL (1988); SIVADAS & DWYER (2000); VÁZQUEZ, SANTOS & ÁLVAREZ (2001); CALANTONE ET AL. (2002); SUBRAMANIAM & YOUNDT (2005).

<sup>63</sup> These are the papers of LI & CALANTONE (1998); LI & CAVUSGIL (1999); SIVADAS & DWYER (2000); TATIKONDA & MONTOYA-WEISS (2001); VÁZQUEZ ET AL. (2001); CALANTONE ET AL. (2002); RITTER & GEMÜNDEN (2003); SUBRAMANIAM & YOUNDT (2005); YANG ET AL. (2009).

<sup>64</sup> These papers are presented, although they are not tested against the third criteria introduced before. The reason is that although they might not match the third criteria, they could potentially deliver first interesting insights towards this research. The third criteria is tested after the brief description of these 9 papers.

<sup>65</sup> A less comprehensive version of LI & CALANTONE'S (1998) investigation.

<sup>66</sup> cf. LI & CALANTONE (1998), pp. 13; LI & CAVUSGIL (1999), p. 129.



cant influence of cooperation abilities towards the success of new product development. In their research, the authors focus on inter-firm cooperation and their effects on the new product development.<sup>67</sup> Moreover, the application of their theoretical findings in empirical research might be interesting for this research. On the other hand, they do not pay attention on customer competences diminishing the relevance of this research and thus the contribution to this thesis seems limited.

TATIKONDA & MONTOYA-WEISS (2001) research the influences of innovation process factors towards innovation capability. They identify a positive effect between process concurrency, innovation success, and finally market success. Due to their profound theoretical basis (i.e. resource-based view (RBV)) as well as empirical validation of their results (through a confirmatory factor analysis), this research might deliver valuable input to this thesis in terms of how to conceptualize or assess innovation capability. However, their main focus is not on customers or even their competences and they focus just on the innovation result instead of innovation capability,<sup>68</sup> which is subject to this thesis. Thus, the contribution to this thesis is bounded.

VÁZQUEZ ET AL. (2001) focus in their theoretical-conceptual investigation on the absorptive capacity of companies. They conceptualize absorptive capacity as a dynamic two-dimensional capability, which is the basis for sustainable competitive advantage. The authors distinguish between potential and realized absorptive capacity and stress that the realized absorptive capacity is the basis for new product development. They deliver hints that the usage of external knowledge can contribute to innovation capability. Additionally, they tested their findings with a confirmatory factor analysis.<sup>69</sup> However, information about customer competences could not be revealed and hence, the contribution of their results to the underlying investigation is considered low.

CALANTONE ET AL. (2002) concentrate on the learning orientation of companies.<sup>70</sup> They compose a set of hypotheses with regard to innovation capability and company success. For validating their model they apply a confirmatory factor analysis. Consequently, the authors' findings about learning effects on innovation capability and their empirical validation should be considered in this thesis, since the way they build their model and applied it to a factor analysis might be useful. Additionally, they consider customers in their context, but only as element of open-mindedness of the company and information source. The authors mainly consider the output of innovation activities and distinctive customer competences are not regarded in their investigation.<sup>71</sup> Hence, their findings are of rather low interest.

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<sup>67</sup> cf. SIVADAS & DWYER (2000), pp. 31.

<sup>68</sup> cf. TATIKONDA & MONTOYA-WEISS (2001), pp. 151.

<sup>69</sup> cf. VÁZQUEZ ET AL. (2001), pp. 185.

<sup>70</sup> cf. CALANTONE ET AL. (2002), pp. 515.

<sup>71</sup> cf. CALANTONE ET AL. (2002), p. 520.



RITTER & GEMÜNDEN (2003) examine effects of network competence towards innovation success. They stress that a company-wide network competence positively affects innovation success. An interesting point of their investigation might be the fact that via network competence external partners (e.g. customers) can be integrated into a company's innovation process. Additionally, they validate their findings with empirical investigations and statistical tools like a co-variance-based analysis. In conclusion, this research might contribute some interesting inputs towards customer integration, since they address aspects of openness of a company,<sup>72</sup> which is important for customer integration. However, concrete customer competences and their impact are not considered. Consequently, their contributions to this research are limited.

SUBRAMANIAM & YOUNDT (2005) assay the impact of intellectual capital on innovation capability. They apply empirical investigations and a profound statistical analysis of their findings with a LISREL analysis. The outcome is that intellectual capital positively contributes to innovation capability. Their research course might deliver relevant input to this research, in particular the executed empirical and statistical steps. However, a customer perspective is missing and the focus is not on customer competences, but on other determinants of innovation capability (e.g. intellectual capital).<sup>73</sup> Hence, their contribution to this research is rather low.

SAMMERL (2006) researches the effects of innovation capability towards a creation of sustainable competitive advantages and she finds that innovation capability is significantly positive correlated with company success. In the course of research, she conceptualizes and operationalizes the construct innovation capability. Moreover, she also empirically tests her constructs. Thus, the insights and results of this investigation could probably deliver valuable input to this investigation with regard to the innovation capability construct. Hence, it is considered throughout this research. Additionally, customers are considered as one source of information in the context of innovation capability.<sup>74</sup> Also from this perspective, some interesting inputs might be obtained for this investigation. However, customers are not explicitly linked to innovation capability and the existence of effects between customer competences and innovation capability is not revealed. Consequently, also SAMMERL'S (2006) research can support but not answer the research question of this thesis.

YANG ET AL. (2009) examine the relationships between resource, logistics service capability, innovation capability, and the performance of Taiwanese container shipping service firms based on the resource-based view and validated with a LISREL analysis. Their results hold that resources have a significant positive effect on logistics service capabilities and innovation capability. In addition, the findings indicated that logistics service capability have a positive effect on the performance of container shipping service

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<sup>72</sup> cf. RITTER & GEMÜNDEN (2003), pp. 745.

<sup>73</sup> cf. SUBRAMANIAM & YOUNDT (2005), pp. 450.

<sup>74</sup> cf. SAMMERL (2006), pp. 9.



firms. However, resource and innovation capability are not found to have significantly positive effects on firms' performance. Again, no insights about relations between customer competences and innovation capability are present.<sup>75</sup> Thus, their contribution to this research is bounded.

**In essence**, the outlined literature matches the criteria **(1) theoretical foundation** and an **(2) empirical evaluation** and is investigated towards contributions to the identification of customer competences effects on the innovation capability of a company. In conclusion, no research is identified that can answer this thesis' research question. Consequently, based on this analysis, first hints for a research gap regarding the existence of effects between customer competences and innovation capability are identified.

As mentioned earlier, a third requirement that addresses **(3) aspects of customers** in the context of innovation capability is formulated. Out of the 56 totally identified papers obtained through the innovation capability literature research, only 4 match all three criteria.<sup>76</sup> They have been presented before. However, in order to ensure that no important contributions are missing, all papers from the innovation capability-related literature research that have not been presented before but do contain aspects of customers in general in the context of innovation capability are presented next.<sup>77</sup>

PAVITT (1991) analyze key characteristics of the large innovating firm. They only name customers as one external contextual source of information without giving any reference to customer competences.<sup>78</sup> Thus, the paper seems to be limited for obtaining insights for this research.

IANSITI & CLARK (1994) investigate the impact of two types of integration – internal and external – on dynamic capabilities. They assign customers to the concept of external integration as one way to reduce uncertainty and they found that the capacity to integrate diverse knowledge bases through problem solving is the basic foundation of knowledge building in an organization and is therefore a critical driver of dynamic performance.<sup>79</sup> However, customers are again treated as passive provider of information without any links to competences. Accordingly, no further insights findings can be obtained from this paper.

NEELY & HII (1998) analyze interrelations between innovation and business performance based on a literature review. They found that a firm's linkages to external networks and the relations to customers are important for innovative activities of the firm.<sup>80</sup> Again,

<sup>75</sup> cf. YANG ET AL. (2009), pp. 4.

<sup>76</sup> The papers matching all three criteria are the papers of LI & CALANTONE (1998), LI & CAVUSGIL (1999), and CALANTONE ET AL. (2002).

<sup>77</sup> These are the additional papers of PAVITT (1991), IANSITI & CLARK (1994), NEELY & HII (1998), NEELY & HII (1999), ROMIJN & ALBALADEJO (2000), LAWSON & SAMSON (2001), DANNEELS (2002), ROMIJN & ALBALADEJO (2002), AKMAN & YILMAZ (2008), and LIN, CHEN & CHIU (2010).

<sup>78</sup> cf. PAVITT (1991), pp. 46.

<sup>79</sup> cf. IANSITI & CLARK (1994), pp. 557.

<sup>80</sup> cf. NEELY & HII (1998), p. 27.



customers are only considered on a general level without focusing on their competences. Hence, their findings are limited with regard to this thesis' research question.

In another investigation, NEELY & HII (1999) investigate the drivers of the innovative capacity of firms. They found that firms draw on internal and external information for innovation, whereas one source of external information are customers. They even found a strong practice of customer co-development.<sup>81</sup> However, customer competences do not play a role in their investigations and thus this research is considered as being of low interest.

ROMIJN & ALBALADEJO (2000) investigate in their paper determinants of innovation capability in small UK firms. Beside other drivers of innovation capability like public financial support for research and development (R&D) or interaction with nearby R&D, they also found that interaction with customers is – although not significantly – positively correlated with innovation capability.<sup>82</sup> Thus, a customer orientation while intending to foster innovation capability is beneficial following their study. However, they do not consider customer competences and hence their contribution to this research is limited.

LAWSON & SAMSON (2001) evaluate the development of innovation capability in organizations based on the dynamic capabilities approach. They mention networks and alliances of customers as a key source of innovations. They are also an effective means of reducing cost, risk, achieving economies of scale, and reducing new product development time. However, they focus on learning about customers, treat customers as passive information provider, and do not further mention competences in any manner.<sup>83</sup> Consequently, this paper provides no relevant information about the existence of customer competences effects on innovation capability.

DANNEELS (2002) investigates in a case study, if and how product innovations contribute to company renewal and development.<sup>84</sup> Based on learning theory, he argues that product innovations can contribute to a development of new and an advancement of existing company competences. In a three-layer-model the competence types level 1 competences, integrative competences, and level 2 competences are combined and the author places customer competences in the layer level 1 competences.<sup>85</sup> Though, this research can deliver some interesting ideas about customer integration and effects on product innovations. However, an operationalization of his identified variables as well as an empirical validation are missing. Hence, the contribution to this research is rather low.

ROMIJN & ALBALADEJO (2002) examine determinants of innovation capability in small electronics and software firms in southeast England. They found that there is a significantly negative correlation between customer proximity and performance measured

<sup>81</sup> cf. NEELY & HII (1999), pp. 47.

<sup>82</sup> cf. ROMIJN & ALBALADEJO (2000), pp. 1.

<sup>83</sup> cf. LAWSON & SAMSON (2001), pp. 383.

<sup>84</sup> cf. DANNEELS (2002), pp. 1095.

<sup>85</sup> cf. DANNEELS (2002), p. 1104.