A THEORY OF MANAGING CREATIVITY-INTENSIVE PROCESSES

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ABSTRACT

This study reports the results of an exploratory, theory building study on the impact of creativity on business processes and their management. The empirical evidence has been derived from organizations within film and visual effects (VFX) production. An adapted grounded theory approach, particularly drawing from the work of Strauss and Corbin, was employed in order to analyze the data. The study identifies the dynamics of business processes that can be described as highly dependent on creativity, interdependent, client-focused, complex, but also repetitive. It further explains the processes' organizational context as well as strategies and information technology (IT) that organizations in film and VFX production use in order to manage their processes. The findings are summarized within a theoretical framework of creativity-intensive processes. The substantive theory developed from this work is that

creativity-intensive processes in film and VFX production are shaped by a complex interplay of artists, clients, and organizational resources. Creativity in business processes causes high unpredictability with regard to process structure, required resources and process outcome. Therefore, so-called creativity-intensive processes are characterized by an iteration between creating a mutual understanding of the requirements of the creative product, generating the creative product, and reviewing it. In order to manage this process, creative supervisors act as process intermediaries and apply various strategies in both internally managing the process and communicating with clients while they pursue both creative and operational process performance. Only when the process is completed, requirements of the creative product are fully understood.

KEYWORDS

Business process management, creativity, case study, grounded theory

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Muenster, April 2009

To my parents

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LIST OF ABBREVIATIONS

BPM	Business Process Management
BPMN	Business Process Modeling Notation
CEO	Chief Executive Officer
CIO	Chief Information Officer
CSS	Creativity Support System
ECT	Expectation Confirmation Theory
EDL	Edit Decision List
EPC	Event-driven Process Chain
GDSS	Group Decision Support System
GSS	Group Support System
IS	Information Systems
IT	Information Technology
TAM	Technology Acceptance Model
TQM	Total Quality Management
TTF	Task-technology Fit Theory
TVC	Television Commercial
VFX	Visual Effects
WIP	Work in Progress

1 EXPOSITION

Managers cannot be expected to ignore business imperatives, of course. But in working towards these imperatives, they may be inadvertently designing organizations that systematically crush creativity.

Theresa Amabile

1.1 Motivation

The phenomenon of creativity is of considerable importance to many organizations and can be seen as a core competitive factor in a variety of contemporary industries (e.g. Florida, 2002; Coulson & Strickland, 1991). Creativity is commonly associated with the generation of products, services, processes, or ideas that are both novel and appropriate (Woodman et al., 1993; Amabile, 1996). Amabile (1998) states that despite its importance, "creativity is undermined unintentionally every day in work environments that were established – for entirely good reasons – to maximize business imperatives such as coordination, productivity, and control" (p. 77). As a consequence, managers are forced to ask questions such as *How can I successfully manage an organization without crushing creativity?*

One widely accepted approach that may provide a response to this question is that of business process management (BPM). BPM has focused on analyzing and improving business processes in order to improve organizational performance and sustain competitive advantage (Hung, 2006; Davenport, 1993). With the emergence of the creative industries (Hartley, 2005; Hesmondhalgh, 2002) as an entire sector that has developed around creative products, the management of business processes that involve creativity becomes critical. Prominent examples include the production of computer games, visual effects (VFX), or feature films. At the same time, other industries such as software development, pharmaceuticals, or research and development increasingly are recognizing the role of creativity (Florida, 2002). Consequently, the question arises of how those processes that are characterized by creativity can be successfully managed.

In recent years research on BPM has shifted the focus towards so-called human-centric or knowledge work processes (Davenport, 2005; Eppler et al., 1999; Harmon, 2007). This has resulted in the increased recognition of the roles of knowledge, judgment, collaboration, and individual capabilities in many critical processes, ranging from financial operations to healthcare, art, design, and entertainment. Davenport

(2005) claims that in the United States alone 28% of the workforce or 36 million people are so-called knowledge workers whose jobs are concerned with the creation, distribution, and application of knowledge. Although these studies reveal important factors such as high levels of required autonomy, motivation, and expertise, the role of creativity and its consequences for the management of these processes has not been investigated in depth. Yet, this knowledge is particularly critical to organizations in industries that not only benefit from, but rely on creativity.

Research on creativity in organizations, on the contrary, has traditionally focused on individuals, groups, and organizations as the level of analysis (Drazin et al., 1999). Thus, existent theories explain, at different levels, the occurrence of creativity, creative behavior, and creative products (e.g. Williams & Yang, 1999; Guilford, 1967; Rubenson & Runco, 1992; Ekvall & Ryhammer, 1999; Runco, 2007; Amabile, 1990). Multilevel theories, such as the one proposed by Woodman et al. (1993), suggest that creativity at a higher level is a function of creativity at the lower levels. Research questions typically focus on how the creative outcome of an organization can be enhanced. As a consequence, Drazin et al. (1999) identify that "scholars tend to model creativity as a discrete task, conducted by individuals or small groups who are isolated from broader organizational and occupational pressures" (p. 289). They also state that viewing creativity as an outcome rather than as a process has led towards static models with the purpose of explaining variance of the creative outcome (exemptions can be found in Drazin et al., 1999; Ford, 1996; Borghini, 2005; Mace & Ward, 2002). The recognition of the importance of a process-oriented view as opposed to an outcome-oriented perspective is comparable to the emergence of total quality management (TQM), which proposed to focus on the process quality as the ultimate cause for the end product's quality (e.g. Powell, 1995).

Existent models of creativity in organizations, due to their level of analysis, the perception of creativity as a discrete task, a mere focus on the creative output, and their static nature, are less applicable to explain how creativity influences business processes and their management. For example, while explaining various factors that impact the outcome of organizational creative processes (e.g. Woodman et al., 1993), these theories do not sufficiently capture the processes' dynamics including required process steps, potential iterations, as well as strategies and information technology (IT) that organizations use throughout the process. Moreover, it cannot be assumed that the creative outcome, or organizational creativity (Woodman et al., 1993), is the only consequence that organizations intend when conducting business processes that contain creativity. Models of the creative process (e.g. Wallas, 1926; Osborn, 1957; Ghiselin, 1963), on the contrary, predominantly focus on individuals and small

groups (Lubart, 2001) and thus fall short in considering the complexities of organizational environments.

With regard to how creativity can effectively be managed, different managerial practices and models are discussed in the literature (e.g. Amabile, 1998; Styhre & Sundgren, 2005; Tan, 1998; Perry, 1995; Davis & Scase, 2000). Amabile (1998), for example, proposes challenge, freedom, resources, work-group features, supervisory encouragement, and organizational support as means to foster creativity. Styhre and Sundgren (2005) discuss practices that are related to technology, intuition, and leadership. Tan (1998) proposes a total systems approach to managing creativity in organizations and identifies three major types of interventions, namely cultural, organization and design, and training development. While these studies explain how creativity in organizations can be nourished, they do not sufficiently relate the proposed practices to the underlying business processes.

Consequently, in the present study it is argued that existent literature does not provide ample answers to the question of how creativity influences business processes and how these processes can be managed. This has resulted in a gap between research on creativity and creativity management on the one hand, and research on BPM on the other hand. Fig. 1.1 suggests that the recognition of the importance and impact of creativity on BPM may be framed as *creativity-aware process management*. The recognition of BPM as a management approach with the potential of effectively managing creativity may be then framed as *process-aware creativity management*.

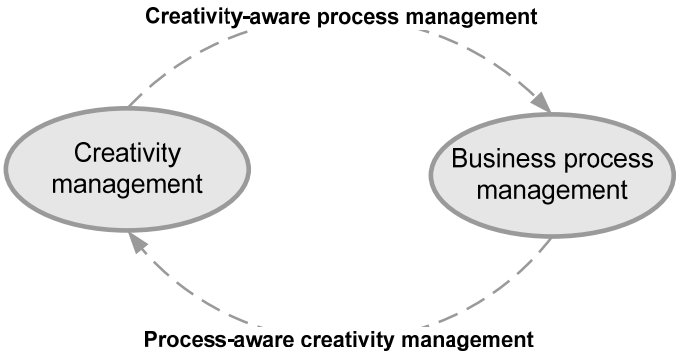


Fig. 1.1: Creativity-aware process management vs. process-aware creativity management

As the present study seeks answers to the question of how creativity impacts business processes, and the management of these, it predominantly focuses on what has been

framed as creativity-aware process management in Fig. 1.1. In doing so, it is expected that the study

(a) advances the recent discussion on human-centric and knowledge-intensive processes by particularly recognizing the phenomenon of creativity as a vital facet of human action and behavior that is increasingly recognized as being imperative to organizational success and

(b) adds a new relevant level of analysis of the phenomenon of organizational creativity, as business processes are a cross-functional and even cross-organizational concept involving individuals, groups, IT, and other resources.

It is assumed that the understanding of the phenomenon of creativity at a process level is imperative to the development and adaptation of IT artifacts, as well as for process re-design, so as to ultimately enhance organizational effectiveness. Moreover, with the emergence of concepts such as case handling or ad-hoc workflow (v.d.Aalst et al., 2005) along with technologies such as service-oriented architectures (Erl, 2004) allowing for more flexible and adaptive work environments, the discussion of creativity within business processes is further nurtured.

In the present study a theory was developed inductively based on qualitative data collected in multiple case studies (Eisenhardt, 1989). The creative industries provide an “extreme situation” in which the “processes of interest are transparently observable” (Eisenhardt, 1989, p. 537). The case study organizations belong to the domains of film production and VFX production, which are part of the creative industries. The phenomena to be studied were processes that can be described as highly dependent on creativity, interdependent, intensively involving the client, complex, but also repetitive. The resulting emergent theory is, in the first instance, limited to explaining phenomena in the substantive area that was studied (Glaser & Strauss, 1967; Strauss & Corbin, 1998). However, by engaging with existent theory, the specific theory is integrated with insights from the related literature and thus a more general theoretical framework is developed.

This research can be positioned towards both the literatures on creativity and on BPM. The so-called *4-Ps model* has been asserted to be imperative to any study of organizational creativity (e.g. Woodman et al., 1993; Borghini, 2005; Couger & Higgins, 1993). The model posits that (a) the creative process, (b) the creative person, (c) the creative product, and (d) the creative place or environment, are the main components of creativity. In the present study, the model is used as a so-called sensitizing device (Klein & Myers, 1999) that is thought to sensitize the researcher for what may

be important in the data (Glaser, 1978). Yet, due to the study's inductive nature, no a-priori concepts were defined. Fig. 1.2 illustrates that this research proposes a process-centric view that is expected to establish a connection between these components.

Utilizing a framework introduced by Davenport (2005), from a BPM perspective, these processes can be characterized by high levels of interdependence of the involved actors, as well as high complexity of work, which manifests in high levels of interpretation and judgment. Davenport (2005) distinguishes four major types of processes, namely those belonging to the transaction model (routine work that relies on formal rules and procedures), the integration model (systematic and repeatable work that depends on cross-functional integration), the expert model (judgment-oriented work that highly relies on expertise and experience), and the collaboration model (improvisional work carried out by flexible teams). In accordance to this scheme, the processes that were investigated in the present study belong to the collaboration model.

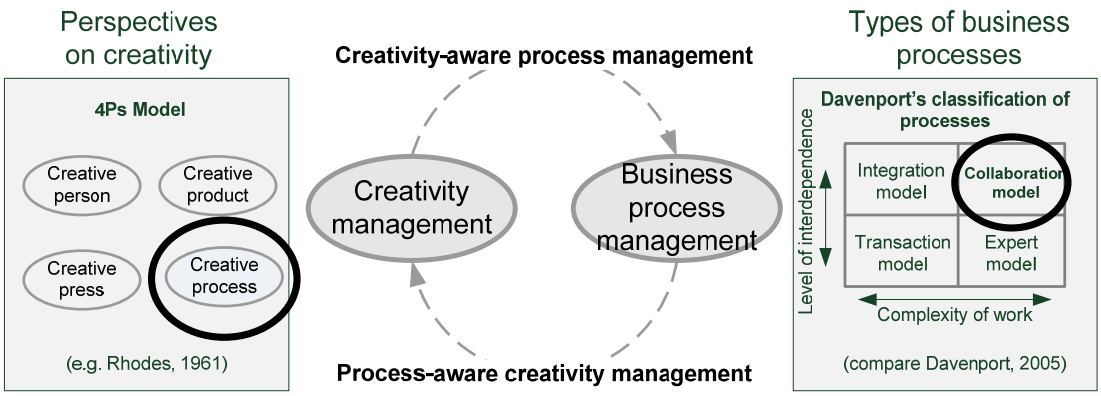


Fig. 1.2: Investigating creativity in collaborative, complex business processes from the creative industries

The inductive design is advanced based on the awareness that, even though existent theories explain various factors and their interplay from various perspectives, little is known about how organizations effectively deal with the phenomenon of creativity at a process level. With regard to what has been framed as creativity-aware process management, it is legitimate to posit that no applicable theory exists. Data was analyzed using an adapted grounded theory approach based on the work of Strauss and Corbin (1998). This approach was particularly fitting, as subject to this study were processes in a new topic area where no applicable theory was available (Glaser & Strauss, 1967; Strauss & Corbin, 1998; Orlikowski, 1993).

The study suggests that process managers have to consider a complex interplay of variables including traits and abilities of artists and clients, group composition, as well as available organizational resources and IT artifacts in order to pursue both operational process performance (such as cost and process efficiency) and creative performance. Operational and creative process performance then ultimately determine client satisfaction. In order to pursue these goals, creative organizations use a set of strategies and IT systems suited to respond to the processes' main characteristics of high levels of uncertainty with regard to outcome, required resources, and process structure. Due to this uncertainty, processes that contain creativity are characterized by a constant iteration between understanding the requirements of the creative product, generating the creative product, and getting feedback. The findings are summarized in a theoretical framework of so-called creativity-intensive processes.

1.2 Research Contributions

The thesis makes two primary contributions. First, a substantive theory was developed that provides researchers with a set of relevant categories and their relationships. The theory can be described as primarily explaining (Gregor, 2006). It is hoped that such theory can be used to guide further research in order to proceed to more general or even formal theory (Urquhart, 2001; Orlikowski, 1993). Second, for practitioners, the study sheds light on the complex context in which processes that contain creativity are managed. It is hoped that the theory will provide insight into the design and adaptation of IT artifacts to be used in managing creativity in business processes as well as for organizational design. The study thus seeks to achieve a synergy between academia and practice "by producing relevant theories that can advance the academic knowledge and, at the same time, can be applied in practice" (Fernández et al., 2002, p. 111).

1.3 Central Phenomenon and Research Questions

Investigating the phenomenon of creativity within business processes is both practically relevant and exhibits an academic challenge. First, understanding how creativity impacts business processes and the management of business processes is of high importance to any organization that relies on creativity in their work processes. It is assumed that a detailed understanding of how creativity affects business processes enables business process managers to effectively manage creativity at a process level. A particular challenge is to be seen in applying management practices and following business imperatives without compromising creativity. Second, from an academ-

ic point of view, it is expected that such a study can contribute meaningfully to the information systems (IS) body of knowledge by providing a substantive theory that can then be used as a starting point to conduct research in other substantive areas in order to proceed to more general theory. The themes that were identified within the contextualization stage of this research were business processes that contain creativity and the question of how these processes can be managed. Correspondingly,

Research problem: *How does creativity impact business processes in the creative industries and the management of these?*

This rather broad research problem could be further broken down into a set of more specific research questions, which evolved during the course of this study (Urquhart, 2001). It is often a consequence of qualitative research that the research questions develop over time during data analysis (Dey, 1993; Creswell, 2003). Likewise, Glaser (1992) states that "out of open coding…, theoretical sampling and analyzing by constant comparison emerge a focus of the research" (p. 25).

The research questions are formulated in a way that they can "be related to procedures in the data analysis" (Creswell, 2003, p. 106). Principally, the research questions relate to the outcomes generated within grounded theory data analysis, particularly within a stage that is called axial coding (identifying different categories), which is preceded by open coding (identifying concepts). The integration of the findings in a larger theoretical scheme as a result of so-called selective coding pertains to the research problem in its broader sense. A detailed description of these coding stages will be provided in chapter 5.

First, it is assumed that it is necessary to identify what factors impact business processes in creative environments, so as to understand the context in which these processes are carried out and managed. This implies the search for general characteristics of such processes. Correspondingly,

Research question 1: *What characterizes business processes in the creative industries and what are the contextual factors that organizations in this industry need to consider when managing these processes?*

The mere identification of factors only supplies the structural components of the emergent theory. As it is subject to this study to also investigate process, it is intended to explore what strategies organizations apply in order to effectively manage these processes. Strategies are understood in a broad sense, subsuming actions taken

by organizations at various levels, including habituated routines, such as rules, regulations, and policies, as well as deliberately planned acts to resolve a problem. It is further sought to particularly focus on the role of IT in this context. Correspondingly,

Research question 2: *What particular strategies do organizations use within business processes to manage creativity?*

Research question 3: *How are these strategies combined, and how are they supported by information technology?*

The fourth research question is closely linked to the previous ones. It is expected that organizations pursue certain goals when applying strategies. Moreover, it is expected that besides (intended) goals there will be unintended consequences. Correspondingly,

Research question 4: *What are the intended consequences of applying a set of strategies in order to manage creativity in business processes? What are the unintended consequences?*

The intention is to provide answers to the above questions by developing an integrated theoretical scheme, that is, a substantive theory (Glaser & Strauss, 1967; Strauss & Corbin, 1998). Answers to the above research problems are sought to emerge from empirical data collected in interpretive case studies conducted with organizations from the creative industries.

It is also assumed that the theoretical insights resulting from this research can set the baseline for the development and adaptation of IT artifacts, as well as of organizational change within creative organizations, so as to ultimately enhance organizational effectiveness.

1.4 Thesis Structure

The thesis is structured as follows. In the next chapter related literature is introduced. The research design is described in chapter 3. Chapters 4 and 5 describe the process of data collection and analysis in detail. The study's results are presented in chapters 6 and 7. This is followed by a discussion of the findings with regard to existent theories (chapter 8). The study concludes with a discussion of implications for research and practice (chapter 9). In the following, a more detailed overview of the chapters is provided.

Chapter 2 – Related Literature introduces the research background. Literature on BPM and creativity was explored. The literature review identified a research gap and thus further justified the study. Due to the inductive nature of this study, the literature is revisited in later chapters.

Chapter 3 – Research Design describes the research methodology. To do so, philosophical assumptions are explicated and the research design is discussed. The chapter justifies the particular approach that was chosen for this research endeavor.

Chapter 4 – Case Studies, Data Collection, and Preliminary Data Analysis introduces the case studies and provides a detailed discussion of how instruments were crafted and data was collected through the use of multiple data collection techniques.

Chapter 5 – Grounded Theory Data Analysis discusses how data was analyzed with a particular focus on the adaptation of the grounded theory method for analyzing data and developing a substantive theory.

Chapter 6 – Study Findings: Categories reports the results of the first two main steps of data analysis, referred to as open coding and axial coding. First, those concepts are introduced that establish the organizational context of business processes in creative environments. This is followed by a discussion of strategies that organizations use in order to handle the phenomenon of creativity within business processes. Subsequent to this section the intended consequences are discussed.

Chapter 7 – Study Findings: Integrated Theoretical Scheme reports on the integration of the identified concepts and relationships into a coherent theoretical scheme.

Chapter 8 – Discussion of Findings: Relating the Theory to the Literature discusses the results of this study by engaging with existent theories at different levels in order to proceed to a more general substantive theory.

Chapter 9 – Closure concludes this thesis by reflecting on its contributions. Furthermore, limitations are discussed and implications for both IS research and the practice of BPM are put forward. The thesis concludes with an outlook to future research. Two main strategies for future research are proposed.

Fig. 1.3 provides a graphical representation of the structure of this thesis.

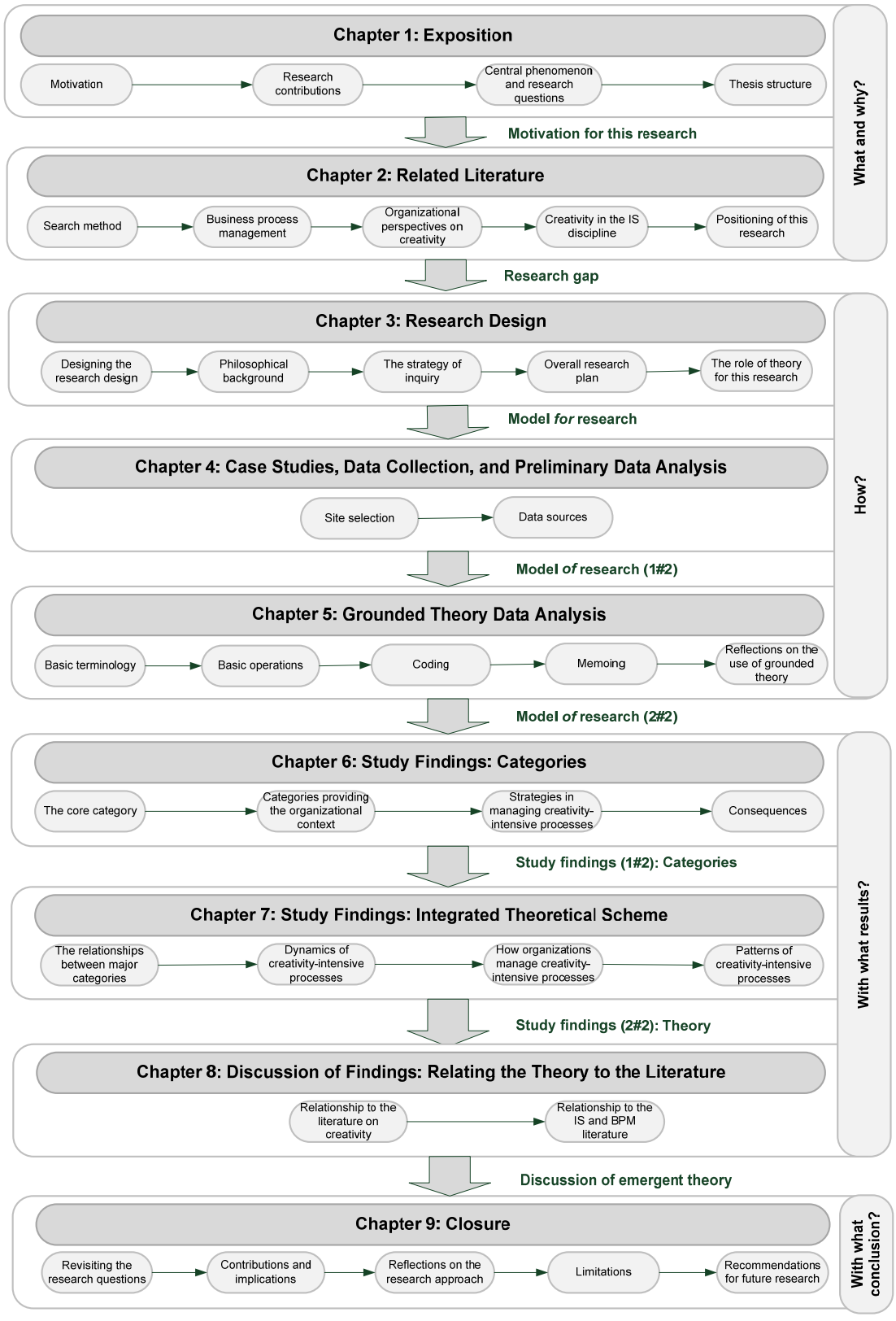


Fig. 1.3: Thesis structure

1.5 Chapter Conclusion

This chapter motivated this research by arguing that BPM may be a response to the question of how organizations can be successfully managed without crushing creativity. The research problem was framed as the question of how creativity impacts business processes and their management. This rather broad research problem was broken down into four distinct research questions. It was argued that, in order to seek answers to these questions, an inductive theory building approach was appropriate.

2 RELATED LITERATURE

Each problem that I solved became a rule, which served afterwards to solve other problems.

René Descartes

2.1 Chapter Introduction

The purpose of this chapter is to establish the context of this research. In order to position the study, a first, non-committal encounter with related literature was conducted. It is important to note that the relevance of the reviewed literature presented in this chapter would be determined by the emergent theory (Urquhart, 2007; Urquhart & Fernández, 2006). Consequently, related literature is also considered in the final section of this study (chapter 8) to compare and contrast it with the study's results (Creswell, 2003). Using literature relatively sparingly in the beginning of this study also conveys an inductive design (Creswell, 2003). In fact, reviewing literature was a continuous process that was conducted throughout the study (Oates, 2006). Correspondingly, further relevant literature is introduced throughout this thesis.

2.2 Search Method

In order to conduct a literature review, the researcher defines three main criteria: domain, sources, and the search strategy (Bandara, 2007; Cooper, 1998). Against the above introduced background of this research, the following domains of related literature were reviewed:

- First, literature on BPM was reviewed, as this research seeks to investigate those processes that are characterized by creativity and thus aims at contributing to the BPM body of knowledge. Particular consideration was given to so-called knowledge-intensive processes or knowledge work processes, which particularly focus on the role of knowledge, judgment, and expertise of the people involved in processes of knowledge generation, transfer, and application.

- Second, literature on research on creativity was reviewed. With consideration of the broad range of literature on creativity and the non-committal nature of this literature review, this was done with a particular focus on organizational and management perspectives on creativity. It must be noted that the field of organizational creativity is quite heterogeneous and comprises of contributions from a variety of fields, including management studies, psychology, so-

ciology, and the humanities (Styhre & Sundgren, 2005). Thus, this first, non-committal encounter with literature on organizational creativity cannot claim to be exhaustive.

- Third, IS literature on creativity and creativity support was reviewed in order to position this research in the broader context of the IS discipline.

The review of the literature resulted in the identification of a research gap that will be explicated in the end of this chapter.

The main sources for the literature were conference proceedings, journals, and books with a particular focus on highly-ranked journals and conferences. For example, Lyytinen et al. (2007) have identified the *European Journal of Information Systems (EJIS)*, *Information Systems Research (ISR)*, the *Journal of the Association of Information Systems (JAIS)*, the *Journal of Management Information Systems (JMIS)*, and *Management Information Systems Quarterly (MISQ)* as the so-called top basket of IS journals. Reviewed journals included, but were not limited to, the aforementioned. Conferences that were reviewed include the *International Conference on Information Systems (ICIS)*, the *European Conference on Information Systems (ECIS)*, and the *Americas Conference on Information Systems (AMCIS)*. Besides IS literature, also journals from the management discipline (e.g. *Academy of Management Journal*, *Academy of Management Review*) and scholarly journals on creativity and the management of creativity (e.g. *Creativity and Innovation Management*), were included in this literature review.

The chapter is structured as follows. First, a brief introduction to BPM and its historical development is provided (chapter 2.3). Particularly the role of knowledge, creativity, and innovation as concepts that were expected to be relevant to this study, is discussed. This is followed by a review of the related literature on research on creativity with a particular focus on organizational theories on creativity and managerial practices (chapter 2.4). Moreover, IS literature on creativity and creativity support is covered (chapter 2.5).

2.3 Business Process Management (BPM)

2.3.1 The Emergence of BPM as a Management Concept

Analyzing and improving work processes in order to increase both efficiency and productivity of organizations has been a key management responsibility for many decades (e.g. Harmon, 2007; Armistead et al., 1999; Hung, 2006; Kettinger & Teng,

1997). Yet, the holistic management concept of BPM is a relatively new approach that emerged in the 1990s, having its roots in earlier practices such as Kaizen (Masaaki, 1986), business process re-engineering (BPR) (Hammer & Champy, 1993; Hammer, 1996; Davenport & Stoddard, 1994), TQM (Powell, 1995), and Davenport's process innovation (Davenport, 1993; Davenport & Stoddard, 1994). The *Australian Community of Practice* (2004) defines BPM as "a structured, coherent and consistent way of understanding, documenting, modeling, analyzing, simulating, executing and continuously changing end-to-end business processes and all involved resources in light of their contribution to business success." The relevance of BPM-related issues has been reinforced by a number of high-impact studies that have been published in recent years. The *Gartner Group*, for example, rated the improvement of business processes as the number one concern of CIOs in three consecutive years (e.g. Gartner, 2007).

The process-oriented approach has been increasingly superseding the function-oriented approach that was proposed by Fredrick Taylor and Henry Ford in the early 20th century (e.g. Taylor, 1911). The latter one fitted a context in which employees mostly had relatively low levels of qualification and where specialization led to higher productivity and lower cost. However, with a growing need for flexibility, highly competitive markets, and increasing customer demands, their approach hindered organizations from being competitive (Hammer & Champy, 1993). As a consequence, the new process-oriented perspective aimed at focusing on processes rather than isolated functions. Employees became responsible for whole processes instead of isolated functions. Thus, the process-oriented approach invoked a shift from controlling employees to empowering employees as well as increasing focus on the customer (Zairi, 1997).

The concept of BPM builds upon the notion of a business process, which represents a series of tasks or activities that need to be carried out in order to collectively realize an organizational objective or policy goal, and a set of conditions that determine the order of the tasks (Hammer, 1990; v.d.Aalst & van Hee, 2002; Becker & Kahn, 2003). BPM as a holistic approach to managing these processes addresses different aspects of governance, IT, strategic alignment, people, and culture (Rosemann et al., 2006). Consequently, this complex management field has been addressed by research in a variety of areas, including, but not limited to, process modeling (Rosemann & v.d.Aalst, 2007), process automation (v.d.Aalst & ter Hofstede, 2005; v.d.Aalst & van Hee, 2002), and process optimization (Reijers & Mansar, 2005). Besides such predominantly conceptual work with a focus on particular BPM artifacts, other studies have contributed to the development of theory in this emergent area. Bandara et

al. (2005), for example, propose a theoretical model of critical success factors of process modeling, Rosemann et al. (2006) develop a theory of BPM progression in organizations, and Recker (2008) builds and tests a model of process modeling standard adoption. Yet, it must be noted that the emergent area of BPM is characterized by a lack of foundational theory, which exhibits a challenge to both academia and practice (de Bruin, 2007).

The present study seeks to contribute to the theoretical foundation of BPM with its objective of developing substantive theory that explains the emergence and management of business processes in creative environments.

2.3.2 Knowledge-intensive Processes

Based on the awareness that modern work environments are increasingly characterized by the application of both tacit and explicit knowledge (Davenport, 2005; Crandall et al., 2006), research has paid significant attention to those processes that are predominantly characterized by the application of knowledge. The discussion on such processes led to the emergence of the notion of knowledge-intensive business processes (Eppler et al., 1999) or knowledge work processes (Davenport, 2005). This concept is mainly concerned with the role of people, the knowledge workers, and their interaction within processes. As Pyke (2006) states, in the development of BPM "one of the key elements in a business process – a person – dropped off the agenda" (p. 2).

Eppler et al. (1999) identify a set of attributes of knowledge-intensive processes. These are contingency, decision scope, agent innovation, knowledge halflife, agent impact, and learning time. They define knowledge-intensive processes as "business processes that have a high need for innovation of the single agent who affects the results of a process directly" (p. 223). Characteristically, the knowledge halflife of such knowledge-intensive processes is lower than that of other processes. Moreover, actors in these processes are confronted with a variety of options for their action. They also point out that knowledge-intensive processes require a long learning time and use the above mentioned attributes in order to determine the knowledge-intensity of a process.

Usually, knowledge-intensive processes are complex, unpredictable, and, as a consequence, difficult – if not impossible – to model in terms of their process flow (Davenport, 2005). There has also been a discussion on how knowledge workers may be supported to carry out their tasks within such business processes. As Harmon (2007) states, knowledge workers "create special problems for anyone who tries to analyze

the processes that employ them" (p. 227). He introduces a continuum where "ordinary workers" work on simple procedural processes, knowledge workers on more complex processes, and so-called experts on unique and extremely challenging processes. Harmon (2007) characterizes a knowledge worker as someone who "employs a few hundred rules to solve the problems he or she encounters" (p. 279). Thus, knowledge workers apply processes of convergent, rule-based thinking to solve their problems. Experts, on the other hand, usually work on problems that require very complex cognitive networks employing a vast number of rules and, in many cases, they step into new territory; i.e., the required rules, procedures, and business partners do not even exist.

Davenport (2005) introduces a matrix that distinguishes the two dimensions of collaboration and work complexity, leading to four distinct types of knowledge-intensive processes (transaction model, integration model, expert model, and collaboration model) that are associated with four types of knowledge workers (transaction workers, integration workers, expert workers, and collaboration workers). Transaction workers have to understand both the flow of their work and the knowledge they require. Their processes can often be automated by systems that provide both the work to be done and required knowledge. Integration workers usually follow processes that are described in documents; these can then be consulted by the workers as they have sufficient time to do so. Expert workers, however, require high levels of autonomy and often discretion in their work. Consequently, in many cases it is a challenge to structure an expert worker's process. Thus, Davenport (2005) suggests to improve their work by providing templates, guidelines, and sample outputs. Finally, collaboration workers are described as the most difficult to address. Their processes are characterized by improvisional work, high reliance on expertise, and fluid deployment of flexible teams. However, he suggests a "gentle process touch" including measurement, instilling customer orientation.

The notion of knowledge-intensive processes is of particular interest for this research as knowledge-intensive processes and processes in creative industries seem to have much in common. For example, various studies suggest a close relationship between knowledge and creativity (Christiaans & Venselaar, 2005; Guilford, 1967; Weisberg, 1999). Guilford (1967) highlights the role of information and the role of previous experience. Amabile (1990) identifies expertise, motivation, and creative thinking skills as the key to creativity. Moreover, characteristics such as a high demand for flexibility and autonomy of the involved workers seem to be relevant in the area of the creative industries, too. Davenport (2005), for example, notes that knowledge

work is often associated with high levels of collaboration, low levels of structure, and high levels of judgment.

The close link between knowledge, creativity, and innovation has also been asserted by the knowledge management literature (Alavi & Leidner, 2001). The knowledge-based theory of the firm (Nonaka, 1994; Spender, 1996; Grant, 1996) has evolved over the last decade extending the resource-based theory of the firm initially developed by Penrose (1959). It postulates that knowledge and its offspring, innovation, have a grave impact on organizational competitive success (see also Cole, 1998).

The present study seeks to contribute to the discussion on those processes that rely on human knowledge and expertise. In doing so, it focuses on those processes that are very much characterized by creativity and the generation of creative products.

2.4 Organizational Perspectives on Creativity

2.4.1 The Concept of Creativity

The study of creativity has a long track record (e.g. Osborn, 1957; Hayes, 1989; Amabile, 1990; Woodman et al., 1993; Lubart, 2001). Also, research on creativity has been subject to a variety of disciplines, including psychology, sociology, organizational behavior, IS, and the humanities (Styhre & Sundgren, 2005). Most definitions of creativity concur in that something ‘new’ is at the core of creativity. May (1959), for example, defines creativity as “the process of bringing something new into birth.” The claim for novelty or newness can also be found in Hausman (1975) and Morgan (1923). As has been stated by various authors, the act of bringing something new into birth can also be seen as the imaginative recombination of known elements (Couger & Higgins, 1993; Ciardi, 1956).

Later definitions require creativity to be purposeful or useful. For example, DeGraff and Lawrence (2002) frame creativity as a purposeful activity that generates valuable and new (or better) products, services, processes, or ideas. Similarly, Sternberg and Lubart (1999) state that creativity “is the ability to produce work that is both novel […] and appropriate […]” (p. 3). In accordance to this, Amabile (1998) claims that “in business, originality isn’t enough. To be creative, an idea must also be appropriate – useful and actionable” (p. 78). The requirement of novelty implies that in many cases the problem itself may be ill-defined (Newell & Shaw, 1972).

In brief, recent definitions of creativity in business exhibit the concepts of novelty/originality and usefulness/value as the most prominent characteristics of the concept (e.g. Borghini, 2005; Sternberg & Lubart, 1999; Mayer, 1999).

At the organizational level, creativity has been defined as "the creation of a valuable, useful new product, service, idea, procedure, or process by individuals working together in a complex social system" (Woodman et al., 1993, p. 293). This definition not only considers the concepts of novelty/originality and usefulness/values, but also places the concept of creativity into the organizational context.

Drawing from various authors, for the purpose of this study, creativity can be framed as a process carried out in complex social settings, leading to products that are both novel and purposeful (Xu & Rickards, 2007; Amabile, 1998; DeGraff & Lawrence, 2002; Sternberg & Lubart, 1999; Woodman et al., 1993). Also, the concept of recombining known elements is seen as a primary feature of creativity. This understanding of creativity is found to be appropriate to investigate the substantive area of the creative industries being the subject to this study. To organizations from the creative industries, the mere objective of novelty proofs meaningless if the result is not valuable in terms of satisfying customer expectations and generating revenue. Moreover, processes are carried out in complex social settings.

Between the concepts of creativity and innovation there is an overlap. In the existent literature, different delineations have been proposed (Runco, 2007; Woodman et al., 1993). Whereas innovation may require a certain level of originality, it does not require maximum novelty, as its primary objective is to be maximally effective (Runco, 2007). Creative efforts, on the contrary, benefit from extreme originality. Similarly, Woodman et al. (1993) argue that "innovation can also include the adaptation of preexisting products or processes" (p. 293) when they define creativity as a subset of the broader domain of innovation (which, by itself, is a subset of the even broader domain of change management). Creativity is also seen as the precursor of innovation (Amabile, 1988) and innovation as the implementation of creative ideas (West & Rickards, 1999; Mumford et al., 2002; Shani & Lau, 2000). Styhre and Sundgren (2005) state that the majority of accounts of innovation view creativity as a part of the innovation process that takes place at the front end. In these views, creativity, "if addressed at all, is isolated and controlled" (p. 27).

2.4.2 Four Perspectives on Creativity

Styhre and Sundgren (2005) state that there are four specific perspectives on creativity that have been subject to research, namely creative processes, creative persons,

creative products, and creative places or environments. This model has been referred to as the *4-Ps model* (Couger & Higgins, 1993). Woodman et al. (1993) argue that an "understanding of organizational creativity will necessarily involve understanding (a) the creative process, (b) the creative product, (c) the creative person, (d) the creative situation" (p. 294) (compare also Brown, 1989; Rhodes, 1961; Harrington, 1990). Couger et al. (1993) write that the *4-Ps model* provides a good structure for understanding creativity as well as its application in the IS discipline as the model "represents creativity as a dynamic phenomenon comprised of four highly interactive components" (p. 378).

In the following, different models of organizational creativity are discussed. The four main perspectives can be found in the discussion as different models focus on different aspects of creativity. As will be seen, in particular more recent models consider different perspectives simultaneously. Woodman et al. (1993), for example, suggest "the integration of process, product, person, and situation into a more comprehensive theory of organizational creativity than previously proposed" (p. 294). Existent theories of creativity in organizations explain, at various levels, the origin and context or creativity, thus integrating the concepts of process, person, product, and situation.

The process-centric view taken in this research is intended to consider all four perspectives. Processes are carried out in environments, involve human beings, and may have creative products as outcomes. Consequently, in this study the *4-Ps model* was used as a so-called sensitizing device that informed data analysis.

2.4.3 Organizational Creativity

Historically, research on creativity shifted from an early emphasis on isolated individuals (Barron, 1955; Guilford, 1956) to the interaction between individuals, that is, creativity at the group and organizational level (Williams & Yang, 1999; Drazin et al., 1999). Williams and Yang (1999) argue that "individual creativity and group creativity are two different beasts" (p. 377). Individual views of creativity focus on creative persons and their personality (Barron & Harrington, 1981; Martindale, 1989), cognitive abilities such as thinking styles (Guilford, 1983; Plucker & Renzulli, 1999; Guilford, 1967; Wallach & Kogan, 1965), motivation (Amabile, 1983), and knowledge (Amabile, 1988). Prominent examples are tests of divergent thinking as proposed by Guilford (1956), or the study of biographical and historical background of persons who showed outstanding creativity (Galton, 1869; Simonoton, 1975). Williams and Yang (1999) state that drawing conclusions from such psychometric studies for organizational creativity is problematic. The phenomenon they refer to has been labeled as "can" versus "will" distinction by Hunt (1995). Put simply, the per-

formance of an individual in a laboratory situation does not necessarily allow conclusions with regard to the same individual's creative performance in the complex setting of an organization.

Consequently, individual views have then been further elaborated on in what can be referred to as systems views, which focus on the individual in a context (Williams & Yang, 1999; Gruber, 1986; Csikszentmihalyi, 1988). Such perspectives account for the problem that the individual perspectives tend to neglect the relationship between creative persons and their environment. That is, "the creative process is perceived as taking place within the context of a particular environment rather than in a vacuum" (Williams & Yang, 1999, p. 379). Systems views thus posit that creative products are the result of a process that takes place in a complex setting. However, they still treat creativity as an "individualized phenomenon" (Williams & Yang, 1999, p. 379). Because any organization is a system, systems views can help conceptualizing the various factors that impact on creative performance within organizational settings (Williams & Yang, 1999). Consequently, the scope of research on creativity was extended to the group and, later, to the organizational level.

At the group level, various characteristics of successful creative groups have been suggested. Important characteristics are leadership, group composition, group structure, cohesiveness, and resource availability (King & Anderson, 1990; Payne, 1990). Generally, creative groups should be heterogeneous and not too large (Amabile, 1998) and leadership should be democratic and collaborative, so as to allow for maximal creative performance (King & Anderson, 1990).

At the organizational level, creativity has been related to critical organizational influences (Amabile, 1998; Runco, 2007; Ryhammer & Smith, 1999; Ekvall & Ryhammer, 1999; Williams & Yang, 1999; Amabile, 1996). Ryhammer and Smith (1999) identify organizational structure, culture, climate, resources, workload pressure, and leadership style as critical organizational influences on creativity. Amabile (1996) suggests a model that comprises of five environmental components that impact on organizational creativity, namely encouragement of creativity, autonomy, resources, pressures, and organizational impediments to creativity. Yet, it has been asserted that relatively few variables at the organizational level have been considered in creativity models (Drazin et al., 1999; Styhre & Sundgren, 2005). Some authors have discussed in more practical terms how organizational creativity can be managed. Perry (1995), for example, discusses the corporate culture of small organizations that fosters creativity and innovation. The issues discussed as being conducive to creativity and innovation include the recruitment of people with appropriate personal and creative

skills, implementation of flat hierarchies, fostering of intrinsic motivation, rotating project leadership, cross-fertilization, and an innovation process comprising of the stages of understand, observe, visualize, implement, and evaluate. Tan (1998) frames the management of creativity in organizations as a complex problem that calls for an integrated approach. He introduces a total systems approach and proposes a framework which posits that organizations comprise of four subsystems: culture, techno-structural, management, and people. He further identifies three types of interventions, namely, cultural, organization and design, and training development. Particularly organization and design are relevant with regard to the present study. Tan (1998) writes that organizational and design changes "are directed at the techno-structural subsystems" (pp. 26f.). Examples are activities such as installing systems to improve communications, aligning reward and appraisal systems, or investing in technology such as creativity-support systems.

2.4.4 Multilevel Models of Organizational Creativity

Taking off from theories focusing on the individual, so-called multilevel models (Giddens, 1994; DiMaggio, 1991) have emerged. In one of the first multilevel models of organizational creativity, Woodman et al. (1993) define organizational creativity as "the creation of a valuable, useful new product, service, idea, procedure, or process by individuals working together in a complex social system" (p. 293). Thus, at an organizational level, creativity is "a function of the creative outputs of its [the organization's] component groups and contextual influences." Thus, their multilevel, interactionist model describes organizational creativity as a complex interplay of individual creativity, group creativity, and organizational creativity that have an impact on the creative process and, therefore, on the creative product. Drazin et al. (1999) write that, to date, "Woodman et al. (1993) offer the most comprehensive theoretical model, linking culture, resources, technology, strategy, and rewards to organizational creativity" (p. 288). Similarly, Borghini (2005) states that "at present only the model proposed by Woodman et al. (1993) offers a broad vision of the problem that approaches a systemic view" (p. 22). The model considers three levels of analysis, individual, group, and organization. It has been asserted that theoretical models of organizational creativity should consider multiple levels of analysis (Borghini, 2005; Drazin et al., 1999). The distinction of these three interrelated levels fits the context of this study, as business processes involve individuals as well as groups, and are carried out in complex organizational settings.

Considering the above introduced literature, two interesting issues can be observed that have been pointed out by Drazin et al. (1999). First, research on organizational

creativity has largely focused on small groups and independent project teams as their level of analysis. Exceptions include the works of Woodman et al. (1993), Glynn (Glynn, 1996), and Borghini (2005). Second, with regard to construct definition, following what has been called a functionalist-reductionist tradition (Rousseau, 1985), organizational creativity has predominantly been framed as an outcome. Thus, independent variables are seen as factors that may be manipulated in order to improve the creative outcome. Moreover, Drazin et al. (1999) note that in the literature on creativity "there seems to be an implicit assumption that the creative process is alike at all levels of analysis – that is, for individuals, groups, and organizational systems" (p. 288).

As a result of the above described levels of analysis, creativity has typically been modeled as a discrete task that is conducted by individuals or small groups, thus neglecting the dynamics of the organizational creative process as well as the dimension of time (Drazin et al., 1999). This has led to static models with emphasis on the explanation of the creative outcome as the dependent variable.

In response to this, Drazin et al. (1999) define creativity as a sense-making process at the individual, group, and organizational level, rather than an outcome. They investigate an exemplary setting that they describe as "an interdependent, complex, large scale, long duration organizational project" (p. 287).

In order to explain how creativity impacts on business processes and how these can be managed, the static, outcome-oriented models do not provide satisfying answers. In comparison to the model proposed by Drazin et al. (1999), the present study's contribution is original in that it investigates business processes that can be characterized as highly dependent on creativity, interdependent, intensively involving the client, complex, but also repetitive. Albeit being of much finer granularity than the large-scale, long duration projects investigated by Drazin et al. (1999), such business processes span organizations from end-to-end while they involve both individuals and groups.

Consequently, in this research a process-centric view was chosen. Therefore, this study can be framed as new response to the assertion that, at present, there is little knowledge of the factors that impact organizational creativity (Drazin et al., 1999; Borghini, 2005). By investigating how creativity impacts business processes and their management, the present study also proposes another level of analysis of creativity, namely that of complex and repetitive business processes. It is expected that such theory can combine concepts at various levels (group, individual, organization-

al) and explain the relationships among these with a particular focus on the processes' dynamics.

In summary, existent studies cover various perspectives on organizational creativity. Even though these studies can be of great benefit to managers who are responsible for business processes, they do not explain how the occurrence of creativity impacts the business processes and how these end-to-end business processes involving individuals, groups, IT, and other resources can be managed effectively. As has been maintained earlier, process managers are impelled to not only seek to foster creative output, but also follow business imperatives such as time and budget, and also must consider and allocate available resources.

2.5 Creativity in the Information Systems (IS) Discipline

To date, the IS discipline has paid relatively little attention to creativity-related topics (exceptions can be found in Wierenga & van Bruggen, 1998; Kristensson & Norlander, 2003; Couger & Higgins, 1993; Massetti, 1996). Most of the studies relate to how creativity can be supported by IT (e.g. Malaga, 2000; Massetti, 1996; Shneiderman, 2000; Hender et al., 2002) and how creativity can be utilized for the design of IT (e.g. Maiden et al., 2004; Cooper, 2000; Ocker et al., 1995).

Couger et al. (1993) present six case studies that show how creativity techniques were used in order to solve IS-related problems so as to suggest how creativity of IS organizations can be improved. They identify twenty creativity techniques that proofed to be particularly fitting to the IS field. They further argue that managers must understand when and where creativity techniques can be used, so as to implement formal programs of creativity improvement.

Cooper (2000) identifies creativity as a key to reengineering. He adapts a creativity model from the organizational literature in order to interpret the process of requirements gathering and experiences from logical design that were made within a reengineering project. He chooses a case-study design and compares the findings based on creativity theory and traditional IT development theory viewpoints. The comparison reveals both similarities and differences.

So-called creativity support systems (CSS) are computer-based tools that aim to support the process of creative problem solving (Massetti, 1996; Abraham & Boone, 1994). Generally, it can be distinguished between those systems focusing on the individual and those systems that focus on groups (Cooper, 2000). With regard to supporting creative groups, particularly so-called group support systems (GSS) and

group decision support systems (GDSS) have been investigated as a means of supporting creativity in team-based environments (Nagasundaram & Bostrom, 1995; Kristensson & Norlander, 2003; Nunamaker & Appelgate, 1987).

In summary, the IS discipline provides insights into the usage of IT in order to support creativity, identifies tools and techniques that can be used in order to enhance the creativity of IS professionals, and has applied creativity theory in order to analyze processes such as requirements engineering. Yet, to the author's best knowledge, the discipline does not provide comprehensive theory that explains how creativity impacts on business processes, and how it can be managed, including the usage of IT. Consequently, the present study seeks to contribute to the IS body of knowledge by generating a substantive theory.

2.6 Positioning of this Research

Grounded in the above discussion on existing literature and considering the aforementioned research problem and research questions, this study can be positioned as follows. It seeks to contribute to the IS body of knowledge by investigating the management of business processes that include creativity. In doing so, it aims at developing a process-oriented theory of creativity in business processes and, therefore, also contributes to the body of literature on organizational theories on creativity. Fig. 2.1 provides a high-level overview of the literature review and the identified research gap.

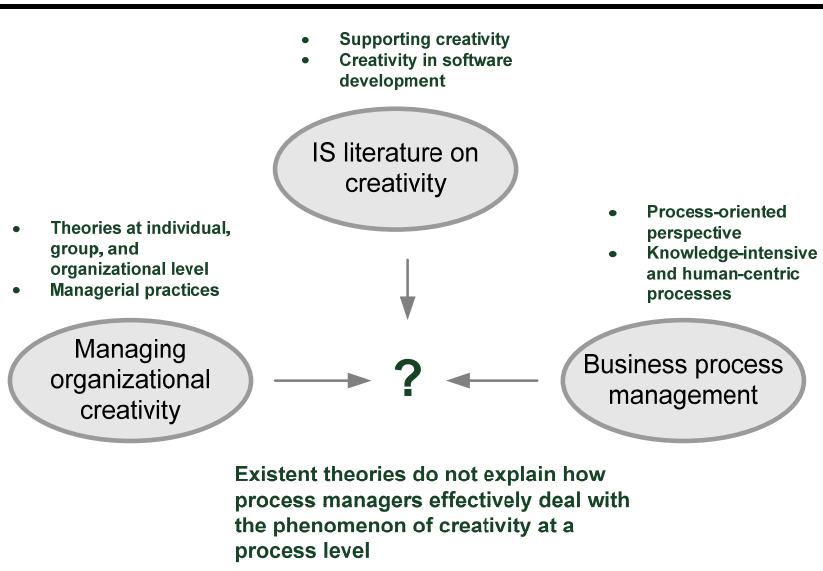


Fig. 2.1: Literature review and research gap

2.7 Chapter Conclusion

This chapter was concerned with establishing the research context. Three main strands of literature were reviewed within a non-committal literature review. This first encounter with the related literature led to the identification of a research gap. It was argued that this study aims at contributing to the IS body of knowledge by generating a substantive theory that explains how process managers effectively deal with the phenomenon of creativity at a process level.

It must further be noted that the literature review helped the researcher to substantially further his understanding of the area to be studied. This knowledge was necessary to understand that the research problem actually existed and helped to relate it to the existent body of knowledge. It is thus strongly agreed with those researchers who posit that even in inductive theory building research, existent literature cannot be neglected (e.g. Walsham, 1995; Urquhart & Fernández, 2006; Eisenhardt, 1989).

3 RESEARCH DESIGN

A good design, one in which the components work harmoniously together, promotes efficient and successful functioning; a flawed design leads to poor operation or failure.

Joseph A. Maxwell

3.1 Chapter Introduction

In this chapter the research design is introduced. Yin (2003) writes that „every type of empirical research has an implicit, if not explicit, research design" (p. 20). A research design links the initial questions to the process of collecting, analyzing, and interpreting data (Yin, 2003). Maxwell (2005) argues that it is important to make the design explicit in order to clearly understand its strengths, limitations, and consequences. In the following, the model *for* research is introduced (Maxwell, 2005). The model *of* research, i.e. a concise description of how this model for research was actually instantiated, is detailed in chapters 3 and 4.

3.2 Designing the Research Design

The specific research design underlying this study is the result of a design process based on three interrelated levels of decisions (Creswell, 2003; Crotty, 1998; Oates, 2006):

- By stating their knowledge claims, researchers explicate how and what they will learn in their study. In doing so, the researcher answers questions with regard to the nature of the phenomena of interest, the nature of knowledge claims, and the relationship between theory and practice (Orlikowski & Baroudi, 1991).

- Strategies of inquiry operate at a more applied level and provide direction for procedures within a research design. Strategies that are associated with the qualitative approach to research are ethnographies, grounded theory, case studies, phenomenological research, and narrative research (e.g. Mertens, 1998). Strategies that are associated with the quantitative approach are experiments and surveys, for example. The selection of the research strategy is influenced by the researcher's goals and the nature of the research problem (Benbasat, 1984).

- The researcher has to apply research methods in order to collect and analyze data. Examples are quantitative research methods such as predetermined instrument-based questions, or qualitative research methods such as open-ended questions leading to interview data.

Tab. 3.1 details the result of the design process based on these three levels.

Tab. 3.1: Levels of decision that influence the research design

Level of decision	This research
Knowledge claims	This study is interpretive in nature. The underlying assumption is that any access to reality is a social construction.
Strategies of inquiry	This research generates theory based on interpretive case studies. For data analysis, the grounded theory method as proposed by Strauss and Corbin (1998) was used.
Research methods	Unstructured and semi-structured interviews, process analysis, and document analysis were used to collect data.

In the following, the philosophical background is described (chapter 3.3). Then the strategy of inquiry, namely case study research, where grounded theory was used in order to analyze data, is introduced. (chapter 3.4). The subsequent section details the overall research plan (chapter 3.5). Last the role of theory in interpretive research and the type of theory that is generated in this study are discussed (chapter 3.6).

3.3 Philosophical Background and Epistemological Claims

It is important to articulate the assumptions underlying a research endeavor, as these precede the choice of a research methodology (Creswell, 2003; Guba & Lincoln, 1994; Becker & Niehaves, 2007). The philosophical paradigm (Burrell & Morgan, 1979; Kuhn, 1996) of this research is that of interpretivism (Walsham, 1995). Interpretive studies aim at creating an in-depth understanding of complex social settings where humans make sense of their perceived worlds. In doing so, interpretive researchers try to understand the phenomena under investigation through meanings and values that people assign to them (Oates, 2006; Orlikowski & Baroudi, 1991; Walsham, 1993). Thus, the underlying assumption is that both reality and any access to reality are social constructions (Klein & Myers, 1999; Walsham, 1995; Orlikowski & Baroudi, 1991). As opposed to positivist studies, interpretive studies are not based on hypothetical deductions but on the interpretation of complex social phenomena (Oates, 2006; Klein & Myers, 1999). In recent years, interpretive studies have increasingly gained popularity in IS research (Walsham, 1995; Klein & Myers, 1999; Orlikowski & Baroudi, 1991; Suchman, 1987; Orlikowski, 1993).

In the present study it was aimed to gain an in-depth understanding of the phenomenon of business processes that contain creativity. It was thus intended to study the phenomenon in what can be referred to as a natural setting with a particular focus on the participant's perspectives (Orlikowski & Baroudi, 1991). Such a setting could be identified within organizations from the creative industries. Hence, a substantive area (Walsham, 1995) of a selected number of case organizations was studied. It is hoped that this understanding can then inform other settings. As Orlikowski and Baroudi (1991) note, interpretive studies intend to understand a phenomenon's deeper structure, as such an understanding can then inform settings different to the observed one.

Even though the underlying paradigm of this research is that of interpretivism, some aspects of positivism are present. In particular, the study aims at generating empirically valid conceptualizations that are expressed by the means of propositions (Fernández, 2003). In the following, the choice of the paradigm is further elaborated on by addressing beliefs about physical and social reality, beliefs about knowledge, and beliefs about the relationship between knowledge and the empirical world (Orlikowski & Baroudi, 1991; Chua, 1986).

3.3.1 Ontological Position

Ontological beliefs refer to the "essence of phenomena under investigation" (Orlikowski & Baroudi, 1991, p. 7). The basic question is whether the reality is independent of humans or whether it only exists through human action and interaction (Burrell & Morgan, 1979).

Ontologically, this research is based on the assumption that reality is constructed and reconstructed by humans through subjective meanings and symbolic action in social processes (Orlikowski & Baroudi, 1991; Walsham, 1995; Burrell & Morgan, 1979). The processes that were subject to this study were not 'given' but the result of action and interaction of various actors within a complex organizational setting; they are an "intersubjective construction" (Walsham, 1995, p. 75).

As a consequence, these processes do not exist independently from humans and, therefore, cannot be objectively measured. These phenomena can thus only be interpreted by researchers. It was therefore intended to "uncover the socially constructed meaning" (Cavana et al., 2001, p. 9) which different actors, such as clients and artists, had created about the processes they are involved in.

Consequently, it was necessary to take a research approach that would allow for recognizing different perceptions of different actors in order to understand how they construct their reality and thus shape the processes that were studied.

It is further hoped that the emergent theory can reveal relevant factors that shape the context of processes that rely on creativity. Such factors would include perceptions and attitudes of the involved actors.

3.3.2 Epistemological Position

Epistemology refers to the question of how we know knowledge, that is, the nature of knowledge claims (Creswell, 2003; Walsham, 1995; Burrell & Morgan, 1979); or, as Orlikowski and Baroudi (1991) frame it, "the criteria by which valid knowledge about a phenomenon may be constructed and evaluated" (p. 8). Consequently, these assumptions help the researcher to identify what research methods and techniques may be used in order to gather empirical evidence (Orlikowski & Baroudi, 1991).

From an interpretive viewpoint "understanding the social reality requires understanding how practices and meanings are formed and informed by the language and tacit norms shared by humans working towards some shared goal" (Orlikowski & Baroudi, 1991, p. 14). Hence, interpretive researchers access reality by constructing interpretations that explain the creation of subjective meanings in a social setting (Orlikowski & Baroudi, 1991; Putnam, 1983; Walsham, 1995; Gibbons, 1987).

In this study, it was intended to generate valid interpretive knowledge by investigating the phenomenon of interest from the participant's frame of reference (Collis & Hussey, 2003). In order to do so, interpretive case studies were chosen as a research method and the grounded theory method was used in order to analyze data. In doing so, it was sought to avoid imposing externally defined concepts. Instead, it was attempted to "derive constructs from the field by in-depth examination of and exposure to the phenomenon of interest" (Orlikowski & Baroudi, 1991, p. 14). Thus, it was aimed to generate theory while not being stifled by the researcher's preconceptions. The grounded theory method is conducive to this assertion as it aims at generating theory that is grounded in empirical data (Glaser & Strauss, 1967). The categories that emerged from the research were intended to "closely couple those relevant to the study's participants" (Orlikowski & Baroudi, 1991, p. 14). In interpretive research, it is intended that participants can "use their own words and images" and "draw on their own concepts and experiences" (Glaser & Strauss, 1967, p. 15). In the present study, for example, it was made use of so-called in vivo terms (Strauss, 1987), i.e., concepts that originate from the words of the participants.

3.3.3 Beliefs about Relationships between Theory and Practice

Beliefs about relationships between theory and practice reflect values and intentions that researchers bring into a study (Orlikowski & Baroudi, 1991). With regard to the researcher's role, two main variants of interpretive research can be recognized, the 'weak' constructionist view and the 'strong' constructionist view. The weak constructionist view posits that the researcher applies various techniques of data collection and analysis in order to understand existing meaning systems and to interpret actions and events (Orlikowski & Baroudi, 1991). This view allows to understand interpretive research as a complementation of positivist research by "generating hypothesis for further investigation, and by filling the knowledge gaps that positivist research cannot attend to" (Orlikowski & Baroudi, 1991, p. 15). In contrast, the strong constructionist view does not allow to complement positivist research but only to replace it. In this case, the researcher "constructs the form and nature of the phenomenon through the world view he adopts to do the research" (Orlikowski & Baroudi, 1991, p. 16). This means that "the researcher's assumptions and values are deeply embroiled in the phenomenon – even in the very selection of a research approach" (Orlikowski & Baroudi, 1991, p. 16). Consequently, the researcher cannot be capable of choosing an 'appropriate' research approach. The present study employed the view of weak constructionism.

3.4 The Strategy of Inquiry

Having addressed the philosophical assumptions, the strategy of inquiry has to be determined. Considering the research problem as well as the philosophical assumptions discussed above, interpretive case studies (Walsham, 1995) were identified as the most appropriate strategy of inquiry. Consequently, a case study approach including multiple methods of data collection was used. An adaptation of the grounded theory method as proposed by Strauss & Corbin (1998) was employed in order to analyze data and generate a substantive theory. In the following, the role of case study research in developing theory is discussed and an overview of the grounded theory method is provided.

3.4.1 Building Theory from Cases

Generally, scientific research comprises of the phases of observation, induction, and deduction (Eisenhardt, 1989; Handfield & Melnyk, 1998; Wallace, 1971). This research is exploratory and aims at generating theory as opposed to testing theory. The main focus of the present study is on observation and induction. However, through-

out the iterative process of building theory, the emergent theory was constantly deductively compared to incoming data (Glaser, 1992).

In order to inductively develop theory, interpretive case studies (Klein & Myers, 1999; Neuman, 1997; Walsham, 1995; Walsham, 1993) were chosen as a research method since this research covers a new topic area and an intimate connection with empirical data is sought (Eisenhardt, 1989). Interpretive case studies "provide an account of what occurs in a social setting, which may be unique to that particular situation" (Oates, 2006, p. 300). It has been asserted that the outcome of case study research can be a theory (Walsham, 1995; Benbasat et al., 1987). The resulting theory can then be applied in further case studies in order to generalize. Benbasat et al. (1987) define case studies as follows: "A case study examines a phenomenon in its natural setting, employing multiple methods of data collection to gather information from one or a few entities (people, groups, or organizations)" (p. 370).

Thus, the case study method is appropriate when seeking answers to a research problem requires the researcher to study the phenomenon in a natural setting or to study contemporary events. Particularly those research phenomena that lack support from a broad theoretical base can be targeted by case study research (Benbasat et al., 1987; Eisenhardt, 1989). Benbasat et al. (1987) further argue that case study research is not suitable if it is necessary to control subjects or events.

In view of that, this research can be characterized as follows. First, it aimed at studying processes that include creativity in their natural setting. Second, no broad theoretical base was available which explained how creativity impacts business processes and how organizations successfully manage business processes that are characterized by creativity. Third, considering the exploratory nature of this research, it was not necessary to control subjects of events. Case study research was thus an appropriate research strategy in order to seek answers to the research problem.

Setting up case studies requires the researcher to make a couple of interrelated choices with regard to units of analysis, single case vs. multiple case design, site selection, data collection methods, and data analysis procedures (Benbasat et al., 1987; Yin, 2003). These issues were considered as follows.

With the purpose of identifying a natural setting to study processes in creative environments, it was planned to carefully choose case study organizations from the creative industries. The research problem targeted the phenomenon of processes in creative environments and thus determined the appropriate units of analysis (Yin, 2003). It was intended to study processes that include creativity by interviewing different

individuals who participate in creative processes. When using grounded theory as a method of data analysis, the unit of analysis is an incident (Fernández et al., 2002; Glaser & Strauss, 1967). Such incidents can have the form of text strings from interviews, or documents. In this study, incidents were also represented by sections in process models. Consequently, the selected cases "represent an aggregated, networked collection" (Fernández et al., 2002, p. 114) of such documents. In the present study multiple cases were included. As Benbasat et al. (1987) state, multiple case designs are particularly fitting when the purpose of the research is theory building. Thus, it was planned to include cases to investigate them both for their similarities and differences. It was also intended to use multiple data collection techniques in order to triangulate across methods; namely document analysis, process analysis, and semi-structured interviews. Triangulation across methods is particularly useful when generating theory, as multiple perspectives allow the researcher to achieve a strong substantiation of emerging concepts (Eisenhardt, 1989; Pettigrew, 1990; Glaser & Strauss, 1967; Orlikowski, 1993). As Miles and Huberman (1994) subsume, "triangulation is supposed to support a finding by showing that independent measures of it agree with it or, at least, do not contradict it" (p. 266). Business process modeling (Davis, 2001) was included as a further technique of data collection. It was hoped that detailed process models can provide answers to questions with regard to who is involved, what is produced, or what tasks are carried out, and thus provide the researcher with an in-depth understanding of processes in creative environments. Semi-structured interviews would then particularly focus on understanding contextual factors, goals, and strategies. Tab. 3.2 provides an overview of the above described levels of decision.

Tab. 3.2: Case study design

Level of decision	This research
Units of analysis	Organizations from the creative industries where individuals work in processes that rely on creativity; the actual units of analysis were incidents, represented by text strings from interviews and process models
Single case vs. multiple case	Multiple cases in order to provide a broader basis for building theory in a substantive area
Site selection	Considering the research topic, it was planned to include case organizations where the phenomenon of interest can be easily observed
Data collection	Multiple methods (document analysis, process modeling, semi-structured interviews)

Level of decision	This research
Data analysis	The grounded theory method in order to inductively generate theory that is grounded in empirical data

Chapter 4 covers the actual selection of cases and data collection methods in detail.

3.4.2 Grounded Theory as a Method for Theory Building

3.4.2.1 The Choice of Grounded Theory as the Data Analysis Method

In order to collect and analyze data an adapted version of the grounded theory method (Glaser & Strauss, 1967; Strauss & Corbin, 1998; Glaser, 1978; Urquhart, 2001; Charmaz, 2006) was used. Over the last decades, the grounded theory method has gained increased popularity in IS research (e.g., Urquhart, 2001; Fernández et al., 2002), suggesting that grounded theory is becoming a well-accepted research method in IS research. The grounded theory approach essentially attempts to explore for, and develop, theoretical statements about the features of a phenomenon of interest while simultaneously grounding the account in empirical observations or data (Martin & Turner, 1986; Glaser & Strauss, 1967). One of the key advantages, and challenges, of the grounded theory approach is that it is applicable to research domains that are characterized by their emergence and lack of substantive theory.

The process of theory building following grounded theory is highly iterative and theory and data are constantly compared (Glaser & Strauss, 1967; Strauss & Corbin, 1998). This process can be referred to as comparative analysis. Glaser and Strauss (1967) further introduce theoretical sampling as a process of ”data collection for generating theory whereby the analyst jointly collects, codes, and analyzes his data and decides what data to collect next and where to find them, in order to develop his theory as it emerges” (p. 45). For the purpose of theoretical sampling, the researcher selects samples (e.g. persons, sites, events) based on concepts and relationships that emerge from the analysis (Morse, 2007; Strauss & Corbin, 1998). Thus, samples are not predetermined; theoretical sampling cannot be planned previous to the study (Strauss & Corbin, 1998). Glaser and Strauss (1967) suggest combining the method of comparative analysis (constant comparison) with theoretical sampling. Strauss and Corbin (1998) describe the purpose of theoretical sampling as “to maximize opportunities to compare events, incidents or happenings to determine how a category varies in terms of its properties and dimensions” (p. 202). Both comparative analysis and theoretical sampling are described in more detail in chapter 5.

In the present study, the grounded theory method was applied in order to analyze data for the following reasons. First, there was a lack of theories that provide ample answers on how creativity influences business processes and their management. Thus, an inductive, exploratory approach was appropriate (Martin & Turner, 1986; Orlikowski, 1993). It has also been asserted that grounded theory is conducive to the process of interpretive data analysis (Piantanida et al., 2002; Orlikowski, 1993).

Second, business processes are highly dependent on, and influenced by, the contextual environment in which they are embedded (Rosemann et al., 2008). Grounded theory aims at generating substantive theory (Glaser & Strauss, 1967) and places special emphasis on the premise that contextual complexities and particularities need to be incorporated into an understanding of a particular phenomenon (Orlikowski, 1993). Thus, it was expected that the grounded theory method as an inductive approach to generating theory can help researchers to gain an in-depth understanding of business processes being investigated, as well as themes related to these.

Third, BPM research focuses on practical issues and thus emphasizes practical relevance. Similarly, grounded theory studies are suggested to generate theories that are not only rigorously developed but also provide useful insights for practitioners (Glaser, 1978; Fernández et al., 2002). Glaser's (1978) arguments include the capacity of grounded theories to support practitioners in providing additional aspects that were not empirically known to them as well as increasing the experts' ability to deal with new situations.

Fourth, grounded theory is understood as to be particularly fitting to study processes as it facilitates "the generation of theories of process, sequence, and change pertaining to organizations, positions, and social interaction"(Glaser & Strauss, 1967, p. 114). Orlikowski (1993) frames the grounded theory method as a research approach that specifically includes elements of process and change. Urquhart and Fernandez (2006) describe grounded theory as "a flexible research method that is good for researching processes, and for building theory in unexplored areas" (p. 462).

3.4.2.2 Straussian versus Glasarian Grounded Theory

Two main streams of grounded theory can be distinguished. Grounded theory was first introduced as a qualitative research method by Barney Glaser and Anselm Strauss in 1967. Strauss (1987) and later Strauss and Corbin (1990; 1998) introduced a differing approach that provides detailed procedures and techniques in order to analyze data. This type of grounded theory received much criticism from Glaser who even requested the 1987 book to be withdrawn, arguing that Strauss' understanding

of grounded theory "misconceives our conceptions of grounded theory to an extreme degree, even destructive degree" (Glaser, 1992, p. 2). Urquhart states that there "is a major disagreement between the cooriginators, rather than a minor point of technical application of the grounded theory method" (Urquhart, 2001, p. 17).

One key issue in Strauss and Corbin's approach is the proposal of a coding paradigm that suggests to group categories into those representing intervening and causal conditions, action/interaction, strategies, and consequences (Strauss & Corbin, 1998). Glaser's main criticism is that the use of the paradigm would lead to forcing of data. In his 1992 book he writes: "If you torture the data long enough, it will give up! This is the underlying approach in forcing preconceptions of full conceptual description. The data is not allowed to speak for itself as in grounded theory, and to be heard from, infrequently it has to scream. Forcing by preconception constantly derails it from relevance" (Glaser, 1992, p. 123).

Thus, he argues that the use of the paradigm would ignore the emergent nature of grounded theory (Urquhart, 2001). Urquhart (2001) further points out that she made similar experiences in her own research as "categories have to be reorientated and some reconsidered as either properties of other categories, or indeed relationships" (p. 17). Thus, she used it rather as a "jumping off point to think about categories, as opposed to a coding guide" (Urquhart, 2001, p. 18).

Consequently, researchers must be aware of the type of grounded theory they are using. As indicated earlier, in this research the Straussian approach to grounded theory was used. It is not the purpose of this study to fully investigate the conflict between the two strands. Yet, it is necessary to explain the main reasons that led to this decision.

Altogether, the approach of Strauss and Corbin appeared to be particularly fitting in order to seek answers to the research problem and research questions: Strauss and Corbin (1998) explicitly state that "by answering the questions of who, when, where, why, how, and with what consequences, analysts are able to relate structure with process" (p. 127) and the focus of this research was on studying a particular kind of processes (those that contain creative tasks). Moreover, Strauss and Corbin encourage researchers to mix grounded theory with complementing methodologies and to even apply existing insights and experience into the study (compare also Warburton, 2005). Warburton (2005) describes Strauss and Corbin's approach as "a 'pragmatic' approach with a more 'structured' attitude to theory building" (p. 4); an approach that was found suitable in order to answer the research questions. Consequently, in this research, for the purpose of analyzing data, an adaptation of the grounded theory

method as proposed by (Strauss, 1987) and further developed by (Strauss & Corbin, 1990; 1998) was employed. Chapter 5 covers a detailed description of how grounded theory was used in order to analyze data.

3.5 Overall Research Plan

Having introduced philosophical assumptions and the main strategies of inquiry, the research plan including detailed methods for data collection and analysis can be described. The research plan underlying this study can be roughly separated into the main phases of contextualization, exploratory case studies, and discussion of findings. Fig. 3.1 provides an overview of the high-level research plan including the chapters in which the various topics are addressed.

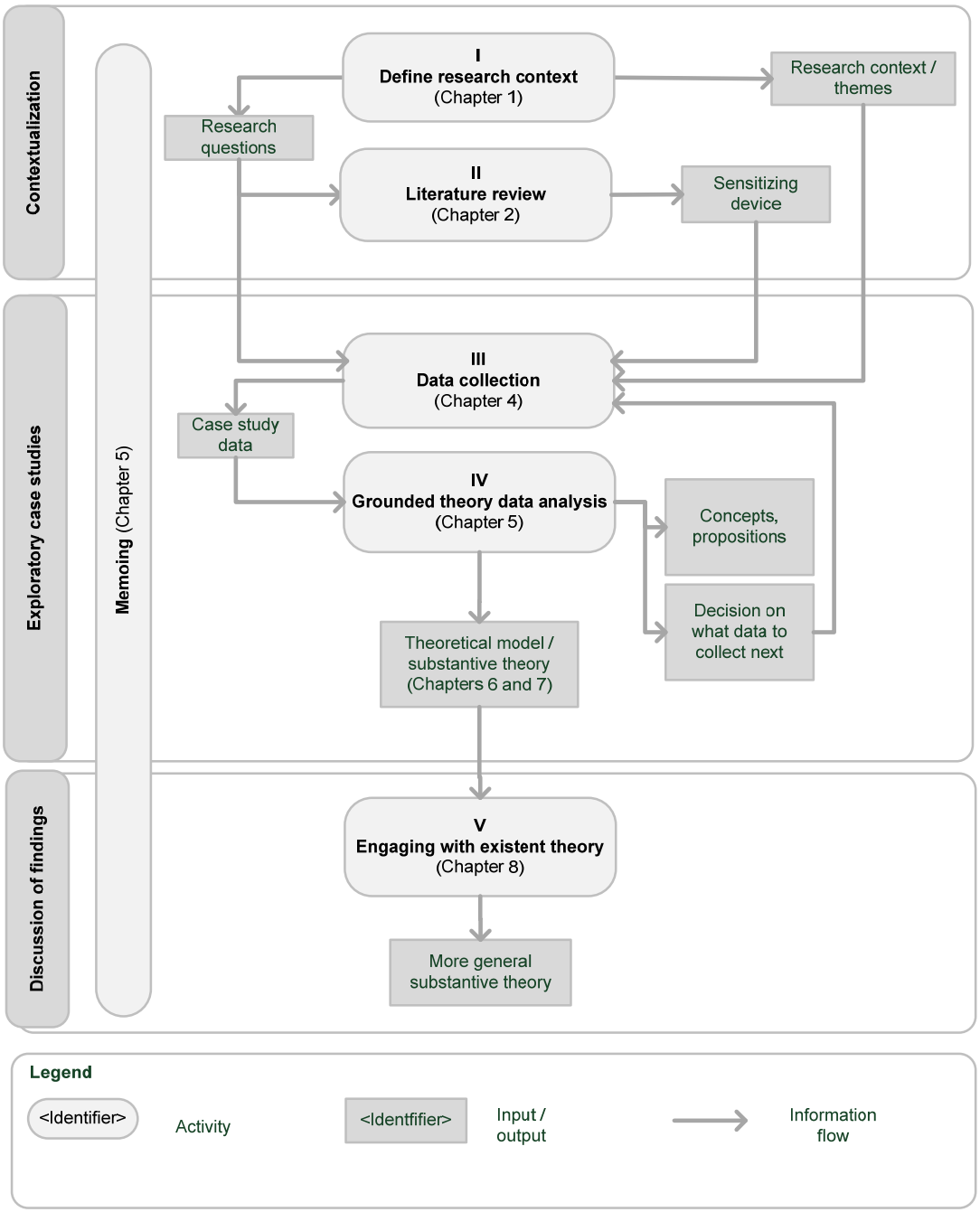


Fig. 3.1: High-level research plan

3.5.1 Phase 1: Contextualization

Within the contextualization phase (stages I-II in Fig. 3.1) including preliminary interviews and a first non-committal literature review (compare chapter 2) the above described problem situation became apparent and tentative research questions were defined. It has been asserted by various authors that even inductive theory building studies cannot neglect existent literature (Urquhart & Fernández, 2006; Walsham, 1995; Eisenhardt, 1989). As indicated earlier, the study started with a rather broad

research problem that was then broken down into more specific research questions. The literature review was non-committal. Thus, literature was revisited throughout the study as the emergent theory determined the relevance of the reviewed literature (Urquhart & Fernández, 2006).

3.5.2 Phase 2: Exploratory Case Studies

In stage III data was collected through semi-structured interviews, process analysis, and document analysis. The process of data collection including site selection, interview design and implementation is covered in detail in chapter 4. The data was then coded and analyzed using an adapted version of the grounded theory method as proposed by Strauss and Corbin (1998) and a theoretical model was developed (stage IV).

Breaking down the process into distinct stages is somewhat artificial, as the process of building theory underlying this research was highly iterative. As indicated in the discussion of building theory from case study data, data was simultaneously collected and analyzed. Similarly, Maxwell (2005) argues with regard to qualitative research design: „Such sequential models are not a good fit for qualitative research, in which any component of the design may need to be reconsidered or modified during the study in response to new developments or to changes in some other component“ (p. 2).

He further states that: “The activities of collecting and analyzing data, developing and modifying theory, elaborating or refocusing the research questions, and identifying and addressing validity threats are usually all going on more or less simultaneously, each influencing all the others. This process isn’t adequately represented by a linear model, even one that allows multiple cycles, because in qualitative research there isn’t any unvarying order in which the different tasks or components must be arranged” (p. 2).

Consequently, the model described above is not more than a conceptualization that is intended to illustrate different tasks that were carried out in a highly interwoven and iterative manner in order to develop theory. The model described in Fig. 3.1 is rather a model for research than a model of research (Maxwell, 2005). The model of research is much more complex and becomes only fully comprehensible through the detailed description of the actual processes of data collection (chapter 4) and data analysis (chapter 5).

3.5.3 Phase 3: Discussion of Findings

Finally, the results of the study were compared and contrasted with existent literature (stage VI). Thus, related literature was considered in two sections: first, within the non-committal literature review with the main purposes of clearly identifying the research gap and positioning this study within the context of IS research and second at the end of the study in order to engage with existent theory.

3.6 The Role of Theory for this Research

A theory is a "set of well-developed concepts related through statements of relationship, which together constitute an integrated framework that can be used to explain or predict phenomena" (Strauss, 1987, p. 15). Relations and concepts exist within certain boundary assumptions and constraints (Dubin, 1969; Bacharach, 1989). Bacharach (1989) notes that a theory is "no more than a linguistic device used to organize a complex empirical world" (p. 496). Hall and Lindzey (1957) describe the purpose of a theory as "that of preventing the observer from being dazzled by the full-blown complexity of natural or concrete events" (p. 9). Popper (1961) describes theories as "nets cast to catch what we call 'the world'" (p. 37). Bacharach (1989) concludes that the function of theoretical statements is to organize and to communicate. Summarizing, theory can be described as a means for understanding the world (Castells, 2000).

Within interpretive research, theory can have different roles (Eisenhardt, 1989). As discussed by Eisenhardt (1989) and Walsham (1995), for example, there are three distinct usages of theory in interpretive studies: theories as an initial guide to design and data collection, as part of the iterative process of data collection and analysis, and as a product of the research (Walsham, 1995, p. 76).

With regard to the role of theory when conducting grounded theory studies, Walsham (1995) notes that particularly the latter two uses would be emphasized as the grounded theory method is characterized by the primacy of inductively constructing theory that is grounded in field data. Consequently, in the present study theory was (a) part of an iterative process of building theory, and (b) the result of the research process. These two aspects are discussed in the following.

3.6.1 Theory as a Result of this Research

Theories can be classified by their breadth of focus (Gregor, 2006). Substantive theories are developed for specific areas of inquiry, mid-range theories hold a moderate level of abstraction, and formal theories are developed for broad conceptual areas.

Mid-range theories are thought to be of particular relevance for practice disciplines (Merton, 1967).

The present study aimed at generating substantive theory. As Glaser & Strauss (1967) argue, grounded theory can be applied in order to generate both substantive and formal theory. Whereas substantive theory is grounded in empirical data from a specific domain of inquiry, formal theory explains conceptual areas of investigation (Glaser & Strauss, 1967). As a consequence, substantive theory is applicable to the domain where it was derived from (Fernández et al., 2002). Glaser and Strauss (1967) further state that substantive theory can be the basis for the development of formal theory: "We believe that although formal theory can be generated directly from data, it is most desirable, and usually necessary, to start the formal theory from a substantive one" (p. 79). It is thus hoped that the substantive theory developed in this research can be the starting point for the development of more general theory.

Gregor (2006) proposes a taxonomy for classifying theories relevant to IS and distinguishes five interrelated types of theory. These are theory for analyzing, theory for explaining, theory for predicting, theory for explaining and predicting, and theory for design and action. She points out that explaining and predicting are the 'twin goals' of theory.

Theories for analysis and description do not explain causality or provide predictive generalizations. Such theories specify relationships that are classificatory, compositional, or associative and thus go beyond the mere description of those phenomena of interest. The contribution of such theory can be seen in providing systematics (in particular the delineation) of phenomena little is known about. Typical forms of such theories are classification schemata, taxonomies, topologies, and frameworks (e.g. Gorry & Scott Morton, 1971).

Theories for explaining provide "an explanation of how, why, and when things happened, relying on varying views of causality and method for argumentation" (Gregor, 2006, p. 619). Gregor (2006) further notes that these theories do not have the primary objective of generating testable hypotheses and proposes the alternative labeling of theories for understanding. A well-known example often used in IS research is the actor-network theory, which, as opposed to other network theories, includes objects and organizations that collectively form actor-networks (Callon, 1986). Thus, the theory can aid people in viewing the world in a certain way (Klein & Myers, 1999). Explaining theories are typical results of interpretive research as they do not seek to provide predictive generalizations. However, interpretive research may also generate theory that provides testable propositions (Gregor, 2006; Walsham, 1995).

Predictive theory focuses on what will be rather than the why. Such theory "states what will happen in the future if certain preconditions hold" (Gregor, 2006, p. 619). The causal relationships between dependent and independent variables are not explained. Gregor (2006) states that not much purely predictive theory can be found in the IS discipline. She further mentions Moore's law, which states that the number of transistors of an integrated circuit doubles every two years, thus doubling its power, as one of the few exemptions (Moore, 1965).

Theory for explaining and predicting provides causal relationships between dependent and independent variables and explains the future consequences at the same time. Such theory is typical for the natural science model of research. Recker (2008), for example, proposes a theory of the continuous use of process modeling grammars that aims to both explain and predict. The theory he proposes has its roots in the technology acceptance model (TAM) (Davis, 1989), expectation confirmation theory (ECT) (Oliver, 1977; Oliver, 1980), and task-technology fit theory (TTF) (Goodhue, 1995), which are explaining and predictive theories by themselves.

Theories for design and action explain how something can be done (Walsham, 1995; Gregor, 2002). Research in this area has also been labeled design science (March & Smith, 1995; Hevner et al., 2004). Subject to design science studies are IT development processes and concepts (Gregor, 2006). A recent example is the use of process grammars as a tool for business process design (Lee et al., 2008).

In the present study, it was intended to develop a theory that is primarily explanatory. As will be seen, however, predictive elements are also present. The emergent theory is explaining in the sense that it describes factors that shape processes that are characterized by creativity. It is predictive because it also describes the consequences that are associated with the application of certain strategies as well as the use of IT.

Caution must be exercised though; it has been asserted that those generalizations drawn from interpretive research are primarily explanations for past data. Social structures that are generated by humans and their interaction are not space-time invariant (Walsham, 1995; Bhaskar, 1979). The generalizations are thus not necessarily capable of wholly predicting future situations (Walsham, 1995). Yet, as Gregor (2006) states, "the degree of certainty in the prediction is expected to be only approximate or probalistic in IS" (p. 619). Different authors have asserted that general laws, such as in natural sciences, are rather unlikely in social contexts, mainly due to the large number of conditions (e.g. Gregor, 2006; Walsham, 1993; Creswell, 2003).

3.6.2 Theory as Part of the Iterative Process of Building Theory: Theoretical Sensitivity

With regard to inductively building theory, Eisenhardt (1989) states that researchers should avoid thinking about the specific relationships between variables as this may bias and limit their potential findings. Yet, she expresses that it is impossible to achieve the "ideal of a clean theoretical slate" (p. 536). Other authors have also pointed out that the idea of the researcher as a 'blank slate' is a misconception (e.g. Urquhart & Fernández, 2006; Selden, 2005; McCallin, 2003). Strauss and Corbin (1998) further note that researchers "might turn to the literature or experience to find examples of similar phenomena" (p. 44). They should, however, avoid early thinking about the actual relationships between these variables. Also the researcher should be self-reflective in order to be conscious of biases that may result from her own background knowledge (Sarker et al., 2001). In this research, this meant constantly stepping back and questioning whether concepts and relationships were actually grounded in the data or were imposed by preconceived knowledge.

As has been reinforced by various authors (e.g. Woodman et al., 1993; Couger & Higgins, 1993), the so-called *4 Ps* (creative product, creative person, creative process, and creative place or creative environment) need to be considered when studying organizational creativity and are central concepts in theories on creativity at individual, group, and organizational levels (Firestien, 1993; Runco, 2007; Isaksen, 1987; Rhodes, 1961; Brown, 1989). The knowledge that was presented in the literature review (chapter 2) served as a sensitizing device (Klein & Myers, 1999; Walsham, 1995). It thus became part of the iterative process of collecting and analyzing data in order to build theory (Walsham, 1995). This is in conformance with Walsham (1995) who states that it "is possible to access existing knowledge of theory in a particular subject domain without being trapped in the view that it represents final truth in that area" (p. 77). He even notes that the warnings of Glaser and Strauss may "tend towards approaches which risk ignoring existing work" (p. 77).

The sensitizing device was thus used to "view the world in a certain way" (Klein & Myers, 1999, p. 75); it provided a tentative understanding of relevant topics or themes and suggested relevant units of analysis. The sensitizing device thus suggested that it was particularly important to consider persons that engage with the process and to understand how they do so, as well as understanding the processes' context. This is congruent with the paradigm proposed by Strauss and Corbin (1998) for conducting grounded theory, as they propose to consider causal and intervening conditions that shape the process under investigation. Thus, the sensitizing device

was a means for guiding theoretical sampling and was further thought to enhance the researcher's ability to make theoretical comparisons. Theoretical comparisons work at a concept level where tools are used to "stimulate our thinking about properties and dimensions and to direct our theoretical sampling" (Strauss & Corbin, 1998, p. 78). Fig. 3.2 provides a graphical overview of the sensitizing device.

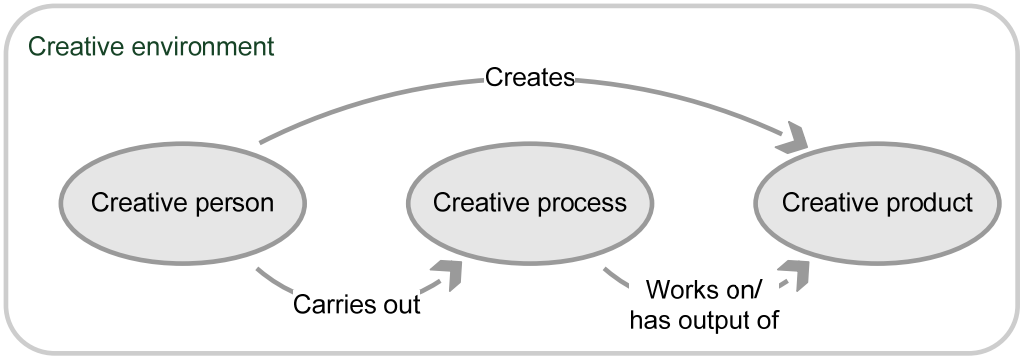


Fig. 3.2: Sensitizing device based on the review of existent literature

As theory needs to be informed by the examination of existent theory (Stuart et al., 2002), in a later, integrative stage (stage V in Fig. 3.1) of this research relevant existent theories on creative processes, creative products, creative persons, and the creative environment were assessed to further explain and inform the emergent theory (Urquhart & Fernández, 2006). Consequently, the process of building theory underlying this research is informed (a) by conducting exploratory case studies and applying the grounded theory method for analyzing data, and (b) by examining and consulting existent theory in a later, integrative stage. Thus, existent theory was not completely omitted but delayed as it was intended to inform later stages of theory development (Gibbs, 2002).

3.7 Chapter Conclusion

It must be noted that the present study employed a research design which cannot be labeled as 'pure' grounded theory. The grounded theory method was applied in order to analyze data that were collected in multiple case studies. Thus, the present study combines grounded theory and case study research. Four arguments have been put forward that explain why grounded theory was chosen as the method of data analysis (lack of theory, contextualization, practical relevance, suitability to study processes). In the present study it was tried to follow the basic principle of the grounded theory method of avoiding to be stifled by pre-conceptions in order to allow theory to emerge from the data; yet, existent literature was not completely omitted. This is congruent with what different authors have written about the role of existent theory

in inductive theory building research (e.g. Urquhart & Fernández, 2006; Walsham, 1995; Selden, 2005).

It was further argued that the study aimed at generating explaining theory, which is typical for research that belongs to the interpretive paradigm. However, predictive elements are also present. It has been asserted that interpretive studies can also generate propositions, which can form the basis towards testable generalizations (Walsham, 1995; Gregor, 2006). This is also congruent with the weak constructionist paradigm underlying this research.

4 CASE STUDIES, DATA COLLECTION, AND PRELIMINARY DATA ANALYSIS

Whatever has happened in my quest for innovation has been part of my quest for immaculate reality.

George Lucas

4.1 Chapter Introduction

This chapter describes the case studies that were used and the data that was collected in the course the study. It gives a summary of the products and processes as well as the role of IT in each organization. It also provides an account of the people who were interviewed and processes that were analyzed. The chapter thus describes the context of the processes that were studied. Moreover, the results of the preliminary data analysis based on initial interviews are introduced. Preliminary data analysis set the ground for the formal process of grounded theory data analysis.

4.2 Site Selection

The selection of case study sites is one of the most important decisions when developing theory (Eisenhardt, 1989). Cases in theory building are chosen for theoretical rather than statistical reasons. In this study, for data collection with the purpose of doing theoretical sampling (Glaser & Strauss, 1967), three organizations from the creative industries were chosen carefully. The creative industries are commonly referred to as an industry that is focused on creating and exploiting intellectual property (Cunningham, 2002). The *UK Government Department for Culture, Media and Sport (DCMS)* (2008) defines the creative industries as "those industries that are based on individual creativity, skill and talent". They also note that the creative industries "have the potential to create wealth and jobs through developing intellectual property." As has been asserted by various authors, the creative industries are one of the fastest growing sectors and are an important economic driver (e.g. Cunningham, 2002; Howkins, 2001; Hartley, 2005). Creative sectors that are commonly seen as being part of the creative industries include film, television, video, software, computer games, music, and the performing arts (Cunningham, 2002). The case organizations that were used within the present study belong to a sector which is often referred to as the film business (Jeffrey, 2006), or the film industry (Ravid, 1999). As will be detailed in the next section, they work in the later stages of the film business value chain, particularly in the so-called post-production and VFX production. The processes that were studied have earlier been described as highly dependent on crea-

tivity, interdependent, intensively involving the client, complex, but also repetitive. The aim was to select sites that "are particularly suitable for illuminating and extending relationships and logic among constructs" (Eisenhardt & Graebner, 2007, p. 27). At the same time, it was desired to enclose cases that are "likely to replicate or extend the emergent theory" (Eisenhardt, 1989, p. 537). Thus, organizations were selected, where "the process of interest is transparently observable (Eisenhardt, 1989; Pettigrew, 1990). Yin (2003) proposes two criteria for site selection: literal replication and theoretical replication. Literal replication refers to sites where similar results are predicted, whereas theoretical replication refers to sites where contradicting results are predicted. Thus, in order to develop theory in a substantive area, a primarily literal approach to selecting cases was chosen. This approach is an accepted practice when conducting exploratory research which seeks to gain in-depth understanding of a particular context (Eisenhardt, 1989; Neuman, 1997). Tab. 4.1 provides an overview of the case organizations that were studied. The particular interviewees and investigated processes will be introduced later in this chapter.

Tab. 4.1: Case study organizations

Organization	Approx. number of employees	Main areas
Organization A	40 employees, 100 full-time postgraduate students, 5000 students attending short courses	Teaching
Organization B	Approx. 100	Post-production: VFX production
Organization C	Approx. 150	Post-production, TVC

The rather narrow focus of the case organizations limits the scope of the emergent theory; the theory is thought to explain the phenomenon of a particular type of processes under certain circumstances in a certain area (Strauss & Corbin, 1998; Urquhart, 2001). However, the three organizations have different business focuses, which made it possible to investigate those organizations, both in terms of their similarities and differences (Orlikowski, 1993; Glaser & Strauss, 1967).

4.2.1 The Context of Film and VFX Production

The process of film production can be broken down into the stages of development, pre-production, production, and post-production (Clevé, 2006; Seidel et al., 2006). In essence, films are projects (Ravid, 1999; Morley & Silver, 1977). A project has been defined as an endeavor in which resources are organized in a novel way and that is characterized by a unique scope of work and carried out within certain time and budget constraints (Turner, 1993). However, within a film production, processes are

usually carried out repeatedly (Seidel et al., 2006). For a feature film, for example, usually many VFX sequences have to be developed. Moreover, much of what is done for a particular film may be done in a similar way for another one. In the following, an overview of the different stages of film production and the involved processes is provided.

Subject to the development stage are functions such as concept, budgeting, financing and scheduling. Particularly the financing stage is complex and demanding (Goettler & Leslie, 2005; Cones, 1998). Gillezeau (2004) distinguishes between concept phase, development phase, and finance phase. “The goal during the concept phase is to create a polished concept document (or ‘pitch document’) that will attract development investment, or better still production financing, for the project” (Gillezeau, 2004, p. 5). The development phase involves creating a written proposal.

Pre-production is the period from the official start of a project to the first day of shooting (Parer, 2006). It deals with all the aspects related to the practical production needs of the project. Gillezeau (2004) states that the line between finance, pre-production, and production can become blurred. This is due to the fact that pre-production might begin even before all the financial aspects are settled. It is a quite complex task to get consistency between contracts and agreements among all the involved parties.

In most cases the production phase is the most expensive one (Gillezeau, 2004). Subject to the production phase is the actual shooting (Clevé, 2006); i.e., the production of the feature film, TV-commercial, etc.

The post-production phase comprises all steps that have to be done between production and final delivery (Clark & Sphor, 1998; Lux, 2007). The person in charge of the post-production process is commonly called a post-production supervisor (Clark & Sphor, 1998; Kellison, 2006). Creation of VFX is also within this phase (Wales, 2005). The creation of VFX is often seen as a separate production process and is called the digital production process, e.g. (Kerlow, 2004). It typically begins parallel to the production phase.

Fig. 4.1 provides an overview of the screen business value chain. The model serves as a business process framework (Becker & Meise, 2003) in order to position the products and processes of the three case organizations.

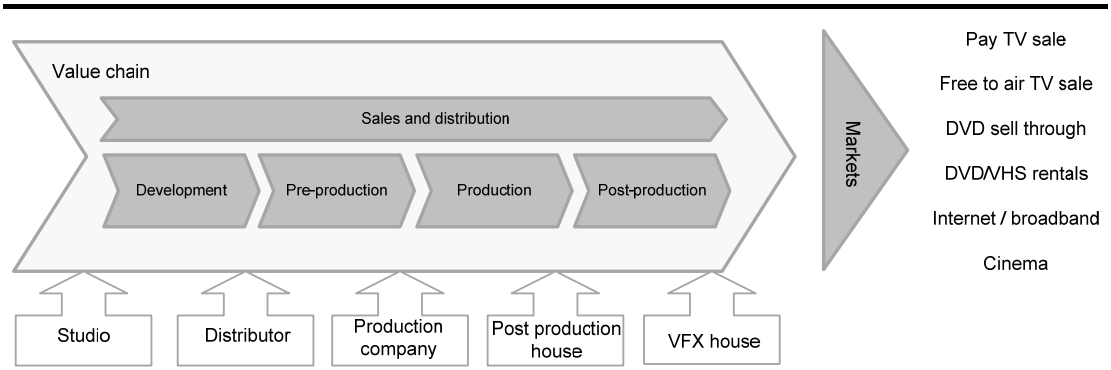


Fig. 4.1: The screen business value chain (compare Seidel et al., 2006)

The organizations that are involved in the value chain differ from production to production. Fig. 4.1 represents those companies that are typically involved in a feature film production. The production company serves as a coordinator and facilitator in the process. The markets that are served are of critical importance as this particularly impacts the deliverable; the deliverable is the main output of the value chain and can be seen as the key driver in the film industry. Post-production processes, for example, largely differ depending on whether the product is to be published on DVD only, is a feature film that will be shown in cinemas, or is a pure TV production (a feature film that will be shown in a theatre, for example, will usually be shot on a medium different to that used for a TV production; this then requires the use of different techniques and systems throughout post-production). The main stages of the value chain can be further broken down into processes of finer granularity. Such processes were subject to this study.

4.2.2 Organization A

Organization A is a teaching body in the field of film, radio, and television production. The organization conducts smaller film production projects and, therefore, has good process knowledge of the different stages of film production. The organization was chosen as a case study because it was hoped that respondents could provide access to a broad range of processes in the film industry. Moreover, the case was intended to provide a broader overview of the value chain and interrelationships between various processes in the film industry.

Products and Processes

The main product of this organization is teaching. It can be distinguished between short courses and degrees. However, the organization also conducts actual film projects. Teaching professionals that were interviewed have practical experiences in film production. Respondents work, for example, as producers on independent film

projects. Fig. 4.2 illustrates that *Organization A* carries out processes that belong to all stages of the film business value chain.

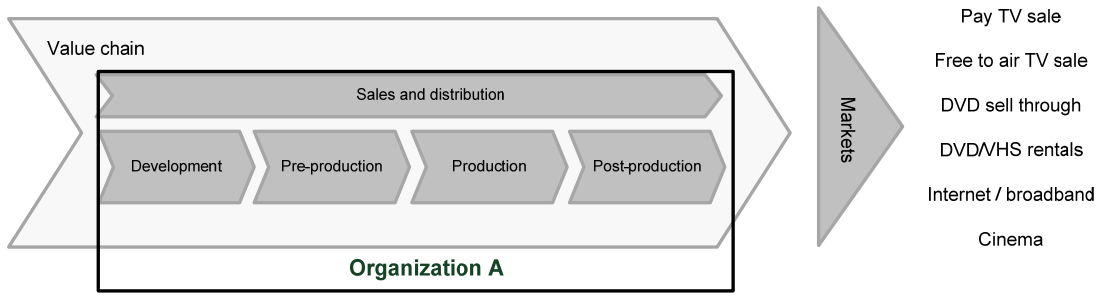


Fig. 4.2: Primary focus of *Organization A*

The Role of IT

Typical IT systems that are used in *Organization A* include tools for scheduling as well as artist systems that are used in order to carry out particular creative processes, such as editing in post-production.

4.2.3 Organization B

Organization B is a VFX house. VFX are computer-generated artifacts that are combined with conventional film material within television commercials (TVC), feature films, and other screen products (Kerlow, 2004). Processes in the VFX industry are characterized by the involvement of people with different roles (VFX artists, technical directors, producers, etc.), who work on highly creative outputs. At the time of the study the organization had around 100 employees. Clients of *Organization B* include major Hollywood film studios, international producers, directors, and VFX supervisors.

Products and Processes

The main products of *Organization B* are VFX for feature films. The core process of *Organization B* is the so-called production pipeline. The main purpose of this process is the generation of computer-generated characters, character animation, as well as realistic simulations. Besides these highly creative processes, the organization employs a number of administrative processes, such as finance processes, human resource processes, and marketing processes. Due to the research objectives of this study, particularly creative processes related to the above mentioned production pipeline were studied. Fig. 4.3 illustrates that *Organization B*, as a VFX house, carries

out processes that are primarily related to the production and post-production stage of the film business value chain.

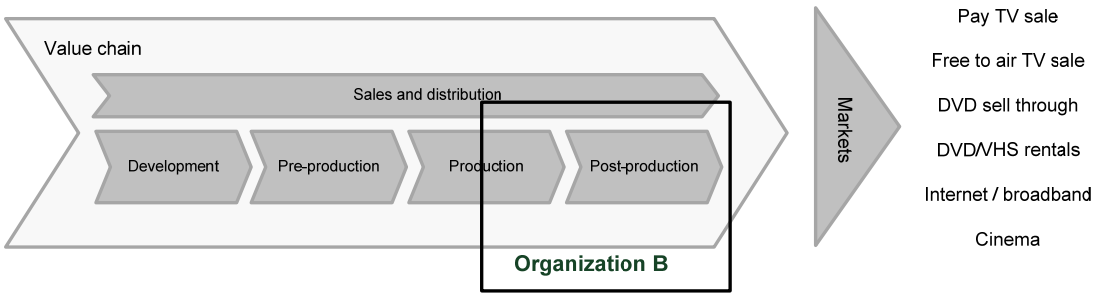


Fig. 4.3: Primary focus of *Organization B*

The production pipeline comprises of complex sets of processes characterized by innumerable interdependencies and high levels of creativity that result from the complexity of the generated products. For example, generating a VFX shot requires the creation of so-called bones, textures, and animation. The primary outputs are computer-generated images (digital assets) that can contain characters, animations, and realistic simulations. One such example is an animated spider. Fig. 4.4 shows the results of an intermediate process step (the so-called mesh). Eventually, the spider will be part of a shot that includes footage from production. Thus, there are also interdependencies with production processes. For example, the spider may be dangling from a web in a barn that was shot on a 'real world' set; hence the intimate connection to the production stage.

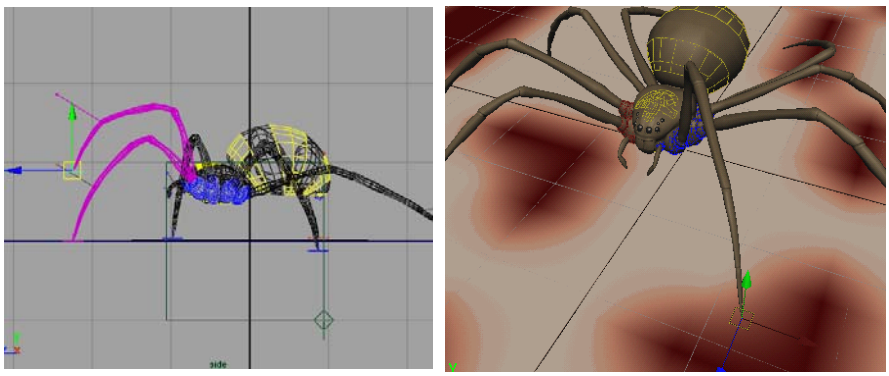


Fig. 4.4: Example (intermediate) product of *Organization B*

The Role of IT

IT has an important role within *Organization B*. IT systems are used for managing VFX production processes, for knowledge management, group communication, and, of course, for supporting the actual creative work. In terms of supporting creative

work, it can be distinguished between IT for 2D animation, 3D animation, rendering, and editing. Moreover, *Organization B* employs software that supports reviews and approvals and numerous other systems supporting various aspects of the processes, such as a system for bug tracking and a wiki that supports knowledge management.

4.2.4 Organization C

Organization C focuses on post-production; i.e. to the stage of film production in which footage and audio are joined to a "flowing coherent piece" (Kellison, 2006). However, besides classical post-production *Organization C* also works in the areas of animation films and VFX production.

Products and Processes

Organization C has a broader scope than *Organization B. Organization C* offers VFX production for TVC, feature film, and television, different post-production services, as well as distribution of various types of digital media (Fig. 4.5). Thus, *Organization B* employs a great variety of processes that rely on creativity. Example processes are post-production, VFX production, sound design, and DVD production, including the design of menus etc.

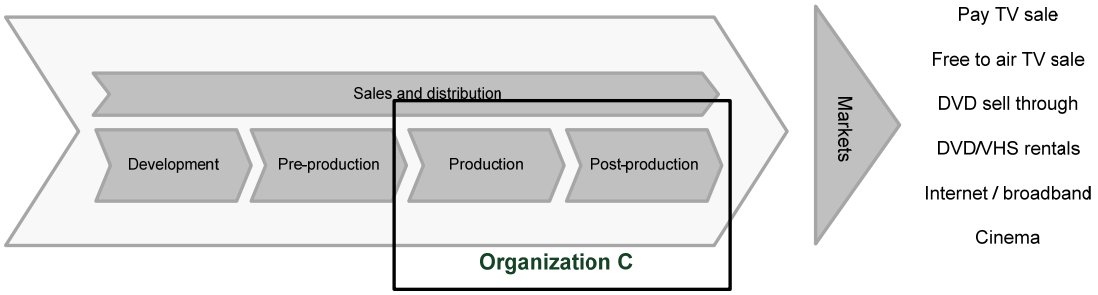


Fig. 4.5: Primary focus of *Organization C*

The Role of IT

Similarly to *Organization B*, IT infrastructure plays an important role in *Organization C*. The organization employs software for process support, knowledge and asset management, as well as the actual creative work. Many aspects of the IT infrastructure that can be found in *Organization C* are similar to those of *Organization B.*

4.2.5 Additional Individual Cases

Two additional interviews were conducted that particularly focused on the role of IT in creative industries processes. The interviewees were thus selected in order to theo-

retically sample (compare chapter 3.4.2). Adding cases to original case studies is quite common in case study research (Eisenhardt, 1989).

One interview was conducted with a production manager from a leading European TV production company, the other with an American IT professional with great experience in the creative industries, particularly in TV production.

4.3 Data Sources

The research strategy of this endeavor was to examine processes that contain creativity in depth and collect contextual information around these processes at the same time. Data collection took place over a period of approximately two years. Altogether, well above 30 people were interviewed.[1] The sourcing strategy involved semi-structured interviews, process analysis and document analysis. That is, multiple data sources were included in the study. The approach of using multiple data collection techniques is referred to as triangulation across methods. As indicated earlier, triangulation across methods is particularly useful when generating theory, as multiple perspectives allow the researcher to achieve a strong substantiation of emerging concepts (Orlikowski, 1993; Eisenhardt, 1989; Pettigrew, 1990; Glaser & Strauss, 1967). With regard to grounded theory, Glaser and Strauss (1967) encourage researchers to include different data collection techniques, as different types of data "give the analyst different views or vantage points from which to understand a category and to develop its properties" (Glaser & Strauss, 1967, p. 65). These different views they call "slices of data" and they go as far as to say that in theoretical sampling "there are no limits to the techniques of data collection, the way they are used, or the types of data acquired" (Glaser & Strauss, 1967, p. 65). Fernandez et al. (2007) pick up this discussion and conclude that "the nature of the data is not important in itself" (p. 233). What is more important is "the role the data play in providing evidence for useful conceptualizations".

The study started with informal interviews with managers, creative workers, and teaching professionals. The research problem became apparent and some initial, tentative research questions were formulated. Semi-structured interviews were then conducted. The interviews were either audio-taped and then transcribed, or detailed notes were taken. During this phase of analysis, the research questions were refined. As Dey (1993) notes, a common consequence of qualitative research is that the re-

[1] 24 people were involved in semi-structured interviews and/or process modeling and approximately another 15 people participated in preliminary interviews and meetings. A detailed account on the 24 people that were involved in semi-structured interviews and process modeling is given below.

search questions develop over the course of the study, during data analysis. Further sources of information were process models and documents. Process-modeling techniques (Scheer et al., 2005; Davis, 2001) as well as document analysis (mainly existent process documentation) were used so as to acquire an advanced understanding of the processes being studied.

Tab. 4.2 provides an overview of the types of interviews that were conducted in the course of this study. The table also provides details on the time horizon in which the different types of data collection were carried out.

Tab. 4.2: Types of interviews conducted in the course of this study

Type of interviews	Description/purpose	Chapter	Time horizon
Preliminary interviews/preliminary meetings	Gaining an initial understanding of relevant themes	4.3.1	April – June 2006
Semi-structured interviews	Understanding context, strategies, and consequences	4.3.2	March 2007 – December 2008
Process modeling and analysis	Detailed analysis of processes that contain creative tasks using a process modeling grammar	4.3.3	May 2006 – March 2007

4.3.1 Preliminary Interviews and Meetings

The preliminary interviews were intended to further the understanding of the research problem. These first encounters with the respondents were structured as open discussions. Topics that were discussed included the general nature of processes within the creative industries as well as process-related challenges currently being faced by the organizations that were investigated. As a result of these interviews, the research problem could be refined and broken down into more specific research questions (compare chapter 1.3).

Tab. 4.3 provides an overview of preliminary interviews and meetings, as well as topics that were discussed. As Tab. 4.3 shows, interviews were also conducted with participants that did not belong to the case study companies that eventually found their way into phase 2 of the study. This process is called convenience sampling as participants are selected who are accessible (Richards & Morse, 2007; Morse, 2007). Strauss and Corbin (1998) describe this mode of sampling as a subtype of theoretical sampling. Morse (2007) states that such sampling is “used in the beginning of a project to identify scope, major components, and trajectory of the overall process” (p. 235). Two of the organizations where preliminary interviews were conducted were

later found to be particularly fitting to further investigate the research problem and eventually became case organizations *A* and *B*. It must be noted that other conversations and meetings that were not recorded in detail also influenced the preliminary stage of this study. As indicated, approximately 15 respondents from film and VFX production were involved within this phase of the research.

Tab. 4.3: Preliminary interviews

Date	Organization	Participants	Identified topics
12-04-2006	*Organization B*	CEO, management	Processes are characterized by high levels of uncertainty Processes need to be flexible Knowledge dissemination is important Risk is an important issue
12-04-2006	*Organization A*	Producer, finance	Overview of the value chain Processes are collaboration-intensive
12-04-2006	Post-production house	Management, artists	Processes are collaboration-intensive Processes intensively involve the client High levels of uncertainty and variation Processes require flexibility Experience of creative persons matters
03-05-2006	*Organization B*	CEO, management	Role of VFX production in the value chain Processes are characterized by high risk Knowledge dissemination is important
03-05-2006	Post-production house	Management	The role of collaboration and integration Processes intensively involve the client
04-05-2006	Post-production house	Artists	Processes are collaboration-intensive Processes are interdependent Processes involve constant reviews
28-06-2006	*Organization B*	Technical directors, artists	Knowledge sharing and dissemination are important

A number of topics and concepts that turned out to be relevant to the study occurred in the preliminary interviews first; examples include the role of flexibility, risk, and knowledge. The interviews also provided a first understanding of the interrelationships between different processes in the substantive area being studied; they suggested that the processes being studied were highly relying on creativity, interdependent, intensively involving the client, and repetitive.

The notes that were taken during the preliminary interviews were revisited in a later stage of data analysis in order to theoretically sample. This way the data could be reorganized based on the emergent concepts and relationships (Strauss & Corbin, 1998).

In summary, the preliminary data analysis prepared the ground for the formal grounded theory coding process that is described in chapter 5 (Reid, 2006).

4.3.2 Semi-structured Interviews

The preliminary interviews set the baseline to design interview questions for semi-structured in-depth interviews. As indicated, the sensitizing device was part of the iterative process of collecting and analyzing data and thus also informed the interview design. Walsham (1995) uses the metaphor of a scaffolding that is built around a building and which is removed once it has served its purpose. In the present study the sensitizing device indicated that the researcher had to learn about creative people, products, processes, and contextual information.

Along with process modeling, semi-structured interviews were the primary data source within the study. As Rubin and Rubin (1995) state, through qualitative interviews "you can understand experiences and reconstruct events in which you did not participate" (p. 3). Rossmann and Rallis (2003) write that interviewing "takes you into participants' worlds" (p. 180), which is conducive to the interpretive paradigm underlying this study. Creswell (2003) further argues that qualitative interviews are useful when it is not possible to observe participants directly; participants can provide historical information.

The interviews conducted were semi-structured, topical, in-depth interviews. Topical interviews are used to study particular events or processes (Rubin & Rubin, 1995, p. 6). Rubin and Rubin (1995) use the notion of the research arena that "defines whom you will be interviewing about what" (p. 22).

In the present study people were interviewed who were expected to have profound knowledge of the processes of interest; both process managers and people who actually carry out the processes were included. As the research aimed at investigating both the nature of those processes that are characterized by creativity as well as their management, it was found necessary to consider both perspectives.

The interviews were designed based on a set of pre-planned questions to cover the subject area (Rubin & Rubin, 1995). While the initial questions were guided by the findings of the contextualization stage and also informed by the sensitizing device,

later questions were guided by the emergent concepts and relationships in particular. Thus, additional interview questions were framed so as to gain a deeper understanding of the emergent concepts, their properties, and interrelationships. As most of these questions stimulated some follow-ups, this mode of interviewing resulted in a tree-and-branch model. This is in accordance to Rubin and Rubin (1995) who write: "Main questions are prepared in advance after the researcher has studied available background material or conducted preliminary interviews. Although the main questions structure the interview, you don't have to follow them rigidly" (p. 200).

Consequently, the interview questions evolved throughout the study. Some questions were omitted whereas others were introduced. With regard to theoretical sampling, Strauss and Corbin (Strauss & Corbin, 1998) note that "during actual interviews or observations, because of increasing sensitivity on the part of the researcher, he or she often adjusts the interviews or observations on the basis of emergent relevant concepts" (p. 207). Thus, the interviews were used in order to theoretically sample; they aimed at producing a deeper understanding of particular concepts, properties, and interrelationships.

Moreover, the interview questions were always adjusted to the specifics of the situation at hand (Strauss & Corbin, 1998). Thus, characteristics of the interviewees such as professional background and personal traits could be considered. The interview questions were shown to two other IS researchers with experience in qualitative research and BPM and revised with regard to understandability. The feedback of these researchers was then incorporated into the interview questions.

Tab. 4.4 provides an overview of exemplary main questions and follow-up questions that guided a semi-structured interview with a creative supervisor from *Organization B*. The interview can be broken down into different parts. The interview questions were intended to provide rich insights into the complex interplay of contextual factors, strategies, and consequences.

Tab. 4.4: Main questions and exemplary follow-up questions

Questions and follow-up questions
Part A: Background and role
1. What is your professional background? 2. What roles have you performed on projects? a. What type of work have you carried out? b. Who have you mainly worked with? c. Have you been responsible for or have you managed any processes as a supervisor? d. Do you consider your role as primarily a creative one?

Questions and follow-up questions

Part B: General characteristics of processes

3. Can you tell us about creative tasks or processes you have worked on?
4. What do you think makes a process or a task creative?
5. What do you think are the main differences between an individual creative process (such as drawing a painting) and organizational creative processes (such as making a film)?
6. What are typical (generic) stages of VFX production processes?
7. Are there particular risks that are linked to creative tasks and what are these risks? If yes, what do you do to mitigate or avoid these risks?
    a. What is the role of review processes with regard to risk mitigation?
    b. Do you think that different tasks can be of varying importance to the overall process? And what makes a task/process important?

Part C: Contextual factors

8. What do you think is needed in order to successfully carry out VFX production processes?
9. What is the role of involved peoples' abilities? Can you tell me about the different abilities?
    a. Are there particular challenges in working with creative people as opposed to working with technical people?
10. What resources are needed?
    a. What are the most important resources?
    b. What restrictions may impact on the creative process?
    c. What is the role of IT in the VFX production process?

Part D: Clients and interaction with clients

11. How does communication with clients take place throughout the process?
12. Does the intensity of communication with the client vary throughout the process? And why?
13. Why do you communicate with the client?
14. What role does IT play in communicating with the client?
15. What is the role of the client in defining requirements specifications?
    a. How is IT used in the process of requirements determination?
    b. What types of systems are used?
    c. How are they used?
    d. Does IT facilitate requirements determination?
    e. Under what circumstances does IT facilitate requirements determination?

Part E: Internal management

16. How do you internally manage VFX production processes?
17. What are the main factors that drive resource allocation?
    a. Who allocates resources?

Questions and follow-up questions

b. What is the role of IT in resource allocation?

c. What problems may occur because of a lack of resources?

d. What are the greatest risks related to resource allocation?

18. How do you piece together a creative team? What are the determining factors of putting people together? How do you manage team failure?
19. How do time and budget impact on creativity?
20. Are there situations when creativity needs to be restricted?
21. Under what circumstances is it necessary to encourage people to be more creative?
22. What type of problems may occur because of certain constraints/restrictions? What are these restrictions?
23. Can you tell me about the role of internal reviews and approvals?
24. What role does IT play in internally managing creative processes?

Part F: The role of knowledge

25. What is the role of knowledge and knowledge management in VFX production processes?
26. How important is it for creative people to access references to previous work or work of others?
27. Do you have a knowledge management strategy?

Part G: Consequences

28. What do you think are the most important goals you are pursuing when you act as a creative supervisor?
29. What do you think is the greatest risk to creativity?

a. What can you do about it?

The interview questions were primarily open ended. Follow-up questions and probes where used in order to gain a deeper understanding of concepts, their attributes, and relationships between concepts. Probes "request the interviewee to elaborate on what they have just said or to explain it further" (Rubin & Rubin, 1995, p. 139). It was sought to word the questions broadly enough to allow the interviewees to express their thoughts, but also narrowly enough to supply specific data that was needed for theoretical sampling (Rubin & Rubin, 1995, p. 204).

It is not possible to relate each question to one of the research questions. For example, asking for the nature of processes that rely on creativity, in several cases, led to a discussion on consequences and strategies. Interview questions were guided rather by the emergent concepts and interrelationships than by the distinct set of research questions that developed out of the research problem.

A total of 13 people were involved in the semi-structured, topical interviews that were conducted in the course of this study. The average interview length was about an hour. Tab. 4.5 provides an overview. The majority of the interviewees held roles of process managers within the case organizations. They were thought to be capable of providing comprehensive insights into the processes' characteristics as well as their management. Most of the interviewees have also worked as 'normal' artists earlier in their career.

Tab. 4.5: Interviewees from the semi-structured in-depth interviews

Organization	Interviewee (age where known, gender)	Interviewee position and background
Organization A	*Interviewee A.1* (male)	The interviewee holds a management role in *Organization A*. He has a business background and has been involved in financing film and television productions. He also has good knowledge of the processes of film production.
	Interviewee A.2 (30, female)	The interviewee is a producer with a background in film and television. She holds a Master's degree in film production and has worked across various aspects of the arts, including funding, digital broadcasting, publicity and marketing, and film production.
	*Interviewee A.*3 (female)	The interviewee has been working as an editor and post-production supervisor in the film and television industry for over 22 years. She has been working with different award winning directors and edited a film that was premiered at the *Cannes Film Festival*. At the time of the interview she was working as head of the post-production department of *Organization A*. The interviewee holds a Bachelor's degree in visual arts.
	Interviewee A.4 (female)	The interviewee is a so-called production executive. She has worked as a runner, production assistant, assistant editor, production manager, continuity supervisor, writer, and director in the 1980s. Moreover, she has gained experience as a continuity/script supervisor on a number of films and TV series.
	Interviewee A.5 (male)	The interviewee has more than 20 years of experience in the film industry. He has particular experience in sound design. Among other things, he has worked as an assistant director, sound designer, and supervising sound editor. He has an educational background in literature, writing, and film.
Organization B	*Interviewee B.1* (32, male)	The interviewee is the CEO of *Organization B*. He has been trained as a software engineer and holds a Bachelor's degree in mathematics and computer science. He has worked in VFX production for 13 years.

Organization	Interviewee (age where known, gender)	Interviewee position and background
	Interviewee B.2 (male)	The interviewee is a digital effects supervisor with an educational background in electrical engineering and computer engineering. He has worked in VFX production since 1995.
	Interviewee B.3 (male)	The interviewee is a VFX supervisor who has worked on VFX for numerous feature film productions, including Hollywood productions, since 1998.
Organization C	*Interviewee C.1* (male)	The interviewee is the general manager of *Organization C*.
	Interviewee C.2 (male)	The interviewee has been a creative director since 1998. He has worked as an animation artist since 1987. He has an educational background in graphic design and animation.
	Interviewee C.3 (female)	The interviewee is a design coordinator. She produces 2D animation graphics.
Additional cases	*Interviewee D.1* (male)	The interviewee is production manager of a leading European TV production company with several years of industry experience.
	Interviewee D.2 (female)	The interviewee is an IT professional with more than 20 years experience in media production.

Summaries of the interviews were sent to the respondents in order to confirm they were understood correctly. Some respondents made minor corrections, mostly with regard to technical terms that were misspelled by the researcher. However, the respondents made no major revisions.

Interviewees from the in-depth interviews were later confronted with the emergent theory for the purpose of validation. Their comments were incorporated into the model. Thus, the model underwent a number of iterations until the respondents agreed on the model.

A complete overview of the interviews that were conducted can be found in Appendix A.

4.3.3 Process Modeling and Analysis

Creswell (2003) argues that the involvement and active participation of participants in the study is essential to qualitative research: “The methods of data collection are growing, and they increasingly involve active participation by participants in the study. Qualitative researchers look for involvement of their participants in data col-

lection and seek to build rapport and credibility with the individuals in the study“ (p. 181).

He further states that data collection types may be involved that “go beyond typical observations and interviews” as these can “capture useful information that observations and interviews may miss” (p. 188). In this line of thought process analysis using process modeling techniques (Scheer et al., 2005; Recker, 2008) was included into the study in order to gain an in-depth understanding of particular processes that rely on creativity. The process models were constructed in collaboration with the participants. Process models could then be analyzed using the grounded theory method.

Process modeling is commonly used within organizations in order to increase process awareness and the knowledge about business processes. Thus, organizational complexity can be deconstructed (Recker, 2008; Bandara et al., 2005). Process modeling can serve different purposes (e.g. Hammer, 1990; Hammer & Champy, 1993; Keller & Meinhardt, 1994; Gulla & Brasethvik, 2000; Peristeras & Tarabanis, 2000). For example, business managers may create process models in order to understand how a complex process works; software engineers may model a process in order to implement workflow automation (Harmon, 2007). In the present study process modeling was aimed at getting an in-depth understanding of particular processes.

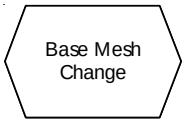
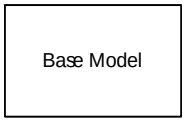
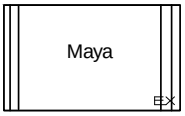
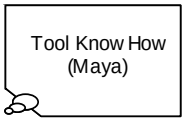
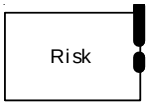
There are different types of process modeling grammars. It can be roughly distinguished between relatively informal methods used by business managers and formal methods used to specify software systems, such as workflow automation (Harmon, 2007; Abeysinghe & Phalp, 1997). Moreover, different process modeling grammars emphasize different aspects of processes (Soffer & Wand, 2007; Recker, 2008).

In the present study it was sought to learn how the processes work form the participants’ point of view. It was therefore vital to discuss and collaboratively develop process models with the respondents. As the respondents could not be expected to work with formal, more rigorous methods without a comprehensive introduction, one of those grammars intended to be used by business managers was employed. Thus, event-driven process chains (EPC) (Scheer et al., 2005; Davis, 2001; Keller et al., 1992) were chosen as a modeling grammar. EPC is one of the most popular process modeling grammars (Rosemann & v.d.Aalst, 2007; Recker, 2008). The choice of EPC was further guided by the researcher’s skill and experience in using the method.

When using a modeling grammar the modeler must decide on what language constructs she uses (Davis, 2001). In the present study, the preliminary interviews and

the sensitizing device had provided the researcher with a first understanding of what may be relevant in order to understand how creativity impacts business processes and their management. Thus, it was intended to identify tasks, actors, IT systems, input- and outputs, but also required knowledge, and risk (for an exhaustive overview of the method compare Davis, 2001). Tab. 4.6 provides an overview of modeling grammar elements that were used in this study.

Tab. 4.6: Modeling grammar elements used in this study

Object type	Symbol	Description
Function/task		A task is a process step. Complex tasks can be further decomposed into more detailed process models.
Event		An event represents a state of a business process that influences or controls the subsequent flow of the business process.
Role		A role represents actors who are involved in a process.
Entity type		An entity type represents a real-world entity. Has been used in order to depict input and output data.
IT system		An IT system is a software system that is used to fulfill a task.
Explicit knowledge		Explicit knowledge represents documented knowledge that is needed to fulfill a task.
Tacit knowledge		This object type represents tacit knowledge that is needed by an actor to fulfill a task.
Risk		This object type represents a risk that can be linked to a task.

Process modeling was conducted in an open atmosphere where respondents were encouraged to discuss any process-related issue that came into their mind. Two basic cases can be distinguished. In the first, the researcher initially discussed the process with the respondents and took notes; process models were then later constructed by the researcher based on the notes and send back to the respondents. The respondents could then provide feedback which was incorporated into the model. After a few (usually less than three) iterations researcher and respondents had found a consensus.

In the second case, process models were constructed collaboratively. In order to do so, the researcher first provided a brief introduction into the modeling language that was used. Process models were then constructed on a screen using a software tool; the respondent could thus directly intervene. When this approach did not work, the researcher asked questions about the process and constructed the models later, thus following the first approach as described above.

Tab. 4.7 provides an overview of the interviewees who were involved in process modeling along with the processes that were analyzed. A more detailed description of exemplary processes can be found in Tab. 4.9-Tab. 4.11. As can be seen, some of the interviewees were also involved in the semi-structured interviewees. The process interviewees with *Organization A* and *B* were partly conducted by two other researchers both of which have been educated in IS and have several years of experience in BPM.

Tab. 4.7: Interviewees from process modeling and processes modeled

Organization	Interviewee (age and gender)	Interviewee position	Processes modeled
Organization A	*Interviewee A.1* (male)	Manager with finance background (compare Tab. 4.5)	Post-production processes
	Interviewee A.2 (male)	Producer (compare Tab. 4.5)	Post-production processes
	Interviewee A.6 (male)	Editor	Post-production processes
Organization B	*Interviewee B.1* (male)	CEO (compare Tab. 4.5)	VFX production processes
	Interviewee B.3 (male)	VFX supervisor (compare Tab. 4.5)	VFX production processes
	Interviewee B.4 (male)	VFX artist, expert in rotoscoping	VFX production processes

Organization	Interviewee (age and gender)	Interviewee position	Processes modeled
	Interviewee B.5 (male)	VFX artist, expert in 2D animation	VFX production processes
	Interviewee B.6 (male)	VFX artist, expert in texturing	VFX production processes
Organization C	*Interviewee C.4* (male)	Project manager for interactive media	Production of interactive media
	Interviewee C.5 (male)	VFX artist	VFX production process
	Interviewee C.6 (male)	Head of technical engineering	Post-production process
	Interviewee C.7 (male)	Technical director	DVD production
	Interviewee C.8 (female)	Facility manager	Project specification
	Interviewee C.9 (male)	Technical director	TVC distribution process
	Interviewee C.10 (male)	Technical director	TVC distribution process

Besides graphically modeling the processes, notes were taken during the interviews in order to collect more comprehensive data. In most cases the interviews raised issues (for example with regard to managing the process) that could not be depicted by the means of the used modeling grammar. Tab. 4.8 provides an overview of typical questions that were asked during process modeling (compare Schwegmann & Laske, 2003 with regard to process analysis). An exemplary process model can be found in Fig. 4.6.

Tab. 4.8: Typical questions that were asked during process modeling

Questions within process modeling
1. Is it possible to define start and end of the process? Where does it start and where does it end?
2. What is the outcome of the process?
3. What steps have to be done in order to carry out the process?
4. Are there steps which can be further broken down?
5. Who is involved in the process?
6. What IT systems are involved in the process?
7. What resources are used in the process?

Questions within process modeling
a. What knowledge is required to carry out the process?
b. Does the process require the use of existent artifacts?
8. What are issues around the process?
a. Particular challenges?
b. Communication?
c. Risks?
d. What else?

The processes that were modeled and analyzed during the study belong to the stages of post-production and VFX production (compare chapter 4.2.1). In the following an overview of modeled and analyzed processes is provided. As will be seen, some of the processes turned out not to be creative at all. Due to confidentiality reasons no comprehensive process models from organizations *B* and *C* are shown.

The main process that was modeled and analyzed with respondents from *Organization A* is that of post-production. As indicated, post-production comprises all steps that have to be done between production and final delivery (Clark & Sphor, 1998; Lux, 2007). A detailed description of these processes can also be found in Lux (2007). Put simply, in post-production the bits and pieces of a film are put together. The post-production process thus is a quite complex process comprising of different creative and non-creative sub-processes (e.g. editing, sound & music editing, and film finish). Tab. 4.9 provides brief descriptions of major interrelated post-production processes. Altogether, post-production turned out to be characterized by numerous iterations. Review processes follow the more creative parts of the process in particular. The post-production process thus comprises of a set of interrelated sub-processes; moreover, it has interdependencies with other film production processes, such as production and VFX production.

In summary, post-production is a highly creative process that involves creative decisions on what pieces of footage are put together in what order, what VFX are added to the scenes, and the sound and music elements to be used. The processes that are described in Tab. 4.6 are typically used in the post-production of a feature film that is shot on film. It must be noted that there is not only one post-production process; the process depends on various parameters, such as the available budget, time, and the delivery format (compare also Lux, 2007).

Tab. 4.9: Exemplary processes analyzed in *Organization A*

Process	Description
Prepare film for edit	The film negative requires processing. As film is an analogue format, it must be converted to tape (a process that is called telecine) and digitized (uploaded to an editing system) so that it can be input for the editing process. During telecine a first grading of the footage can be done, for example, the lighting of a scene or inserting effects such as 'grain' or contrast. Hence, this process involves some creative decisions.
Offline editing	Offline editing is a creative process where picture-editing decisions are made on a low-resolution version of the footage. It is an iterative process that includes internal and external reviews. The offline edit involves the editor and director, and perhaps the post-production supervisor. The result of the editing is an edit decision list (EDL) – a list that describes the order in which the footage is put together.
Online editing	The online editing process is where the data recorded by the EDL is applied to the high resolution, master footage. The process may include additional grading by a colorist. The process may include internal and external reviews.
Sound editing	This process includes utilizing sounds recorded on set, and the design and generation of additional sound effects. This process is iterative; reviews involve the director, sound designer, and perhaps producer and postproduction supervisor. The final elements are then mixed and become the sound track.
Music composition	This process includes the scoring, recording, and mixing of the music elements. This process is iterative and reviews involve the director, composer, and perhaps producer and postproduction supervisor. The final elements are mixed and become the so-called score.
Film finish	Within film finish the various elements (picture and sound) are put together in order to produce a coherent piece.

Tab. 4.10 provides an overview of major processes that were analyzed with respondents from *Organization B*. Note that these processes were part of a project that *Organization B* was conducting at that time. The processes are repetitive as *Organization B* had to deliver a multitude of digital artifacts that went through the so-called production pipeline being the main process. Moreover, similar production pipelines are used in other projects. In essence, the production pipeline is the main process of VFX production. All other processes can be viewed as sub-processes. The production pipeline is a highly creative process that generates VFX. An exemplary artifact that is produced within the production pipeline is the spider that has been shown in Fig. 4.4.

Tab. 4.10: Exemplary processes analyzed in *Organization B*

Process	Description
Modeling	Within modeling the skeleton and facial structures are developed. The process results in a basic model that does not include color and texture. Modeling is a creative process which comprises of both creative (e.g. look development) and non-creative elements (e.g. receive materials). The process is collaborative as it involves editors, animators, supervisors, and clients. Particularly the creative elements are characterized by the application of both tacit and explicit knowledge. The process is further characterized by internal and external reviews.
Animation	Within animation the modeled characters are animated. It comprises of both creative (e.g. performing the actual animation) and non-creative (e.g. file type conversions) elements. The process is highly iterative and involves both internal and external reviews. It is also characterized by the application of both tacit and explicit knowledge.
3D	In 3D modeling the 3D models are perfected and then composited. Creative elements include the 3D compositing. Non-creative elements include the receiving of materials and the delivery of the outputs. The process is highly iterative and involves internal and external reviews.
2D	In 2D modeling the 3D composite is taken and put into a so-called 2D plate. The process exhibits similar features as the above described 3D process (it includes creative and non-creative elements, internal and external reviews, iterations, etc.).
Look development	In this stage additional features are added to the model. Thus, shades, textures, and colors are developed in order to proceed to a more realistic model.
Deliver product	The so-called final composite is delivered to a client.

In *Organization C* different post-production and VFX production processes were analyzed. Tab. 4.11 provides an overview. As indicated, *Organization C* employs a broad range of processes.

Tab. 4.11: Exemplary processes analyzed in *Organization C*

Process	Description
Project specification for post-production	The process of specifying a post-production project. The process involves a number of creative people, including the editor, director, producer, colorist, and post-production producer. Within a meeting, the technical specifications are discussed. These are then consolidated and distributed. The technical specifications are the base of the contracts as well as the schedule for post-production. Even though the process is not primarily creative, the distinctions that are made here impact the highly creative post-production process; decisions with regard to resources and budget are made here.

Process	Description
DVD production	The DVD production process includes the creation of a bid as well as the creation of a conceptual model of the disk functionality. Thus, the process includes some creative elements that require iterations and review.
Interactive media	Similarly to DVD production, the creation of interactive media includes both the creation of a bid as well as the design of the media's functionality. Thus, the process includes some creative elements that require iterations and review.
VFX production	*Organization C* also produces VFX. The process is highly creative and characterized by iterations and both internal and external reviews. Processes are thus similar to those describe in Tab. 4.10.

In the subsequent chapter it will be described how the process models were coded and analyzed using the grounded theory method. It will be seen that empirical evidence for the existence of relevant concepts such as different creative persons and creative supervisors could be found. Moreover, other concepts such as approval processes and the iterative nature of creative processes became evident.

The process models provided the researcher with an advanced understanding of the nature of the processes being studied. This knowledge was then used in order to conduct semi-structured interviews and to theoretically sample. The researcher was thus empowered to ask specific questions with regard to IT systems, involved actors, and required resources, for example. Moreover, the relevance of both technical and creative reviews of creative products became apparent. The process models were revisited throughout the study and further coded; thus, alike the preliminary interviews, the process models were used in order to theoretically sample.

Fig. 4.6 provides an exemplary excerpt from a process model from *Organization B*. The model depicts tasks, actors, IT, inputs and outputs, and required knowledge. The model shows that there are certain tasks within the process that require the application of knowledge. The knowledge that is codified in *Organization B* is depicted as explicit knowledge. The model also shows implicit knowledge that is required by the artist.

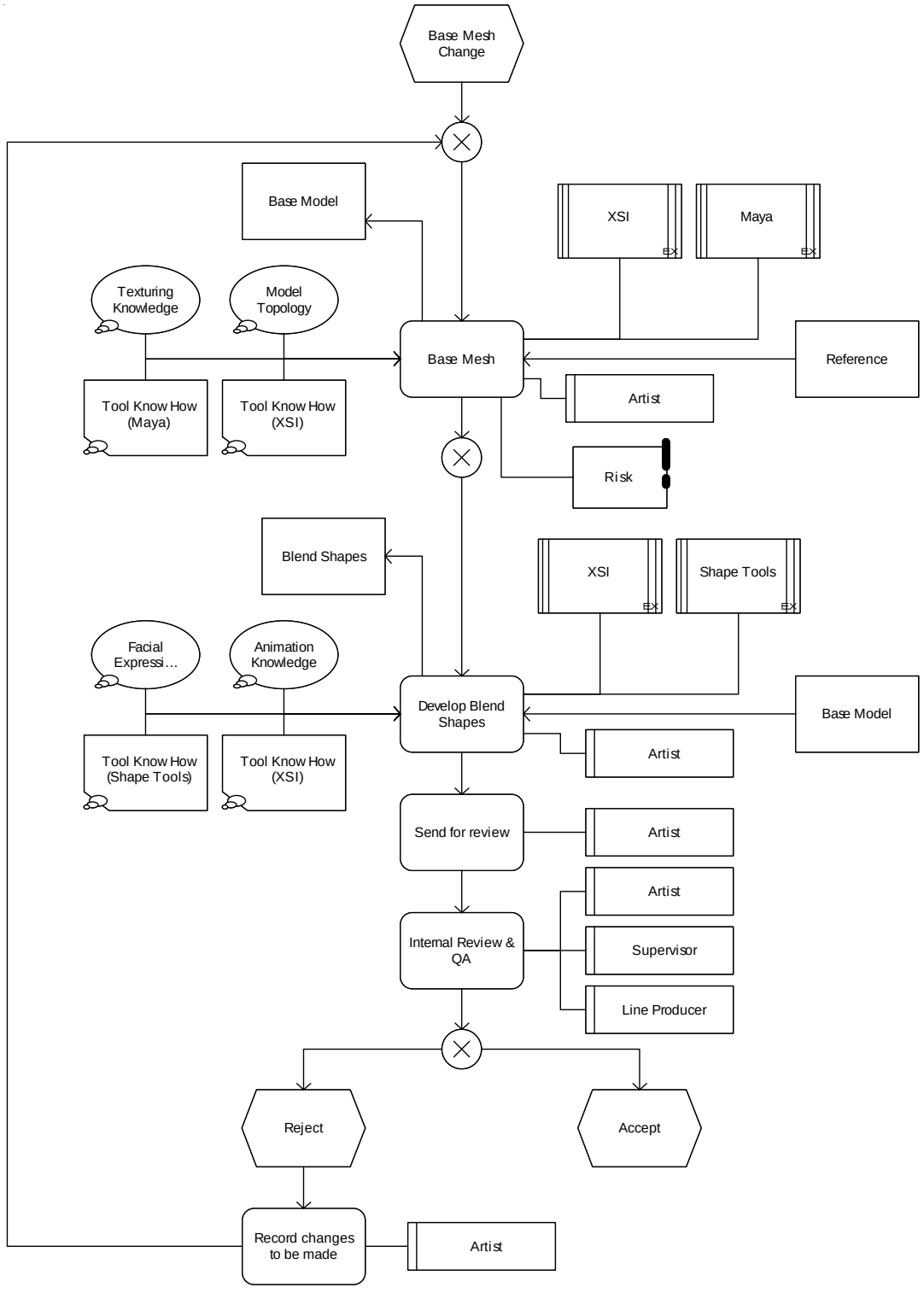


Fig. 4.6: Exemplary process model created based on interviews with *Organization B*

While the process models provided insights into the nature of the processes, it also became apparent that static models such as EPC are not capable of capturing the evolving and dynamic structure of processes that highly rely on creativity. It became

evident that processes in the case organizations are characterized by numerous iterations and a high demand for flexibility.

4.3.4 Documents

Documents that were collected within this study included

- process models that were provided by the case organizations,
- *PowerPoint* presentations, and
- press releases on the case organizations.

Similarly to the process models that were generated by the researcher, those process models that were collected in the organizations helped understanding the nature of the processes being studied. Fig. 4.7 provides an example of such a model from *Organization A*. The model depicts the process flow for one particular post-production process. It does however not capture information on involved roles, such as producers, editors, etc.

Other documents such as press releases helped contextualizing this research. Useful documents could be found through internet search. Some of the information that was obtained through the analysis of these documents was used for the case descriptions provided in chapter 4.2.

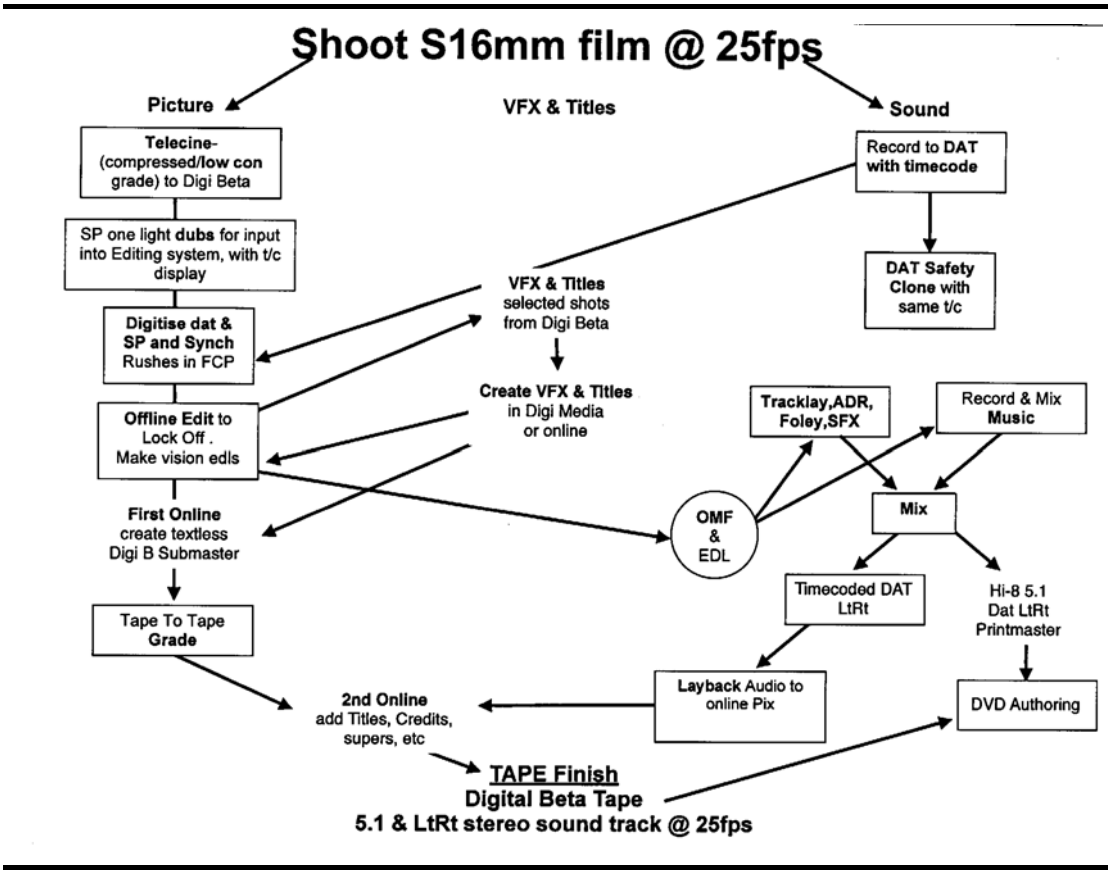


Fig. 4.7: Exemplary process model as provided by *Organization A*

4.4 Chapter Conclusion

The chapter provided a detailed description of site selection and data collection procedures including the design and implementation of interviews. Support for the chosen approach of using multiple data sources in theory building research can be found in numerous publications (e.g. Glaser & Strauss, 1967; Strauss & Corbin, 1998; Creswell, 2003).

The choice of using process modeling as a technique of data collection may seem unorthodox and raises at least one important issue: Process modeling techniques are, by their very nature, limited to express certain aspects of what is studied. This was dealt with in the present study by (a) also using textual description of the processes that were modeled and (b) using semi-structured interviews in order to collect rich data.

It is concluded that process modeling helped to gain a detailed understanding of relevant concepts that shape processes in the case organizations (e.g. involved people, used IT systems, required knowledge). The task of process modeling also equipped

the researcher with profound knowledge of the used terminology, which facilitated the conduct of semi-structured, in-depth interviews.

Another benefit must be seen in the direct involvement of participants. As has been asserted by Creswell (2003), for example, qualitative researchers “look for the involvement of their participants in data collection and seek to build rapport and credibility with the individuals in the study” (p. 181). Data collection is also not limited to textual data, but can also include images (Creswell, 2003).

5 GROUNDED THEORY DATA ANALYSIS

The best scientist is open to experience and begins with romance – the idea that anything is possible.

Ray Bradbury

5.1 Chapter Introduction

This chapter provides a detailed account on how the grounded theory method was used in the present study in order to analyze data and build theory. First, the terms are introduced that are used to describe the various elements that occur in the process of theory building. Next, the basic operations of the grounded theory method, namely making comparisons and theoretical sampling, are described. This is followed by a detailed description of the process of building theory and a discussion of the use of memoing as a key technique in conceptualizing. The chapter concludes with some reflections on the use of the adapted approach of Straussian grounded theory. This chapter along with the previous one provides a model *of* research, whereas chapter 3 presented a model *for* research.

The software tool *NVivo* was used in order to analyze data. The data sources in form of protocols, interview transcripts, process models, and other documents were imported into the tool. *NVivo* supports the researcher in conducting the different stages of data analysis that are described in this chapter. It has been asserted that the use of qualitative computing can assist researchers in dealing with the complexity of coding qualitative data (e.g. Bazeley, 2007; Gibbs, 2002; Richards, 2002).

5.2 Basic Terminology

In the following, the terms are introduced that are used in order to describe the process of analyzing data and building theory according to the grounded theory method. Examples from the present study are used in order to illustrate the use of these terms. The distinction that is made in this study is based on the definitions provided by Strauss and Corbin (1998). Other researchers may use different labels. Urquhart (2001), for example, writes: “The relationships between codes/categories/concepts (whatever you have decided to call your labeling of data bits) is critical in generating

theory" (p. 115).[2] In the present study, the notions of phenomena, concepts, categories, subcategories and properties are used.

Phenomena are "important analytic ideas that emerge from our data" (Strauss & Corbin, 1998, p. 114). For example, the central phenomenon that was identified in this study is that of a business process that includes creativity or even relies on creativity. Strauss and Corbin (1990) frame a phenomenon as "the central idea, event, happening, or incident about which a set of interactions or actions are directed at managing or handling, or to which the set of actions is related" (p. 96).

Concepts are labeled phenomena (Strauss & Corbin, 1998, p. 103). Thus, concepts are abstract representations of what is identified as being relevant in the data (Strauss & Corbin, 1998, p. 103). The process of developing concepts is called conceptualizing. Conceptualizing is at the heart of building theory (Strauss & Corbin, 1998). Examples for concepts that emerged in this study are the roles of the *client* and *artist*, but also strategies such as *managing expectations*. Naming phenomena enables researchers to ask questions about these phenomena. Eventually, these questions can take the form of propositions or hypotheses (Strauss & Corbin, 1998, p. 102). Thus, relationships between concepts are identified and theory is generated. Concepts are the building blocks of a theory (Strauss & Corbin, 1998, p. 101; Mouton, 1996).

Categories are more abstract concepts. For example, the phenomenon of processes that contain creativity was represented by the category of the *creativity-intensive process* that eventually became the core category of this research. Similarly, Dey (1999) states that the "term category is commonly used to refer to a class of things" (p. 52). The distinctions are based on "similarities and differences between things." Accordingly, the category of the *creativity-intensive process* represents a class of processes that share certain characteristics.

Categories can have subcategories that provide further explanations. Subcategories enhance the explanatory power of a category by answering questions such as how, when, what, and with what consequence (Strauss & Corbin, 1998, p. 127). For example, *strategies in managing creativity-intensive processes* is a subcategory of the core category of the *creativity-intensive process*. This subcategory explains how organizations handle the phenomenon of business processes that include creativity. As will be explained in detail in the section on axial coding, Strauss and Corbin (1998) distinguish different types of subcategories. In the present study, subcategories were

[2] In the present study, italics are used in order to represent conceptualizations (e.g. the category *strategies in managing creativity-intensive processes* or the property *process expertise).*

also used in order to further detail categories (compare Urquhart, 2001). *Strategies in managing creativity-intensive processes*, for example, could be further detailed into *strategies in internally managing creativity-intensive processes* and *strategies in communicating with the client.*

Both categories and subcategories have properties. Properties represent certain characteristics shared by objects that belong to a category. Properties vary on a dimensional range. For example, *visual knowledge* was identified as a property of the category *client* (clients "have" visual knowledge). Visual knowledge pertains to the client's ability to assess whether a product is likely to meet her requirements, based on visual artifacts such as style frames or early prototypes. This makes it possible to classify particular clients (objects) on a continuum of visual knowledge from low to high. Thus, particular incidents that can be observed in the data have a dimensional profile and form a particular pattern (Strauss & Corbin, 1990). These variations are used in order to identify relationships between categories.

The researcher's definition and interpretation of attributes or properties are important with regard to the actual classification; i.e. the development of categories (Strauss & Corbin, 1998, pp. 104f.). Roles within the investigated processes, for example, were conceptualized as *artists* or *creative supervisors*. While objects that belong to the two groups have much in common, there are some differing attributes that were considered to be important in the context of this research. For example, creative supervisors are those persons who have higher levels of responsibility or accountability for both product and process; they have to review the work of others and they act as process intermediaries.

Fig. 5.1 provides an overview of the relationships between the above mentioned terms. Note that concepts are the general building blocks of a theory. Categories, subcategories, and properties are thus concepts.

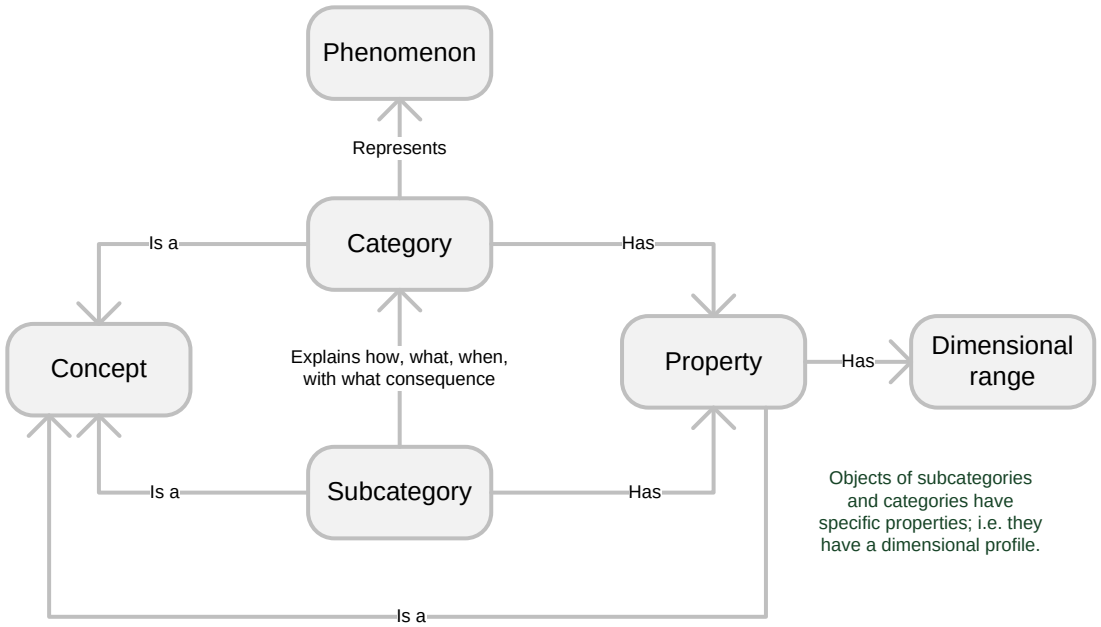


Fig. 5.1: Coding scheme

5.3 The Basic Operations of Grounded Theory Data Analysis: Making Comparisons and Theoretical Sampling

Before the actual process of data analysis can be introduced, it is necessary to discuss the two basic operations of the grounded theory method: *making comparisons* and *theoretical sampling* (Strauss & Corbin, 1998; Glaser & Strauss, 1967).

Making Comparisons

Making comparisons is the basic operation of conceptualizing. It can be further distinguished between *constant comparative analysis* and *theoretical comparisons*.

Put simply, *constant comparative analysis* describes a process in which the researcher compares incident to incident in the data with the purpose of discovering similarities and differences between these incidents (Strauss, 1987, p. 25). Similar incidents are put under the same label while differing incidents are put under different labels. Incidents are also referred to as empirical indicators. Glaser (1978) explains the so-called concept indicator model as follows: “Our concept indicator model is based on constant comparing of (1) indicator to indicator, and then when a conceptual code is generated (2) also comparing indicators to the emerging concept” (p. 62). Fig. 5.2 illustrates the concept indicator model.

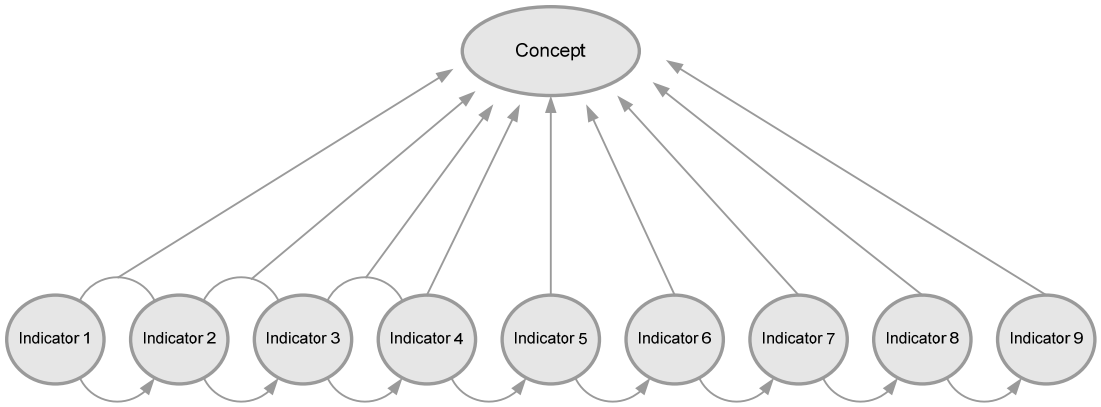


Fig. 5.2: Concept indicator model (Glaser, 1978, p. 62)

Theoretical comparisons refer to the researcher's theoretical sensitivity and are "an essential subsidiary instrument for raising questions and discovering properties and dimensions that might be in the data by increasing research sensitivity" (Strauss & Corbin, 1998, p. 67). In order to enhance theoretical sensitivity, in this research the above introduced sensitizing device was used.

Theoretical Sampling

Theoretical sampling describes the process of data collection that is driven by concepts. Thus, theoretical sampling is based on the process of making comparisons as described above. In order to theoretically sample, the researcher visits places and people that provide good opportunities to gain an in-depth understanding of the emergent categories. In particular, the researcher aims at discovering variations among categories so as to be able to develop these categories in terms of their properties and dimensions (Strauss & Corbin, 1998, p. 201).

5.4 The Coding Process

Coding is the process of conceptual abstraction, where categories are grounded in the data (Dey, 2007; Holton, 2007). Codes are abstract representations of objects or phenomena (Strauss & Corbin, 1998). Put simply, coding means to classify incidents in the data through labeling or tagging (Coffey & Atkinson, 1996; Miles & Huberman, 1994). This classification then assists conceptualization (Bazeley, 2007). Three main stages of analysis in Straussian grounded theory can be distinguished: open coding, axial coding, and selective coding (Strauss, 1987; Strauss & Corbin, 1990; Strauss & Corbin, 1998). Fig. 5.3 provides an overview of the specific activities that were carried out in the course of grounded theory data analysis. Fig. 5.3 thus details stage IV of the research plan that was introduced in chapter 3.

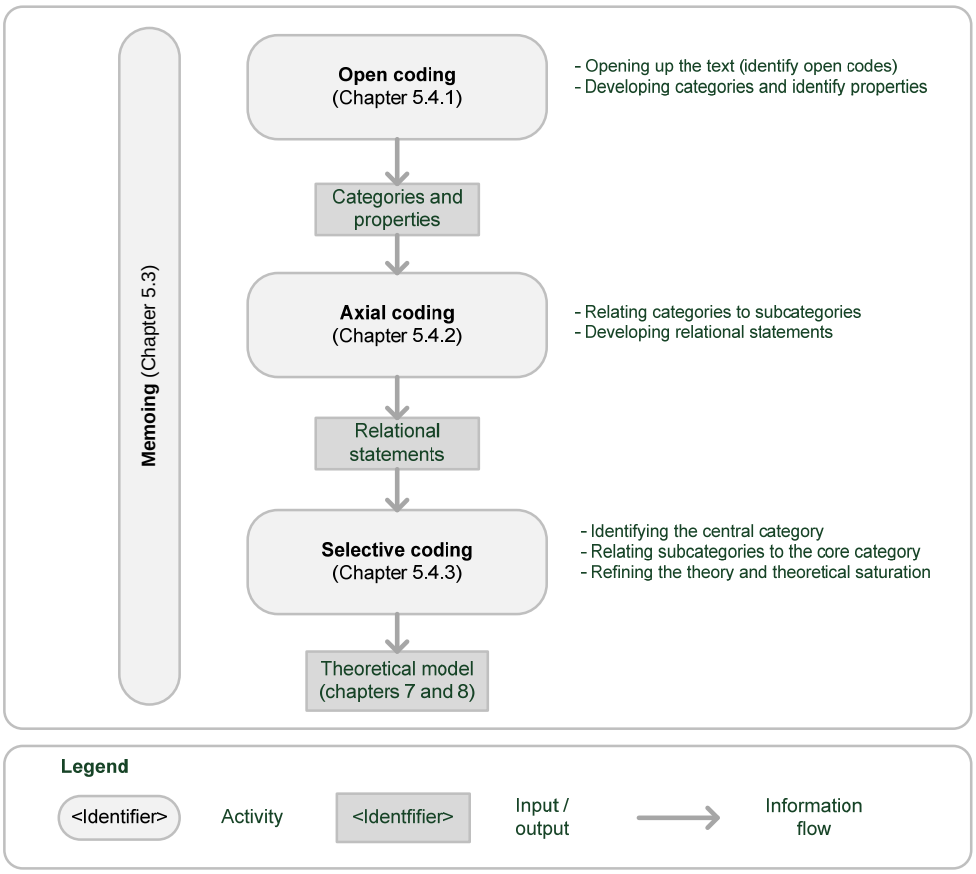


Fig. 5.3: Grounded theory data analysis

In this study, during open coding relevant categories were identified and evidence for these categories was collected. In axial coding, relationships between categories and subcategories were identified. Axial coding was followed by selective coding, where the core category, the central phenomenon of the research, was identified and other categories were related to the core category. Thus, the emergent theory was integrated into a larger theoretical scheme by linking the different categories to the central research phenomenon.

As the process of data collection and analysis was highly iterative, the above described separation into phases is somewhat artificial. Due to the iterative nature of this process, Dey (1999, p. 47) refers to open coding, axial coding, and selective coding as emphases rather than phases. Similarly, Strauss and Corbin (1998) note that from the "analysis of the first interviews, the researcher cannot help but notice how concepts relate to each other" (p. 135).

5.4.1 Open Coding

Within open coding, initial codes that led to the conceptualization of categories and their properties were identified. In the following it is first explained how the text was

opened up. This is followed by a detailed description of how concepts[3] were integrated into categories and further developed in terms of their properties and dimensions.

5.4.1.1 Opening up the Text

Open coding started with a process that Strauss and Corbin (1998) refer to as microanalysis; i.e., a line-by-line analysis of semi-structured interviews that leads to the identification of initial codes. This way each case was coded. This enabled comparisons within the same group as well as comparisons with different groups. As Strauss and Corbin (1998) write, a close examination "of data for both differences and similarities allows for fine discrimination and differentiation among categories" (p. 102).

Open coding started with a microanalysis of the interviews from *Organization A*. Initial codes were identified. Coding the first interviews was a laborious act that literally took several days per interview. Various authors assert that this process is not only time consuming but may even be quite messy (e.g. Esteves et al., 2002; Urquhart, 2001; Reid, 2006). The analysis of the interviews from *Organization A* was followed by an analysis of the interviews from *Organization B* and *Organization C*. It has to be noted that this is only a rough distinction as it was started to move forth and back in the data from the different case study organizations very early in the study. Moreover, with the purpose of theoretical sampling, additional interviews were conducted with all three organizations as well as with individuals that did not belong to any of the case organizations (compare chapter 4 on data collection).

The process of open coding starts with labeling. That is, the analyst places names on certain incidents, events, and objects in the data. Those incidents, events, and objects that share common characteristics are given the same name, which eventually leads to the grouping of concepts. Strauss and Corbin (1998) describe this procedure as follows: "Thus, when we classify like with like and separate out which we perceive as dissimilar, we are responding to characteristics, or properties inherent in the objects that strike us relevant" (p. 105).

The name that is used for this act of conceptualizing can either be placed by the analyst or it can be taken from the words that were actually used by the respondents

[3] The notions of concept and code are used interchangeably in this study. As indicated, concepts are the general building blocks of a theory. Strauss and Corbin (1998) note that concepts are integrated into more abstract concepts, called categories. Urquhart (2001), for example, states that "open codes are grouped into categories and subcategories and indeed some open codes become categories in their own right."

(Strauss & Corbin, 1998, p. 105). The latter ones are called in-vivo terms (Strauss, 1987; Glaser & Strauss, 1967). For example, in this study the label of the *creativity-intensive process* was introduced by the researcher, whereas *managing expectations* was an in-vivo term that was used by the respondents.

Tab. 5.1 provides a few examples of open codes that were identified in an interview with a producer from *Organization A*, who responded to the question "What is the role of a producer in managing the process?" Analysis at this stage took place at a word and sentence level (Urquhart, 2001). As the codes show, it became apparent that producers are particularly involved in interacting with clients. The second quote stems from *Interviewee B.2*, who also talked about the interaction with the client. He emphasized the role of collaborating with the client when creating a shot. Codes that were identified include *collaborating with client* and *forming the client opinion*.

Tab. 5.1: Exemplary open codes (1#2)

Quote	Open codes
*I think, managing expectations **[managing expectations]**. And the role that the producer has in terms of delivering to a client **[delivering to a client]**, because that would often be rare that along the line the client is directly involved. So, it's not that it's rare, but […] the producer is much more involved with the project every single day and they are reporting obviously outside to a client **[reporting to a client]**. And when the client comes in **[client touch points]** that's the moments when you are getting direct feedback from the clients **[getting feedback from clients]**. But, the role the producer has in managing those expectations **[managing expectations]**, I think is really important. (Interviewee A.2)*	*Managing expectations* *Delivering to a client* *Reporting to a client* *Client touch points* *Getting feedback from clients*
*Because the very definition of the value that we create is partly created by the level of communication. At the end of the day, it's an image that goes up on the film that people will watch. But for that image to be meaningful, for it to achieve what it means to achieve, you actually have to have gone through the process of creating that image with a person **[collaborating with client]**. If you just walked up to a director and went "bang, there's your shot," maybe, very much maybe, it would work for them. But it probably won't. Instead, they need to explain to you what they are trying to achieve **[explaining the process, managing expectations]** and then have you show them how that works, and then together you end up where the end image is **[collaborating with client]**. And it's hard to overstate how important that process is in forming their opinion **[forming the client opinion]** of what they want in the image. (Interviewee B.1)*	*Collaborating with client* *Explaining the process* *Managing expectations* *Forming the client opinion*

Tab. 5.2 provides exemplary codes that were identified in passages from an interview with *Interviewee A.1* and an interview with *Interviewee B.1*, who both talked about the nature of processes that rely on creativity. Initial open codes included *latitude*, *variance*, *uncertainty*, and *judgment*. In the first interview, for example, the code *variance* was used, in the second the code *uncertainty*.

Tab. 5.2: Exemplary open codes (2#2)

Quote	Open codes
*The distinction is more about latitude **[latitude]**. Latitude that exists in the performance of the task, whatever it is. I guess, what I am calling a technical task **[technical task]** is one where there is not so much latitude, it's expected to be performed in this band here, so you are not expecting a lot of variance in the performance **[variance]**. Whereas what I am calling a creative task **[creative task]** is one where is more variance inherently in the task. (Interviewee A.1)*	*Latitude* *Technical task* *Variance* *Creative task*
*And I think for us one of the features of it being a creative process is that you can't […], there's no objective way of defining the outcome **[uncertainty with regard to outcome]**; as it is with the way with the aesthetics. After you got it, you can cast some judgment **[judgment]** over whether or not it is appropriate, but you can't sit down before you start and define the outcome in a sort of objective, measurable way **[uncertainty with regard to outcome]**. (Interviewee B.1)*	*Uncertainty with regard to outcome* *Judgment*

The mere act of labeling does not provide the researcher with "greater understanding of what the concepts stand for or mean" (Strauss & Corbin, 1998, p. 109). Yet, this initial stage of coding is not a mere labeling of events or objects as with the act of labeling the researcher also starts conceptualizing. The following memo[4] on the first quote from Tab. 5.1 exemplifies microanalysis of data, that is, how the text was opened up in this study:

> ***Memo.*** *The interviewee is a producer and thus someone who interacts directly with the client. The first aspect that strikes me is the notion of "managing expectations" **[managing expectations]**. Thus, the interviewee is pointing out that her role is to manage something very abstract. When she refers to the moments of "when the customer comes in," she refers to what, in the context of business processes, may be labeled as **[client touch points]**. These are the occasions when it is possible to get "direct feedback from the customer" **[getting feedback from clients]**. Thus, it is the client touch points where the producer gets the chance to*

[4] Memos are discussed in depth in chapter 5.5.

> *receive direct feedback from the client and to manage expectations. Moreover, the fact that the customer comes in quite regularly appears to be a property of creativity-intensive processes. If I compare this to other processes, for example from automotive industries, this may be a distinction. However, there would be other, not necessarily creative, processes that may involve the customer for the sake of quality assurance, for example. As the producer communicates with the client the producer acts as an interface between the creative organization and the customer. This role of the producer as a* ***[process intermediary]*** *has also been pointed out by other respondents so I should keep this in mind.*

As can be seen in this example, actual names that were chosen for codes were suggested by the context that was investigated (Strauss & Corbin, 1998, p. 106). For example, the notions of *client touch points* and *process intermediary* can be easily related to the context of managing business processes.

5.4.1.2 Developing Categories

So far, it has been illustrated how first open codes were identified and similar incidents, events, and objects were grouped under the same label. This process led to the identification of concepts. Strauss and Corbin (1998) write that "an analyst might derive dozens of concepts" (p. 113). Similarly, in this study quite a big number of concepts emerged (well above 250). A complete overview of these so-called lower-level codes (Urquhart, 2001) can be found in Appendix B. Those concepts that ultimately found their way into the theory were highly recurrent (Sarker et al., 2001).

By grouping concepts into categories the number of units the analyst works with can be reduced (Strauss & Corbin, 1998, p. 113). Tab. 5.3 provides some examples of how concepts were integrated into higher level concepts, that is, categories. For example, various codes had been identified that could be grouped under the more abstract label of *managing the scope of creativity*, whereas others could be grouped under the category of *task allocation and team building.* Similarly, different roles of persons in creative organizations had been identified and were then grouped under categories such as the *artist* and the *creative supervisor*. For example, *VFX supervisors*, *directors*, *animation supervisors*, *producers*, and *leads* were grouped under the category *creative supervisor* as these concepts share various characteristics that are of relevance in order to explain how processes in creative environments are managed: First of all, creative supervisors share the characteristic of being responsible for creative products and processes (property *accountability)*. Moreover, creative supervisors act as process intermediaries (property *acting as process intermediary)* that align the creative organization's processes with the client's processes. They are

thus the main interface when it comes to cross-organizational communication. These and other shared characteristics led to the formation of the according category.

Tab. 5.3: Developing categories: examples of integrating codes into categories

Category	Codes
Managing the scope of creativity	*Avoid endless exploring, channeling creativity, encouraging creativity, creative buy-in, giving latitude, granting bending rights and responsibilities, providing stimuli to creative people, putting people under time pressure, restricting creativity, setting up creative atmosphere*
Task allocation and team building	*Challenge creativity, finding a balance between technical and creative, identification of complementary skill sets, task allocation, trial and error, getting the right team, knowledge induction process, knowledge transfer*
Artist	*VFX artist, editor, sound editor, compositor*
Creative supervisor	*Lead, VFX supervisor, producer, team leader*

Categories not only reduce the number of units the analyst works with, they also "have the potential to explain and predict" (Strauss & Corbin, 1998, p. 113). Having identified a certain category, the researcher can start to ask questions about this category. For example, with regard to the role of an *artist*, the researcher may ask what abilities they have that influence their ability of being creative. In this study, this question led to the identification of properties such as the *creative skills* and *creative agenda*.

Having formed categories, these can be further developed by identifying their properties and dimensions. Both categories and subcategories have properties (Strauss & Corbin, 1998). Strauss (1987) defines properties as "the most concrete feature of something (idea, thing, person, event, activity, relation)" (p. 21). As properties can vary along dimensional ranges, they give categories variation (Strauss & Corbin, 1998). For example, artists are characterized by the property *process expertise*. This expertise refers to the artist's capacity of assessing, breaking down, and carrying out a certain process; it varies on a dimensional range from low to high. Similarly, creativity-intensive processes are characterized by the property of *uncertainty with regard to structure* as their structure is often not known in advance. This uncertainty (how many exceptions may occur etc.) can range from quite low to very high, depending on a number of contextual factors that shape the process.

By qualifying categories through the specification of their particular properties and dimensions, the researcher can formulate so-called patterns (Strauss & Corbin, 1998, p. 107). For example, one pattern could be *artists with high process expertise* and another pattern could be *artists with low process expertise*. This way, various occurrences of a category can be linked to varying combinations of dimensionally specified properties and thus to a different pattern.

Strauss and Corbin (1998, pp. 117f.) refer to these properties as general properties. They use the example of *color* where *shade* and *hue* would be general properties. Similarly, *process expertise* and *motivation* can be seen as general properties of the category *artist*. As a color's hue may vary from *dark* to *light*, an artist's process expertise may vary from *low* to *high*. A dimensionally specified property, such as a *low expertise*, can then be regarded to as a specific property of a certain phenomenon in a particular context. As will be seen, these specific properties, or dimensional profiles (Strauss & Corbin, 1990), are important means in order to formulate propositions and thus build theory.

Tab. 5.4 provides some examples for categories and properties that are shared by objects that belong to that category.

Tab. 5.4: Exemplary categories and properties

Category	Exemplary property	Dimensional range	Description
Creativity-intensive process	*Uncertainty with regard to process outcome*	low…high	Processes that can be categorized as creativity-intensive processes share the property of uncertainty with regard to outcome (general property). However, different creativity-intensive processes may have different levels of uncertainty with regard to outcome (specific properties). Depending on the level of uncertainty, the organization applies different managerial practices in order to successfully manage the process.
Creative supervisor	*Accountability*	low…high (or discrete: responsible for character, responsible for sequence, responsible for process)	Creative supervisors are characterized by being responsible for both process and outcome. That is, they have a certain accountability (general property). However, there may be different types of creative supervisors with different levels of accountability (specific properties), depending on whether they are responsible for a whole process or only for a certain animated character, for example.

Note that properties, like categories, vary in degree of conceptual abstraction (Glaser & Strauss, 1967, p. 36). Some of the properties that were developed in this study are rather powerful and abstract properties. Examples include a creative supervisor's accountability or an artist's process expertise. Other properties are less abstract. An example is the property *frequency*, which describes one feature of the category of *approval and review*. Arguably, some of the more abstract and powerful properties could have become categories or subcategories in their own right. In the context of this study, however, it was sought to conceptualize in a way that allowed for the creation of dense categories with high explanatory power. Such categories would have the ability to explain variations through the dimensional ranges of their properties. It is also important to note that the focus was on meaning rather than on quantification (Goulding, 1999, p. 12).

5.4.1.3 Coding of Process Models

Process models were also coded. As indicated in the previous chapter, the bulk of the process models were generated before the semi-structured interviews were conducted. However, the actual coding of process models was commenced once the coding of the semi-structured interviews had begun. In order to do so, areas within the process models were defined. The analysis software *NVivo* allowed the researcher to define such areas in images (in the case of the present study, these images were process models), comment on these areas, and also assign codes to them. The same area was often coded by multiple codes. Fig. 5.4 provides an exemplary extract from a process model from *Organization B* along with two areas that were defined and coded. The first area, for example, was coded at the nodes *artist* and *required tacit* and *explicit knowledge*. The second area was coded at the node *approval and review*, which became a category in its own right. The textual descriptions on the right-hand side of Fig. 5.4 provide some further explanation on why the codes were chosen. Note that the figure is a simplification for the sake of readability; in fact, often a large number of codes was applied to the process models.

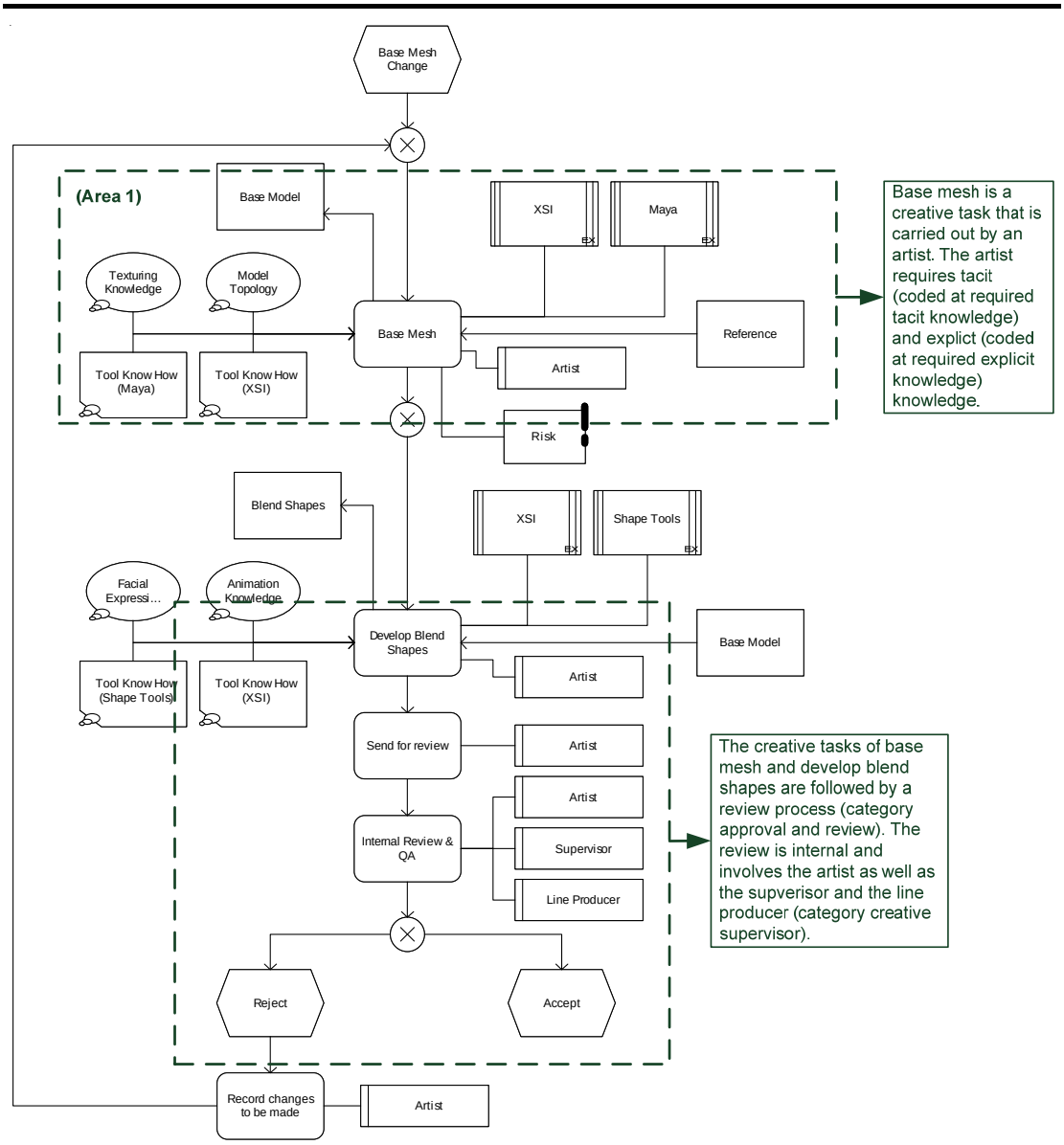


Fig. 5.4: Open coding of process model from *Organization B*

Fig. 5.4 thus provides evidence for certain concepts that also emerged from the interviews. First, it became evident that creative sections (e.g. develop blend shapes) are characterized by the application of tacit knowledge. The process model also exhibits a review process that follows the creative task (internal review & quality assurance). Moreover, the process model reveals different IT systems that are used within the process.

5.4.2 Axial Coding

5.4.2.1 Relating Categories to Subcategories

Axial coding is the process of relating categories to their subcategories in order to build precise and complete explanations about the phenomena being studied (Strauss & Corbin, 1998, p. 124). Axial coding constantly overlaps with open coding (Dey, 1999). In essence, axial coding is the stage in the process of data analysis where the codes generated in open coding are grouped into categories and subcategories and where relationships between categories emerge (Urquhart, 2001). Thus, structure is related with process. As Strauss and Corbin (1998) note, "structure or conditions set the stage, that is, create the circumstance in which problems, issues, happening, or events pertaining to a phenomenon are situated or arise. Process, on the other hand, denotes the action/interaction over time of persons, organizations, and communities in response to certain problems and issues" (p. 127). This way, the researcher identifies relationships around the "axis" of single categories (Strauss, 1987, p. 64). In conformance to this, it was sought to understand both structure and dynamics of processes in creative environments. In doing so, the study aimed at identifying involved stakeholders, resources, etc., as well as the mechanisms of how organizations effectively deal with such processes.

In order to identify relationships, Strauss and Corbin (1998) propose to differentiate categories into conditions (contextual, causal, and intervening), phenomena, actions/interactions, and consequences. This scheme, they refer to as *the paradigm*:

- *Conditions* are "a conceptual way of grouping answers to the questions why, where, how come, and when." Conditions thus "form the structure or set of circumstances or situations, in which phenomena are embedded" (Strauss & Corbin, 1998, p. 128).

- *Actions/interactions* are responses made by individuals or groups to certain issues, problems, happenings, or events that arise under certain conditions (Strauss & Corbin, 1998). Strauss and Corbin (1998) make further distinctions here; strategic actions are "purposeful or deliberate acts that are taken to resolve a problem and in so doing shape the phenomenon in some way" (p. 133). Routines, on the contrary, are "actions/interactions that tend to be more habituated ways of responding to occurrences in everyday life such as having an established protocol" (p. 133).

- *Consequences* represent the result of the actions/interactions that were taken by individuals and groups. Consequences may be both intended and unintended. As with conditions and actions/interactions, consequences have properties, such as impact or duration.

In this study, Strauss and Corbin's original approach turned out to be applicable to a certain extent. It was found quite difficult to discriminately classify each subcategory of a particular category as a condition, action/interaction, or consequence. One reason may be seen in that the role (or paradigm item) of a category or subcategory is very much determined by the situation at hand. Thus, the same category can belong to different paradigm items, depending on the dimensional pattern of a particular incident.

Let us consider the following example. The data suggested a relationship between the level of detail of requirements specifications of the creative product and the uncertainty with regard to process structure, required resources, and outcome. Put simply, less detailed requirements specifications lead to higher uncertainty. In this scenario, the level of detail of requirements specifications of the creative product represents a causal condition, whereas the described uncertainty represents a consequence. However, as organizations apply certain strategies in communicating with the client, requirements specifications get more detailed throughout the process. Thus, being a causal condition in the former situation, the dimensionally qualified category becomes a consequence in the latter.

The categories and properties involved in this example were conceptualized as follows. The *level of detail of requirements specifications* became a property of the categories of the *client*, *creative supervisor*, and *artist*. These categories have the property of *understanding of the requirements of the creative product*. *Uncertainty with regard to process structure, required resources,* and *outcome* were conceptualized as properties of the creativity-intensive process (and were given according labels). Other researchers may have identified the *understanding of the requirements of the creative product* as a category in its own right, or a property of the category *creative product*. However, considering the process-centric perspective of this research, the chosen conceptualization appeared to be appropriate; as will be explained, the process is characterized by communication between different involved stakeholders who mutually influence their understanding of the requirements of the creative product.

Tab. 5.5 is an early example of how the coding paradigm was used in order to draw some initial distinctions when coding axially for processes that contain creativity (Seidel et al., 2008).

Tab. 5.5: Early grouping of categories in axial coding

Coding paradigm item	Categories
Contextual factors	*Constraints*
	Requirements specifications
	Artist
	Client
Strategies	*Approval processes*
	Showing references
	Allowing latitude
	Knowledge management
	Resource allocation
	Group communication
Consequences	*Mitigating creative risk*
	Client satisfaction
	Creative process performance
	Operational process performance

It must be noted that the categories shown in Tab. 5.5 were early categories. As will be explained in the section on selective coding, it was necessary to re-group and further integrate categories with their subcategories in order to develop an integrated theoretical scheme. This led to a particular hierarchy of categories and subcategories (Sarker et al., 2001) where subcategories "specify a category further" (Strauss & Corbin, 1998, p. 119).

Summarizing, the coding paradigm was used as a guidance in order to help the researcher to think about ways to relate categories to subcategories (compare Sarker et al., 2001). At a high level, it was possible to distinguish contextual factors that shape processes in the studied organizations, strategies that these organizations deliberately use in order to manage their processes, as well as intended consequences. Thus, the coding paradigm was used to sensitize the researcher; i.e., to give him ideas and to help him "draw some preliminary distinctions" (Urquhart, 2001) and hence roughly group emerging categories.

5.4.2.2 Developing Relational Statements

As indicated, the process of relating categories results in the formation of hypotheses (Strauss & Corbin, 1998, p. 135). In order to do so, categories are linked "at a dimensional level" (Strauss & Corbin, 1998, p. 126). For example, the data suggested that high levels of *uncertainty with regard to outcome* are associated with high levels of *creative risk*, but also high levels of *creative potential* (dimensionally qualified properties). This led to the following (preliminary) proposition:

> ***Exemplary preliminary proposition 1:*** *High levels of uncertainty with regard to the process outcome are associated with high risk, but also with high levels of creative potential.*

This way, the conditional structure was identified and thus structure was linked with process. Strauss & Corbin (1998) as well as Glaser & Strauss (1967) call these statements about the relationship between concepts hypotheses. In the present study it is preferred to employ the notion of propositions, as hypotheses are often used in connotation with testable variables (Handfield & Melnyk, 1998; Popper, 1961).

Propositions that were formulated within this study were constantly compared to incoming data (Strauss & Corbin, 1998, p. 135; Glaser & Strauss, 1967). It was intended to (a) discover contradictions and (b) to discover variations that could then extend the dimensional range of categories and thus enhance their explanatory power (Strauss & Corbin, 1998, p. 135). Note that, due to the large number of categories and properties, the data did not suggest each and every possible relationship between categories. Consequently, it was virtually impossible to deductively validate all possible relationships (Sarker et al., 2001). Instead, it was focused on the recurrent patterns that appeared to be most important in order to explain the causes, reactions, and consequences of the management of processes in the case organizations.

As indicated earlier, it was also tried not to be dogmatic in classifying categories. With regard to the above mentioned example, the following proposition exemplifies how the *understanding of the requirements of the creative product* became a consequence:

> ***Exemplary preliminary proposition 2:*** *Strategies in communicating with the client can further the mutual understanding of requirements of the creative product.*

5.4.3 Selective Coding

Axial coding was followed by selective coding, where the core category representing the central phenomenon of the study was identified and other concepts were related to it. Technically, what Strauss and Corbin (1998) name selective coding is similar to what Glaser (1978) names theoretical coding (Jones & Noble, 2007). In selective coding, "all other subordinate categories and subcategories become *systematically* linked with the core" (Strauss, 1987, p. 69). Thus, the researcher identifies the core category of the research and links all other categories to it in order to proceed to an integrated theoretical scheme.

5.4.3.1 Identifying the Central Category

The core category is thought to represent the study's central theme (Strauss & Corbin, 1998, p. 146). It has the ability "to pull the other categories together to form an explanatory whole" (Strauss & Corbin, 1998, p. 146). The central phenomenon of this study is represented by the category of the *creativity-intensive process*. The categories *contextual factors*, *strategies*, and *consequences* pertain to the central phenomenon and its parts. As Strauss and Corbin (1998) state, it is "not until the major categories are finally integrated to form a larger theoretical scheme that the research findings take the form of a *theory"* (p. 143). They further write: "In an exaggerated sense, it [the core category] consists of all the products of analysis condensed into a few words that seem to explain what 'this research is all about'" (p. 143).

The identification of the *creativity-intensive process* as the core category of this research reflects the researcher's interpretation of what this research is all about (Strauss & Corbin, 1998, p. 146). The choice was also determined by the research problem and research questions that were targeted by this research endeavor.

Strauss and Corbin (1998) present a set of criteria for choosing a central category. Tab. 5.6 provides an overview and links these criteria to this study.

Tab. 5.6: Criteria for choosing a central category

Criteria proposed by Strauss and Corbin (1998)	This research
All categories can be related to the core category	All categories that were identified in the course of the study could be easily linked to the creativity-intensive process. Categories either shape the central phenomenon or stand for strategies that organizations apply in order to pursue certain goals.
Must appear frequently in the data	The creativity-intensive process as the main category appeared frequently in the data.

Criteria proposed by Strauss and Corbin (1998)	This research
No forcing of data	All categories could be linked to the creativity-intensive process without forcing of data.
Abstract naming	The notion of the creativity-intensive process appeared to be sufficiently abstract to enable to further collect empirical data from other substantive areas in order to proceed to a more general theory.
Analytical refinement through integration with other concepts	The category of the creativity-intensive process was refined analytically as it was integrated with other concepts enhancing its explanatory power. Examples are concise descriptions of contextual factors such as artists, creative supervisors, or IT context.
The concept can explain both variations and the main point	Creativity-intensive processes are highly dependent on various factors. Thus, the nascent theory covers a broad range of varying conditions. The theory explains how organizations react to these by applying various strategies in order to control both product and process.

As indicated, other researchers may have chosen a different core category. One may think about the category *creative product*, which represents the outcome of the investigated processes. Any action that is taken by artists or creative supervisors basically also pertains to the creative product. Similarly, *management strategies* or *practices* could have chosen as the core category. Also it would have been possible to identify more than one core category. For example, *strategies in communicating with clients* and *strategies in internally managing creativity-intensive processes* could have been chosen as core categories. Another example would be the *process of requirements determination*, which can be seen as a sub-process of creativity-intensive processes. The conceptualization that was chosen in the present study is grounded in the research problem that aims at investigating the impact of creativity on business processes and their management, thus suggesting a process-centric perspective.

5.4.3.2 Relating the Subcategories to the Core Category Using the Paradigm: Further Integration of Concepts

In order to proceed to an integrated theoretical scheme, subcategories were linked to the core category using the paradigm. When the act of selective coding was commenced, it became apparent that there was need to further group concepts in order to densify categories. This resulted in a hierarchy of categories and subcategories (compare Urquhart, 2001). Thus, the results of the stage of axial coding (compare Tab. 5.5, for example) turned out to be no more than intermediate. In fact, all three stages of coding were highly interwoven and the grouping of categories further proceeded when the researcher had already started to code selectively.

In the following, integrative diagrams are used in order to illustrate how categories and subcategories were related to each other. Such integrative diagrams often do not contain every concept that emerged from data analysis. The idea behind these diagrams is to focus on those concepts with the status of major categories (Strauss & Corbin, 1998, p. 153). A detailed description of the different categories and their properties and dimensions is provided in the next chapter.

The contextual factors identified were grouped under the four categories *roles*, *constraints*, *IT context*, and *creative product*. Together these categories establish the context in which organizational creative processes are carried out. These categories, in turn, became subcategories of the more abstract category of *contextual factors*. Fig. 5.5 depicts the node tree that details the relationships between the according categories and subcategories. Detailed descriptions of the different contextual factors, along with their properties and dimensions, can be found in chapter 6.3.

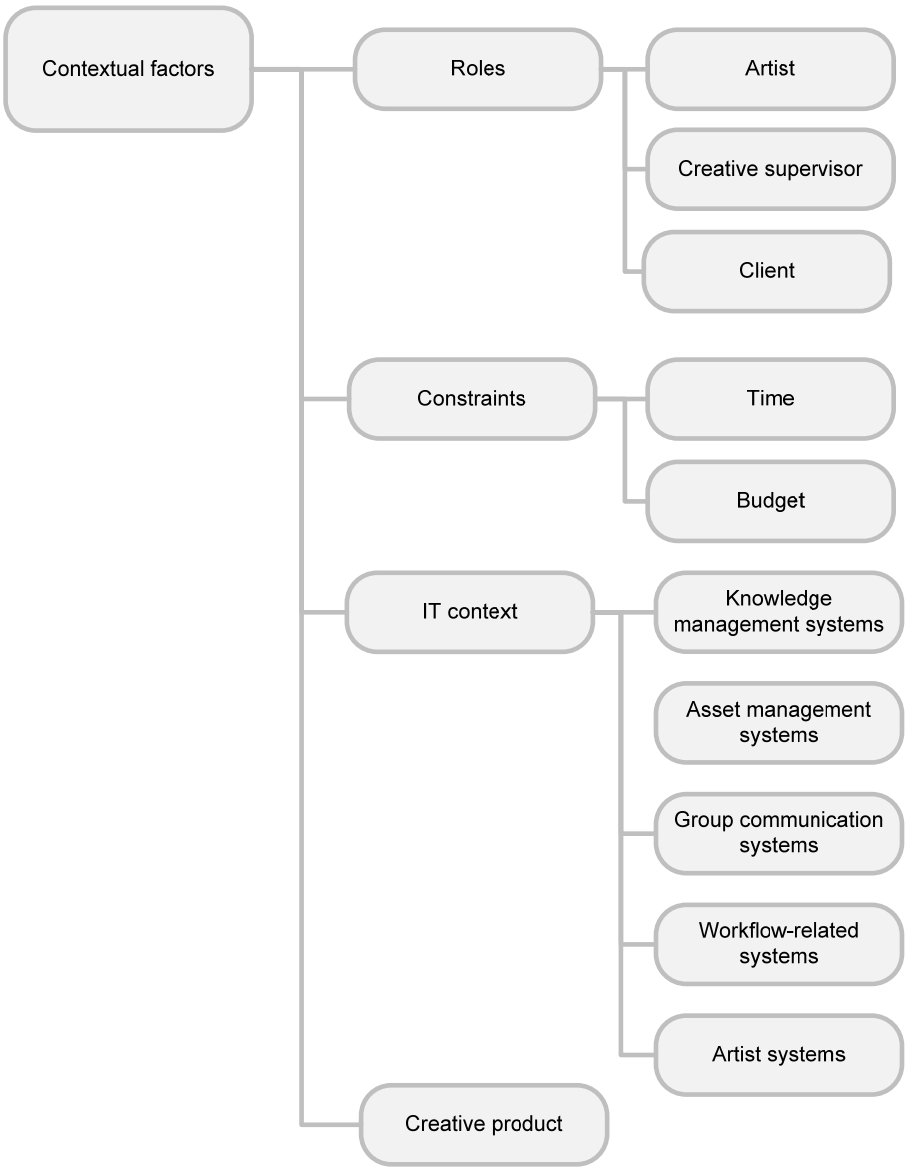


Fig. 5.5: Overview of the category *contextual factors*

The strategies that were identified in open and axial coding could be further grouped into more abstract categories. First, it could be distinguished between *strategies in communicating with the client* and *strategies in internally managing creativity-intensive processes.* These two categories were further grouped under the even more abstract category *strategies in managing creativity-intensive processes*, which explains how creative organizations deal with the phenomenon of business processes that rely on creativity; they thus became subcategories of this category. Furthermore, three subcategories were grouped under *strategies in communicating with the client*. These are *understanding and refining the requirements*, *ongoing communication,* and *approval and review*. The grouping of categories resulted in the node tree of categories and subcategories that is depicted in Fig. 5.6. Thus, the categories on the right-

hand side are subcategories in relation to the categories on their left. Some of the concepts shown in Fig. 5.6 were lower-level codes that became categories in their own right. Detailed descriptions of the specific strategies can be found in chapter 6.4.

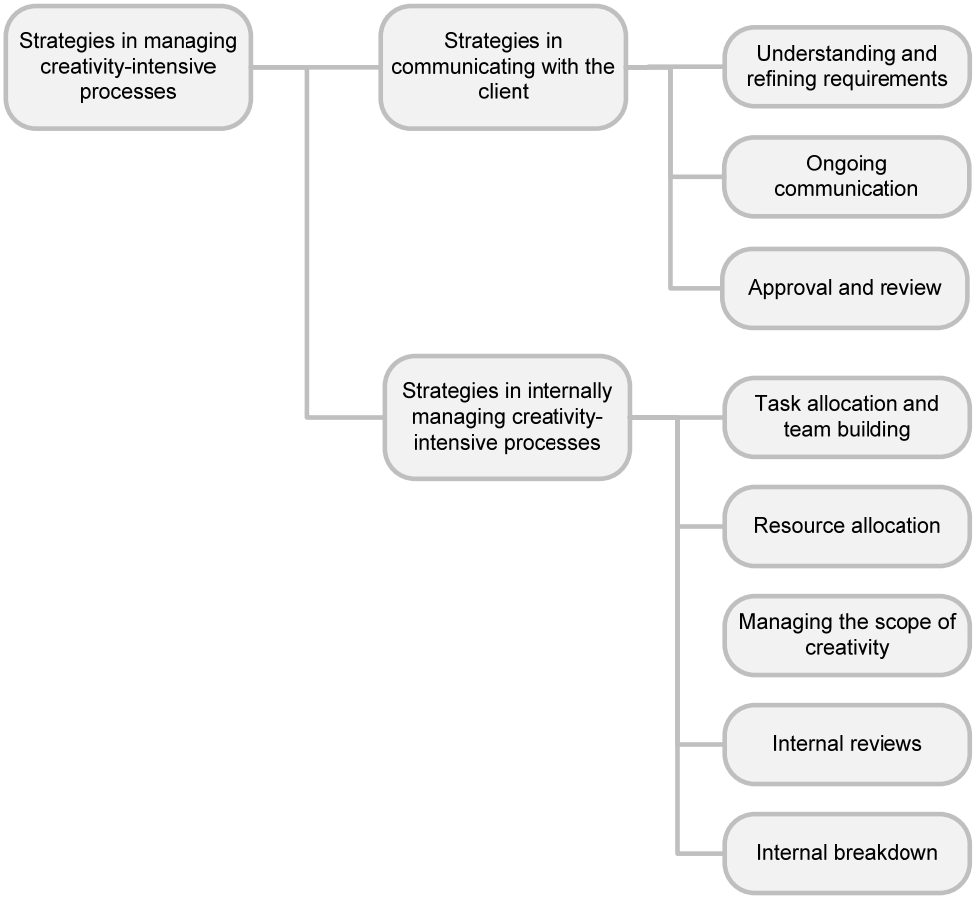


Fig. 5.6: Overview of the category *strategies in managing organizational creative processes*

Similarly, the different consequences were grouped under the category *consequences*. Fig. 5.7 provides an overview. Detailed descriptions of the different consequences can be found in chapter 6.5.

Fig. 5.7: Overview of the category *consequences*

Tab. 5.7 provides an overview of how major categories were grouped under more abstract categories, and how this relates to the coding paradigm as proposed by Strauss and Corbin (1998).

Tab. 5.7: Grouping of categories and the coding paradigm

Category	Subcategories	Coding paradigm item
Contextual factors	*Roles* *Constraints* *IT Context* *Creative product*	Causal conditions, intervening conditions, contextual factors
Strategies in managing creativity-intensive processes	*Strategies in communicating with the client* *Strategies in internally managing creativity-intensive processes*	Strategies, actions/interactions
Consequences	*Mutual understanding of requirements* *Mitigating operational and creative risk* *Operational process performance* *Creative process performance* *Client satisfaction* *Creative ownership*	Consequences

Category	Subcategories	Coding paradigm item
Creativity-intensive process	*Contextual factors, Strategies in managing creativity-intensive processes, consequences*	Phenomenon

Fig. 5.8 provides an overview of how categories and subcategories relate to each other.

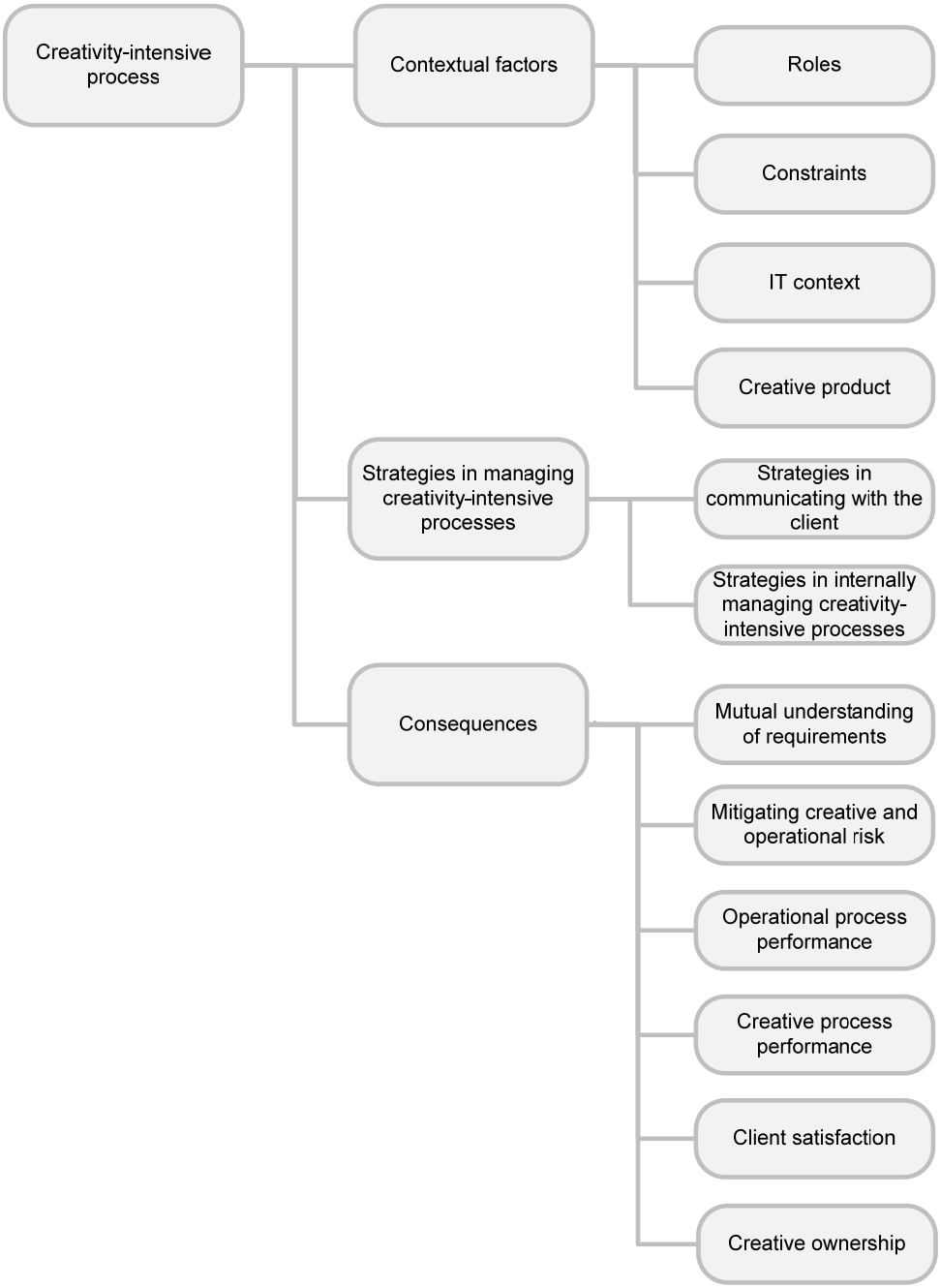


Fig. 5.8: Overview of major categories and subcategories

The separation between open coding, axial coding, and selective coding turned out to be somewhat artificial. In reality the coding process proved to be hard to disentangle and was characterized by moving forth and back between data and interpretation. In this manner, the first relationships emerged very early in this study and became apparent during the first interviews (for example, relationships between creativity and risk, creativity and knowledge, as well as the role of clients).

5.4.3.3 Refining the Theory, Reaching Theoretical Saturation, and Validation

Having started to develop the overall theoretical scheme by relating categories to the core category, the next step was to refine the nascent theory (Strauss & Corbin, 1998, p. 157).

The interpretation was based on multiple methods that were applied to check the representativeness of categories and relationships (Orlikowski, 1993). The interview findings were checked against the findings from process modeling, as well as against existing documentation. For example, evidence of the role of so-called approval processes that are applied to mitigate risk could be found in the interview data from all three case organizations and was reinforced by process models, indicating that particularly creative parts of business processes are followed by different types of approvals.

In order to refine the theory and to fill in poorly developed categories, both data and memos were revisited and some additional data was selectively collected through semi-structured interviews. In order to decide when "to let go," Strauss and Corbin's (1998) advice was followed, who write: "Not every detail can be well developed or spelled out. Of course, large gaps should be filled in. A category should be sufficiently developed in terms of properties and dimensions to demonstrate its range of variability as a concept" (p. 158).

The iteration between data and categories/relationships was concluded when additional data analysis did not provide any further insight and did not reveal further categories shaping the phenomenon of *creativity-intensive processes*. Glaser and Strauss (1967) refer to this stage in the process of data analysis as *theoretical saturation*. Holton (2007) notes that this state of the process of data analysis yields the interchangeability of indicators (p. 265).

In order to validate the theoretical scheme, two avenues were used that are proposed by Strauss and Corbin (1998). First, the theoretical scheme was compared to the raw data, which they refer to as a "high-level comparative analysis." Second, the re-

searcher went back to the respondents and presented the theoretical scheme to them. Participants validated the model and, at the same time, made some recommendations with regard to presentation that were actually incorporated into the model. It can be noted that respondents indeed perceived the theoretical scheme as a sound explanation for what was going on in their organizations.

5.5 Memoing

For theorizing and commenting in this research extensive use of *memoing* was made (Miles & Huberman, 1994; Glaser, 1978; Charmaz, 2006; Strauss & Corbin, 1998). Lempert (2007) describes memo writing as being the fundamental process of the engagement with data in order to build grounded theory. “Memo writing is the methodological link, the distillation process, through which the researcher transforms data into theory” (Lempert, 2007, p. 245). Similarly, Glaser (1978) refers to memoing as “the core stage in the process of generating theory” (1978, p. 83). Memos are primarily conceptual and focus on the integration of data, often showing that data are instances of concepts (Miles & Huberman, 1994). In the present study memoing was used throughout the iterative and highly interwoven process of building theory. Consequently, it is possible to distinguish two types of data the present study relies on: first, data that was collected by the researcher through interviews and other data collection techniques and, second, the researcher’s interpretations of these data.

Memos that were written throughout the study can be roughly classified along two dimensions. The first dimension distinguishes three types of memos, namely *code notes*, *theoretical notes*, and *operational notes*. The second dimension distinguishes memos with regard to the stage within the process of data collection and analysis. These are *line-by-line memos*, *preliminary concept memos*, *concept memos*, *relationship memos*, and *integrative memos*. The distinction of these different types of memos reflects the researcher’s personal style of writing memos and analyzing data. Fig. 5.9 provides an overview of how the different types of memos relate to each other and to the coding process.

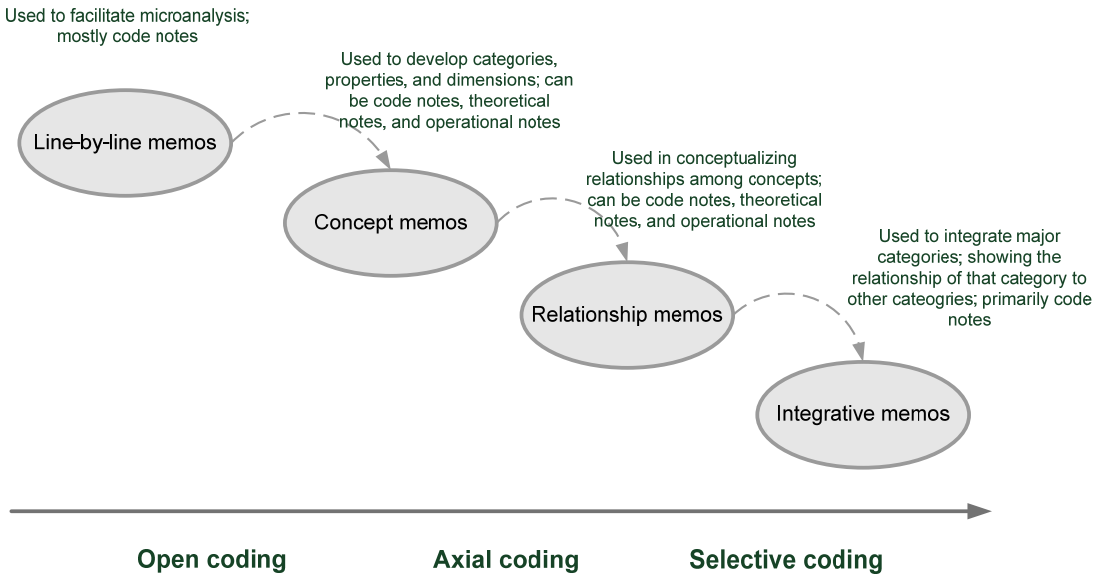


Fig. 5.9: The use of memoing in the stages of data analysis

Memos were kept separately from the data. However, useful illustrations from the data were used in order to show how properties and dimensions were identified. Similarly, Strauss (1987) writes that "data should not be put in memos, with the exception of clearly demarcated, useful illustrations, referenced to the field notes where the illustration was taken" (p. 127).

5.5.1 Code Notes, Theoretical Notes, and Operational Notes

Code Notes

Code notes are memos that contain the results of the different coding stages of open coding, axial coding, and selective coding (Strauss & Corbin, 1998, p. 217). Strauss and Corbin (1998) further note that "early notes include categories, concepts that point to categories, and some properties and dimensions" (p. 224). Code notes were thus used in order to develop categories and to identify properties or indicate where on the dimensional range of a property a particular event was located. Consequently, code notes provided dimensional specificity that could then be used in order to proceed to the identification of relationships among categories (compare Strauss & Corbin, 1998, p. 225). Particularly in the beginning of data analysis, data was shown in the early code notes in order to exemplify the identification of concepts, properties, and dimensions.

Theoretical Notes

Theoretical notes were thought to sensitize the researcher and summarize his thoughts with regard to theoretical sampling and further issues (Strauss & Corbin, 1998, p. 217). For example, theoretical notes captured the researcher's thoughts about possible properties, dimensions, and relationships that would then guide theoretical sampling (Strauss & Corbin, 1998, p. 225).

Operational Notes

Operational notes were used to document the research process and record procedural directions including the development of interview questions.

5.5.2 Memos in Different Stages of Data Analysis

Line-by-line Memos

Line-by-line memos were used early in the study in order to facilitate what Strauss and Corbin (1998) call microanalysis of the data. These memos were used to open up the text; once a certain concept emerged from the data, a concept memo was written from the line-by-line memo. Line-by-line memos were primarily code notes that were used to code the first interviews.

Concept Memos

Concept memos were used in order to develop an in-depth understanding of certain concepts. Concept memos were code notes, theoretical notes, and operational notes. Concept memos elaborate on categories, properties, and dimensions. While the study proceeded, the emphasis shifted from line-by-line memos to concept and relationship memos. Out of first open codes, concepts emerged that were then further developed. Some concepts eventually became categories in their own right. Concept memos were also used in order to integrate concepts into categories and to identify subcategories. The distinction between relationship memos and concept memos is a crude one; the two blend into each other. As Strauss and Corbin (1998, p. 225) note, it is difficult to separate open from axial coding.

Relationship Memos

While the study proceeded relationship memos were increasingly used. These memos were thought to conceptualize the emergent relationship between concepts. Relationship memos were used within the stages of axial and selective coding. They can be code notes, theoretical notes, and operational notes. In selective coding there were

fewer code notes and more theoretical notes. Relationship memos were often based on code notes as they provided basic analytic ideas on the categories along with their properties and dimensions. Thus, relationship memos were intended to "present answers to the questions of what, when, where, with whom, how, and with what consequences" (Strauss & Corbin, 1998, p. 230).

Integrative Memos

Integrative memos were written for each major category that had emerged. In order to do so, memos on the different subcategories and properties were revisited and the most relevant aspects were summarized. Moreover, integrative memos explained the relationships between a category and other categories.

The process of reading and sorting memos helped the researcher to discover relationships among categories and were also an important device in order to integrate the various categories into a coherent theoretical scheme; i.e., linking all categories to the core category of this research (Strauss & Corbin, 1998, p. 238).

5.6 Reflections on the Use of the Grounded Theory Method in this Study

5.6.1 Adaptations

At some stages in the research progress, the original approach as proposed by Strauss and Corbin (1998) turned out to be too rigid. Simply put, it was not possible to neatly label every category as a paradigm item. Strauss and Corbin (1998) note: "We know that readers will treat the material in this book as items on a smorgasboard table from which they can choose, reject, and ignore according to their own tastes – and rightly so" (p. 8).

In a similar manner, Charmaz (2000, p. 513) notes that grounded theory provides a set of flexible strategies. In this line of thought, the research method that was applied in this study was particularly tailored to the research problem to be investigated. One main decision was to use grounded theory in order to analyze (and also collect) data. Even though the approach to grounded theory that was used in this study was an adaptation, the mandatory procedures of the grounded theory method as proposed by Strauss and Corbin (1998) were followed. The study was based on theoretical sampling, constant comparison, coding, and memoing (compare also Jones & Noble, 2007). Also the coding paradigm was used, even though in an adapted version. The most important adaptations made in this study are the following:

- A sensitizing device was used in order to accompany the iterative process of theory building and to enhance theoretical sensitivity.
- In axial coding, there was no distinction made between intervening and causal conditions. Instead, so-called contextual factors were identified.
- Also, it was not distinguished between actions/interactions and strategies. Instead, two different categories of strategies were identified: those pertaining to internally managing creativity-intensive processes and those pertaining to communicating with the client.

5.6.2 The Role of the Sensitizing Device

Having explained how grounded theory was applied in order to analyze data, the role of the sensitizing device desires further discussion. As an integral part of collecting and analyzing data it suggested that processes, products, persons, and context were relevant when studying business processes that rely on creativity. It will remain unclear whether the usage of the sensitizing device negatively impacted the study. From this author's perspective as an interpretive researcher, the sensitizing device impacted the study as follows.

While the sensitizing device suggested the importance of creative persons, it became apparent that there is not 'the' creative person. Instead, different roles that are involved in the processes emerged. Artists, creative supervisors, and clients are all creative persons as they actively contribute to the generation of creative products. What turned out to be important is that these people may have different understandings of the requirements of the creative product, as well as different abilities. Each of these three categories could be developed in terms of their properties and dimensions. It is concluded that the sensitizing device enhanced the researcher's theoretical sensitivity as he was sensitized to look for the role that people have in the context of the processes being studied; however, at the same time the study's inductive design allowed the emergence of a far more detailed picture.

Similarly to the creative person, many examples for creative products could be found. However, all the properties that emerged as being important had not been known in advance.

The study started with a quite general and exterior understanding of the creative process. Throughout the study it became evident that creative processes largely differ, even among such a homogenous group as the one that was studied in this case. Thus, the properties and dimensions of creative processes actually emerged from the

data. Moreover, the creative process (later labeled the *creativity-intensive process)* proofed to be the core category that all other categories could be meaningfully linked to.

The study did not reveal a singular concept such as *creative environment*. The creative environment turned out to be very complex and to be constituted by a complex interplay of various factors. It became apparent that it was one of the main challenges to the research to uncover this interplay.

5.7 Chapter Conclusion

As indicated in chapter 3, it can be distinguished between models for research and models of research. Whereas in the chapter on the research design the model for research was introduced, this chapter described the model of research.

This chapter also presented an overview of categories and subcategories that were developed in the course of this study. The following chapter provides a detailed account of all categories and subcategories, including their properties and dimensions. In doing so, actual data is presented in order to show how open codes emerged and how these were then integrated so as to develop more abstract categories.

Finally, the version of grounded theory that was used in this study in order to analyze data as well as the role that the sensitizing device played was discussed. It was concluded that the usage of the sensitizing device did not constrain the researcher from discovering new and relevant elements during the study.

6 STUDY FINDINGS: CATEGORIES

What is a scientist after all? It is a curious man looking through a keyhole, the keyhole of nature, trying to know what's going on.

Jacques-Yves Cousteau

6.1 Chapter Introduction

The nascent theory is introduced in two consecutive chapters. This chapter presents categories and subcategories along with their properties and dimensions. Based on the above discussion on the coding scheme and with regard to the research questions, the categories are presented in four groups: the core category, categories providing the organizational context, strategies, and consequences. A cross case summary of evidence for the categories can be found in Appendix B. The subsequent chapter (chapter 7) then describes relationships between the categories in the form of an integrated theoretical scheme. The trajectory that links the various categories is the *creativity-intensive process* that was identified as the core category of this research. This category "has the prime function of integrating the theory and rendering it dense and saturated as the relationships are discovered" (Strauss, 1987, p. 35). The classification according to the paradigm must be seen as a rough distinction. Strauss and Corbin (1998) note: "An analyst is coding for explanations and to gain an understanding of phenomena and not for terms such as conditions, actions/interactions, and consequences" (p. 129).

As has been explained in chapter 5, what has been labeled a contextual factor may also be influenced by the strategies and may also become part of the consequences, for example. This has been demonstrated in the section on grounded theory data analysis to some extent and will be discussed in detail in this chapter.

In the following, for each category its subcategories (or lower level categories), properties, and dimensional ranges are introduced. Thus, a concise description of the categories that were first mentioned in the previous chapter is provided. Illustrative quotes are presented for the different categories and their properties. These quotes were indicators for the concept (category, property) discussed and were coded accordingly. The structure of this chapter reflects the hierarchy of categories and subcategories that was introduced in the previous section. Fig. 6.1 provides an overview.

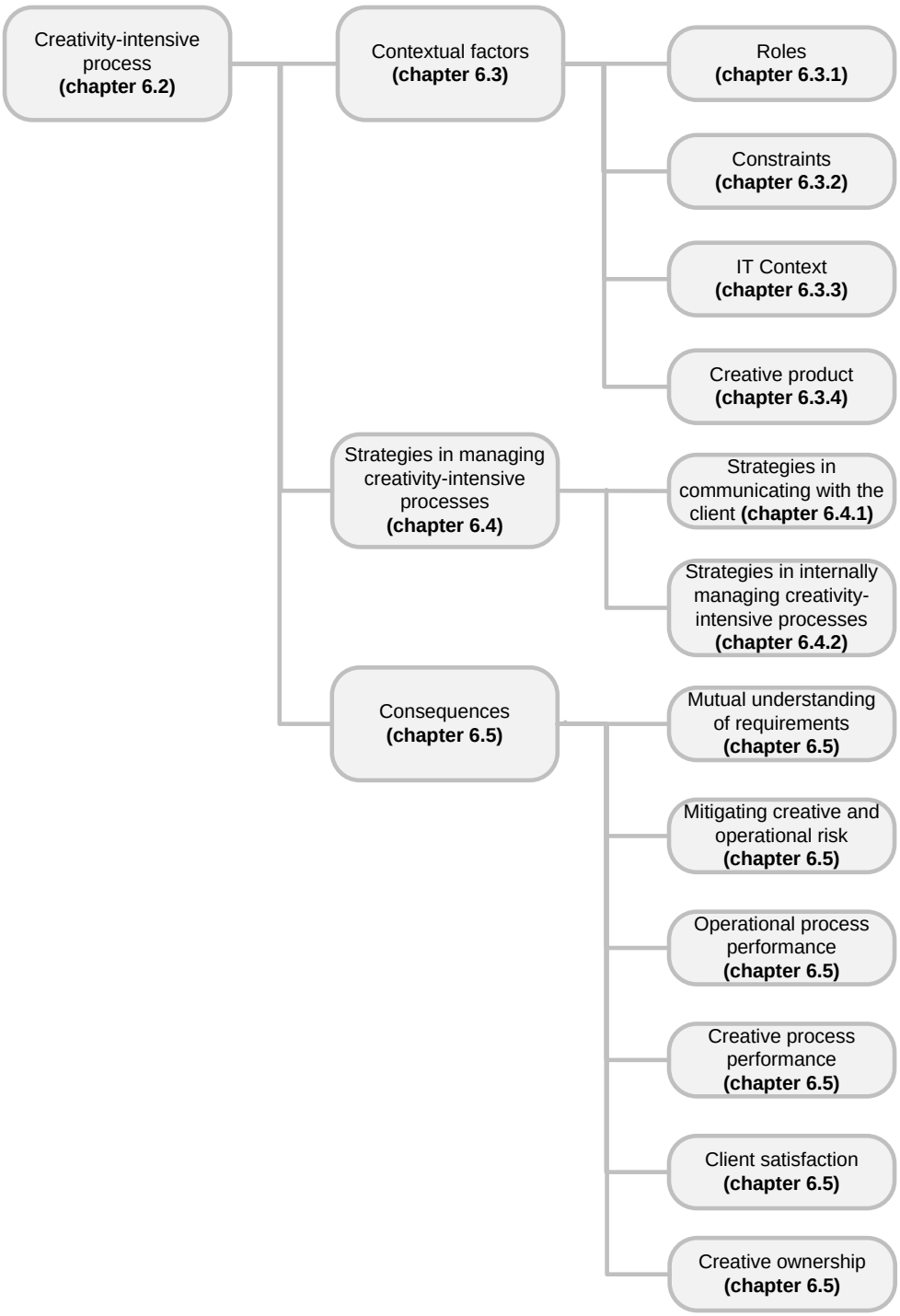


Fig. 6.1: Major categories and subcategories

In accordance with Strauss and Corbin (1998), those categories that are introduced as *contextual factors*, *strategies in managing creativity-intensive processes*, and *consequences* can be referred to as subcategories of the core category *creativity-intensive process* (Strauss & Corbin, 1998). They "answer questions about the phenomenon such as when, where, why, who, how, and with what consequences, thus giving the concept greater explanatory power" (Strauss & Corbin, 1998, p. 125).

By describing the emergent categories along with their properties, it is not possible to avoid any potential overlap with the subsequent chapter on the integrated theoretical scheme. Thus, first relationships between concepts will become apparent in this chapter. However, a distinct introduction of the categories in all their complexity is seen necessary in order to then show how these categories can be related along their dimensionally qualified properties.

6.2 The Core Category: The Creativity-intensive Process

The category *creativity-intensive process* captures the phenomenon of business processes that are largely characterized by creativity. As indicated, processes in the case organizations turned out to be highly dependent on creativity, interdependent, intensively involving the client, complex, and repetitive. A good example for a creativity-intensive process is the VFX production pipeline that was introduced in chapter 4.2.3. This process generates digital sequences for films. It is built upon the creativity of the involved VFX artists and comprises of various interdependent subprocesses. It also intensively involves the client as VFX sequences are often produced for a production studio that, for example, produces a feature film. At the same time, the process is repetitive as usually not one, but many VFX sequences have to be produced.

The study revealed a number of properties that give the category *creativity-intensive process* variation and thus allow accounting for a broad range of processes. For example, creativity-intensive processes can vary with regard to their level of uncertainty or number of iterations. The different properties are introduced in three subsections. The first pertains to the properties of *uncertainty with regard to outcome*, *process structure*, and *required resources*, as well as to structural aspects of creativity-intensive processes (6.2.1). The second covers the properties *collaboration-intensity*, *communication-intensity*, and *knowledge-intensity* (6.2.2), and the third introduces the two intimately connected properties of *creative risk* and *creative potential* (6.2.3).

6.2.1 Uncertainty, Varying Levels of Structure, and Iteration

The Properties of Uncertainty with Regard to Outcome, Process Structure, and Required Resources

The following quote is a good example for those comments that were made by respondents when discussing the nature of processes that rely on creativity (for the first quotes exemplary codes from open coding are shown in brackets):

> *I would denote creativity by arriving at the end of a process without necessarily having a pre-structured guide or a series of processes to get there* ***[not having a pre-structured guide].*** *[…] I think if you do something incredible technical you are replicating* ***[replication of process steps]*** *– might be a bunch of separate steps and things that have already been decided – but you don't actually bring anything of your own to it* ***[bringing something individual to it]****. (Interviewee C.2)*

This creative director drew a line between doing something "incredible technical" and doing something "creative." Whereas being creative to him meant arriving at the end of a process without "having a pre-structured guide," a technical task is predominantly characterized by replication. This was reinforced by other statements, such as the following:

> *There are inherent steps at every point that is part of the process that need to be taken. And they can fork into a whole set of choices, some of which will be possible, and some of which won't be possible* ***[process choices]****. Where the creativity comes in, in my understanding of creativity, [...]sometimes you might jump a step* ***[jumping process steps]*** *to come up with a much more creative solution. We think very laterally* ***[thinking laterally]****. So, putting steps in to make sure you stay on the same path is actually sometimes contrary to what the creative process is about. (Interviewee A.4)*

According to this production executive from *Organization A*, there are often different possible paths (open code *process choices)* that one can take in a creative process. Also, it may be necessary to jump process steps in order to come up with creative solutions. Another respondent from *Organization A* asserted that

> *It's about the variance in the task, I think* ***[variance in process]****. How much judgment is used in the task itself* ***[judgment]****. So highly creative is where there is much variance. (Interviewee A.1)*

This respondent used the notion of "judgment," which is closely linked to subjective opinions. Thus, a reason for what this respondent called "variance" may be seen in

subjective perceptions of the involved people. The role of subjectivity was also highlighted by a producer from *Organization A*:

> *I suppose something, a task, that requires an individual's opinion* ***[individual opinion]*** *or input is what is different each and every time. It's not simply a chain of events of doing a process from A, B, C. (Interviewee A.2)*

A respondent from *Organization B* reinforced the difference between creative and non-creative tasks when he highlighted that non-creative tasks are rather well-structured and predictable and may even be automated:

> *Generally speaking, when you do something technical, you have a much better understanding of what it is you are trying to do at the end. And then you are able to draw upon more related information and often, what you are doing is somewhat mechanical or can be automated or dealt with in a different way. It's different […] with creative processes. (Interviewee B.1)*

The above examples chiefly refer to aspects related to the process and thus to how work is done and what is needed to do it. Respondents also spoke about the characteristics of the outcome of a process. There was a widely held view that not only the process is characterized by uncertainty, but also its outcome. The following comment was made by a creative director from *Organization C:*

> *There are the occasions where a job, whilst in theory is nailed down, won't get determined till somewhere further down the line, particularly when there is something where there's a lot of fluid simulation or water splashing or character that is very complex to make. In theory it's all fine and they leave us alone as we get to make it. But then, when it comes to approving all that work, to say it's actually in line with that, that can get creative again. (Interviewee C.2)*

This comment relates to the outcome of a process and expresses that it is often not known until the process is completed. It further became apparent that this is particularly the case for very complex products. In a similar manner, the CEO of *Organization B* said:

> *And I think, for us, one of the features of it being a creative process is that you can't […], there's no objective way of defining the outcome; as it is with the […] aesthetics. After you got it, you can cast some judgment over whether or not it is appropriate, but you can't sit down before you start and define the outcome in a sort of objective, measurable way. (Interviewee B.1)*

He also expressed that a main reason for what has been labeled *uncertainty with regard to outcome* may be seen in varying subjective opinions or judgments over the creative product. Altogether, three main characteristics of creativity-intensive processes became apparent:

1. In most cases the outcome of processes that rely on creativity is not entirely known in advance. Yet, often it is not the case that nothing is known about the creative product. Let us consider a particular animation sequence for a film or a VFX shot in a feature film. A producer who needs that sequence to complete the film would certainly know the technical format and might also know its length (not necessarily though). However, some aspects remain unknown until the process commences. Particularly creative aspects (e.g. what characters occur in a particular sequence or what do the characters look like etc.) are not known in advance.

2. Not only the process outcome is not known in advance, but also the actual process that leads to this outcome. Required process steps and iterations are not entirely predictable. For example, when producing a particular VFX shot for a feature film, the organization does not know what iterations are necessary for what process step (e. g. creating the surface of an image that is part of a VFX shot). Also, required process steps may not be known in advance as the product and its properties are further developed throughout the process. However, it is not the case that nothing is known about the process structure. For example, particular well-structured sub-processes, such as review processes, or aspects of data management may be known previously.

3. As required process steps and iterations are not entirely predictable, so are resources and involved people. For example, within VFX production processes in *Organization B*, while the process is conducted, it may become necessary to involve further people with particular skill sets. Again, it is not the case that nothing is known about required resources. Certain resources that are required (e.g. a particular software tool) may be known as well as resource constraints (e.g. available time).

Summarizing, it became noticeable that those processes that largely rely on creativity are characterized by the properties of *uncertainty with regard to outcome, process structure,* and *required resources*. *Uncertainty with regard to process structure* and *required resources* pertain to how something is done, whereas *uncertainty with regard to outcome* pertains to the result. Uncertainty with regard to the outcome appears not to be an entirely unwanted effect, but also provides the latitude that is

needed in order to diverge from the status quo and generate truly creative products. Thus, uncertainty could have also been labeled *variability*. The data also suggested that more complex products, by their very nature, can come along with particularly high degrees of uncertainty.

The Property of Varying Levels of Structure: Creative and Non-creative Parts of Creativity-intensive Processes

Both process models and the data collected in semi-structured interviews suggested that the investigated processes comprise of well-structured or predictable parts (that often do not involve any creativity at all) and creative parts. The following comment exemplifies how respondents differentiated between creative and non-creative (or technical) parts of a process:

> *The distinction is more about latitude. Latitude that exists in the performance of the task, whatever it is. I guess, what I am calling a technical task is one where there is not so much latitude. It's expected to be performed in this band here, so you are not expecting a lot of variance in the performance, whereas what I am calling a creative task is one where is more variance inherently in the task. (Interviewee A.1)*

This respondent used the notions of "variance" and "latitude." His comment expresses that technical tasks are characterized by low levels of latitude and low levels of variance. Creative tasks, on the contrary, are characterized by high levels of variance (as indicated, *variance* was one of the open codes that were drawn up by the property of *uncertainty with regard to process structure).* The following paragraph has already been shown above in order to illustrate the property of *uncertainty with regard to process*. This respondent from *Organization A* also pointed out that some steps in creativity-intensive processes are "inherent" while others are characterized by different choices and lateral thinking:

> *There are inherent steps at every point that is part of the process that need to be taken. And they can fork into a whole set of choices, some of which will be possible, and some of which won't be possible. Where the creativity comes in, in my understanding of creativity [...] sometimes you might jump a step to come up with a much more creative solution. We think very laterally. So, putting steps in to make sure you stay on the same path is actually sometimes contrary to what the creative process is about. (Interviewee A.4)*

The label of *inherent process steps* is one of the open codes that were drawn up by the property of *varying levels of structure*. In summary, the data indicated that creative parts can often be broken down into creative and non-creative elements. Thus,

complex creative tasks can be interpreted as *creativity-intensive sub-processes*.[5] The analysis of process models in particular facilitated the discovery of those sections within a process that were well-structured and predictable as opposed to those that were characterized by uncertainty; the latter ones were characterized by feedback loops, usually followed by approval processes, required tacit knowledge, and were assessed as being particularly critical to the overall process by the respondents. They thus exhibited the properties of *uncertainty with regard to process structure*, *required resources*, and *outcome*. The awareness that business processes that are characterized by creativity comprise of both creative and non-creative parts eventually led to the notion of the *creativity-intensive process* as opposed to the *creative process*.

The Property of Iterative Nature

Creativity-intensive processes not only cover various levels of structure, varying from pre-determined to very creative; they are also characterized by numerous iterations. As different people with different subjective opinions are involved in the process, it becomes necessary to create a mutual understanding of process goals. This mutual understanding is created in an iterative process. The following comment exemplifies this:

> *Basically, there's a client who has an idea of what something should be and you have an artist who's doing it. And the clearer you can make the communication back and forth, which is just data, it's just the information, it's like whether the data, the image goes to a client, or the feedback, the data comes back. It's an iterative loop and, you know […]. I think that's what basically the creative process is. (Interviewee B.2)*

This VFX supervisor described how the organization gathers requirements from the client, does creative work, and evaluates this work. The data also indicated that the iterative nature of creativity-intensive processes implies a constant alternation between divergent thinking and convergent thinking. For example, the creative organization may come up with a number of ideas that are then presented to the client. In an iterative process client and creative organization create a mutual understanding of process goals and decide on one or maybe a few options that are further pursued. Fig. 6.2 shows a process model that was developed within an interview with *Interviewee C.5*. The process model shows the typical iterative loop that follows creativi-

[5] An alternative labeling for the concept of the *creativity-intensive sub-process* is that of a *pocket of creativity* which thus denotes sections in a creativity-intensive process that are very much characterized by creativity. The notion of *pockets of creativity* will be particularly used in the discussion of the present study's implications for the practice of BPM in chapter 9.

ty-intensive sub-processes, or tasks (in this case the final compositing), within creativity-intensive processes. It also shows the involvement of the artist, creative supervisors (director and VFX supervisor), and the client, who may be a marketing agency, for example. What does not become apparent in Fig. 6.2 is the fact that the iteration would not necessarily mean to go back to the stage of final compositing. Depending on the feedback, it may even be necessary to go back to earlier stages in the process. During process modeling in the case organizations it proofed to be difficult to model any possible iteration that may occur within a creativity-intensive process.

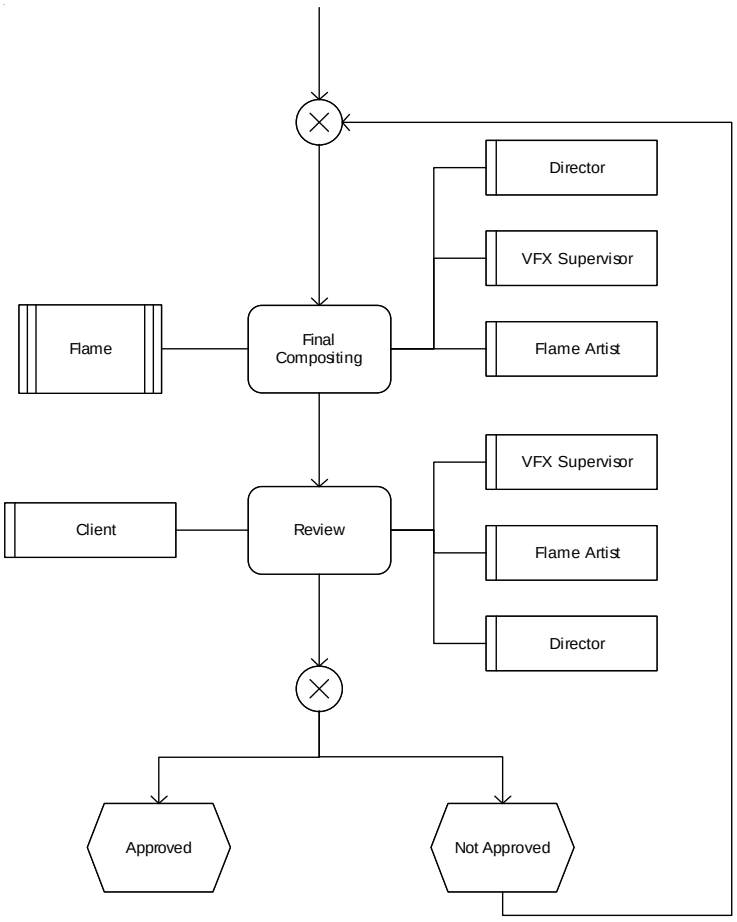


Fig. 6.2: Typical iterative loop in creativity-intensive processes (extract from VFX production process modeled with *Interviewee C.5)*

Tab. 6.1 details the core category *creativity-intensive process* by presenting an overview of the above introduced properties.

Tab. 6.1: Properties of the category *creativity-intensive process* (1#3)

Property	Description	Open codes
Uncertainty with regard to outcome	Certain characteristics of the process-oriented object (creative product) are not known in advance. Uncertainty with regard to outcome depends on various factors, such as the level of requirements specifications, and can be ranked on a dimensional range from low to high.	*Conflict potential, disagreement, making creative judgments, no objective way in defining the outcome, variance in outcome, bringing something individual to it*
Uncertainty with regard to process structure	Process structure (required process steps, number of iterations, process flow) of creativity-intensive processes is often not known in advance. This is mainly due to different perceptions of involved people. Uncertainty with regard to process structure varies on a dimensional range from low to high.	*Bringing something individual to it, individuality, latitude, low predictability, tackling new work, variance in process, doing things differently, flexibility, jumping process steps, process choices, varying numbers of iterations, not having a pre-structured guide, thinking laterally*
Uncertainty with regard to required resources	Similarly, required resources in creativity-intensive processes are often not fully known in advance. Uncertainty with regard to required resources varies on a dimensional range from low to high.	*Flexibility of resource use, doing things differently*
Varying levels of structure	Parts of a creativity-intensive process have a predetermined structure, other parts do not. Thus, creativity-intensive processes comprise of both unstructured, hard-to-predict sections and well-structured sections at the same time.	*Creative tasks, technical tasks, granularity, inherent process steps, sub-processes, patterns, recurrent elements*
Iterative nature	Creativity-intensive processes are highly iterative. They constantly iterate between understanding the requirements, doing work, and reviewing work.	*Communicating back and forth, convergence and divergence, iterative loop, matching subjective opinions, recurrent stages, iteration time*

The above introduced properties cannot be seen in isolation but are closely linked to other properties, which are introduced in the following.

6.2.2 Collaboration-intensity, Communication-intensity, and Varying Touch Points

The Property of Collaboration-intensity

Creativity-intensive processes are characterized by various levels of collaboration-intensity, depending on the number of involved creative and non-creative people. The property *collaboration-intensity* varies on a dimensional range from low to high. At the one extreme there may be a painter who generates a painting. At the other extreme there is the complex creativity-intensive process of making a feature film,

involving the shooting, sound-design, post-production, and the production of VFX. A VFX supervisor said the following about collaboration in VFX production processes:

> *I think you try to work through it together as, you know, a collaborative team. You try to win their trust in the beginning and gain that leverage that if something goes bad, you work through it together and that's what I strive for in every job. (Interviewee B.2)*

Apparently, collaboration in creativity-intensive processes not only involves members of the creative organization, but also clients. This was further reinforced by the process models which exhibited intensive client involvement. Moreover, it became apparent that also process managers are intensively involved in the process, as the following comment by a producer illustrates:

> *The producer is much more involved with the project every single day and they are reporting obviously outside to a client. And when the client comes in, that's the moments when you are getting direct feedback from the clients. (Interviewee A.2)*

High levels of collaboration-intensity contribute to uncertainty. This is due to the involvement of various subjective opinions with regard to the creative product. The following comment exemplifies this:

> *The more chains information passes through, the more chances […] there are it would not turn out the way supposed to be interpreted differently, you know. (Interviewee B.2)*

Thus, the property of *collaboration-intensity* within creativity-intensive processes describes the involvement of, and collaboration between, clients, artists, and creative supervisors.

The Property of Communication-intensity

Creativity-intensive processes are also characterized by what is epitomized by the property of *communication-intensity.* This finding may seem obvious as creativity-intensive processes are also collaboration-intensive and highly iterative. In fact, product iterations can be seen as one way of communicating as intermediate product steps shape the understanding of the requirements of the creative product of both members of the creative organization and clients. Thus, particularly those parts within a creativity-intensive process where the creative organization and the client create a mutual understanding of the requirements of the creative product require intensive communication. The following paragraph is an extract from an interview with *Interviewee B.2*, who was asked about an early stage of creativity-intensive processes, where the organization seeks to understand the requirements:

> *And it's almost like a stage where more is better and you are trying to strike conversations and you are trying to find out more and you are trying to steer the client into what is, you know, more possible for you. You do your negotiating if one thing is harder and other things are easier. (Interviewee B.2)*

Obviously, communication within creativity-intensive processes serves different purposes, such as what this VFX supervisor called to "steer the client" or "negotiating."

The Property of Varying Client Touch Points

Client touch points are those sections or points in time within a creativity-intensive process where the organization communicates with the client. It became apparent that there are different types of client touch points. Some involve formal approval while others aim at creating a mutual understanding of process goals between artists and clients. Usually, client touch points occur together with the more creative parts of a process. The following response made by a producer from *Organization A* expresses the importance of client touch points that involve approvals:

> *If you don't like the color of the coat that's fine, we can change that, that's technically oriented. But the risk is that if you don't get enough approval along the steps along the way and you get to a point where the client just doesn't like it, it can be very difficult to go back and say, "ok, at what point didn't you like it?" (Interviewee A.2)*

This producer explained that clients need to review and approve the creative product "along the steps along the way." The awareness that clients need to be involved in the process in certain stages was also supported by the process models, which suggested that client touch points normally take the form of approvals that follow highly creative parts of a creativity-intensive process. The same interviewee reinforced the awareness that creativity-intensive processes are characterized by varying client touch points with the following comment:

> *And then it's the negotiation skills of the producer to kind of encourage or discourage them from coming in. (Interviewee A.2)*

Where within the process touch points are located thus also depends on the producer.

The Property of Varying Internal Review Points

Similarly to client touch points, creativity-intensive processes have internal review points. These represent points in time when artists and creative supervisors review

creative products. Alike with external reviews, the creative supervisor must carefully decide when within a process the creative product needs to be reviewed. Different types of internal review points were identified; some only involve individual artists who perform technical quality assurance by themselves while others involve various artists as well as creative supervisors. It can roughly be distinguished between technical quality assurance and creative reviews.

The Property of Knowledge-intensity

Creativity-intensive processes are characterized by what can be referred to as high *knowledge-intensity*. Artists require technical knowledge (how to use a tool, how to carry out a process), as well as references to previously created artifacts. Respondents pointed out that the creative parts of the processes are very much characterized by the application of tacit knowledge; i.e. these parts rely on a number of people that actually have this required knowledge. The following comment was made by a VFX supervisor who talked about the tacit knowledge that is required in order to carry out particular creative tasks (in this case a complex VFX shot involving an explosion):

> *But as soon as you can demonstrate that they now gathered knowledge, or they expanded their expertise, then it becomes a no-brainer: "listen, for the next project we can do this." (Interviewee B.3)*

With regard to the transfer of tacit knowledge within VFX processes, a VFX supervisor from *Organization B* said the following:

> *The key thing for us is knowledge transfer; and one of the things that seem to work really, really well, and something that people really value, is having the time to see and understand what other, how other people solved problems. (Interviewee B.1)*

Altogether, there was strong evidence that knowledge transfer and dissemination are one of the organizations main concerns. As indicated earlier, being creative often means to build upon things that have been done previously. Thus, actors within creativity-intensive processes need to know (and have access to) things that have been done previously. The following comment by a creative director from *Organization C* exemplifies this:

> *I think creativity can still be drawing together other things that have been quite predetermined […] but putting them into a new arrangement. That's the same as creativity as well. Everything you draw on, everything I draw on in my creativity comes from somewhere. So it's already been created somewhere. (Interviewee C.2)*

Fig. 6.3 is an extract from a process model from *Organization A* that shows how the knowledge that is required to carry out the creative task of performing an animation was modeled. *Required tacit knowledge* and *required explicit knowledge* are open codes. Explicit knowledge refers to codified, articulated knowledge (e.g. tool know how), while tacit knowledge refers to an artist's implicit knowledge, which is closely linked to her expertise.

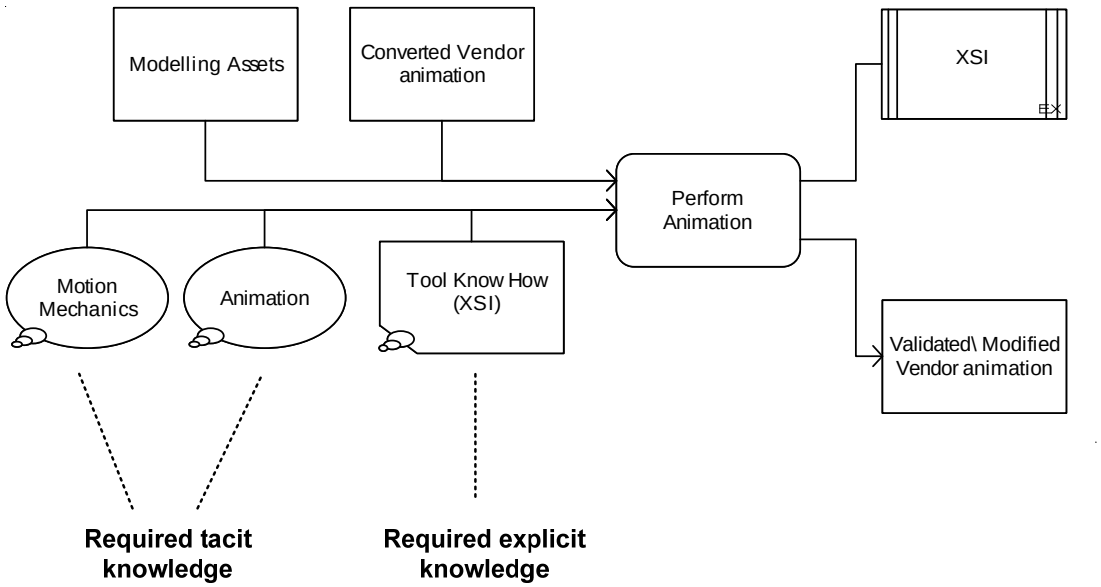


Fig. 6.3: Tacit and explicit knowledge required to carry out a creative task (process model from *Organization B)*

Tab. 6.2 provides an overview of the above introduced properties.

Tab. 6.2: Properties of the category *creativity-intensive process* (2#3)

Property	Description	Open codes
Collaboration-intensity	Creativity-intensive processes are characterized by various levels of collaboration-intensity. At the one extreme is the painter who generates a painting, at the other extreme is a feature film. Collaboration-intensity contributes to the uncertainty with regard to process structure, required resources, and outcome. Collaboration-intensity varies on a dimensional range from low to high.	*Client involvement, intensive involvement of creative supervisor, working through it together, collaborative team, winning trust*
Communication-intensity	Closely linked to the property of collaboration-intensity is the property of communication-intensity. In general, creativity-intensive processes are associated with relatively high levels of communication-intensity as various stakeholders must create a mutual understanding of process goals. Communication-intensity varies on a dimensional range from low to high.	*Passing information back and forth, negotiating, steering the client*
Varying client touch points	Creativity-intensive processes are characterized by varying client touch points. Where within the process the creative organization communicates with the client depends on various factors, including the client's abilities and the type of job. Particularly those sections that are characterized by high levels of uncertainty are associated with intensive communication with the client.	*Coming in for approval, feedback points, stopping for approval, timing for inviting feedback*
Varying internal review points	Creativity-intensive processes are also characterized by varying internal review points. Different types of internal review points include technical quality assurance and creative reviews.	-
Knowledge-intensity	Artists require expertise as well as explicit and tacit knowledge (technical guidelines, references to previously created artifacts, other people's opinions) for their creativity.	*Areas of expertise, getting access to information, hub of information, required tacit knowledge, required explicit knowledge, knowledge reuse, knowledge transfer, making decisions*

6.2.3 Risk and Creative Potential

The Properties of Creative and Operational Risk

In order to explain the properties of *creative* and *operational risk*, first a brief discussion on the concept of risk in the literature is provided. Risk can be defined as "the

likelihood of a negative outcome" (Levine, 2004). Although there are slight differences in the applied terminology of defining risk, most definitions are built around a congruent set of core concepts. No matter if risk is defined as "a function of the probability that an identified threat will occur and then the impact that the threat will have on the business process or mission of the asset under review" (Peltier, 2004) or the "probability with which an error will lead to an (unwanted) consequence" (z. Mühlen & Rosemann, 2005), it all comes down to the three concepts of a causal condition, an unwanted consequence and the probability that the causal condition leads to that consequence.

As indicated earlier, creativity-intensive processes are connected to high uncertainty with regard to possible outcomes. Being creative means to be original and come up with novel ideas and solutions, which are then judged by different people with often differing subjective opinions. Consequently, creativity-intensive processes are linked to varying levels of risk, which is conceptualized by the means of two properties.

First, uncertainty with regard to outcome can lead to client dissatisfaction due to different perceptions of the quality of the creative product. Much of this is attributable to the awareness that the creative product is not fully known before it has been generated. This will be referred to as *creative risk*. Another facet of creative risk is the unwanted consequence of a lack of external compliance. As various characteristics of the outcome are not known in advance, organizations need to be careful to not infringe upon policies or laws. *Interviewee D.2*, for example, explained that a movie scene may be too sexually explicit for a certain market. The CEO of *Organization B* described another example for a creative risk: the danger of generating no outcome due to different subjective perceptions of the creative product. He made the following comment in regard to this:

> *Another big risk is you don't actually get an outcome at all. Obviously, you can go down a process and you might not get something that the client likes. And then you are kind of in an awkward position, because you don't really have any more money to do the work. If they take what you've got, they are going to be unhappy with it. And that can be quite a challenging thing, particularly where either you or the client doesn't have a strong vision for what it's going [to] look like. (Interviewee B.1)*

Second, uncertainty with regard to process structure and required resources can lead to what will be referred to as operational risk. For example, the process may require more iterations than expected, which ultimately results in higher costs and time consumption. Uncertainty with regard to process structure (required steps etc.) may also lead to a mismatch between what is required in order to fulfill the client expectations

and the actual capabilities of the creative organization. The CEO of Organization B made the following comment with regard to the danger of getting caught "focusing on execution" due to a potential mismatch between capabilities and requirements of the creative product (these are lower level codes that were epitomized by the property of *operational risk):*

> *Getting caught focusing on execution [is a big risk]. So getting into the process and then realizing that what you are actually doing is spending a lot of time trying to work out how to do the work and, therefore, not being open to being flexible enough to the client. That's a huge risk. (Interviewee B.1)*

Thus, one big risk is that the organization does not know what is needed in order to carry out a process. Again, the intimate connection to the properties of *uncertainty with regard to process structure* and *required resources* becomes obvious.

The Property of Creative Potential

While creativity-intensive processes are linked to both creative and operational risk, they also exhibit a certain creative potential. The property of *creative potential* denotes the capacity of a certain process to diverge from the status quo and to produce truly creative (novel and purposeful) products. The creative potential is influenced by a number of contextual factors, including the level of requirements specifications, available resources, and latitude granted by creative supervisors. It varies on a dimensional range from low to high. Very clear directions from the client, for example, may reduce the creative potential of a process:

> *I have to try and understand what the client wants and sometimes it becomes less creative if I have a very, very clear brief. (Interviewee C.2)*

It is important to note that low levels of creative potential do not necessarily imply that the end product is not creative. In some cases the creativity may have happened before (on the client's side, for example). However, the creativity that is enacted within the creative organization may then be very low. The creative potential (or level of creativity) of a process therefore denotes the creativity from the creative organization's viewpoint. The following comment that was made by a design coordinator from *Organization C* illustrates this:

> *They [artists] still need to be creative to understand what the director's vision is. And also to come up with some other ideas that might enhance that. But the reality is that they have been given a task, the director has it in mind; They say, "enact that like that." (Interviewee C.3)*

The property *creative potential* refers to the organizational perspective as opposed to the individual perspective. From an individual viewpoint a certain task (for example lighting a particular scene) may be incredibly creative. From an organizational viewpoint however, this particular creative act may only pertain to one aspect of the creative product and thus, may not have significant impact on the degree of novelty or originality of the overall output. *Interviewee C.1*, for example, distinguished different levels of creativity-intensive processes, which he called "concept level," "design level," and "crafts level." These levels refer to different types of tasks with different impact on the overall process.

Tab. 6.3 provides an overview of the above introduced properties.

Tab. 6.3: Properties of the category *creativity-intensive process* (3#3)

Property	Description	Open codes
Creative risk	Creativity-intensive processes are characterized by creative risk. This property denotes the probability of the occurrence of an unwanted consequence which is mainly due to uncertainty with regard to outcome and different subjective perceptions of this outcome. Creative risk varies on a dimensional range from low to high.	*Changing mind, client dissatisfaction, conflict situation, generating no outcome, lack of approval, lack of communication, no obvious metric of completion*
Operational risk	Creativity-intensive processes are also characterized by operational risk. This property denotes the probability of the occurrence of process-related errors, such as a mismatch between the requirements of the creative product and the creative organization's capabilities. This risk is mainly caused by uncertainty with regard to outcome, process structure, and required resources. Operational risk varies on a dimensional range from low to high.	*Exceeding time and budget, getting caught focusing on execution, mismatch between requirements and capabilities*
Creative potential	Creativity-intensive processes have a certain creative potential. This creative potential denotes the processes' capacity of generating products that are truly creative, that is, characterized by high degrees of novelty or originality. The creative potential of a creativity-intensive process varies on a dimensional range from low to high.	*Level of creativity, open end, space for exploration, creativity constraints*

In summary, creativity-intensive processes are characterized by *uncertainty with regard to outcome*, *process structure*, and *require resources*, as well as *knowledge-intensity*, *collaboration-intensity*, and *communication-intensity*. They are further linked with *operational* and *creative risk*. Moreover, creativity-intensive processes exhibit what can be referred to as a *creative potential*. The factors that shape the

process and cause dimensional variations of the properties are explained in the subsequent sections as well as in chapter 7 where the relationships between the categories are explained and an integrated theoretical scheme is introduced.

6.3 Categories Providing the Organizational Context

The coding paradigm as well as the sensitizing device advocated the researcher to particularly consider the context of the processes under investigation. Each of the following categories is part of the context of a creativity-intensive process. Each category thus refers to a given phenomenon and can be linked to the *creativity-intensive process* as the core category of this research. They are an "abstract representation of an event, object, or action/interaction" (Strauss & Corbin, 1998, p. 103).

The data analysis revealed three roles as being salient in the context of the investigated business processes: *artists*, *creative supervisors*, and *clients*. Moreover, it became clear that certain *constraints*, the *IT context*, as well as the *creative product* are part of the complex environment in which creativity-intensive processes are carried out.

6.3.1 Roles

The roles of the *artist*, *creative supervisor,* and *client* are rather complex concepts. For each of these categories a set of properties was identified that bring variation to it. It was decided to conceptualize at the level of roles rather than that of traits and abilities, for example, as it was hoped this would lead to parsimonious theory with a limited number of concepts with great explanatory power. Moreover, the concept of roles is commonly understood and accepted in the BPM discipline.

6.3.1.1 Artist

There are different people who act creatively within creativity-intensive processes. Examples include producers, offline editors, and VFX artists. These people share different properties such as *creative skills* or *motivation.* They act in the role of what is epitomized by the category *artist*. Artists collectively carry out business processes in order to generate creative products. Tab. 6.4 shows some open codes that led to the formation of this category. Evidence for these codes was found both in interview data and in process models. The analysis of process models helped to understand when within the process artists are involved, what resources they require, and what outputs they generate. Note that, in the course of data analysis, further types of artists

were identified; however, once the category *artist* had emerged as being salient, these slices of data were drawn upon that category.

Tab. 6.4: Category *artist:* open codes

Category	Open codes	Exemplary data
Artist	*VFX artist*	VFX artists are involved in certain tasks in process models from organizations *B* and *C*. Their work is characterized by the application of tacit knowledge on how to create imagery. Such imagery can be characters or VFX sequences which can be characterized as creative products that are both novel and purposeful.
	Editor	Editors are involved in processes in organizations *A* and *C*. Editors carry out the creative tasks of offline-editing and online-editing.
	Sound editor	Sound editors could be identified in the process models from organizations *A* and *C*. Sound editors contribute creatively to the process of post-production by developing the sound mix that complements the images.
	Compositor	A compositor is a more specialized notion of a VFX artist. Compositors are responsible for combining separate images or elements (both computer-generated and live-action) in order to form a single image.

The data suggested that artists carry out tasks that are both characterized by divergent and convergent thinking and often rely on tacit knowledge with the purpose of generating creative products. Fig. 6.4 provides an exemplary extract from a process model from *Organization A* that shows the involvement of artists. The editor is an artist who carries out the offline editing, which is a creative task. In doing so, she makes use of the resource *Avid Editing Suite*, which is a particular IT system. The output of this creative task is a creative product, a so-called edit decision list (EDL). Thus, editors act creatively as they produce an outcome which is both novel and purposeful. In the following editorial review, besides the editor, a producer, the director, and the investor are involved. In this case, producer, director, and investor are clients of the post-production house, who are involved in approving or disapproving the creative product.

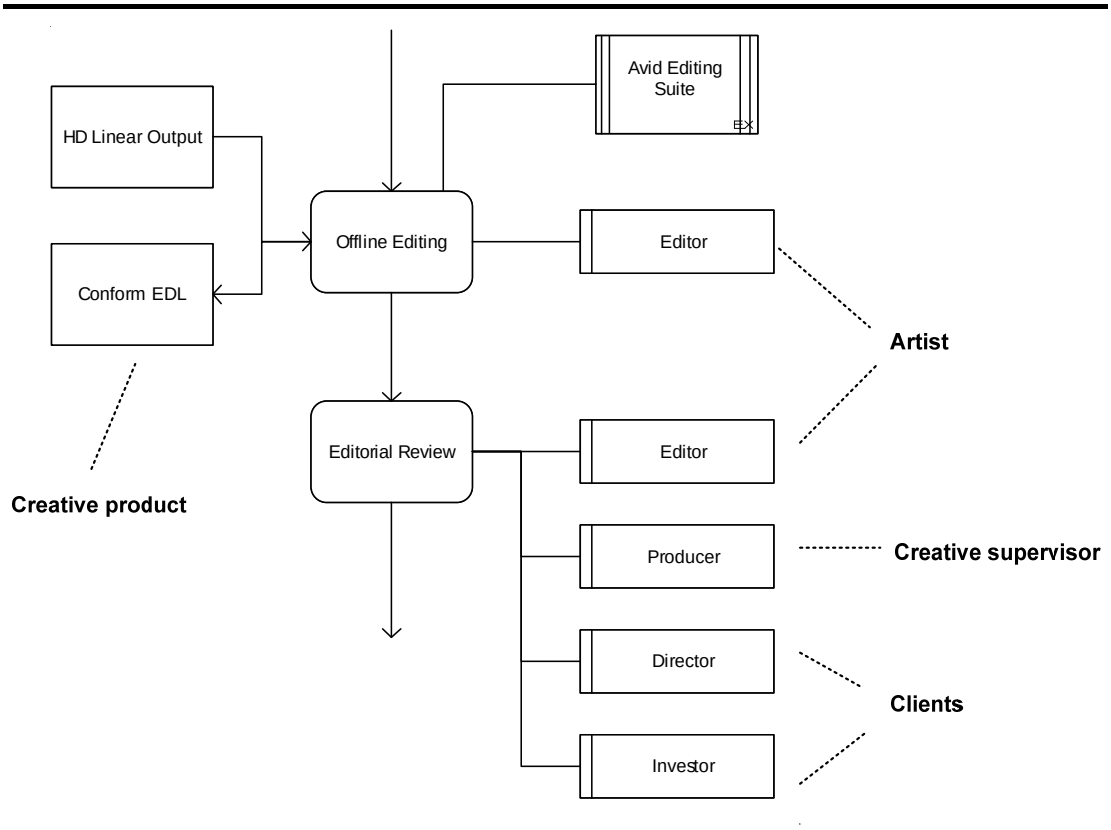


Fig. 6.4: The category *artist* in process models (Process model from *Organization A)*

In the following, properties are introduced that give the category *artist* variation. These properties are *process expertise*, *creative skills, working style*, *motivation*, *creative agenda*, *location*, and *understanding of requirements of the creative product*. Evidence for these properties was mainly derived from the semi-structured interviews.

The Property of Process Expertise

The property of *process expertise* epitomizes skills such as the *ability to assess a process*, the *ability to break problems down*, and the *ability to carry out a process* (these are all codes that emerged from the data analysis). The ability to assess a process refers to assessing how long it takes to carry out a certain task and what is needed (resources, procedures) to do so. The ability to break problems down is relevant in order to identify parts of a complex problem that can be solved separately before it is put together again. The ability to carry out a process refers to technical capabilities that are required to use a certain tool, for example. In the above example (Fig. 6.4) the artist must be capable of using the software tool *Avid Editing Suite*. As will be discussed later on in detail, this ability can help to reduce both operational and creative risks that are linked to a process. The following quote is a good example

for what respondents said about the *ability to assess a process* and its relationship to risk:

> *It's a complete skill to know how long it takes you to do something, you know. And there are some great artists who can't. And one time they might […] be able to do something in a day, and next time it takes a month. And they may be the best artists in the building. But what happens is, on certain tasks, you may not want that. If there's a person who always comes in within ten days, and you just know it, like they know they can do it in ten days, that is a better option, because the risk is lower. (Interviewee B.2)*

The CEO of *Organization B* commented about what is epitomized as the *ability to break problems down*. Particularly in VFX production this is important as the organization is often faced with quite complex tasks that consist of different interrelated processes:

> *If I said, "create an asteroid," in itself that is a large problem; but you can sit down and say, "well ok, we need to [...] break it down into problems that we can solve and then pull it back together." (Interviewee B.1)*

The same respondent talked about what has been conceptualized as the *ability to carry out a process*:

> *When you are trying to solve a creative problem, often one of the most advantageous things to have is somebody who has solved problems similar to that before. I mean you'll never have a problem that's the same by its nature, but you can have done similar things before, which massively reduces the amount of time you have to spend in the early stages, sort of trying to seek out what it is that you are doing. (Interviewee B.1)*

In this paragraph there is also a strong assertion that there is a close relationship between experience and the ability to carry out a process. The respondent also affirmed that a lack of ability to carry out a process – which is often due to a lack of experience – can impact the operational risk associated with that process:

> *There are certain tasks which, if you don't have a certain level of experience or capability you just won't to be able to do. (Interviewee B.1)*

The required process expertise also highly depends on the task. Within VFX production, for example, there are different roles such as compositors or animation artists who have different skill sets. In some cases, the same person may be capable of fulfilling different roles, in others not. It became evident that expertise in a certain area is often bound to particular people the whole organization relies on. Creativity-

intensive processes are characterized by the application of tacit knowledge. The following excerpt from an interview with a VFX supervisor from *Organization B* (*Interviewee B.3)* exemplifies that this concentration of expertise can become critical when such a person is not available:

> *Respondent "We may have someone that's incredibly talented in what they do, but they are the only one. So when they go on vacation, guess what?"*
>
> *Interviewer: "They go and no one else can do the job."*
>
> *Respondent: "No, they don't go on vacation then [laughs]. So either one of those situations is really, really bad."*

This effect is further nurtured by the involvement of freelancers; the film industry (and in particular the three case organizations) are characterized by a lot of freelancing work.

The Property of Creative Skills

The property of *creative skills* refers to a person's ability to generate products that are both novel and purposeful, as well as a person's capability of aesthetically judging a product. The concept integrates codes such as the *ability to see*, *aesthetic judgment*, and *creativeness*. While the above introduced property of *process expertise* describes the prerequisite to enact a process, high process expertise is not necessarily associated with high quality and originality of the creative product. The following comment exemplifies how creative skills impact on the process:

> *Some people would just get a skeleton and the library and modify, other people would make a fantastic skeleton that does all sorts of amazing things and that's creative and that's not. So the same task in two different people's hands is different. So it changes […] depending on how you solve the thing. That's why some of those things are creative or not. (Interviewee C.2)*

The creative skills of different creative people differ largely. The CEO of *Organization B* provided the following answer when he was asked for important abilities of artists who work in VFX production:

> *The ability to see. You know, actually have an eye for what is good and what looks good. An aesthetic judgment. We call it "an eye," but, an aesthetic judgment is very important. (Interviewee B.1)*

In this comment it becomes clear that the ability to judge is a crucial ability. The data further indicated a close relationship between a person's knowledge and her ability of acting creatively. High levels of experience and knowledge are conducive to a person's ability to act creatively. As indicated earlier, being creative often means to build upon products that have been generated previously.

The Property of Working Style

Different artists in the case organizations can be characterized by varying working styles (property *working style)*. It became apparent that the differences in working style are one reason for high levels of uncertainty with regard to process structure and required resources of creativity-intensive processes. Put simply, different people will solve the same problem in different ways. The following comments are typical for those that arose with regard to different working styles:

> *Especially creative people, will have their own preferences of how they want to work. But the thing is, after a while, you just learn that even that has a pattern to it. (Interviewee B.3)*

and

> *Some people are more technically focused and they like the details […] while other people like to do it in a bit looser and organic way with less structure. (Interviewee A.3)*

When saying that people have their own preferences of "how they want to work," this VFX supervisor suggested that the processes look differently, depending on the people who carry them out.

Motivation

In order to motivate artists, creative supervisors try to challenge them creatively. Even though there are tasks that are generally perceived as transactional and repeatable, organizations try to ensure that there is a mix of this kind of work and truly creative work. *Motivation* is a property of the category *artist* that varies on a dimensional range from low to high. A respondent from *Organization C* said:

> *So, for example, if someone knows that they are not working on a big box office hit, because we have to do all kinds of work here, that sometimes has a bit of an impact on their motivation. And some people don't care. (Interviewee B.3)*

Creative Agenda

The property of the *creative agenda* conceptualizes the artist's desire to act creatively. The following quotes are typical for the comments made by the respondents with regard to an artist's creative agenda:

> *I think you want those creative persons to fulfill their own expectations. I think you need them to. Because that's why you are asking them to be part of the project. (Interviewee A.2)*

and

> *Everybody has their own creative agenda. They are trying to push sometimes on their job; so you have to try and stem that somehow; you have to give people latitude to be creative, but not that creative that everybody is driving a project in different ways and it falls over. (Interviewee C.2)*

It became also apparent that there is an intimate connection between an artist's creative agenda and that person's motivation. If artists are given the opportunity to pursue their personal creative agenda, while simultaneously working towards the project's goals, this can foster their motivation.

The Property of Location

Particularly organizations *B* and *C* often work on processes where artists are geographically distributed. Being VFX and post-production companies, they contribute to larger film projects where they cooperate with a studio that, in many cases, is located in a different city, in some cases even on a different continent in a different time zone. As will be discussed later on in detail, the geographical distribution of involved organizations impacts on communication strategies and brings particular challenges to processes that rely on creativity. In order to deal with the challenge of geographical distribution, the case organizations have developed IT-supported strategies that allow for rich, visual communication. In the creative industries digital artifacts are generated that often have to be distributed to collaborating creative people and organizations. It is possible to roughly distinguish between co-location and geographically distributed location. A producer from *Organization A* made the following comment with regard to what was conceptualized by the property of *location*:

> *The most successful kind of creative partnerships I think are done face-to-face. But often on a project you won't be face-to-face. (Interviewee A.2)*

Understanding of Requirements of the Creative Product

When artists act creatively they do this in response to the requirements of a creative product that are commonly conveyed by a client and often mediated by a creative supervisor. Due to the product's creative nature, it is not possible to unambiguously specify all requirements. Certain qualitative aspects of the product are not known in advance. Consequently, the basis for the creative accomplishment of an artist is her understanding of the requirements of the creative product. The data suggested that often the artist's understanding of these requirements differs from the client's and the creative supervisor's. For example:

> *And you'll notice that the designers always see things completely differently from each other. Even if somebody's initial ideas are similar, the way that they actually physically design it and put it together is always very different. (Interviewee C.3)*

Tab. 6.5 details the category *artist* by providing an overview of the above introduced properties.

Tab. 6.5: Properties of the category *artist*

Property	Description	Open codes
Process expertise	The property of process expertise refers to a person's capability of assessing, breaking down, and carrying out a certain process.	*Ability to break problems down, ability to carry out a process, ability to assess a process, experience, capability, creative problem solving*
Creative Skills	The property of creative skills refers to a person's ability to generate products that are both novel and purposeful, as well as a person's capability of aesthetically judging a product.	*Ability to see, aesthetic judgment, creativeness, experience, having an eye, creative problem solving*
Working style	Different artists may solve the same problem in different ways which contributes to uncertainty with regard to outcome, process structure, and required resources.	*Preferences*
Motivation	In order to motivate artists, creative supervisors try to ensure that they are challenged creatively. Even though there are tasks that are generally perceived as transactional and repeatable, organizations try to ensure that there is a mix of this kind of work and truly creative work.	*Being attached to a project, feeling happy, negative criticism*
Creative agenda	Refers to the artist's desire to pursue certain creative goals that match their sense of aesthetics and creativity.	*Craving for creativity, fulfilling personal expectations, desiring a free reign*

Property	Description	Open codes
Location	Pertains to the geographical location of artists which impacts on communication strategies. At a high level it is possible to distinguish between co-location and geographically distributed location.	-
Understanding of requirements of the creative product	Throughout the creativity-intensive process, artists develop an understanding of the requirements of the creative product. This understanding may differ from the client's understanding. The understanding of the requirements of the creative product varies on a dimensional range from vague to very detailed.	*Seeing things differently, no objective way in defining the outcome, differing interpretations*

In summary, artists are characterized not only by their *process expertise* and *creative skills*, including their knowledge and cognitive abilities, but also by their *creative agenda*, *working style*, *motivation*, *location*, and *understanding of requirements of the creative product*. All these properties shape creativity-intensive processes and impact the way how they can be managed, including the use of IT.

6.3.1.2 Creative Supervisor

In all three case organizations, certain actors were identified who have roles that are associated with particularly high levels of responsibility for both process and product. Exemplary codes are *VFX supervisors*, *leads*, and *directors*, which were drawn up by the category of the *creative supervisor*. Tab. 6.6 shows open codes that led to the formation of this category.

Tab. 6.6: Category *creative supervisor:* open codes

Category	Codes	Exemplary data
Creative supervisor	*Lead*	So-called leads in VFX production are accountable for certain artifacts or processes. For example, there may be character leads or sequence leads.
	VFX supervisor	VFX supervisors were interviewed in both organizations *B* and *C*.
	Producer	Producers are involved in all stages of the screen business value chain. Producers can be creative supervisors in post-production, for example.
	Team leader	The notion of a team leader was used by respondents as a general term referring to different supervisors, such as leads, or VFX supervisors.

Creative supervisors coordinate various artists and report to a client. Often there is a hierarchy of creative supervisors. Evidence for such a hierarchy was found in all three organizations. A producer described the role of the creative supervisor as follows:

> *There is always a stakeholder above them [artists], someone who's got to report to a client or report to a distributor. (Interviewee A.2)*

Creative supervisors are usually artists themselves. They need to be able to evaluate creative products and to stimulate creativity. However, they often do less creative work than 'normal' artists, as they are responsible for managing the process, which includes the communication with clients. Creative supervisors thus act as *process intermediaries* between clients and artists. Consequently, they hold a key role in the aforementioned iterative process of understanding requirements, doing work, and getting feedback. Fig. 6.5 illustrates the role of the creative supervisor as a process intermediary.

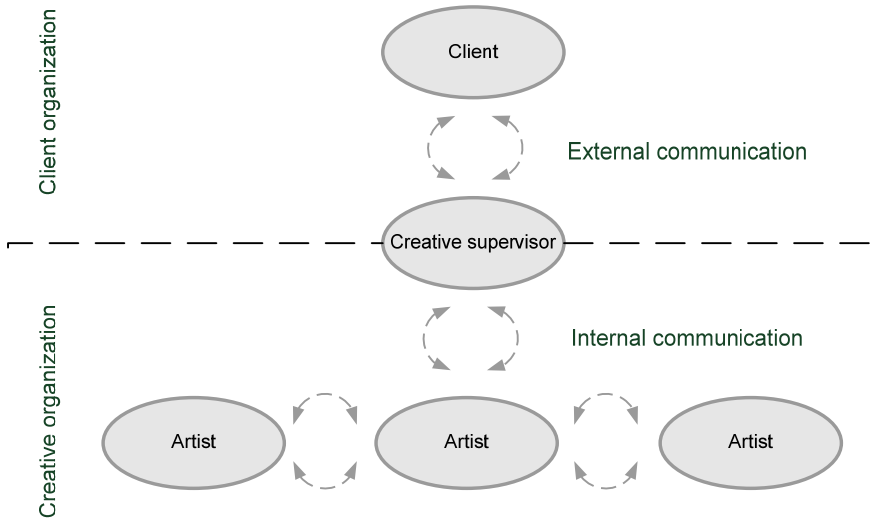


Fig. 6.5: Creative supervisor as process intermediary

The creative supervisor is responsible for receiving feedback and product requirements from the client, passing it on to the artists, and to deliver the product to the client. A VFX supervisor from *Organization B* described his role as follows:

> *I am responsible for getting [...] feedback from the clients [...] and then I am ultimately responsible for getting the images of what we deliver from the artist to the client. (Interviewee B.2)*

and

> *So […] all of us, people who aren't working on shots, [we are responsible for] passing information back and forth, between an artist and a client, you know. (Interviewee B.2)*

The same person further pointed out that he sees another important role of the creative supervisor in making sure that that the involved actors feel comfortable:

> *So you want the client to feel that you are really keen and all the artists working on it are keen […] and they are happy with who's actually doing their work. (Interviewee B.2)*

and

> *You want the artists to feel that the client respects them and their work, and they feel part of working on a good project, delivering good stuff to a client. (Interviewee B.2)*

Thus, there is a close relationship between the properties of *collaboration-intensity* and *communication-intensity* of the category *creativity-intensive process* and the role of the creative supervisor. As processes become more complex and are increasingly characterized by the occurrence of differing subjective opinions, they require process intermediaries. On the contrary, those processes with low collaboration do not require creative supervisors. A VFX supervisor from *Organization B* said:

> *If there is one client and one artist, you don't need somebody like me. (Interviewee B.2)*

As process intermediaries, creative supervisors have to make sure that the creative organization understands the *client vision (*open code*)* of a creative product; i.e. creative supervisors must understand the requirements of the creative product by themselves and pass these on. They are responsible for creating a mutual understanding between the creative organization and the client. This process involves matching the organization's capabilities and available resources with the client's expectations, so as to mitigate operational risk. In doing so, the creative supervisor communicates both with the client and with artists within the creative organization. Strategies that are used in order to pursue these purposes will be discussed later in this chapter.

Evidence for the category of the *creative supervisor* was derived both from semi-structured interviews (as has been exemplified by quotes), and from the analysis of process models. In the process model shown in Fig. 6.4, for example, the producer is a creative supervisor who manages the process and acts as an intermediary between editor, director, and investor.

In the following, those properties are introduced that give the category *creative supervisor* variation. These are *accountability*, *supervising expertise*, and the *understanding of the requirements of the creative product*.

Property of Accountability

Creative supervisors must consider both operational and creative process performance. As there are usually different creative supervisors involved in a project, their responsibilities vary. A creative supervisor may be responsible for a certain process or section of a process. *Organization B*, for example, distinguishes different types of so-called leads with regard to the scope of their accountability. There are character leads, sequences leads, etc. A creative director described this accountability as follows:

> *So we have groups working on different jobs and they always make sure there is somebody who has the final say. (Interviewee C.2)*

A more general statement with regard to the hierarchy of supervisors was made by a producer from *Organization A:*

> *I think you've got different stakeholders. I think […] often in that chain of events you will have different people that are responsible for various elements, but they are often reporting back to a director or back to a producer. (Interviewee A.2)*

Accountability was often interpreted as being rather flexible. For example, creative supervisors aim at passing accountability down. The following quote exemplifies this:

> *What happens is, you pass the accountability down. […] I like people to be accountable for their own stuff, so what you do is to set up a really good schedule […]. If they have to do a certain task or shot, they know in how many days they have to do it. So they become accountable to do that. (Interviewee B.2)*

Supervising Expertise

The concept of *supervising expertise* of the creative supervisor epitomizes the creative supervisor's abilities in managing a creativity-intensive process. It became noticeable that, in many cases, artists with particularly high levels of expertise become creative supervisors. What has been written in the previous section on the artist's abilities therefore holds for the creative supervisor as well. However, the supervisor does not necessarily need to have detailed knowledge about certain procedures that

are carried out within the process. Creative supervisors rather need the ability to *break processes down*, the *ability to see*, and the *ability to assess a process* (codes that were drawn up by the property *supervising expertise)*. Moreover, they need to have what can be referred to as high *people skills* (open code). Creative supervisors have to manage both creative individuals and creative groups/teams. Thus, they need to constantly motivate creative people to be (more) creative. They seek to find a balance between assigning 'boring' jobs with little creativity and very creative jobs to creative people, so as to foster their motivation. A VFX supervisor from *Organization B*, for example, expressed the difficulty of assessing and picking the right people for a job:

> *It's really hard and I guess that you mix technical and artistic,[…] it's hard to mix that and like it's just […] in hiring and then figuring who's going to work on your teams and stuff. You know, it's sort of a skill to pick those people, you know. But it's difficult, you know, it's difficult stuff that we do. (Interviewee B.2)*

A respondent from *Organization C* emphasized the creative supervisor's role in what was coded under the labels of *making people feel comfortable* and *motivating people*:

> *And sometimes you have to help them understand or make them feel that they have thought of it themselves […] that's the thing, I think that nobody would do a job like this, if they didn't have that ability, I don't think. (Interviewee C.2)*

Another facet of a creative supervisor's expertise is their communication or negotiation skills. A producer from *Organization A* expressed this as follows:

> *And that's usually managed with the key stakeholders; those decisions are made between a director and a producer or an editor, or a director, producer and a client […]. If you're delivering the product to someone, that person has every right to say any point along that chain "I want to come in and approve it." And then it's the negotiation skills of the producer to kind of encourage or discourage them from coming in. It's about trust, too. (Interviewee A.2)*

Understanding of the Requirements of the Creative Product

Alike artists, creative supervisors develop an understanding of the requirements of the creative product. Usually, creative supervisors directly interact with the client. Due to the product's creative nature, the creative supervisor's understanding of the requirements can differ from the client's understanding of the requirements. A creative supervisor from *Organization C* described his role in the process of understanding the requirements as follows:

If you are thinking about the customer you have to – or I have to, I have to try and understand what the customer wants and sometimes it becomes less creative if I have a very, very clear brief. (Interviewee C.2)

Tab. 6.7 details the category of the *creative supervisor* by providing an overview of the above introduced properties.

Tab. 6.7: Properties of the category *creative supervisor*

Property	Description	Open codes
Supervising expertise	Refers to how well a creative supervisor is capable of recognizing what process is appropriate to what situation and what client. Creative supervisors in the case organizations have to know who should be involved in a process at what point in time, how teams should be designed etc. The expertise varies on a dimensional range from novice to very experienced. Another facet of a creative supervisor's process expertise is their people skills. Creative supervisors need to have good people skills to motivate creative people to be (more) creative. Because some jobs in the case organizations do not require much creativity, creative supervisors have to find a balance between assigning relatively non-creative jobs and very creative jobs to creative people, so as to foster their motivation and thus their creativity. Creative supervisors are generally perceived as having high people skills.	*Communication skills, experience, negotiation skills, people skills, unintrusivness*
Accountability	Creative supervisors are responsible for both process and product. Thus, they consider both conventional and creative process performance. As there are usually different creative supervisors involved in a project, they have varying responsibilities. Usually, a creative supervisor is responsible for a certain process or section of a process.	*Creative control, financial accountability, having the final say, level of the hierarchy, making final decisions, making sure that creative objectives are being hit, reporting back, responsibility, passing accountability down*
Acting as process intermediary	Creative supervisors have a crucial role in building the interface between client organization and creative organization.	*Enabling people, getting feedback from clients, interface to client, mediating between client and artist, mediating different creative points of view, passing information back and forth, passing on information, delivering to the client*
Understanding of the requirements of the creative product	Creative supervisors develop a certain understanding of the requirements of the creative product. The understanding of the requirements of the creative product varies on a dimensional range from vague to very detailed.	*Differing interpretations, no objective way in defining the outcome, understanding what the client wants*

6.3.1.3 Client

Processes in the case organizations are not only influenced by artists and creative supervisors, but also clients. Clients provide initial requirements specifications for creative products and, therefore, can be seen as the raison d'être for creativity-intensive processes. In most cases, clients are not end-consumers, but other creative organizations. A VFX company, for example, contributes to larger projects, such as feature films, and the client can be a feature film studio. As clients actively contribute to the creativity-intensive process, they can also be seen as creative persons. They are involved in the process of generating novel and appropriate products.

The intensive involvement of clients is typical for the investigated organizations. Of course this is not the case in every process that relies on creativity one could possibly think of. An independent painter, for example, may produce for an anonymous market and might not even know the client. In the following, the main properties of the category *client* are introduced.

Client Expertise

Similar to the expertise of artists and creative supervisors, the abilities of the client play a salient role in creativity-intensive processes. These abilities are epitomized by the property of *client expertise*. The role of the client's expertise was asserted by different respondents from all three case organizations. For example:

> *I mean I deal with a lot of clients and I know exactly when I can or can't show somebody something, because some people are more visually literate and open to seeing something where I can show them something that's a third finished and I expect them to understand where it's going and some people I wouldn't show anything that is a third finished because I know they can't make that into life. (Interviewee C.2)*

This creative director mentioned the client's visual literacy; i.e. the client's ability of assessing a visual artifact. Besides the client's visual literacy, her level of familiarity with the process is relevant. Clients with good understanding of the processes that run on the creative organization's side are capable of assessing what can be done and what it takes to do it:

> *Their level of familiarity with the process is an important thing. I mean I imagine it must be the same for like a wine maker. You know, if you give someone a taste straight after the vintage, they are going to have to know quite a lot about wine to meaningfully contribute. (Interviewee B.1)*

Another relevant aspect of client expertise is their "creative ability:"

> *And again, it kind of depends on really the client's level of expertise in visual effects. But also their creative ability, and their creative potential as well. Because some clients are just so specific about what it is that they want, that they basically just say, "I want one, two, and three." And it's very clear to them. (Interviewee B.3)*

This respondent thus also referred to the level of familiarity with the process. Moreover, he talked about what he called their "creative ability" or "creative potential." The way he described it suggests that high creative ability or potential enable the client to be more specific in describing what they actually want.

Client Processes

Clients may be creative (e.g. a studio that entrusts a VFX house with the generation of images) and non-creative organizations (e.g. a car vendor that entrusts a VFX house with the generation of images that are used in the latest TV commercial). Of course, these organizations run their own processes, which are often intertwined with the creative organization's processes. The requirements for the creative product are thus often influenced by the processes that run on the client's side. This can include technical requirements (for example, a particular technical format for a VFX shot may be required) and also creative requirements (for example, the style of a creative artifact must match the style of the artifact to which it contributes). Given that clients are often creative organizations themselves, their processes may also be characterized by high levels of uncertainty with regard to outcome, process structure, and resources. Consequently, creative supervisors are required to have an understanding of the client processes in order to align their own processes. For example, when generating a VFX shot, the creative supervisor must know what format is to be delivered as well as when and to whom it is to be delivered. A design coordinator portrayed the relationship between the creative organization's processes and the client's processes as rather problematic, as there is usually a lack of knowledge about the client's processes:

> *Not only are you working with a variable depending on who you are working with as a designer, because each designer has different strengths, but you are also working with the variable of the client. You don't know what processes are going on over there and how that affects your processes, cause it will eventually do that. (Interviewee C.3)*

The concept of client processes is intended to express the interdependent nature of creativity-intensive processes. Creativity-intensive processes do not run in isolation;

they are highly intertwined with both internal and external processes. Because of this, creativity-intensive processes were described as being interdependent earlier.

Location

As the location of artists impacts on the communication strategies that are used so does the location of clients. Geographical distance requires other communication strategies than face-to-face meetings, for example. Despite the fact that this may seem obvious, it is of particular relevance to processes that rely on creativity; products in the case organizations are complex creative artifacts that require rich communication that needs to be supported by visual means. The clients of *Organization B*, for example, are often studios that are located in the United States while *Organization B* is located in Australia. A producer from *Organization A* said the following:

> *If there are people on the other side of the world it can often be done written. But the most successful kind of creative partnerships I think are done face-to-face. But often on a project you won't be face-to-face. (Interviewee A.2)*

Client Understanding of Requirements

When the categories of the *artist* and the *creative supervisor* were discussed earlier in this chapter, for both categories, the property of the *understanding of the requirements of the creative product* was introduced. The *client understanding of the requirements of the creative product* conceptualizes the client's point of view. It was conceptualized based on lower level codes such as *client vision*. As has also been maintained, in many cases the client's, the creative supervisor's, and the artist's understandings of the requirements can differ. The CEO of *Organization B* put it as follows:

> *Some clients have a really clear vision of what they want. Some clients have no idea what they want and want you to provide them with a very specific set of things. (Interviewee B.1)*

Tab. 6.8 provides an overview of properties that are shared by clients of creative organizations.

Tab. 6.8: Properties of the category *client*

Property	Description	Open codes
Client processes	Clients may be creative and non-creative organizations that have their own processes. The requirements for the creative product are influenced by the client processes. These can include technical requirements (for example, a particular format may be required) and also creative requirements (for example, the style of a creative artifact must match the style of the artifact to which it contributes). Because clients are often also creative organizations, there can be a high level of uncertainty with regard to their processes.	-
Expertise	This concept refers to the client's ability to express their requirements, to know the abilities of the creative organization, and to assess creative artifacts. The latter aspect influences at what stage the client can be involved into approval processes and can also be referred to as their visual literacy. The expertise of a client varies on a dimensional range from low to high.	*Visual literacy, visual knowledge, familiarity with the process, creative ability, creative potential, being able to meaningfully contribute, understanding where the process is going*
Location	The client location impacts on communication strategies. Geographical distance requires other communication strategies than face-to-face meetings, for example.	*Co-location, geographical distance, face-to-face*
Understanding of requirements of the creative product	As artists develop an understanding of the requirements, so do clients. Even though the client usually has some initial idea of what the product should look like, the product's specifics and, therefore, the client's understanding of these often become evident only when the product is actually generated. The client's understanding of the requirements of the creative product may differ from the artists' understanding.	*Client vision, creative input, having an idea of what something should be*

6.3.2 Constraints

Different respondents from all case organizations asserted that, in their view, time is the most relevant constraint in creativity-intensive processes. Moreover, budget was mentioned as an important restriction of creativity-intensive processes. Obviously there is a close link between the budget and the time available. For example:

> *A lot of the time it's dictated by time and budget. Unfortunately, that's just the way it is and as much as we like to have that whole creative process as an important core thing, it often doesn't work out that way. (Interviewee C.3)*

and

> *A lot of these things are dependent on being able to spend the appropriate time at various stages and there are some things you can't rush. (Interviewee B.1)*

and

> *And you have to work within a certain schedule and a certain kind of timeframe and you have to have the ability to adapt quickly. (Interviewee A.3)*

It also became clear why time is so important to the process. In the first place, time allows creative persons to explore for different options. In VFX production, for example, it is crucial to have this freedom in order to generate alternatives that can then be shown to the client. Thus, time allows for divergence. A VFX supervisor from *Organization B* put it as follows:

> *Where it does get creative is that the artist will have ideas, and when they have enough time to work on a task, they do a variety of different results. (Interviewee B.3)*

Tab. 6.9 provides an overview.

Tab. 6.9: Category *constraints*

Category	Description	Open codes
Budget	The budget is one of the most important resources that impact on the management of processes in the case organizations. For example, budget constraints limit the creative organization to a certain number of iterations of the creative product and also to the use of certain technical equipment.	*Budget constraints, lack of money, putting in more money*
Time	Available time limits the options that artists can explore in order to generate a creative product. Obviously, there is a close relationship between the resources of time and budget.	*Spending appropriate time, time constraints, lack of time, time for creative exploration, being overburdened*

6.3.3 IT Context

IT plays a prominent role in creativity-intensive processes. The categories of *knowledge-management systems*, *asset management systems*, *group-communication systems*, *workflow-related systems*, and *artist systems* were generated in order to conceptualize different types of systems that constitute the IT context of the case organizations. Most evidence for these categories was derived from organizations *B* and *C*. One reason may be seen in the fact that *Organization A* as a teaching body is less concerned with establishing a complex IT infrastructure in order to support creative work than a commercial organization from the creative industries. It must also be noted that the above categories are thought to conceptualize those IT systems that are

of particular relevance to creativity-intensive processes. Of course, the case organizations also employ complex IT infrastructures that include operation systems and network capabilities to transfer data etc.

The view of the IT artifact that is taken in this research can be framed as a "tool view;" an "engineered artifact, expected to do what its designers intend it to do" (Orlikowski & Iacono, 2001, p. 123).

Knowledge Management Systems

The category of *knowledge management systems* epitomizes a rather broad range of tools that are used by the case organization in order to store, retrieve, and transfer knowledge (Alavi & Leidner, 2001). Because (previous) knowledge is an important factor influencing creativity, knowledge management systems are used for making explicit knowledge available to carry out creativity-intensive processes. *Organization B*, for example, uses a wiki in order to provide information on how certain tools can be used:

> *If you need to learn how to render or [how to use] all those tools, about passing the information back and forth, you know, if you know the name for it, you can search for it. (Interviewee B.2)*

Moreover, they provide a blog where employees write about problems they encounter and solutions they develop. However, it also became clear that the usage of different tools leads to a decentralization of knowledge. As the following comment by a VFX supervisor illustrates, this decentralization is perceived as a weakness:

> *We are not doing enough knowledge management. I think, that's like the next phase for this company, that we really need to explore. We do have wikis and people are great about put in information, but the big problem that I have with our knowledge management, or lack of, is that it's too decentralized. (Interviewee B.3)*

The awareness that interviewees from both organizations *B* and *C* opined on not doing enough knowledge management further affirms the relevance of such technologies within creativity-intensive processes.

Asset Management Systems

In particular the data that was collected in organizations *B* and *C* suggested that different types of asset management systems play a salient role in creativity-intensive processes. The category of *asset management systems* epitomizes a class of software

systems that are used to retrieve different types of artifacts. Examples for such artifacts include images, film sequences, or animations. It became evident that asset management systems can be used to facilitate the process of understanding the requirements of the creative product, as well as the generation of the product itself through the re-use of artifacts that have been generated previously. In the process of understanding the requirements, existent artifacts are often used in order to support communication by getting reference to what has been done previously. This also means to cognitively stimulate both creative people and clients by providing new options and potential associations. In the following quote a respondent from *Organization C* explained how asset management is used:

> *As we do jobs, and we need to get reference and people say "oh, have you seen that ad that Car Company A [company name changed] did", or whatever, we get the ad, we put it in […] a reference library, and you can put it under "cars" or whatever. (Interviewee C.3)*

This is congruent with the awareness that being creative in many cases means to put together artifacts that have been created previously. For example, the CEO of *Organization B* said that

> *The ability to draw upon past assets is very valuable. (Interviewee B.1)*

A creative director from *Organization C* made a similar comment by saying that

> *Creativity can still be drawing together other things that have been quite pre-determined, you know, but putting them into a new arrangement. That's the same as creativity as well. Everything you draw on, everything I draw on in my creativity comes from somewhere. So it's already been created somewhere. (Interviewee C.2)*

Group Communication Systems

In most cases, different creative and non-creative actors are involved in creativity-intensive processes. Thus, communication between artists, non-creative persons, creative supervisors and clients is essential. Particular challenges arise from geographical distribution, which is typical for processes in the creative industries. The category of *group communication systems* epitomizes those IT systems that aim at facilitating communication among actors (artists, creative supervisors, and clients) that are involved in creativity-intensive processes.

Creativity-intensive processes require what respondents called "rich" communication. One example for such a software tool that enables "rich" communication is

Communicate[6]. *Communicate* is used in *Organization B*. The software allows two parties (e.g. client and creative organization) to simultaneously watch a *Quicktime* video[7], stop the *Quicktime* video at any point in time and draw in the still picture. Such means of communication were considered to be more powerful than written feedback or speech. In the following paragraph a respondent from *Organization B* explained the value of *Communicate:*

> *Our software company sells this tool called Communicate, which is a synchronized Quicktime player, which by its nature is pretty simple. But we get quotes from all sorts of people working on the biggest Hollywood films, basically saying "I don't know how I could have made this film without a tool like this, because it enables us to communicate in a way that's so much more powerful than on phone."And all it really is, is the ability to draw an image together. It's a very simple technical problem, but it allows a richness in communication that makes the whole process more effective. (Interviewee B.1)*

Workflow-related Systems

The category of *workflow-related systems* epitomizes a broad class of systems that is aimed at supporting the execution processes. This understanding is much broader than that of typical workflow definitions (e.g. Oberweis, 2006; v.d.Aalst & van Hee, 2002). Different systems and tools such as task lists and job tracking systems are used to support processes in the case organizations. For some tasks, such as the production of VFX, highly specialized systems are used to support artists in conducting various steps of the process. The main purpose of such systems and tools is seen by giving people more time to be creative by supporting repetitive and well-structured parts of creativity-intensive processes, while simultaneously handling the complexity of artifacts (particularly in VFX production and animation, sequences consist of hundreds of artifacts):

> *The better a company is in like making those tools, not as, you know, painful, then people have more time to do creative stuff. (Interviewee B.2)*

However, no comprehensive process support for entire processes is used, which is due to the high demand for flexibility in creativity-intensive processes. These tend not to have a pre-determined process flow and are characterized by many possible exceptions.

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6 Due to confidentiality reasons the name has been changed.

7 *Quicktime* is a platform for playing multimedia contents that was developed by *Apple Inc.* (www.apple.com/quicktime)

Artist Systems

Within creativity-intensive processes, all three case organizations use what is epitomized by the category of *artist systems*. Artist systems are tools that are used by creative people in order to generate creative artifacts. A VFX supervisor from *Organization B* said:

> *And then, there are software tools that do the creative bit and then there are file system tools and everything. (Interviewee B.2)*

For example, in organizations *A* and *C* so-called editing-suites are required in order to generate the edit of a film or TV commercial. *Organization B* uses tools for 2D animation, 3D animation, and rendering, for example. One interesting aspect that was mentioned is the role that artist systems play with regard to the iterative nature of creativity-intensive processes. One main benefit in the efficient use of systems ("how quickly you can get an image out") was seen in the ability to have higher numbers of iterations:

> *And it's just about removing all the things that get in the way. And so, be it sort of data tools, like how you get something transferred across the net to them, or be it generation tools, like how good our artist tools are at creating images, on how efficient our rendering processes are, all of those contribute to how quickly you can get an image out. (Interviewee B.2)*

As the following quote illustrates, higher numbers of iterations are perceived as leading to a "better and richer" process with the client:

> *From our point of view, what IT does is, it enables us to more rapidly generate images to test out our theories. […] When we have things well set up and are ready to work on things, we are always focusing on the iteration time that it takes from an idea to an image. The shorter that is, the better and the richer the process can be with the client. They tell us we get back to them, then we can iterate. (Interviewee B.1)*

Tab. 6.10 provides an overview of the five types of systems that were identified as being of particular relevance in creativity-intensive processes.

Tab. 6.10: Category *IT Context*

Category	Description	Open codes
Knowledge management systems	Because (previous) knowledge is an important factor influencing creativity, knowledge management systems are used for making explicit knowledge available to carry out creativity-intensive processes. This implies the use of tools to locate and interpret knowledge.	*Accessing documentation, blogging, organizing information, populate the knowledge base, search engine, shared ontology, understand how other people solved problems, wiki, decentralization of knowledge, searching for information*
Asset management systems	Asset management systems can be used to facilitate the process of understanding the requirements of the creative product, as well as the actual work. In the process of understanding the requirements, existent artifacts can be used to support communication by showing what has been done before and what could be done. This includes cognitively stimulating both creative people and clients by providing new options and potential associations. In many cases being creative means to put together things that have been done before.	*Free texture sites, getting reference, Google search, Internet, reference library, drawing on existent assets*
Group communication systems	In most cases, different creative and non-creative actors are involved in creative tasks. Thus, communication between artists, non-creative persons, creative supervisors and clients is essential. Particular challenges arise from geographical distribution, which is typical for processes in the creative industries.	*Communication channels, dissemination of feedback, enabling iterations, richness in communication*
Workflow-related systems	Different systems such as task lists are used to support processes in the case organizations. For some tasks such as the production of VFX, highly specialized systems are used to support artists in conducting various steps of the process. The main purpose of such systems is regarded as giving people more time to be creative by supporting repetitive and well-structured parts of creativity-intensive processes, while simultaneously handling the complexity of artifacts (particularly in VFX production and animation, sequences consists of hundreds of artifacts).	*Job tracking system, process support, providing deadlines, providing templates, scheduling, task lists, tracking the process, giving people time to be creative, ticketing system for technical support*
Artist systems	Within creativity-intensive processes, the case organizations use what can be epitomized by the category of artist systems. Artist systems are tools that are used by creative people in order to generate creative artifacts	*Computer-aided design, editing suite, 2D modeling, 3D modeling, graphics editor, rendering*

6.3.4 Creative Product

The category of the *creative product* is a conceptualization of the outputs of creativity-intensive processes that are characterized by novelty and appropriateness (compare chapter 2.4.1 on the main characteristics of creativity). Examples from the case organizations include animations, VFX sequences, EDLs, sound effects, etc.

Creative products are so-called process-oriented business objects (Becker & Kahn, 2003) in business processes. They are generated collectively by artists. Creative products are designed for a client. Often a creative product (such as a VFX shot) is part of a more complex product (such as a feature film). Therefore, the requirements of the creative product are determined by its utility to contribute to a more complex product. The spider that was introduced in chapter 4, for example, may be placed in a setting that results from a live-shot and thus become part of a bigger creative product.

The *creative product* was conceptualized as a contextual factor as it shapes the creativity-intensive process in different ways. However, the creative product has a particular role: it is both the raison d´être and the output of creativity-intensive processes. In a highly iterative process of understanding the requirements, clients and creative organizations create a mutual understanding of the requirements of the creative product. The creative organization then implements their understanding of the creative product, resulting in an intermediate creative product, which can then be reviewed.

Consequently, the requirements of the creative product were not conceptualized as a property of the category *creative product,* but as a property of the categories *artist*, *creative supervisor*, and *client* that 'have' an understanding of the requirements of the creative product (compare chapters 6.3.1.1, 6.3.1.2, and 6.3.1.3). There is usually no objective way of describing these requirements.

In the following, the main properties of the category of the *creative product* are introduced. These are *intermediate product specifics*, *final product specifics,* and *quality*.

Intermediate Product Specifics

As has been maintained, creativity-intensive processes are characterized by uncertainty with regard to process outcome. Consequently, the actual specifics of the creative product are not known until the process is completed. The creative product is thus reviewed throughout the process. Since its specifics are exposed to subjective opinions of different involved stakeholders, the current specifics at any point in time must be seen as intermediate.

Final Product Specifics

The intermediate product specifics become the final product specifics once no additional iterations are needed. In processes of case organizations, products are eventually signed off. When a product is signed off its specifics are not altered anymore.

Quality

Creative products have to meet both technical and creative requirements. The creative quality can be measured by the novelty and appropriateness of the product. However, the perception of creative quality is highly subjective. *Interviewee C.3*, for example, said that:

> *Everybody absorbs and processes things like music or visual stimuli differently. (Interviewee C.3)*

Thus, the ultimate measure for creative quality is client satisfaction. *Interviewee B.3* touched this point when he said:

> *What we are trying to make sure is that every step of the way we are addressing is what the client wants. (Interviewee B.3)*

In addition, at least two different dimensions of the quality can be distinguished: technical and creative. This has also been asserted by the process models which exhibit that there are technical reviews (often referred to as quality assurance) and creative reviews (both types are described later in this chapter).

Tab. 6.11 provides an overview of the properties of the category of the *creative product*.

Tab. 6.11: Properties of the category *creative product*

Property	Description	Open codes
Intermediate product specifics	Creative products often undergo a number of intermediate steps until they are finalized.	*Getting an image out quickly, not leaping to the solution too soon, testing out*
Final product specifics	The intermediate product specifics become the final product specifics once no additional iterations are needed.	*Getting something subjective final, signing off*

Property	Description	Open codes
Quality	Creative products have to meet both technical and creative requirements. Thus, creative and technical quality can be distinguished. The creative quality can be measured by the novelty and appropriateness of the product. Generally, the quality of a creative product varies on a dimensional range from low to high.	*Measuring product quality, novelty, perceived creative quality, subjectivity, technical quality*

6.4 Strategies in Managing Creativity-intensive Processes

Process managers in creative environments apply and combine various strategies in order to manage their processes. As a consequence, managing creativity-intensive processes is a complex process in itself. Two subcategories of strategies play a salient role within creativity-intensive processes: *strategies in communicating with the client* and *strategies in internally managing creativity*. The two different fields of strategies in managing the processes internally and of strategies in communicating with the client were also explicitly mentioned by the respondents. For example, a VFX supervisor from *Organization B* said:

> *So, whether it's because the client is having a lot of difficulties, or whether they are really demanding, that is one area. But a lot of times you have internal difficulties as well, you have personality conflicts, you have technology issues where we expected that certain solutions were going to work in a certain way and they don't. Or sometimes we thought we were going to get a certain number of machines, but it turns out that we got half of that. (Interviewee B.2)*

Even though the distinction between communicating with the client and internally managing creativity-intensive processes emerged from the data, it is nonetheless the researcher's conceptualization. Other researchers may have grouped the strategies differently.

6.4.1 Strategies in Communicating with the Client

Strategies in communicating with the client serve different purposes: first, communication with the client is essential to create a mutual understanding of requirements of the creative product. This includes the process of matching the requirements that are put forward by the client to the organization's capabilities and available resources. Second, communication with the client can help to mitigate and even avoid what has been referred to as creative risk earlier. And, third, communication with the client is necessary for establishing client trust, which enables the creative organization to keep ownership of the creative process. Establishing such trust is important, because

the converse can lead to constant intervention and control, which can reduce creativity. Three subcategories of *strategies in communicating with the client* can be distinguished: *understanding and refining requirements*, *ongoing communication*, and *approval and review*. Tab. 6.12 provides an overview of the category *strategies in communicating with the client*. In the following the specific strategies are described.

Tab. 6.12: Strategies in communicating with the client

Category	Subcategory	Specific strategies
Strategies in communicating with the client	*Understanding and refining requirements*	*Creative brief, matching requirements with capabilities, providing stimuli, showing references*
	Ongoing communication	*Showing work in progress, managing expectations*
	Approval and review	*Formal approvals, temporary approvals*

6.4.1.1 Understanding and Refining Requirements

Understanding and refining the requirements of the creative product means to create a mutual understanding between creative organization and client. Within this stage, (visual) artifacts, such as images or film sequences, become "part of the language" that is used in order to understand and refine the requirements:

> *[Using visual artifacts] becomes part of the language as well, which is great, you know. They say: "Listen, in this movie, even if it wasn't from the studio that we are working with, in this other movie, this was done, we like this effect, but this is how we want to have this […]." And that is a great way to work. (Interviewee B.3*)

Tab. 6.13 provides an overview of different specific strategies that creative organizations use in order to determine the requirements of a creative product.

Tab. 6.13: Strategies in understanding and refining requirements

Category (specific strategy)	Description	Open Codes
Creative brief	The creative brief is done upfront and is a process for creating a common understanding between artists and clients with regard to where the project is heading. Interestingly, it is not only about briefing the creative people. Creative people can stimulate the client by presenting alternative solutions for a creative product, for example. The creative brief can be seen as a strategy for supporting requirements engineering in a creative way.	*Creative brief* is an in-vivo term
Providing Stimuli	The creative organization provides stimuli to the client in order to iteratively generate a shared understanding of the project goals. As has been mentioned above, the strategy of providing stimuli is often combined with the strategy of the creative brief.	*Bouncing ideas, forming the client opinion, changing ideas, presenting alternatives*
Showing references	Showing references supports the creative brief; that is, it helps to generate a common understanding between creative people and client on where the project is heading. Moreover, it can provide stimuli for coming up with truly creative ideas (while still generating a common understanding).	*Visual artifacts as part of the language*
Matching requirements with capabilities	One main aspect of understanding and refining the requirements is to ensure that there is no mismatch between what is needed to fulfill the client's expectations and the creative organization's capabilities. Such a mismatch can lead to operational failure and is therefore associated with a high level of operational risk.	*Negotiating, steering the client, validating early*

6.4.1.2 Ongoing Communication

The category of *ongoing communication* pertains to strategies that are closely related to the other two groups of strategies in communicating with the client *(understanding and refining requirements, review and approval)*. In fact, determining the requirements of the creative product is an ongoing process that, in many instances, does not stop until the product is finally completed. Thus, organizations use strategies in ongoing communication, such as *showing work in progress (WIP)*. At the same time, these strategies are ought to mitigate risk as they ensure that the creative organization is heading down the right path. Thus, ongoing communication ensures constant reviewing of the creative product. Tab. 6.14 provides an overview of strategies in continuous communication.

Tab. 6.14: Strategies in ongoing communication

Category (specific strategy)	Description	Open Codes
Showing work in progress	Showing work in progress is a means of continuous communication with the client. Clients are kept up to date to ensure that expectations are met. Showing work in progress is thus a means to further the mutual understanding of the requirements of the creative product. Showing work in progress is less formal than review/approval processes.	*Showing the client as much as possible, making clear what you are trying to achieve*
Direct interaction between client and artist	In some cases, ongoing communication can take the form of direct interaction between clients and artists. In this case, communication is not done through the creative supervisor anymore.	*Getting clarity, getting feedback from client, reporting to a client, showing the right things, intruding the process*

6.4.1.3 Approval and Review

As indicated, due to varying perceptions of the creative product, there is an invariable need for approval and review. Approval processes aim to mitigate risk and to control the process. Approval processes include different types of people, most notably artists, creative supervisors, and clients. Evidence for the involvement of these groups of people could be found in the process models (compare Fig. 6.4, for example). The strategy *approval or review* is a rather complex concept that can be further differentiated by a set of properties. For example, approvals can be face-to-face or distant (property *communication channel)*, they can be final or temporary (property *finality)*, they can be daily, weekly, or monthly (property *frequency)*. With regard to the finality of a review, a VFX supervisor from *Organization B* said:

> *Our client is usually a VFX supervisor on the production side or an animation supervisor and they actually have to get approvals from the director. So you don't really get final approvals. You almost always get feedback or you just get a temporary approval and then the approval comes later on. (Interviewee B.2)*

Moreover, the stakeholders involved in a review vary. This was conceptualized by the property of *involved people*. The following quote illustrates this:

> *It benefits us to make sure that the people that are focused on that particular area that's being discussed with the client are involved in the client review. But sometimes you have to make decisions to not include people in the client review. Let's say that I know a client re-*

view is going to be a little bit tough and things may be said that are not necessarily positive, then I have to try to keep artists from being exposed to that kind of thing. (Interviewee B.3)

As indicated, process modeling also provided strong evidence for the relevance of approval processes. Examples can be found in Fig. 5.4, Fig. 6.2 and Fig. 6.4. Tab. 6.15 provides an overview of the properties of external approvals (strategy of *approval and review).*

Tab. 6.15: Properties of the strategy of *approval and review*

Property	Description	Open codes
Finality	Often, only temporary approvals are given; the final approval often comes in later.	*Final approvals, temporary approvals, could be better approval*
Frequency	Approvals vary with regard to frequency.	*Review schedule, dailies, weekly approvals*
Communication channel	The communication channel primarily depends on the location. Face-to-face approvals are the exception. Particularly organizations *B* and *C* make increasingly use of digital approvals. Usually, approvals are facilitated by IT.	*Approval logistics, face-to-face, digital approval*
Involved people	Approvals vary in the involved people. The data has shown that it is of high relevance who is involved in a certain approval. Missing out relevant stakeholders can lead to additional product revisions and even project failure.	*Excluding people from review, including people involved in the creative process*

Tab. 6.16 provides an overview of the strategy of *approval and review*.

Tab. 6.16: Strategy of *approval and review*

Category (specific Strategy)	Description	Open codes
Approval and review	Approval processes are a means of ensuring that the process meets the client's requirements. Approval processes thus aim to mitigate risk and control the process. There are different types of approval processes. These can involve so-called screenings where clients, creative supervisors, and artists meet face to face.	*Getting clarity, getting feedback from client, reporting to a client, showing the right things, intruding the process*

6.4.2 Strategies in Internally Managing Creativity-intensive Processes

Creative supervisors manage the creativity-intensive process and must ensure that everybody works towards one goal. Managing creativity can have diverse facets, ranging from restricting creativity due to technical and creative constraints, to encouraging and motivating creative people to be more creative, as well as the deliberate allocation of resources. Five major strategies in internally managing creativity-intensive processes emerged from the study. These are *task allocation and team building*, *resource allocation*, *managing the scope of creativity*, *internal reviews*, and the *internal breakdown*.

6.4.2.1 Task Allocation and Team Building

Creative supervisors assign tasks to artists and build creative teams. In order to be allocated to a task, artists must have a certain level of expertise. Task allocation is also a means to facilitate knowledge transfer. By putting junior and senior persons on the same task, the organization enables the transfer of tacit knowledge. As indicated, particularly creative parts of a process are largely characterized by the application of tacit knowledge:

> *We try to staff things a little bit better to just say: "You know what, you going to have to have someone shadowing you that you are going to learn from, and you have to disseminate that knowledge." (Interviewee B.3)*

Moreover, the case organizations seek to find a balance between creatively challenging tasks on the one hand side and rather simple tasks on the other. The rationale is to give creative people the opportunity to follow their creative agenda, which, in turn, fosters motivation.

The allocation of creative people is also a strategy that can aid risk mitigation. In some cases, a creative process may be close to failure and it may difficult to detect the cause. Bringing in someone else may constitute a solution. This further brings out the role of the human factor within creativity-intensive processes. A respondent from *Organization B* explained it as follows:

> *There are certain tasks which, if you don't have a certain level of experience or capability, you just won't to be able to do. So by putting somebody on them, if you misjudge that, you have completely wasted their time on that because you are not going to get anything for it; they are not going to solve the problem and you have to do it with someone else. (Interviewee B.1)*

6.4.2.2 Resource Allocation

Creative supervisors allocate resources (time, budget, technical equipment) to both creative and non-creative tasks within business processes:

> *If we only have one resource of a particular type and we have two projects that need it, they [creative supervisors] make the call which one gets it. (Interviewee B.1)*

It became apparent that resource allocation has a direct impact on the performance of creativity-intensive processes. For example, a lack of resources may compromise creativity and thus impacts the quality of the creative product. As indicated in chapter 6.3 on contextual factors, time and budget were repeatedly highlighted as being important resources in creativity-intensive processes. A lack of time is often associated with lower levels of the quality of the creative product. Thus, creative supervisors must identify the most complex and creative parts of a process, so as to allocate sufficient time. Generally, more time enables creative people to explore and come up with various options, which can then be used with the purpose of creating a shared understanding between client and creative organization. Besides time and money, there are other important resources, particularly different types of IT systems. With regard to the use of IT systems the CEO of *Organization B* made the following comment:

> *There are going to be technical resources that are required depending on the problem. And they become more and more important the better you understand what the issue is. (Interviewee B.1)*

Obviously, the allocation of resources requires a good knowledge of the underlying process. Given the fact that the process, its outcome, and the required resources are often not fully known in advance, deliberate resource allocation must be seen as a major challenge that requires high levels of expertise of creative supervisors, in particular the ability to assess what it takes to carry out a process.

6.4.2.3 Managing the Scope of Creativity

The strategy of *managing the scope of creativity* epitomizes a group of actions that creative supervisors apply in order to make sure that everybody works towards one goal while still being creative. This category turned out to have several facets. While in some cases a creative supervisor might have to restrict creativity, in other cases she might encourage people to be more creative. One way to do so is to apply the aforementioned strategy of *showing references* with the purpose of providing stimuli

to an artist. It is the creative supervisor's responsibility to decide how much freedom (often referred to as latitude) creative people have to alter both process and product:

> *Everybody has their own creative agenda. They are trying to push sometimes on their job so you have to try and stem that somehow; you have to give people latitude to be creative, but not that creative that everybody is driving a project in different ways and it falls over. (Interviewee C.2)*

However, as the following paragraph illustrates, in most cases, it is rather necessary to channel creativity "down the right path" as opposed to restricting creativity. It must be ensured, that the creativity contributes to the process goals. Creative supervisors aim at encouraging people to be creative while at the same time ensuring that everybody contributes to the process goals. Within a discussion on restricting and encouraging creativity, *Interviewee B.1* said the following:

> *Yes, in the sense of creativity from the context of endless exploring. No, in the sense that I think if you are doing it right, as long as the creativity is actually channeled down the right path, then it's always valuable. (Interviewee B.1)*

One way to encourage people to be more creative is to set up an atmosphere where people feel comfortable. A VFX supervisor from *Organization B* said:

> *And what you do is you encourage that [being creative] by setting up an atmosphere where people feel comfortable in front of other artists and their supervisors to […] throw out ideas. (Interviewee B.2)*

Another open code that was drawn up by the category of *managing the scope of creativity* is that of the *creative buy-in*, which refers to incidents where creative supervisors try to find a balance between an artist's personal agenda and the project goals:

> *I think you want that creative person to fulfill their own expectations. I think you need them to. Because that's why you are asking them to be part of the project. (Interviewee A.2)*

So the study suggests that to foster motivation (which ultimately contributes to product creativeness and product quality), creative supervisors must make sure that artists not only work towards process goals, but also fulfill their personal creative expectations. One way to do this is by allowing creative people relatively high degrees of autonomy.

6.4.2.4 Internal Reviews

The evaluation of creative products is performed by creative supervisors with the aim of operational and creative process performance. It is performed to align the different tasks (sub-processes) of a project. The internal evaluation of creative products was conceptualized by the strategy of *internal reviews*. The actual feedback that is provided in internal reviews varies on a dimensional range from positive (approval) to negative (disapproval). Thus, a review or approval may result in further iterations of the creative product. The following comment was made by the CEO from *Organization B* with regard to the outcome of internal reviews:

> *Reviews are a good way of setting the bar in both directions; because that person will tell someone "that's not good enough, you need to take it further," but they will also tell someone "that's good, you don't have to take it any further. Let's take that to the client." (Interviewee B.1)*

As with external reviews that include the client (compare chapter 6.4.1.3), the creative organization must carefully decide who is involved in a particular internal review. Often, review processes consume a lot of time. Consequently, involving too many people may cause friction losses that, in turn, reduce process performance. At the same time, not involving people who participate in the generation of the product is associated with higher creative risk.

Two major strategies in internal approval emerged from the study. One is primarily aimed at mitigating operational risk, whereas the other one is primarily aimed at mitigating creative risk. Creative reviews are primarily meant to mitigate creative risks. Usually creative reviews involve artists and supervisors who are responsible for a certain artifact or process. It is the supervisor's responsibility to make sure that the product meets the client's expectations. Technical reviews are primarily meant to mitigate operational risk.

Internal reviews share the same properties as external reviews; i.e. *finality*, *frequency*, *communication channel*, and *involved people*. However, they are usually temporary as final approval can only come from the client. In most cases internal reviews are done face-to-face. It also became apparent that a lot of internal reviewing is done in a continuous, informal manner. A respondent from *Organization A* came up with the following example from sound design:

Sometimes, when you work on your own, you just need another set of ears to come in and experience it and say "it's working great, move on," or "it's complete garbage, what were you thinking?" (Interviewee A.5)

6.4.2.5 Internal Break Down

The case organizations work on rather complex processes and creative artifacts. As a consequence, the work needs to be internally broken down before the product can be generated. For example, in order to generate a shot with a spider in it, *Organization B* must create the skeleton of the spider, as well as the spider's skin. Moreover, the spider needs to be animated, show a certain emotion etc. All these tasks are – highly interrelated – creativity-intensive processes by themselves. The strategy of the *internal break down* emerged as being salient in creativity-intensive processes.

Tab. 6.17 provides an overview of strategies in internally managing creativity-intensive processes.

Tab. 6.17: Strategies in managing creativity-intensive processes internally

Category (strategy)	Description	Open codes
Task allocation	First, artists who are allocated to a task must have a certain expertise. Second, task allocation is used in order to facilitate knowledge transfer. By putting junior and senior personnel on the same task, the organization enables the transfer of tacit knowledge. As indicated, particularly creative parts of a process are largely characterized by the application of tacit knowledge. An attempt to find a balance between creatively challenging and rather simple tasks is also made in order to give creative people the opportunity to follow their creative agenda, which in turn fosters motivation.	*Challenge creativity, finding a balance between technical and creative, getting the right team, identification of complementary skill sets, knowledge induction process, knowledge transfer, task allocation, trial and error*
Resource allocation	Particularly time and budget were identified as being important resources in creativity-intensive processes. A lack of time is often associated with lower levels of the quality of the creative product. Thus, creative supervisors try to identify the particularly complex and creative parts of a process so as to allocate sufficient time. Generally more time enables creative people to explore and come up with various options.	*Artifact reuse, leveraging people, optimize use of resources, over-commit resources, overloading key resources*

Category (strategy)	Description	Open codes
Managing the scope of creativity	In most cases it is necessary to channel creativity down the right path as opposed to restricting creativity. It must be ensured that the creativity contributes to the process goals. Often, creative organizations have to encourage creativity. One way to achieve this is by applying the aforementioned strategy of showing references in order to provide stimuli to an artist.	*Avoid endless exploring, channeling creativity, encouraging creativity, creative buy-in, giving latitude, granting bending rights and responsibilities, providing stimuli to creative people, putting people under time pressure, restricting creativity, setting up creative atmosphere*
Internal reviews	Creative reviews are primarily meant to mitigate creative and operational risks. Usually creative reviews involve artists and supervisors who are responsible for a certain artifact or process. It is the supervisor's responsibility to make sure that the product meets the client's expectations. Internal reviews are also used to encourage creativity. Thus, this strategy is closely linked to the strategy of managing the scope of creativity.	*Communicating standards, dailies, friction losses, providing feedback, gathering creativity from the group, reporting back to a supervisor, tech checks, informal reviews*
Internal breakdown	Creative organizations have to break down creativity-intensive processes into different sub-processes or tasks; they identify what (sub-) processes must be carried out in order to generate a more complex creative product. This step is essential in order to match the requirements of the creative product with the creative organization's capabilities.	-

6.5 Consequences

Creative organizations apply the above introduced strategies, as they intend to achieve certain goals. Tab. 6.18 provides an overview of the primary (intended) consequences that occur as a result of the application of strategies. This implies that there are also unintended consequences, which are dimensional variations of the intended ones (for example, low client satisfaction instead of high client satisfaction). The extreme can be that unintended consequences are the complete opposite of the intended ones (for example client dissatisfaction instead of client satisfaction).

Mutual Understanding of Requirements

As indicated, artists, creative supervisors, and clients develop an understanding of the requirements of the creative product. Creative organizations aim at creating what can be referred to as a mutual understanding of the requirements of the creative product. A design coordinator from *Organization C* said:

> *Designers will see things differently and if there are two designers working on a project they need to be able to have a cohere vision when they are moving forward. Otherwise you are*

> *going to get two people seeing things completely opposite ways. So that's a big thing for us, […] what you call all "being on the same page." (Interviewee C.3)*

Mitigating Operational and Creative Risk

Creativity-intensive processes are linked to the probability of an unwanted consequence, due to causal conditions mainly linked to the human factor and the nature of the creative process. It became apparent that is caused mainly by the (intended) high variance of possible outcomes of creative tasks, as well as the unpredictability of the underlying process. Creative organizations apply strategies such as *approval and review* and *showing work in progress* with the intention of mitigating creative risk. In the following paragraph a VFX supervisor from *Organization B* talked about the creative risk of producing something that does not meet the client's expectations and the need to mitigate this risk:

> *But you have to be really careful for the things that are a little bit more challenging technically […]. Thousands of dollars later, you can come up with a product where the client just goes "no, that's not really what I wanted." So, we have to identify that process at the beginning. (Interviewee B.3)*

Operational Process Performance

The data further indicated that creative organizations aim at what can be referred to as *operational process performance*. This category epitomizes typical economic goals, such as meeting time and budget. The CEO of *Organization B* made the following comment with regard to what he called "good use of resources:"

> *[…] that it makes good use of the resources I've got, rather than requiring me to constantly going on higher resources that I don't have. (Interviewee B.1)*

Creative Process Performance

Besides operational process performance, the case organizations aim at creative process performance. Creative process performance refers to the quality of the creative output. Potential measures for the creative process performance are the level of originality or the number of outputs generated. A producer from *Organization A* said the following with regard to individuality or originality of creative products:

> *I think if you do the technical tasks perfectly every single time and if they are flawless, it's the creativity that makes those products individual. (Interviewee A.2)*

Client Satisfaction

Client satisfaction relates both to the creative product and the creative process. To achieve client satisfaction, organizations need to control variables such as time and budget while still delivering a creative product of high quality. That is, the product must both meet non-creative (technical) requirements and creative requirements (novelty, appropriateness). A VFX supervisor from *Organization B* made the following comment with regard to meeting client expectations:

> *But as the project is going on, well, we have to make sure, and focus on, first and foremost, that the client is getting what they want. (Organization B)*

It thus became apparent that client satisfaction is seen as the most important goal by this respondent. This view was reinforced by respondents from all case organizations. Creative organizations seek to achieve client satisfaction by involving the client in the process, defining requirements specifications in collaboration with the client, and by delivering products of high technical and creative quality. Thus, there is a close relationship between the aforementioned goals of operational and creative performance and client satisfaction. The association between client satisfaction and the delivery of products of high creative quality also becomes apparent in the following paragraph:

> *I mean that's how we strive to do the kind of work we do, which we hope is the best kind of stuff that you can get. Like really delivering for our clients and trying to make good commercials that are on world standard. And film and all that stuff that we do is not only being creative and meeting a target, which anybody can really do. (Interviewee C.2)*

This creative director pointed out that the organization does not only want to meet the client expectations, but to even exceed them. A reason may be seen in the organization's desire of gaining sustainable competitive advantage by delivering to the "world standard." Similar comments were made in *Organization B* where a VFX supervisor used the phrase of "blowing the client away," for example:

> *And you really want to make sure that you blow the client away. (Interviewee B.3)*

Creative Ownership

Creative organizations try to invoke client trust in order to not lose control of the process. The category *creative ownership* thus epitomizes the creative organizations control over the creative decisions that are made throughout the process. Thus, keeping creative ownership is not the ultimate intended goal, such as client satisfaction,

but rather an intermediate goal that is pursued by creative organizations. A creative director from *Organization B* made the following comments:

> *And if they [clients] have confidence in you, you can show them an image that otherwise they might not like, that they will like. You can change their perception of what you are presenting them by how you present. (Interviewee B.1)*

and

> *You have to develop a confidence in you and in the process. (Interviewee B.1)*

Tab. 6.18: Consequences

Category (consequence)	Description	Open codes
Mutual understanding of requirements	Creative organization (represented by artists and creative supervisors) and clients interact in order to create a mutual understanding of the requirements of the creative product.	*Determining requirements specifications, having a cohere vision, being on the same page*
Mitigating operational and creative risk	Creative organizations seek to mitigate both operational and creative risk. In order to do so they apply strategies in communicating with the client and in internally managing creativity-intensive processes.	-
Operational process performance	Operational process performance refers to classical measures such as time, budget, and process efficiency. Organizations apply strategies that are known from process management such as process automation and process optimization to achieve these measures.	*Making good use of resources, exceeding time and budget, getting caught on execution*
Creative process performance	Creative process performance refers to the creative product. It can be measured by the novelty/appropriateness of the creative product, as well as by the number of outputs generated. The creative performance of a task can be measured by the quality of the creative product, that is, by its novelty and purposefulness. Whereas the latter may relatively easily be identified through client satisfaction, the first former can only be rated by experts in the particular area.	*Blowing the client away, exceeding expectations, individuality, originality*
Client satisfaction	Client satisfaction relates both to the creative product and the creative process. To achieve client satisfaction, organizations need to control variables such as time and budget while still delivering a creative product of high quality. Thus, client satisfaction is impacted by both operational and creative process performance.	*Addressing what the client wants, being in a service industry, blowing the client away, delivering to a client, delivering to the world standard, exceeding expectations, making the client feel comfortable, thinking about the client, working towards the client's goal*

Category (consequence)	Description	Open codes
Keeping ownership over the creative process	Creative organizations aim to create client trust. Having client trust is important as a lack of it can cause constant intervention and control, resulting in reduced creativity. Where there is client trust, there is thus less risk of losing momentum, which can impede creative and operational process performance. Creative organizations try to retain the creative ownership over a process; this is necessary to (a) act creatively and thus impact the creative potential of a process, and (b) to control the process and thus mitigate creative and operational risk.	*Client trust, making the client feel comfortable, confidence*

6.6 Chapter Conclusion

This chapter provided an overview of the different categories that were generated based on empirical data. The categories were introduced in four groups: First, the core category of this research, the *creativity-intensive process*, was introduced. Second, contextual factors that shape the phenomenon of the creativity-intensive process were explained. This was followed by a description of strategies and IT systems that creative organizations use in order to manage their creativity-intensive processes, as well as an account of consequences of the usage.

The conceptualizations that were proposed in this chapter are the researcher's interpretation of the data. Other researchers may have developed different categories and properties. From an interpretive point of view, however, it is more important that the concepts that were developed are plausible (compare Urquhart, 2001).

7 STUDY FINDINGS: INTEGRATED THEORETICAL SCHEME

Understanding the creative process is the foundation of genuine mastery in all fields.

Peter M. Senge

7.1 Chapter Introduction

In this chapter, the relationships between the above introduced categories are further explained by introducing an integrated theoretical scheme. In doing so, first the relationships between the main factors that shape creativity-intensive processes are explained. This is followed by a description of the dynamics of creativity-intensive processes and an explanation of how creative organizations use and combine strategies in managing these.

As indicated, not the notions of conditions, strategies, and consequences are important, but the relationships among categories. Within the above description of the categories, first relationships have been implicitly mentioned. Now these relationships are explicated by integrating the categories into a coherent theoretical scheme. As Strauss and Corbin state, "it is not until the major categories are finally integrated to form a larger theoretical scheme that the research findings take the form of a theory" (Strauss & Corbin, 1998, p. 143). Thus, the classification used above is no more than a device that has helped systematizing the process of theory building.

The key findings of this study are expressed by the means of propositions. It is important to note that these propositions are a means to represent theory that is grounded in the data. It is not subject to this research to test theory. Due to its interpretive nature also narrative is used in order to provide "rich inside" (Walsham, 1995) into the context that has been studied. The theoretical model is further illustrated by two figures. The first captures the relationship between the major categories, while the second depicts the dynamics of creativity-intensive processes. The two models complement each other; they provide different perspectives onto the same ideas. As Strauss and Corbin (1998) state: "There is *not* just *one* correct way of stating relationships" (p. 145).

7.2 The Relationships between the Major Categories

In the following, the relationship between the primary contextual factors and creativity-intensive processes is explained. Thus, this section provides answers to research question RQ1:

Research question 1. *What characterizes business processes in creative environments and what are the contextual factors that organizations in this industry need to consider when managing these processes?*

In Fig. 7.1 it is suggested that creativity-intensive processes are carried out as a complex interplay between artists, creative supervisors, clients, and organizational resources.[8] The according categories and their interactions were identified as being salient in the data. Creative supervisors apply strategies in managing creativity intensive processes in response to this, as they pursue (a) process performance by meeting constraints such as time and budget (thus pursuing operational process performance) while (b) still being creative and generating products that satisfy client expectations (thus pursuing creative performance). IT is provided by the organization and is used in order to support the different strategies as well as to generate creative products. It is not claimed that the concepts and their relationships presented here are exhaustive.

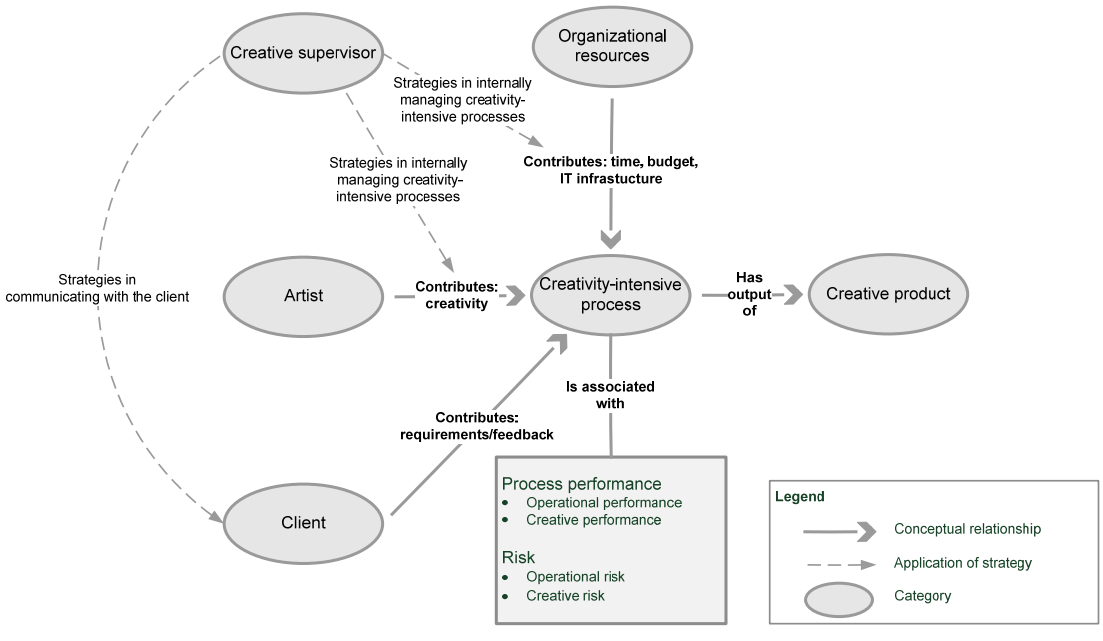

Fig. 7.1: Conceptual relationships between categories

8 The notion of *organizational resources* in Fig. 7.1 subsumes both the category of *IT context* and the category of *constraints*. Moreover, the figure only depicts the major relationships. In some cases, for example, there will be communication between artists and clients.

The process typically starts with clients (category *client)* who bring in their understanding of the requirements with regard to a particular creative product (property *understanding of the requirements of the creative product)*. Clients can be end-consumers or creative organizations themselves. Examples of end-consumers are enterprises that entrust the creative organization with the creation of a TVC. An example of a creative organization as clients is a feature film studio that employs various VFX companies to contribute to a film project. Artists (category *artist)* may be members of a creative group. They bring in their expertise and creative skills (properties *process expertise* and *creative skills)* – in short, their creativity. Artists utilize resources, most importantly time and budget (category *constraints*), but also technical equipment such as the above mentioned artist systems (category *IT context*). Creative supervisors (category *creative supervisor)* manage creativity-intensive processes by applying various strategies in communicating with clients and in internally managing the process (categories *strategies in internally managing creativity-intensive processes* and *strategies in communicating with the client)*. Most of the communication between clients and the creative organization is done through creative supervisors who act as process intermediaries.

Creativity-intensive processes have creative products as an outcome (category creative *product)* and are associated with process performance (properties *operational* and *creative performance)* and with risk (properties *operational* and *creative risk)*. Due to different subjective opinions, often ill-defined requirements specifications, as well as individual characteristics of involved stakeholders, creativity-intensive processes are characterized by uncertainty with regard to outcome, required resources, and process structure (properties *uncertainty with regard to outcome*, *required resources*, and *process structure)*. The involvement of different artists, supervisors, and clients may lead to conflict situations that companies seek to resolve through the use of the above mentioned strategies in order to mitigate risk and attain process performance.

The study suggests that the understanding of the requirements of the involved clients, artists, and creative supervisors in particular contributes to the uncertainty that is linked to creativity-intensive processes. At one extreme, nothing except for a vague idea is specified. At the other, most features of the product are known in advance. The understanding of the requirements thus ranges from vague to very detailed. The impact of low levels of details of requirements specifications as well as differing working styles (property *working style* of the category *client)* is expressed in the following comments:

> *The reality is that they have been given a task. The director has it in mind; They say "enact that like that."The other side of their job is they are given a blank canvas. For example, with film work, they will read a script and they'll be told "we need a title sequence for this script. Go away, read the scrip,t and see what you come up with." And you'll notice that the designers always see things completely differently from each other. Even if somebody's initial ideas are similar, the way that they actually physically design it and put it together is always very different. So that's very much a creative thing where they have free reign. (Interviewee C.3)*

and

> *Some people would just get a skeleton from the library and modify, other people would make a fantastic skeleton that does all sorts of amazing things. And that's creative and that's not. So the same task in two different people's hands is different. (Interviewee C.2)*

The following proposition is suggested:

> ***Proposition 1:*** *Creativity-intensive processes are characterized by uncertainty with regard to process structure, required resources and process outcome. This uncertainty is caused and influenced by various factors, particularly the understanding of the requirements of the creative product of involved clients, artists, and creative supervisors, as well as their individual characteristics (e.g. working style, expertise).*

The uncertainty inherent to creativity-intensive processes was identified as the cause of the closely related properties of *operational* and *creative risk* and *creative potential* of creativity-intensive processes. This uncertainty is not only an unwanted consequence, however. It is at the core of creativity as it is a result of diverging from what has been done previously and thus generating products that are associated with high levels of novelty. Thus, high levels of uncertainty are not only associated with high levels of risk, but also have the potential to generate truly novel products. Particularly ill-defined requirements allow the creative organization high degrees of freedom.

> ***Proposition 2:*** *High levels of uncertainty in process and outcome are associated with high levels of creative potential as they tend to lead to the generation of products that are characterized by novelty, but also with high levels of operational and creative risk as there may be undesirable consequences such as client dissatisfaction or a mismatch between capabilities and requirements.*

As indicated, the requirements of the creative product are captured by the property of *understanding of the requirements of the creative product*, which is shared by the categories of the *client*, the *artist*, and the *creative supervisor*. Consequently, there can be a mismatch between the different understandings of the requirements of the creative product. Such a mismatch is associated with particularly high levels of risk as there is a high probability of client dissatisfaction with the product that is generated.

The study suggests that high levels of expertise and skills of clients, artists, and creative supervisors can mitigate both creative and operational risk. The property of *process expertise* of the category of the *artist* captures abilities such as assessing the required capabilities to carry out a certain task and breaking down a problem. The property of *creative skills* captures their capability of creatively judging creative products. Similarly, clients have a certain level of expertise (property *client expertise)* that impacts how well they are able to convey requirements of a creative product, understand the capabilities of the creative organization, and judge a product even early in the process. Generally, high levels of expertise of representatives of the creative organization allow them to better understand the client's requirements, assess what is needed to fulfill these requirements, and match the requirements to the capabilities. In consequence, high levels of expertise of involved stakeholders are associated with lower levels of both operational and creative risk.

> ***Proposition 3****: High levels of expertise and creative skills of artists, creative supervisors, and clients are associated with lower levels of operational and creative risk. On the contrary, low levels of expertise and creative skills of artists, creative supervisors, and clients are associated with higher levels of operational and creative risk.*

7.3 The Dynamics of Creativity-intensive Processes

In order to understand how the case organizations manage creativity-intensive processes, it is necessary to understand the processes' dynamics; i.e. how the processes unfold over time. Fig. 7.2 suggests that creativity-intensive processes comprise of a number of highly interwoven stages or phases (indicated by the property *iterative nature)*: understanding the requirements, internally breaking the requirements down, doing work, and evaluating work. Evaluation or review, as well as doing work, are also parts of understanding the requirements of the creative product. This means that requirements are not entirely known before the process is completed. The completion in turn results in a final product and measurable process performance (properties *operational* and *creative performance* of the category *creativity-intensive*

process). As indicated, Fig. 7.2 complements Fig. 7.1 and presents a different perspective on the same ideas. Whereas Fig. 7.1 depicts the relationships and interactions between the different categories, Fig. 7.2 depicts the dynamics of creativity-intensive processes.

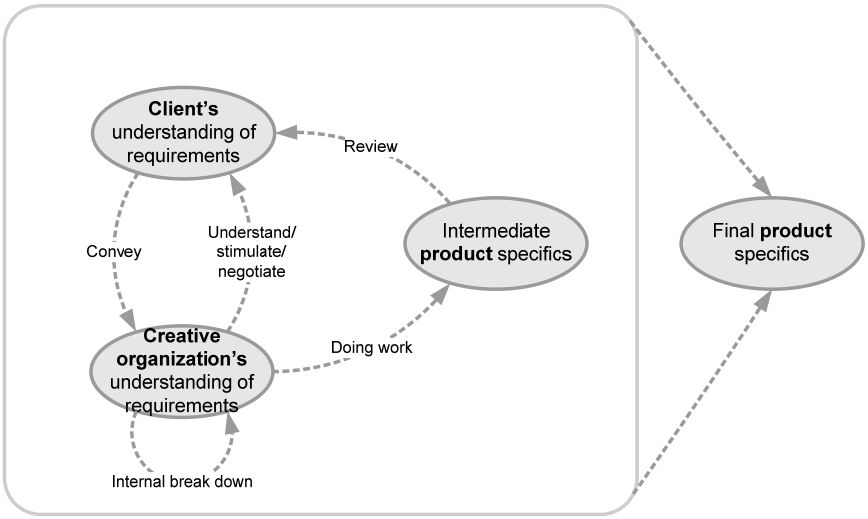

Fig. 7.2: The dynamics of creativity-intensive processes

As stated in the previous section, there are at least two different facets of the requirements specifications of the creative product: First, the client's understanding of the requirements and, second, the artist's and creative supervisor's understanding of these requirements (represented in Fig. 7.2 by the creative organization's understanding of the requirements). The client's understanding of her own requirements (conceptualized as a property of the category *client)* can be seen as the raison d´être for carrying out the creativity-intensive process. This understanding is conveyed to, and understood by, the creative organization (usually by the creative supervisor as a process intermediary) and forms their understanding of the client's requirements (conceptualized as properties of the categories *creative supervisor* and *artist).* Based on this understanding, the process is carried out and an (intermediate) product is created (property *intermediate product specifics).* The specifics/quality of the creative product (property *quality)* is accordingly impacted. The product is only intermediate because it needs to be reviewed. This review may further impact the client's understanding of her own requirements which is then conveyed to/understood by the creative organization and so on. The process of understanding and refining the requirements is both a divergent and convergent process. The following comment exemplifies this:

> *You seek first to understand the question, and then, when you are sure you understand the question, you go broad and then you narrow back down to come to the end goal. (Organization B)*

The study further suggests that creativity-intensive processes comprise of well-structured, predictable parts (that often do not involve any creativity at all) as well as creative parts; this is epitomized by the property of *varying levels of structure*. In VFX production, for example, the aforementioned production pipeline is a process that generates a particular VFX, such as an animated character. At the highest level, the process is characterized by uncertainty with regard to outcome, process structure, and required resources. Yet, to accomplish the task, various discrete tasks (or sub-processes) must be carried out. Some of these discrete elements can be viewed as well-structured sub-processes with defined outcomes, whereas others are highly creative. The latter ones can be viewed as creativity-intensive (sub-) processes by themselves. Thus, at the highest level, there is a complex creativity-intensive process of which neither outcome nor structure or required resources may be entirely predictable. At the other end, there is the creative process of an individual, such as generating a particular idea or sketch for a VFX shot. Fig. 7.3 exemplifies this for the production pipeline.

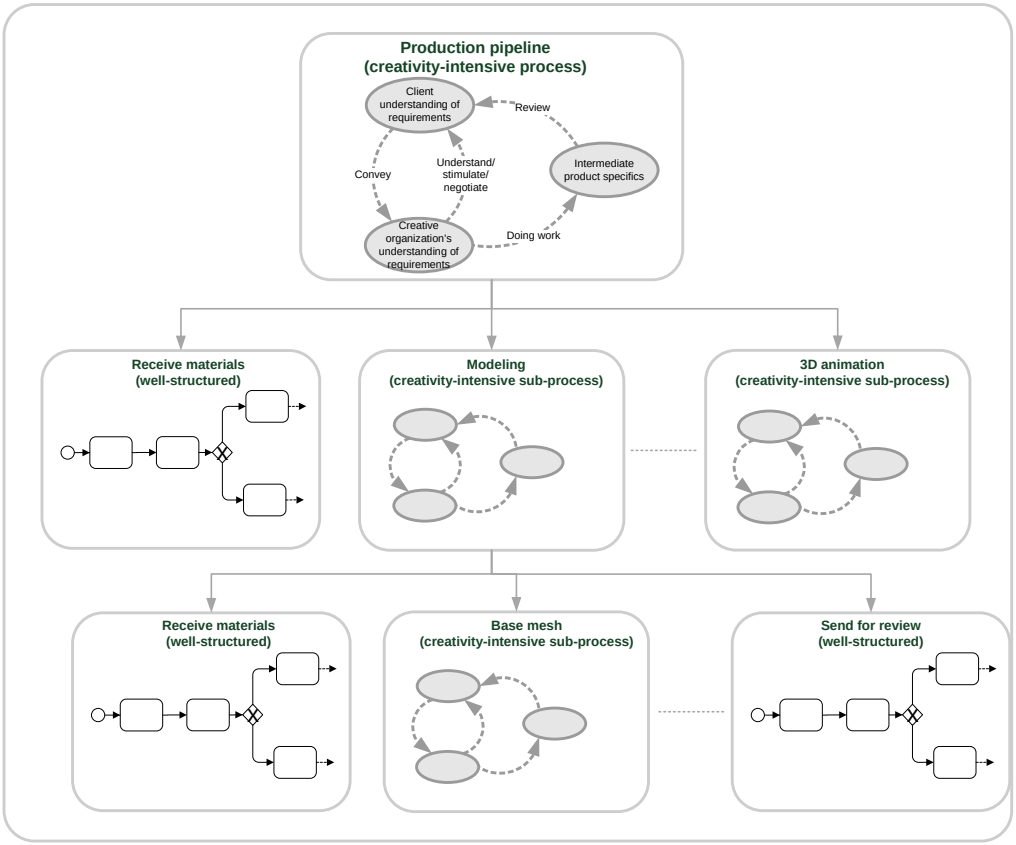

Fig. 7.3: Well-structured and creative parts of creativity-intensive processes

For example, at a high level, the production pipeline can be seen as a constant iteration between understanding the requirements of a shot, generating the shot, and evaluating the shot. However, in order to actually accomplish this, certain discrete tasks (or sub-processes) must be carried out. An example for a well-structured element with a defined outcome is the task of receive materials where materials such as references and scans are received from different sources. Modeling and 3D animation are examples for creativity-intensive sub-processes, where artists generate creative products such as the spider from chapter 4. The dotted lines indicate that a complete production pipeline comprises of many more elements than are depicted in Fig. 7.3. Tab. 7.1 provides a brief description of the above mentioned creative and non-creative (sub-) processes.

Tab. 7.1: Examples for creative and non-creative elements of the production pipeline

Task/sub-process	Description
Receive materials	Receive materials is a task where materials from different sources are received and stored in a database. The task does not include any creative elements. Thus, it is not linked to uncertainty with regard to its outcome. Moreover, it does not rely on highly specialized tacit knowledge and does not require persons to think creatively, that is, diverge from what has been done previously.
Modeling	Modeling is a highly creative task that is carried out by a modeler. The output of this sub-process is a modeling asset which can be referred to as a creative product. The specifics of the product are not entirely known until the task has been carried out.
3D animation	3D animation is highly creative. The sub-process's output is a so-called 3D rendered image sequence. It is characterized by uncertainty with regard to process outcome. Even though certain characteristics of the animation may be known in advance, others are not until the task is completed. The result of 3D animation also highly depends on the animator who carries out the task.

7.4 How Organizations Manage Creativity-intensive Processes

As indicated, organizations apply different strategies in order to manage creativity-intensive processes so as to attain the two primary goals of operational and creative process performance while simultaneously mitigating operational and creative risk. This section provides answers to research questions 2, 3, and 4:

Research question 2. *What particular strategies do organizations use within business processes to manage creativity?*

Research question 3. *How are these strategies combined, and how are they supported by information technology?*

Research question 4. *What are the intended consequences of applying a set of strategies in order to manage creativity in business processes? What are the unintended consequences?*

As shown in Fig. 7.4, the strategies that were introduced in a previous chapter can be related to the different stages of creativity-intensive processes. As has been maintained, it can be distinguished between strategies in communicating with the client and strategies in internally managing creativity-intensive processes (conceptualized as two categories that were grouped under the more general category of *strategies in managing creativity-intensive processes).* The following proposition is suggested:

> ***Proposition 4:*** *Creative organizations seek to achieve both operational process performance and creative process performance. In doing so, they apply strategies pertaining in internally managing creativity-intensive processes and in communicating with clients.*

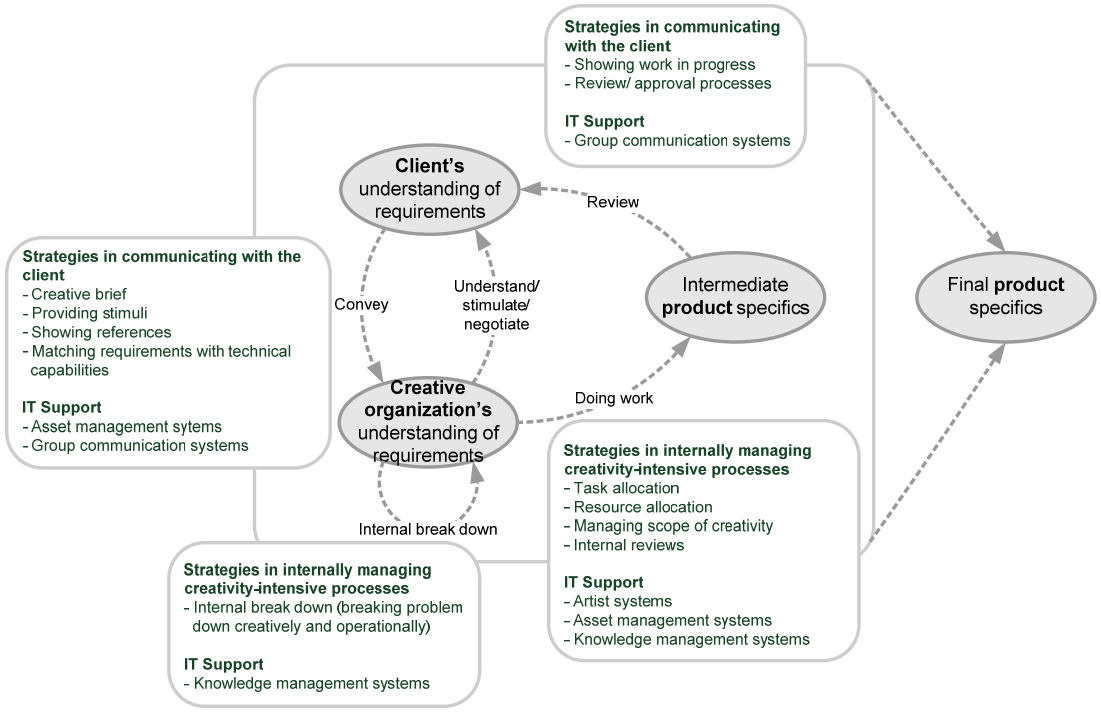

Fig. 7.4: Strategies and IT used in managing creativity-intensive processes

As the requirements of the creative product evolve throughout the process, the degrees of freedom as well as associated risk are highest at the outset when almost any thought is permissible. Fig. 7.5 provides an overview of how requirements and risk develop throughout the process. The model is a simplification in that it describes how the understanding of requirements and the associated risk ideally develop throughout the processes, if the creative organization successfully (a) develops a

good understanding of the client's vision and matches the requirements with the capabilities, (b) breaks down the problem creatively and operationally, (c) manages the process of generating the product, and (d) reviews the product throughout the process.

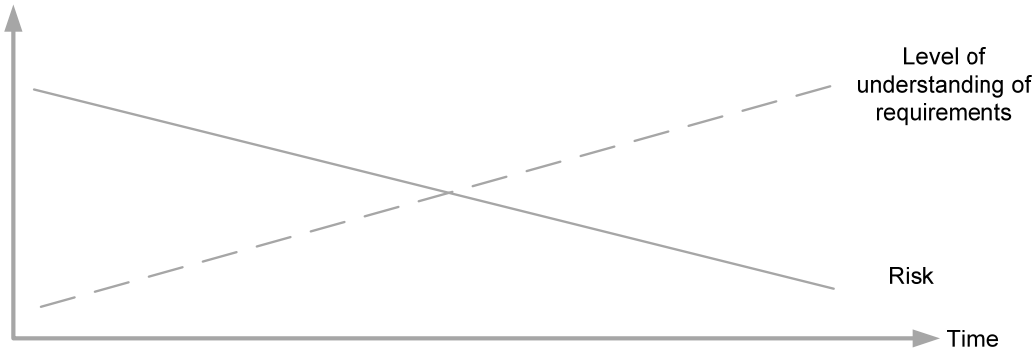

Fig. 7.5: Development of level of requirements specifications and risk in creativity-intensive processes

In the following, first the role of IT in creativity-intensive processes is discussed. This is followed by a discussion of strategies in communicating with the client and strategies in managing creativity-intensive processes internally. The aforementioned tool view of the IT artifact (Orlikowski & Iacono, 2001) is further accommodated by explaining what IT creative organizations use in order to support the different strategies. IT is seen as a resource that is conceptualized as "a particular piece of equipment, application or technique which provides specifiable information processing capabilities" (Kling, 1987, p. 311).

7.4.1 IT in Creativity-intensive Processes

IT plays a major role in supporting creativity-intensive processes (category *IT context)*. Knowledge-related technologies, asset management systems, as well as group-communication systems and artist systems, are used to support different strategies in managing creativity-intensive processes (Fig. 7.6). Moreover, the findings suggest that workflow-related technologies can enhance the process performance of creativity-intensive processes. However, these systems must be capable of handling a high demand for flexibility, such as a lack of pre-determined process-flows and the prevalence of high numbers of exceptions.

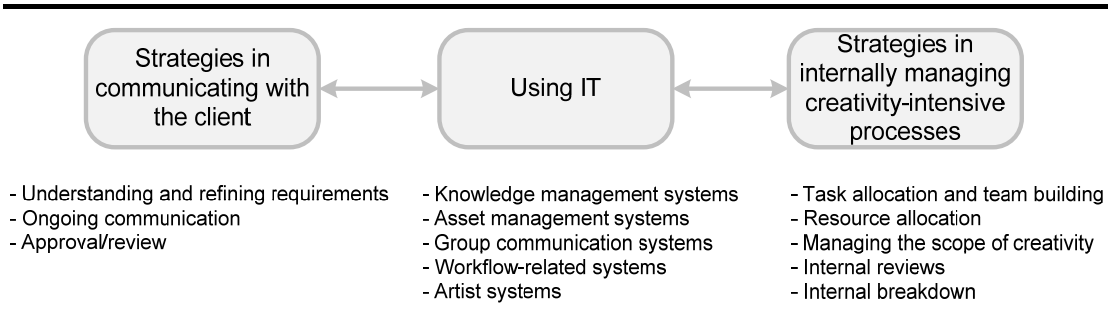

Fig. 7.6: The relationship between IT use and strategies in managing creativity-intensive processes

The study suggests that artists have high demands with regard to system design and usability. The following comments made by a production manager (*Interviewee D.1)* exemplify this (translated from German):

> *The challenge is that requirements to an IT system are different as if one had to deal with engineers; the requirements to the user interface are different. It needs to be much more intuitive. It needs to be flexible and it must have an attractive design. (Interviewee D.1)*

and

> *Creative people see their creativity being in the foreground. They have fear of contact with systems that appear not to be creative. (Interviewee D.1)*

The study further indicates that, in many cases, the use of IT in creativity-intensive processes is not mandatory. Different creative people approach tasks in different ways. While one artist may use an asset management system in order to retrieve references to previously generated artifacts, another may not. A main reason can be seen in the aforementioned uncertainty with regard to process and required resources. Often there are countless ways an artist may venture in order to solve a particular task. As a consequence, 'bad' design may even prevent artists from using a particular system.

Much of the IT in the case organizations is thus rather used according to a pull-principle where, based on the particular process or situation, creative supervisors and artists decide what of the available IT is used in order to carry out a particular process.

In the following the use of IT within the above introduced strategies is discussed in more detail.

7.4.2 How Organizations Manage Creativity-intensive Processes Externally: Communicating with Clients

The primary cause for the need to apply strategies in communicating with the client must be seen in the high uncertainty that is related to structure, resource consumption, and outcome of creativity-intensive processes. As indicated, this uncertainty is in turn caused by vague requirements specifications and individual characteristics of involved stakeholders (artists, creative supervisors, and clients). Through their communication, creative organizations and clients seek to develop what has been conceptualized as a *mutual understanding of the requirements of the creative product*. High levels of a mutual understanding between clients and creative organizations are associated with lower levels of risk, as the probability of the occurrence of unwanted consequences such as client dissatisfaction decreases.

> ***Proposition 5:*** *Strategies in communicating with the client can further the mutual understanding of requirements of the creative product as well as matching the requirements to the organization's capabilities and available resources, which in turn leads to risk mitigation and higher client satisfaction.*

In order to decide where within the overall process the particular strategies are applied, creative organizations seek to understand where client touch points are located within the process. The study suggests that clients need to be involved particularly in the more creative parts of the process. That is, those parts where there is a lot of uncertainty and thus decisions of high creative impact are made. There is a particular tendency for this to happen at the beginning of creativity-intensive processes. Often, the creative product is developed in an interactive process between creative organization and the client. At the beginning of this process there is the so-called creative brief. Within this process creative organizations even try to stimulate the client's imagination by means of the strategy of *showing references* to previously created products so as to come up with ideas that are both novel and appropriate and thus meet client expectations. Thus, the process of understanding the requirements can be described as a negotiation process between creative organization and clients. In this line of thought *Interviewee B.3* said with regard to understanding the requirements "it almost becomes like a negotiation process".

The study further suggests that the abilities and professional background of the clients have to be considered when managing creativity-intensive processes. Whereas some clients are capable of seeing where a process is heading very early, other clients need to be shown a nearly finished product. These abilities are captured by the

property of *client expertise*. The following quotes exemplify this. All three respondents pointed out that there are differences in the expertise of different clients:

> *[With] a more sophisticated client, we actually probably could jump into 3D and show them the model and say "are you happy with the model like this?" Because […] they are more comfortable seeing the detail. (Interviewee B.1)*

and

> *But we just say "listen, this is only addressing the movement and the performance of the characters." And some clients can review that kind of work objectively, and some can't. (Interviewee B.3)*

and

> *Like an agency person from an advertising agency will need to be handheld a lot more than someone who is from a production company who's been down that road before… (Interviewee C.2)*

Also the nature of the creative product influences how and where the client can be involved. A creative director made the following comment:

> *Sometimes it's a job where it's very, very easy to make something, prototype something very quickly. And there is sometimes a job where there's thousands of computing hours involved. (Interviewee C.2)*

While in the first case the organization can show the client a prototype very quickly, the organization would work with references to previously created artifacts or with style frames of the artifact that is being developed in the second, so as to facilitate communication with the client. The following proposition is suggested:

> ***Proposition 6:*** *Particularly tasks with high levels of uncertainty (and thus high creative potential) require intensive communication with the client in order to create a mutual understanding of process goals and thus mitigate creative risk, that is, the occurrence of unwanted consequences such as client dissatisfaction.*

The creative organization must thus decide very carefully where within a process the client gets involved. This is epitomized by the property of *client touch points* of the category *creativity-intensive process*. Also too much reviewing may even compromise creativity. For example:

> *I think there is a danger in too much reviewing and intruding into the processes So that's why I think normally it's coming from the top down. It should be at defined points. Clearly defined points. (Interviewee A.1)*

Group communication systems can be used to support strategies such as showing work in progress and evaluation of creative products. Group communication systems allow for higher numbers of iterations while simultaneously mitigating creative risk by constantly providing work in progress to the client.

> ***Proposition 7:*** *Group communication systems allow for higher numbers of iterations of the creative product as well as ongoing communication, thereby facilitating the process of creating a mutual understanding of the requirements of a creative product, which in turn leads to risk mitigation and improved client satisfaction.*

Organization C, for example, uses a remote review and approval tool based on *Apple Quicktime* technology. By synchronizing timeline and playback of movies, different parties are able to view the work simultaneously. The tool supports audio-visual communication. It also allows for interaction, as artists and clients can draw on the images they are seeing. The tool thus enables rich communication among geographically distributed stakeholders. The CEO of *Organization B* described the impact of the tool as follows:

> *It enables us to communicate in a way that's so much more powerful than on phone. And all it really is, is the ability to draw an image together. It's a very simple technical problem, but it allows a richness in communication that makes the whole process more effective. (Organization B)*

Moreover, *asset management* systems are used by creative organizations to access existing assets and contents that can be applied in the process of communicating with clients. As indicated, such assets are used to provide reference in order to stimulate the client and negotiate requirements of the creative product.

> ***Proposition 8:*** *Asset management systems can be used to access existing assets that can then be applied in the process of communicating with clients, thereby facilitating the process of creating a mutual understanding of requirements of the creative product, which in turn leads to risk mitigation and improved client satisfaction.*

The following quote exemplifies how *Organization B* uses digital assets:

> *You may take car chases from twenty movies. What we have started to do is keep those on one server. There's a database for keywords and you can look up what's on there. (Interviewee B.2)*

7.4.3 How Organizations Manage Creativity-intensive Processes Internally

As has been maintained, creative supervisors have to manage a process that is characterized by the interplay of artists. In the following, strategies and IT are discussed that are applied to manage creativity-intensive processes internally. There is a close association with the relationship and interaction between clients and creative organization (i.e. the strategies described above). The study suggests that creative organizations apply strategies in internally managing creativity-intensive processes in order to pursue both operational and creative process performance while simultaneously mitigating operational and creative risk.

> ***Proposition 9:*** *Strategies in matching capabilities with requirements, managing the scope of creativity, resource allocation, and internal review lead to enhanced operational and creative process performance and the mitigation of creative and operational risk.*

The level of creativity (property *creative potential)* associated with a creativity-intensive process is restricted by requirements specifications as well as available resources such as time and budget. The creative supervisor must ensure that all participants work towards one goal, particularly when different creative teams are working together. In some cases this requires the creative supervisor to encourage people to be more creative (to generate products that diverge from what has been done before), whereas in some cases creativity needs to be restricted. One supervisor put it as follows:

> *Everybody has their own creative agenda. They are trying to push sometimes on their job so you have to try and stem that somehow; you have to give people latitude to be creative, but not that creative that everybody is driving a project in different ways and it falls over. (Interviewee C.2)*

Thus, the strategy of *managing the scope of creativity* varies on a dimensional range from restricting creativity to encouraging people to be more creative.

Review processes are also used internally in a similar manner to strategies for communicating with the client, both for quality assurance (technical aspects) and for internal creative feedback. For internal review processes, the intended consequence is likewise to meet requirements specifications and to mitigate risk (by recognizing

errors early in the process, for example). Particularly where high latitude is allowed by management, both internal and external approval processes are needed, so as to avoid unwanted consequences (risk mitigation).

Another important strategy is that of resource allocation. Creative supervisors have to decide what resources are allocated to what task. Often, resources are allocated to tasks with particularly high creative impact. If there is a lack of resources for a creative task (or creativity-intensive sub-process), creativity can be compromised. Due to the complexity of the work and due to uncertainty with regard to outcome, process structure, and required resources, resource allocation is a complex process. First, time and budget must be allocated. Moreover, there is a close relationship to the allocation of artists as well as other resources, including IT. The following comment that was made by a creative supervisor from *Organization B* exemplifies this complexity. He also pointed out that all these decisions ultimately impact on the artist's work:

> *When we look at the production we have to figure out what kind of people we want to bring on, what kind of applications we are going to be using. Because a lot of times, even though we have an established pipeline using certain software, depending on the work, we may have to get different software. So that has to be taken into consideration. We also have to think about machines, what kind of machines we are going to need, how much disk space we are going to need. So all of those things end up impacting our artists' work. (Interviewee B.3)*

The following comment highlights how resource allocation impacts on the creative potential:

> *You just want to be able to focus on those other areas that you know are going to be a lot more complex, where there will be a lot of creative decisions that have to be made. So in those areas you do want to make sure that you have ample time, ample people. (Interviewee B.3)*

The study suggests that asset management systems are used to access existing assets that are then used in order to generate creative products. As indicated, in many cases being creative means to draw from artifacts and ideas that have been created previously. Thus, supporting creativity-intensive processes with asset management systems can increase productivity and creative output.

> ***Proposition 10:*** *Asset management systems can be used in order to facilitate access to existing assets and contents that can be used to provide reference and can also be reused. Thus, these systems can facilitate the process of ge-*

nerating the creative product and positively influence creative and operational process performance.

Moreover, different systems such as task lists are used to support processes in the case organizations (epitomized by the category of *workflow-related systems)*. For some tasks, such as the production of VFX, highly specialized systems are used to support artists in conducting various steps of the process. The main purpose of such systems is regarded as that of giving people more time to be creative, by supporting repetitive and well-structured parts of creativity-intensive processes, while simultaneously handling the complexity of artifacts (particularly in VFX production and animation, shots consist of hundreds of artifacts). However, no comprehensive process support for entire processes is used. The study suggests that this is due to the high demand for flexibility in creativity-intensive processes. These tend not to have a pre-determined process flow and are characterized by many possible exceptions.

Proposition 11: *Workflow-related systems such as task lists can be utilized to facilitate the process performance of creativity-intensive processes by handling the complexity of creative artifacts and supporting the well-structured and pre-determined parts of the processes. In turn, such systems provide creative people with more time to be creative, thereby resulting in higher creative and operational process performance, which in turn leads to increased client satisfaction.*

Knowledge management systems are used in both organizations *B* and *C*. Much of the knowledge that is applied within creativity-intensive processes is tacit knowledge, often of freelancing people. Organizations thus seek to explicate and store this knowledge in knowledge bases in order to make it available for the entire organization. The study suggests that knowledge management systems can help to transfer knowledge among artists and can be particularly useful in supporting operational process performance.

Proposition 12: *The use of knowledge management systems enables to store and access explicit knowledge that can be applied in creativity-intensive processes, thereby leading to enhanced operational process performance.*

Tab. 7.2 provides an overview of how the different IT systems relate to the strategies that creative organizations apply in order to effectively carrying out creativity-intensive processes.

Tab. 7.2: IT in creativity-intensive processes

IT System	Role in creativity-intensive processes
Knowledge management systems	Creativity-intensive processes are knowledge-intensive and particularly characterized by the application of tacit knowledge. Knowledge management systems are used with the primary purpose of knowledge transfer between different individuals.
Assert management systems	Asset management systems can provide access to previously defined artifacts. Therefore, they can assist the stage of requirements determination as well as the actual creative work as existing artifacts may be re-used.
Group communication systems	Group communication systems support various stages of the process, starting with requirements determination, showing work in progress throughout the process, and evaluating artifacts.
Workflow-related systems	Workflow-related systems can increase the efficiency of well-structured parts of creativity-intensive processes. In turn, this can lead to more creative space in order to carry out creativity-intensive processes and thus result in better creative performance. Workflow-related systems such as task lists also facilitate the strategies of task allocation and resource allocation.
Artist systems	Artists systems are used by the artists in order to generate creative artifacts. Thus, these systems are used in the stage of doing work.

7.5 Patterns of Creativity-intensive Processes

It is possible to distinguish between different patterns of creativity-intensive processes that depend on the contextual factors that were discussed above. The following comment highlights the complexity of the processes that were investigated within this study:

> *If there was one client and there was one artist they can just talk to each other all time. What happens is, when you work on a movie that is bigger, you need people like me, you need producers. And what you are trying to do is to be able to talk to one or two clients, […] talk to as many artists as you need to get the job done. (Organization B)*

For example, there are processes with a particular emphasis on the stage of understanding and refining the requirements. Only when a very detailed understanding of the requirements is reached, the creative organization starts to physically generate the actual creative product. In another case the creative organization may very quickly start to physically generate the product and provide the client with a prototype.

Also within the different stages of creativity-intensive processes different patterns occur. For example, within the stage of understanding and refining the requirements, the creative organization may, in a largely divergent process, come up with a big number of different options among which one is selected, discussed, and eventually

produced. However, the creative organization may also start with one option which is then, in an iterative process, further developed before it is actually physically generated.

7.6 Chapter Conclusion

This chapter introduced a substantive theory on creativity-intensive processes by presenting an integrated theoretical scheme that links the major categories that were identified in the study to the core category of the *creativity-intensive process*. In order to fully understand the theory, however, also the previous chapter, which provided a detailed account of the various categories, must be considered. Thus, the emergent theory has been presented by describing its constituent categories that were then integrated into a substantive theory. The substantive theory was described by means of two main figures, textual description, and a set of interrelated propositions. The latter ones are intended to provide a concise description of the study's key findings.

8 DISCUSSION OF FINDINGS: RELATING THE THEORY TO THE LITERATURE

Your theory is crazy, but it's not crazy enough to be true.

Niels Bohr

8.1 Chapter Introduction

The theoretical model presented in this paper was developed within, and is applicable to, the institutional context of a substantive area. It is hoped that engaging with aspects of existent formal theory will facilitate a more general substantive theory (Glaser & Strauss, 1967; Eisenhardt, 1989; Orlikowski, 1993). As indicated, the ultimate relevance of the existing literature would be determined by the emergent theory (Urquhart & Fernández, 2006; Urquhart, 2007; Urquhart et al., 2006). The emergent theory indicates a set of contextual factors, strategies, and consequences that are of relevance with regard to the management of creativity-intensive processes. These concepts and relationships are now compared with those from the related literature. Due to the variety of literature both in the fields of BPM and creativity, it cannot be claimed to be exhaustive in the attempt to engaging with existent theory. The chapter is subdivided into two main sections. Chapter 8.2 considers the literature on creativity, most notably organizational theories on creativity. Chapter 8.3 considers the BPM and IS literatures.

8.2 Relationship to Literature on Creativity and Creativity Management

In the presentation of the first, non-committal literature review (chapter 2.4) it was argued that the theoretical investigation of creativity requires the consideration of multiple levels. These are in particular the individual, the group, and the organizational level (Drazin et al., 1999; Woodman et al., 1993). This distinction is now used in order to engage with existent theory at various levels (chapters 8.2.1-8.2.3). Then the theory is related to multilevel models of organizational creativity (chapter 8.2.4) and compared and contrasted with models of the creative process (chapter 8.2.5).

8.2.1 Relationship to Theories at the Individual Level

With regard to the *4-Ps model*, theories at the individual level predominantly focus on the creative person and her ability to act creatively. The present study reveals that artists, creative supervisors, and also clients may be regarded to as creative persons; they are actively engaged in contributing their creativity to the process of generating

creative products. The study thus provides a more specific understanding of different creative persons that contribute to the context of, and are actively involved in, creativity-intensive processes. Consequently, these categories are now related to individual views on creativity.

Much has been written about the concept of the creative person over the years. For example, there are detailed accounts of antecedent conditions (Galton, 1869; Simonoton, 1975), personality factors (Woodman & Schoenfeldt, 1989), cognitive factors (Guilford, 1984), intrinsic motivation (Amabile, 1990), or knowledge (Weisberg, 1999). Woodman et al. (1993) conclude that individual creativity is a function of antecedent conditions, cognitive style, personality factors, relevant knowledge, motivation, social influences, and contextual influences.

With regard to relevant knowledge and expertise, Amabile (1988) distinguishes between domain-relevant skills and creativity-relevant skills. Whereas the former include knowledge about the domain, required technical skills, and domain-relevant talent, the latter one captures personality factors and cognitive style (Amabile, 1988, p. 84). Creativity-relevant skills thus work on a rather general level. Similarly, the present study suggests *process expertise* and *creative skills* as main properties of artists. *Process expertise* captures process-related abilities such as assessing, breaking down, and carrying out a process. In comparison to the concept proposed by Amabile (1988), *process expertise* can be seen as being more substantial with regard to the context that was studied; it particularly reveals those aspects that were seen relevant by respondents with regard to managing creativity-intensive processes. The ability of generating creative products is represented by the property of *creative skills*. The study identifies two major facets of this property: being able to generate creative products and the capability of aesthetically judging a product; the latter one is important in order to mitigate creative risk, for example. Amabile (1998), in comparison, describes creative thinking skills as a person's capacity of putting existing things together in a novel way. In this line of thought, this study indicates that the reuse of previously created knowledge and artifacts plays a prominent role in generating creative outcomes.

While the property of *creative skills* epitomizes a person's capability of generating creative products, it does not explain the factors that impact on this capability. Existent theories can thus help to further explain a creative person's capacity of acting creatively. Cognitive processes and factors that impact on idea production include fluency, flexibility, originality, elaboration, transformation abilities (Guilford, 1983; Guilford, 1984), as well as field dependence (Witkin et al., 1962). Particularly diver-

gent thinking or divergent production have been discussed as being one of the main cognitive abilities that lead to creativity (Guilford, 1956; Guilford, 1984). As Runco (2007) puts it, "divergent thinking leads the individual to numerous and varied responses" (p. 9). Consequently, cognitive models can also help to further understand the main properties of creativity-intensive processes (i.e., *uncertainty with regard to process structure*, *resources*, and *outcome)*. As divergent production means to try out "solutions that depart from the status quo" (Amabile, 1998, p. 79), it can be concluded that there is an intimate connection to low levels of predictability and thus high levels of uncertainty.

It has also been asserted that, in order to produce purposeful products, creative persons sequentially apply divergent and convergent thinking processes (Basadur et al., 1982). Woodman et al. (1993) conclude that "for a creative person to produce socially useful products, his or her divergent thinking must come hand in hand with convergent thinking" (p. 299). The sequence of divergence and convergence also became apparent in the present study. At various levels (individual, group), creativity-intensive processes are characterized by a sequence of divergent and convergent thinking. With regard to the overall process (such as the production of a particular VFX sequence), the organization may start with the exploration of various options that are then presented to a client. Next, in a convergent process, one possible solution is selected and the product is generated. Along the line of this generation, however, groups and individuals bring in their creativity; this is often characterized by divergent thinking; i.e. exploring various novel paths and ideas. Isolated solutions must eventually fit into the overall product, which, in turn, is a rather convergent process. The dichotomy between divergent and convergent production may also help to further explain the occurrence of risk and the gradual development of the understanding of requirements throughout the process. While the early stages of creativity-intensive processes are largely characterized by divergent thinking, the focus shifts toward rather convergent thinking as the process enfolds over time; more and more decisions are made that merely need to be implemented.

Besides the two properties of *process expertise* and *creative skills* of the category of the *artist*, the present study also posits the relevance of knowledge within creativity-intensive processes. Knowledge is relevant to both *process expertise* and *creative skills*; both high levels of *process expertise* and *creative skills* tend to be associated with high levels of knowledge and experience. The study suggests that creative organizations aim at fostering the knowledge of artists and supervisors by facilitating knowledge transfer. The strategy of *team building*, for example, is used in order to disseminate knowledge by putting together more senior and more novice people.

Moreover, the case organizations make use of technologies such as wikis and blogs so as to facilitate knowledge transfer.

The property of the *creative agenda* of the category *artist* is closely related to the concept of intrinsic motivation, which has been discussed in the literature (Woodman et al., 1993; Amabile, 1998; Barron & Harrington, 1981). Amabile (1998), for example, distinguishes intrinsic and extrinsic motivation and concludes that the former is the far more important one with regard to a person's creativity. The present study reveals that, with regard to managing creativity-intensive processes, creative supervisors seek to manage the scope of creativity by allowing people to follow their creative agenda while simultaneously working towards the process goals. Thus, creative supervisors particularly aim at fostering intrinsic motivation.

With regard to motivation of creative people, it has been posited in the related literature that evaluation and reward systems can adversely affect creative performance (Amabile, 1983). In line with this, the data from the case organizations did not suggest that extrinsic motivation, such as extra money, plays a prominent role in creativity-intensive processes. Yet, one of the main findings of the present study is that approvals/reviews are one of the most relevant strategies that are applied by creative organizations with the purpose of mitigating operational and creative risks. However, these reviews/approvals do not aim at evaluating the creative person, but the creative product, in order to guarantee that it will meet the client's expectations. In fact, feedback provided by reviews and daily meetings (so-called dailies) are seen as fostering intrinsic motivation; these meetings are held in a democratic, collaborative way, where everybody has the right to bring forward their opinions and ideas. The findings with regard to review/approval hence do not contradict the existent literature that posits that evaluation and reward systems may adversely affect intrinsic motivation. On the contrary, the existent literature can complement the understanding of the role of approval and review processes; apparently, creative supervisors have to be cautious about how these approvals are conducted.

Moreover, the present study reveals other relevant properties, namely *working style*, *location*, and *the understanding of the requirements of the creative product* of the category *artist*. The nascent theory explains how these properties are considered by creative supervisors when managing creativity-intensive processes. Particularly the property *understanding of requirements of the creative product*, which is shared by the categories of the *artist*, *creative supervisor*, and *client*, turned out to be one of the primary factors that shape creativity-intensive processes. The study reveals strategies in communicating with the client that are applied with the purpose of creating a mu-

tual understanding of the requirements. Further relevant properties of creative supervisors are their *supervising expertise*, their *accountability*, and their *role as a process intermediary*. Also, creative supervisors develop an understanding of the requirements of the creative product. Similarly, clients have a certain level of expertise (property *client expertise)* and a location that impact on the creativity-intensive process and the way it can be managed.

It can be concluded that the present study complements, and can be complemented by, the existent literature on antecedent conditions, cognitive factors, personality, knowledge, and motivation of creative persons. First, from a BPM perspective, it provides a more specific picture of creative persons by distinguishing different creative roles within creativity-intensive processes. Such a detailed view is desirable in order to understand the complex interplay of different roles that are salient in creativity-intensive processes. The study further contributes to the literature by identifying those properties of creative persons that are of particular relevance when managing creativity-intensive processes. For example, the study indicates that for process managers in creative organizations it is important to understand the process-related skills of the involved actors, including their ability to assess what it takes to carry out or to break down a particular process. At the same time, concepts from the literature enable to enhance the explanatory power of the categories of the *artists*, the *creative supervisor*, and the *client* by providing, and explaining, antecedent, personality, and cognitive factors that impact on a person's capacity of acting creatively. While it is expected that much of what the study has revealed is applicable to other contexts, this transfer will require further empirical research.

8.2.2 Relationship to Theories at the Group Level

Thus far, the encounter with the related literature has focused on the personal factors or properties of creative persons that impact the process. Yet, as has been argued earlier, organizational creativity does not take place in isolation. Williams and Yang (1999), for example, identify a conflict between "the creative thinker whose ideas are fostered through solitary, focused work" and the "team-oriented, organizational leader who focuses squarely on working with others within the system" (p. 389). The present study reveals that creativity-intensive processes are highly collaborative. They involve teams of artists, clients, as well as organizational leaders, who were conceptualized by the category of the *creative supervisor*. Thus, creative organizations are forced to find a balance between both types of creative acting. While they are forced to collectively work on creative products, they must also support artists in their individual creativity.

At the group level, theories suggest various characteristics of successful creative groups. Important concepts are leadership, group composition, group structure, cohesiveness, and resource availability (e.g. King & Anderson, 1990; Payne, 1990). Generally, creative groups should be heterogeneous and not too large (Amabile, 1998; Paolillo & Brown, 1978) and leadership should be democratic and collaborative, so as to allow for maximal creative performance (King & Anderson, 1990). Aspects such as leadership and group composition have implications for the categories *creative supervisor* and *strategies in internally managing creativity-intensive* processes in particular. One of the main strategies in internally managing creativity-intensive processes is that of team building. The study suggests that creative supervisors consider properties such as *process expertise* and *creative skills* in order to make sure that teams have the capabilities that are required to carry out certain tasks. Moreover, teams are often built in a way that is thought to facilitate knowledge transfer (e.g. by composing teams of both senior and novice artists).

The related literature suggests that if very creative (heterogeneous, democratic) groups carry out certain tasks, there will be a tendency for this to lead to high uncertainty with regard to process and outcome (e.g. Amabile, 1998). Consequently, creative supervisors need to decide carefully where within the creativity-intensive process high uncertainty is desirable in order to enhance the creative potential. Existent models can thus further the understanding of the strategy of *team building*.

It has been asserted that group performance (the creative output of a group) is reduced due to errors in task performance strategies, such as poor integration of the members' efforts (Woodman et al., 1993; Hackman & Morris, 1975). Problem-solving within groups can become more effective by training in problem-solving skills (Bottger & Yetton, 1987). It has also been asserted that the success of a group depends on the weight that is given to the responses of the most capable persons of the group (Yetton & Bottger, 1983). These insights may be conducive to the application of strategies in order to manage creativity-intensive processes so as to enhance the performance of the overall group.

With regard to social information or social knowledge, Woodman et al. (1993) write that "groups provide an arena in which members can use others as resources to augment their own knowledge. In this manner, the member does not just add to his own knowledge but uses others' knowledge to stimulate the usefulness of his or her skills" (p. 303). The present study reinforces the role of knowledge of group members. One of the study's main findings is that stimuli provided among group members (artists, supervisors, and clients) are seen as being of high relevance for the

group's creativity. The case organizations thus seek to make existent knowledge available and to disseminate this knowledge among group members. In a broader sense, this knowledge includes artifacts that have been created previously. This is in concurrence with Woodman et al. (1993) who further write that "other types of information available in the work context will affect individuals and group processes/outcomes" (pp. 303-304).

It can be concluded that the existent literature on creativity at the group level supports and complements the findings of the present study. Teams in the case organizations, for example, turned out to be characterized by democratic and collaborative leadership. All creative workers who were interviewed in the case organizations perceived themselves as team players contributing to a creative process. The role of the creative supervisor as the team-oriented leader turned out to be crucial for both accomplishing business goals, such as resource and time efficiency, as well as creative performance. The existent literature complements the present study by providing an in-depth understanding of different factors related to group composition, group characteristics, and group processes. At the same time, concepts that were presented in this study complement existent models by explaining specific strategies in managing creative, client-focused, interdependent, and repetitive business processes. The process-centric view provides a novel perspective on creative groups, their interactions, and management strategies that are applied within creative organizations.

8.2.3 Relationship to Theories at the Organizational Level

At the organizational level, existent theories reveal factors that influence the so-called organizational climate which, in turn, influences creative performance (Runco, 2007; Ryhammer & Smith, 1999). Important factors include encouraging risk taking, supporting the free exchange of ideas, legitimization of conflicts, and the separation of the generation of creative products and their evaluation (Cummings & O'Connel, 1978; Basadur et al., 1982). Another group of contextual influences on creativity is the availability of creativity training programs (Wheatley et al., 1991).

Some of these factors are also indicated by the present study. Examples include the free exchange of ideas, as well as the separation of the generation of creative products and their evaluation through approval processes. Yet, it became evident that there is an intimate connection between doing creative work and approval. As the processes that were investigated are client-focused, every creative product must, above all, meet the client's expectations. Likewise, a climate of risk taking was observed as organizations are aware of creative risks, but seek to mitigate these by implementing according strategies. Thus, the process-oriented perspective exhibits

when within creativity-intensive processes risk taking is explicitly encouraged. One of the study's main findings suggests that these sections are associated with high levels of uncertainty and creative potential.

Another factor that has been paid attention to is that of information exchange or communication both within the organization and with the external environment (Woodman et al., 1993; Cummings & O'Connel, 1978). It has been asserted that an organization's ability to use external information is crucial for its innovation (Cohen & Levinthal, 1990; Zahra & George, 2002). This is congruent with the findings of the present study, which indicate that organizations use external information to learn about what has been done previously, for example. Searching the web for existent artifacts in order to generate stimuli is a typical strategy. Moreover, the case organizations foster intra-organizational exchange of ideas through internal reviews and the use of knowledge management technology.

Altogether, the proposed theoretical framework can be enhanced by the concept of the organizational climate. Moreover, creative organizations may consider formal creativity training programs.

8.2.4 Relationship to Multilevel Models of Organizational Creativity

How does the model presented in this research relate to the rather complex models of organizational creativity as proposed by Woodman et al. (1993) and Drazin et al. (1999)? The question has been partly answered in chapter 2 when it was argued that the study would investigate a particular type of processes (those that can be described as creative, intensively involving the client, interdependent, and repetitive) and would particularly focus on the dynamics of creativity-intensive processes and on how the processes can be managed. In contrast, Drazin et al. (1999), for example, investigate a particular type of process that they describe as "an interdependent, complex, large scale, long duration organizational project" (1999, p. 287).

As the above encounter with the related literature has shown, the present model also complements, and is complemented by, the complex model that has been proposed by Woodman et al. (1993). Their model provides a comprehensive account of factors that impact organizational creativity, group creativity, and individual creativity. As the above discussion has shown, these factors can be used in order to enhance the explanatory power of the concepts that constitute the substantive theory developed in this study.

In summary, the process-oriented view that has been suggested in the present study offers a perspective on creativity that involves individual, group, and organizational, as well as creative and non-creative aspects at the same time. Considering existent theories at individual, group, and organizational level fosters the understanding of central categories, including roles such as artists and supervisors, but also strategies that are applied in order to manage creativity-intensive processes. Fig. 8.1 provides an overview.

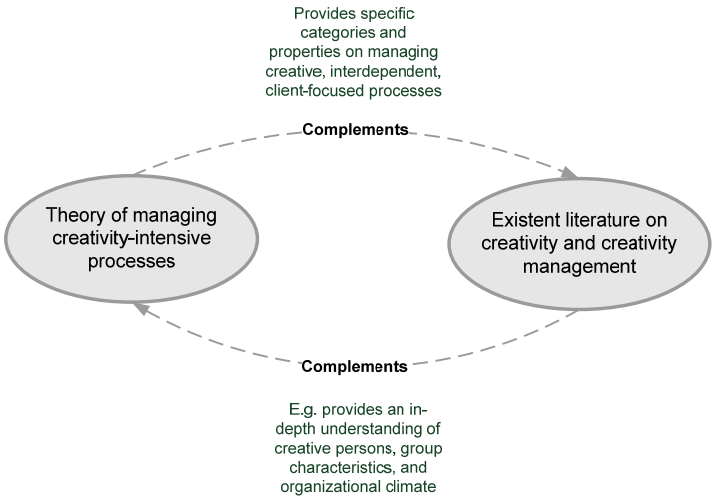

Fig. 8.1: Relationship between existent literature on creativity and the present study

8.2.5 Relationship to Models of the Creative Process

Thus far, the emergent theory has been related to theories at the individual, group, and organizational level. For the most part, these theories explain independent variables that impact the dependent variable of the creative outcome. Thus, the above discussion was led in a predominantly functionalist-reductionist manner (Rousseau, 1985), where creativity is seen as an outcome, rather than a process. In the following, process models of creativity are discussed and related to the present study.

Research on the creative process started in the first half of the 20th century (e.g. Wallas, 1926; Patrick, 1935; Hadamard, 1945). The original so-called four stage model comprises of the stages (1) preparation, (2) incubation, (3) illumination, and (4) verification (Wallas, 1926). The model has influenced various influential researchers (e.g. Osborn, 1957), and even more recent studies draw on it (e.g. Amabile, 1988). Yet, there are other studies that reject the potentially superficial four stage description in favor of an integrated approach (e.g. Ghiselin, 1963). Consequently, in the second half of the twentieth century, particular attention was paid to more detailed

sub-processes that are involved in creativity (e.g. Ochse, 1990; Sternberg & Lubart, 1995).

In his discussion of existent models of the creative process, Lubart (2001) concludes that “several key questions about the creative process remain” (p. 301). These questions include the differences between creative and non-creative processes, the question of to what extent creative processes are recursive, or the generality of the creative process. With regard to the last aspect, for example, he notes that ”there may be a difference between the creative process involved in online productions, such as acting or playing improvisational jazz, and offline productions, such as writing a script for a play or composing a symphony” (Lubart, 2001, p. 304).

Moreover, as has been asserted by Drazin et al. (1999), in the literature on creativity “there seems to be an implicit assumption, that the creative process is alike at all levels of analysis – that is, for individuals, groups, and organizational systems” (p. 288). With regard to BPM such an assumption cannot be made. Business processes vary on various organizational levels, involve different resources, and are highly dependent on a complex interplay of organizational variables.

An in-depth understanding of the above described issues becomes critical when organizations seek to manage business processes that include creativity. For example, it must be assumed that business processes that contain creativity are by no means solely creative but also involve rather transactional and technical tasks. Moreover, process managers are forced to understand the processes’ nature including involved sub-processes and recursion. In particular, in the present study it is argued that models must be capable of linking stages and sub-processes of organizational creative processes to strategies and IT systems that organizations use in order to successfully manage their processes. It cannot be assumed that the creative output is the only relevant measure, as organizations have to consider business imperatives such as time, cost, and resource consumption.

The study shows that typical stages such as incubation and verification (Lubart, 2001) of individual creative processes can also be found in organizational creative processes. Thus, organizational creative processes can be seen as up-scaled individual creative processes where the single creative individual is replaced by a creative organization where various individuals in a complex interplay generate what can be referred to as the creative product. Consequently, creativity can no longer be viewed as a solely individual act of imagination, but a collaborative effort of organizational stakeholders that requires much communication, inhibits great conflict potential, and thus requires organizations to use certain strategies in order to successfully manage

this organizational creative process. In other words, at the one extreme there is the painter who draws a painting. Incubation, iterations through product development, and all the reviews happen in her head. At the other extreme there is the production of a movie where hundreds of creative people must be coordinated in order to collaboratively generate a very complex creative product.

8.3 Relationship to the IS and BPM Literatures

Having discussed the relationships of the emergent theory to the existent literature on creativity and creativity research, the present study is now related to the literatures on IS and BPM. Once more, it must be noted that it is not claimed that the attempt in engaging with existent theory has been exhaustive. Instead, four themes were selected that emerged as being particularly relevant to this study. First, the relationship to knowledge-intensive processes is discussed (chapter 8.3.1). The study has affirmed that there is a close relationship between knowledge-intensive processes and what has been identified as creativity-intensive processes. In particular, the concept of what will be referred to as the *creative worker* is discussed in this context. Second, the relationship to the knowledge management literature is conversed (chapter 8.3.2). The study posits that knowledge creation, storage, and transfer play a salient role within creativity-intensive processes. Third, the relationship to the concept of the process manager is elaborated (chapter 8.3.3). This topic was chosen grounded in the emergence of the category of the *creative supervisor* that takes a central role in the management of creativity-intensive processes. Fourth, the study is related to the treatment of creativity in the IS literature (chapter 8.3.4).

8.3.1 Relationship to the Literature on Knowledge-intensive Processes

In the noncommittal literature review (compare chapter 2), particularly the work on knowledge-intensive processes and knowledge workers was considered. The study has shown the existence of many parallels between knowledge-intensive processes and what has been identified as creativity-intensive processes. Considering Davenport's (2005) model (compare chapter 2.3), the investigated processes can be framed as belonging to the collaboration model. In conclusion, it is proposed to view creativity-intensive processes as a sub-class of knowledge-intensive processes that are characterized by high levels of collaboration, judgment, and, in particular, uncertainty with regard to process outcome, required resources, and process structure. Put simply, creativity-intensive processes are knowledge-intensive processes that generate creative products.

Davenport (2005) further argues that knowledge work processes may be subdivided into their constituent stages. He notes that some of these stages may be more suitable for structuring than others. Obviously, this is similar to what has been conceptualized as *varying levels of structure* in the present study. What Davenport describes as those sections of a process that are less amenable for structuring is comparable to what has been called *creativity-intensive sub-processes* (an alternative notion is that of a *pocket of creativity*). In brief, Davenport (2005) suggests viewing knowledge work as a process. However, he argues, one must be cautious to not exclusively rely on the process perspective as much of this work is not well-structured. This is congruent to the findings of the present study, which provide a process-centric view on creative work. The study indicates that creativity-intensive processes comprise of both well-structured and highly creative parts. The processes are further highly iterative and collaboration- and communication-intensive.

As indicated in chapter 2 on the non-committal literature review, Harmon (2007) introduces a continuum where "ordinary workers" work on simple procedural processes, knowledge workers on more complex processes, and experts on unique and extremely challenging processes. The present study has shown that artists deserve special attention. It is thus proposed to extend the continuum with the role of *creative workers*, which is a generalization of the concept of the artist. Alike experts, creative workers work on unique and extremely challenging processes. And although Harmon states that expert work can involve the creation of new products and even writes that it "involves thought and creativity" (p. 278), it is this author's belief that it is necessary to further distinguish between those experts whose work often relies on convergent thinking and those whose tasks are primarily characterized by originality, divergent thinking, and exploration. A business consultant, for example, in many cases has to solve problems through the application of complex methods from operations research. Without any doubt, this consultant is an expert worker. However, this task would not be a creative task as the solution would not necessarily be novel but only useful. In another situation, the same consultant may be asked to develop a whole new business model, which in fact would be a highly creative task. Another example is software development which, in many cases, will require creativity. Thus, the line between the two types of work is somewhat blurred. Yet, at the same time, there will often be big differences between the work of creative workers and that of other experts. Monetary rewards, for example, may foster the motivation of many experts, while they will not work to increase the intrinsic motivation of the majority of creative workers. Creative workers can thus be framed as experts whose processes are very much characterized by uncertainty and not only require high levels of exper-

tise, but also creative skills. Fig. 8.2 provides an overview of how Harmon's framework may be extended.

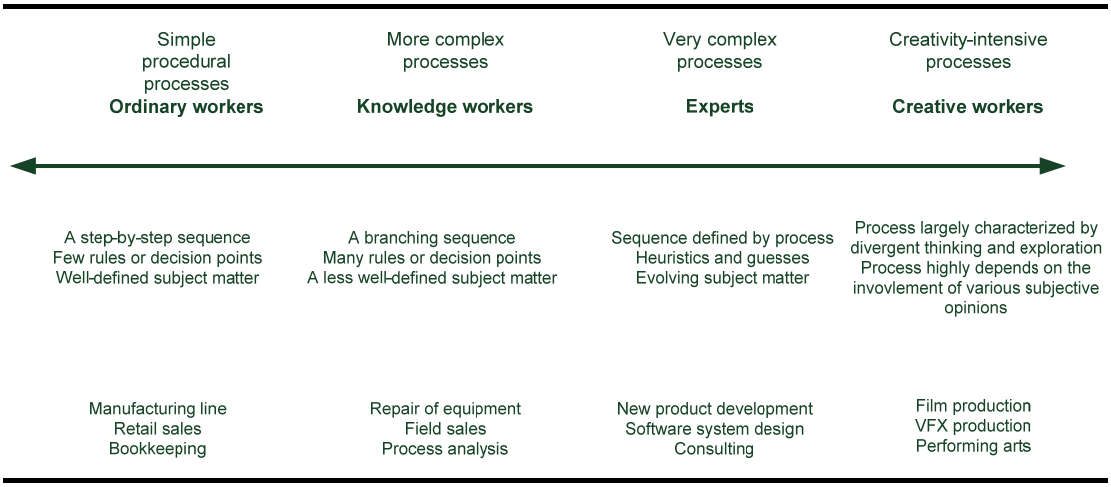

Fig. 8.2: Creative workers in business processes (adapted from Harmon, 2007)

In summary, creativity-intensive processes can be framed as a sub-class of knowledge work (or knowledge-intensive processes). The present study thus complements the BPM literature on these types of processes by providing a substantive theory that is grounded in empirical data. At the same time, existent literature on knowledge management and knowledge work processes can provide additional insights into how creativity-intensive processes can be managed.

8.3.2 Relationship to the Knowledge Management Literature

The emergent theory asserts that knowledge plays a salient role in creativity-intensive processes. This is epitomized by properties such as *knowledge-intensity* of the category of the *creativity-intensive process*, or *process expertise* and *creative skills* of the category of the *artist*. The study thus indicates that, by the application of knowledge management technologies and conscious knowledge dissemination through team building, creative organizations seek to enhance both creative and operational process performance. The literature on knowledge management can help to further the understanding of the role of knowledge with regard to creativity and innovation. The knowledge-based theory of the firm (Cole, 1998; Nonaka, 1994; Spender, 1996) asserts that knowledge has a substantial impact on organizational success and must be considered as a prerequisite for innovation (Nelson & Cooprider, 1996). Knowledge may even be seen as constituting the only source of sustainable competitive advantage (Nonaka, 1991; Kogut & Zander, 1992). Moreover, the literature provides an understanding of different types of knowledge processes that play a salient role in any organization. Alavi and Leidner (2001), for example, identify crea-

tion, storage/retrieval, transfer, and application as four integrated knowledge processes. The literature further identifies different types of knowledge; generally, it can be distinguished between tacit and explicit, and individual and organizational knowledge (Spender, 1996). Both an organization's explicit knowledge base and the capabilities of meaningfully transform explicit into tacit knowledge can be seen as being critical to the process of organizational knowledge creation (Cole, 1998; Nonaka, 1991; Spender, 1996). Knowledge also plays a prominent role with regard to a person's or an organization's capacity of acting creatively. Sheinderman (1998), for example, introduces a framework that posits a number of foundational beliefs; the first one states that "New Knowledge is Built on Previous Knowledge" (p. 90). He further argues that computing technology can be helpful in the otherwise difficult, costly, and time consuming process of locating the relevant knowledge.

The knowledge management literature thus provides an in-depth understanding of how organizations create, store/retrieve, transfer, and apply knowledge. These processes could also be observed within the creative organizations: Knowledge is created within creativity-intensive processes. It is stored within knowledge-based systems, retrieved, transferred, and applied. The study also indicates that the transfer of knowledge is part of strategies in internally managing creativity-intensive processes through team building, for example. It became noticeable that those parts of creativity-intensive processes that are particularly creative also rely on the application of the involved artist's tacit knowledge.

8.3.3 Relationship to the Concept of the Process Manager

The category of the *creative supervisor* emerged as being salient in the context of managing creativity-intensive processes. The study suggests that creative supervisors are responsible for creativity-intensive processes. Harmon (2007) asserts that "for each process, there must be someone who is responsible for the day-to-day functioning of that process" (p. 114). This role he refers to as that of a *process manager*.[9] Process managers carry out the typical management tasks of plan, lead, organize, and control (Harmon, 2007). In the following, some central statements with regard to the role of a process manager are used in order to relate her role to that of the creative supervisor. First, with regard to the responsibilities of a process manager, Harmon (2007) writes the following:"The process manager is responsible for what happens as the process is executed. He or she is also responsible for working with suppliers, customers and support processes to assure that the process he or she manages has the

[9] It must be noted that there are differing definitions of the role of the process manager in the related literature (e.g. Neumann et al., 2003).

resources and support it needs to produce the product or service the process's customer wants" (p. 115).

The key issues that Harmon describes in this paragraph pertain to creative supervisors, too. Creative supervisors work as process intermediaries; i.e. they are responsible for working with involved stakeholders from outside the organization, such as clients. Moreover, they apply strategies such as resource allocation in order to make sure that the process runs smoothly. The study further reveals that creative supervisors are particularly characterized by an intensive involvement into the process. They not only allocate resources and monitor the process, but they are also responsible for making final decisions. Thus, creative supervisors are actively involved in the process of generating creative products. Harmon (2007) makes a further interesting comment with regard to the stage of the process lifecycle in which process managers usually get involved: "Most process managers are assigned to manage an existing process that is already organized and functioning. Thus, their assignment does not require them to organize the process from scratch, but, if they are wise, they will immediately check the process to assure that it is well organized and functioning smoothly" (Harmon, 2007, p. 117).

The present study indicates that creative supervisors in creativity-intensive processes must be able to quickly respond to changing requirements. Much of this is due to the fact that creativity-intensive processes are characterized by uncertainty with regard to process, outcome, and required resources. Consequently, creative supervisors must have particular competencies so as to be able to successfully manage creativity-intensive processes.

Even though none of the case organizations used the terminology of a process manager, there was clear evidence for the existence of roles that, in accordance to the above provided definition, can be framed as process managers. Creative supervisors can be described as operational process managers who are particularly characterized by being intensively involved in the process. Due to the creative nature of the processes, they need the ability and authorization to quickly respond to changing requirements with regard to the process-related object (the creative product) and the process, including process design and resource allocation. The study also reveals that usually there is a hierarchy of creative supervisors (or process mangers) with different responsibilities. In VFX production, for example, creative supervisors may be responsible for the whole production pipeline, for a sub-process (e.g. compositing), or for certain artifacts, such as a sequence or a character. The latter ones may be called sequence or character leads, for example.

8.3.4 Relationship to Creativity Research in the IS Literature

Shneiderman (2000) proposes a research agenda with a set of interrelated activities which he argues could benefit from software support. These are searching and browsing digital libraries, consulting with peers and mentors, visualizing data and processes, thinking by free associations, exploring solutions, composing artifacts and performances, reviewing and replaying session histories, and disseminating results. The present study reinforces the relevance of the majority of these activities within creativity-intensive processes. This research has also shown how creative organizations use software in order to support such activities in real world scenarios. Examples include the use of asset management systems with the purpose of retrieving previously generated artifacts or group communication systems that facilitate consultation with peers.

In the literature, also specific designs have been proposed as a means of fostering both individual and group creativity and have been tested with regard to their influence on creative performance (e.g. Malaga, 2000; Massetti, 1996; Abraham & Boone, 1994; Rouse, 1989; Stenmark, 2001). Basically, so-called creativity support systems (CSS) aim at providing stimuli to users in order to enhance their creative performance. The present study also suggests that providing stimuli is of high relevance within creativity-intensive processes. Asset management systems, for example, are used in order to support strategies for stimulating creativity (such as the strategy of *showing references).*

The existent literature also supports the assertion that group communication systems can further creativity at the group level (e.g. Kristensson & Norlander, 2003; Nunamaker & Appelgate, 1987; Nagasundaram & Bostrom, 1995). This is reinforced by the present study, too. Process managers (creative supervisors) in creativity-intensive processes are responsible for managing communication both within the organization and with clients outside the organization. In doing so, they apply group communication systems in all stages of creativity-intensive processes (i.e. understanding the requirements, doing work, and evaluation).

The present study hence contributes to the discussion of creativity in the IS literature by linking classes of IT systems to particular strategies that are used within creativity-intensive processes. It thus establishes a connection between the processes' dynamics and the use of IT to foster creativity. At the same time, existent IS literature on supporting both individual and group creativity can further the understanding of the use of IT within creativity-intensive processes. For example, creativity support systems may be considered by creative organizations in order to support their crea-

tivity-intensive processes. Therefore, the present study can also contribute to the discussion on creativity support systems by providing a process-centric perspective that may indicate where within complex creativity-intensive processes creativity-support may be needed. Here, the concept of pockets of creativity may provide useful guidance in order to identify those sections.

Other studies relate to how creativity can improve different stages in the process of system design (Maiden et al., 2004; Cooper, 2000; Ocker et al., 1995; Nguyen et al., 2000). It is expected that findings of the present study can also inform the understanding of the system design process. Much of what characterizes creativity-intensive processes in the creative industries is expected to be also valid in the discipline of software engineering. Processes are client-focused and include creativity, for example. Nguyen et al. (2000) state that "early stages of the RE [requirements engineering] process involve developing understanding of a problem situation, the problem domain, and the requirements for achieving improvements in the problem situation" (p. 1). The stage of requirements engineering in software development thus appears to be comparable to what has been labeled the stage of understanding and refining the requirements of the creative product in creativity-intensive processes. Thus, the present study has the potential of further explaining how the process of system design can be managed. However, more empirical research is required as the present study is limited to the substantive area of film and VFX production.

Fig. 8.3 provides an overview of the relationship between the present study and the treatment of creativity in the IS literature.

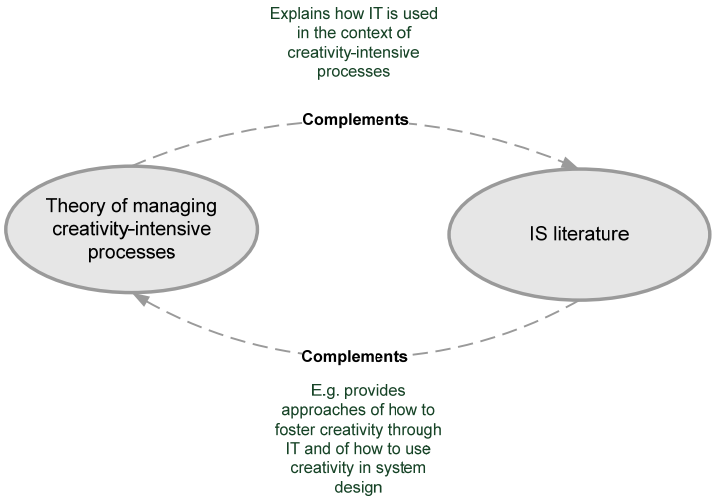

Fig. 8.3: Relationship between the IS literature and the present study

8.4 Chapter Conclusion

In this chapter, the emergent theory was compared and contrasted with existent literature. In doing so, it was related to organizational theories on creativity, as well as to the literatures on BPM and IS. Creativity-intensive processes were classified as a sub-class of knowledge-intensive processes that is characterized by high levels of collaboration, divergent thinking, and high risks due to uncertainty in outcome, required resources, and process structure. Moreover, the chapter showed that the emergent theory largely complements with existent theories on creativity at various levels. Only in some instances, such as the intertwining of reviewing and generating the creative product, potential conflicts were identified. Thus, in order to fully understand the substantive area that was studied, not only the emergent theory, but also existent theories at the individual, group, and organizational level may be considered. Engaging with existent theories also suggests that the nascent theory may be applicable to further areas. Categories such as the artist have been subject to research. However, the emergent theory proposes new properties that contribute to the body of knowledge.

9 CLOSURE

Nothing is as practical as a good theory.
Kurt Lewin

9.1 Chapter Introduction

This chapter concludes the study. In doing so, it revisits the research questions, discusses contributions, as well as the implications the study results have for research and practice. Moreover, limitations of this study are discussed against the background of its interpretive nature and the research method that was applied. Finally, an outlook to the future research agenda is provided.

9.2 Revisiting the Research Questions

Research question 1: *What characterizes business processes in the creative industries and what are the contextual factors that organizations in this industry need to consider when managing these processes?*

The study suggests that business processes in the creative industries (more specifically: in film and VFX production) are characterized by uncertainty with regard to outcome, structure, and resources. They are knowledge-, communication-, and collaboration-intensive and highly iterative. One creativity-intensive process can cover various levels of structure, often ranging from well-structured and highly predictable to highly creative and not having any predetermined structure at all. The study further explains the dynamics of creativity-intensive processes; put simply, they iterate between understanding the requirements, doing work, and review. A number of factors that shape the context in which creativity-intensive processes are carried out emerged from the data. The primary factors that shape the processes are the people who are involved in the processes, as well as certain resource constraints, and the available IT infrastructure. The engagement with existent theory that was presented in the previous chapter advanced the understanding of these salient categories and properties. For example, existent theories further explain concepts such as the creative climate of an organization.

Research question 2: *What particular strategies do organizations use within business processes to manage creativity?*

The study proposes two major types of strategies that organizations in the creative industries use in order to manage their processes: strategies in internally managing creativity-intensive processes, and strategies in communicating with the client. The study further links these strategies to the different stages of creativity-intensive processes.

Research question 3: *How are these strategies combined, and how are they supported by information technology?*

The study explains how strategies are combined (e.g. showing references and providing stimuli) and what IT systems organizations use in order to support these strategies (e.g. asset management systems in order to support the strategies of showing references and providing stimuli).

Research question 4: *What are the intended consequences of applying a set of strategies in order to manage creativity in business processes? What are the unintended consequences?*

The study reveals that organizations in film and VFX production seek to gain both creative and operational process performance, while simultaneously mitigating creative and operational risk.

It is concluded that the study provides ample answers to the quite general research problem as well as to the more detailed research questions.

9.3 Contributions and Implications

This research has implications for both theory and practice. As will be shown in the subsequent sections, it contributes to the body of knowledge on creativity and BPM research. Moreover, conclusions can be drawn from the present study that are hoped to be beneficial for the practice of BPM. It is expected that these conclusions can support BPM practitioners who manage business processes that include creativity.

9.3.1 Contributions and Implications for Theory

This research proposes an emergent, substantive theory about the management of business processes that highly rely on creativity. The theory is substantive as it is based on empirical evidence that was collected in the specific area of film and VFX production. It is emergent as it is based on an exploratory study that aimed at inductively building theory as opposed to testing theory. However, given the weak constructionist view that was posited in chapter 3.3, this research may be complemented

by positivist, hypothesis testing research. The substantive theory that was developed in this study can be summarized as follows:

Creativity-intensive processes in film and VFX production are shaped by a complex interplay of artists, clients, and organizational resources. Creativity in business processes causes high unpredictability with regard to process structure, required resources and process outcome. Therefore, so-called creativity-intensive processes are characterized by an iteration between creating a mutual understanding of the requirements of the creative product, generating the creative product, and reviewing it. In order to manage this process, creative supervisors act as process intermediaries and apply various strategies in both internally managing the process and communicating with clients while they pursue both creative and operational process performance. Only when the process is completed, requirements of the creative product are fully understood.

The proposed substantive theory has the primary purpose of analysis and explanation. Tab. 9.1 provides an overview of the structural components of the nascent theory utilizing Gregor's (2006) taxonomy (see also chapter 3.6.1).

Tab. 9.1: Structural components of the emerging theory

Theory component	Instantiation
Means of representation	Textual and graphical
Primary constructs	Creativity-intensive process, artist, creative supervisor, client, IT context, constraints, creative product, strategies in managing creativity-intensive processes, consequences
Statements of relationship	In form of propositions, graphical illustrations, and rich textual description (Walsham, 1995)
Scope	Processes in organizations where creativity is a core competitive factor and/or part of the organization's primary activities
Causal explanations	Causal explanations are present. However, the focus is on the reciprocal nature of the relationships in order to understand the interaction of humans and IT in the processes studied (Orlikowski & Baroudi, 1991)
Testable propositions	Propositions are present; to be testable, however, these propositions have to be further developed into more general statements
Prescriptive statements	Not present

The emergent theory was presented by the means of textual description, propositions, and two graphical illustrations. These conceptualizations provide different perspectives onto the same ideas. Textual description was used in order to provide "rich in-

sight" (Walsham, 1995) into the complex phenomenon that was studied. Walsham (1995) states that IS case studies can produce four types of generalizations: the development of concepts, the development of theories, drawing of specific conclusions, and the contribution of rich insights. These generalizations are explanations of a particular phenomenon that was studied in a particular context. He further notes that such generalizations are not mutually exclusive. In the emergent, substantive theory all four types of generalizations are present. Tab. 9.2 provides an overview.

Tab. 9.2: Generalizations drawn from this research

Generalization	This research
Concepts	The study produced a number of concepts; the creativity-intensive process is the central concept (or core category) of this research. Other concepts represent contextual factors, strategies and consequences.
Theory	The relationships between the concepts (or categories) form a substantive theory that can be described as theory for analysis and explanation.
Drawing of specific conclusions	The study draws specific conclusions with regard to the use of strategies and IT in creativity-intensive processes. The propositions were formulated rather as tendencies than as predictions (Walsham & Waema, 1994).
Contribution of rich insight	The study provides rich insight into the phenomenon that was studied. These rich insights were presented in form of textual description. Rich insight is thought to capture aspects "that are not easily categorized as concepts, theories. or specific implications" (Walsham, 1995, p. 80).

Considering the first non-committal literature review, as well as the stage of relating the emergent theory to the literature, it can be concluded that the emergent, substantive theory contributes to both the literature on creativity and BPM:

- By explaining the dynamics and context of creativity-intensive processes it provides a response to the assertion that the majority of existent models views creativity as an outcome rather than a process and thus contributes to the literature on creativity. The process of relating the nascent theory to the existent literature revealed that the substantive theory complements, and can be complemented by, existent theories on creativity at the individual, group, and organizational level.

- By explaining how organizations can manage creativity-intensive processes by applying a set of strategies and IT, the emergent theory con-

tributes to the BPM literature. Creativity-intensive processes are a subtype of knowledge-intensive processes.

The contributions and implications for to the practice of BPM are further discussed in the next section.

9.3.2 Contributions and Implications for the Practice of BPM

The results of the study suggest that creativity implies significant challenges for process managers. Gregor (2006) states: "Theories are practical because they allow knowledge to be accumulated in a systematic manner and this accumulated knowledge enlightens professional practice" (p. 613). It has been asserted in the literature that grounded theory studies in particular are capable of generating theory that is highly relevant to practice (Glaser, 1978; Fernández et al., 2002). Glaser (1978) argues that grounded theorists can contribute a great deal by providing the 'man in the know' with substantive theory, and expresses a number of arguments suggesting the high practical relevance of grounded theory studies (compare Tab. 9.3, left column). Arguably, the BPM domain is a field characterized by high relevance to practice (Rosemann, 2008). In this domain the relevant 'man in the know' may be a BPM professional, process owner, or manager responsible for a particular process. It is argued that the emergent theory provides these stakeholders with information and insights that are relevant to their task settings. Tab. 9.3 links the arguments provided by Glaser (1978) to the practice of BPM.

Tab. 9.3: Practical relevance of grounded theory studies of BPM phenomena

Arguments for practical relevance, adopted from (Glaser, 1978)	**Practice of BPM**
Practitioners get the ability of identifying additional consequences, conditions, and strategies beyond of those that were empirically known to them.	Particularly those BPM practitioners that are relatively new to a field will profit from theory that explains essential conditions, strategies and consequences. Thus, grounded theories can be used to inform practitioners about both intended and unintended consequences and, for example, may facilitate risk management.
Practitioners are supported in expanding the description and meaning of incidents by placing them into the greater context.	The BPM practitioner is able to abstract from a specific situation (such as a specific process failure), reflect on it, and develop new solutions to the problem situation at hand.
Increasing the expert's capacity to know by introducing a limited number of concepts that can be applied in various situations.	Grounded theorists try to generate categories with great explanatory power. Such powerful concepts can be easily remembered and applied by BPM practitioners in various contexts.

Arguments for practical relevance, adopted from (Glaser, 1978)	Practice of BPM
By expanding the practitioners' theoretical knowledge, they are enabled to expand their capacity to deal with new, more complex situations, as their knowledge is not limited to particular incidents anymore.	BPM practitioners can take responsibility for more complex processes. By applying theoretical knowledge they are no more limited to only knowing certain instances of particular processes.
The theory helps experts to emancipate from restrictions of their specific expertise as theory enables them to become more open to change as they begin to see that certain incidents are mere patterns of a process.	Business processes in many industries are highly dynamic and require BPM practitioners to constantly adapt to new challenges. Thus, emancipation can be seen as an important enabler for process change.

It is hoped that the proposed theory is of high practical applicability as it fits the substantive area of the study and is thought to hold an adequate level of generality to be applicable to a range of processes that rely on creativity. Moreover, it is thought to be understandable to practitioners and suggests useful advice on how to manage creativity in business processes (Glaser & Strauss, 1967; Orlikowski, 1993). Process managers can thus utilize the framework to analyze their creativity-intensive processes, understand the contextual setting, and implement strategies to simultaneously pursue both operational process performance and creative process performance. In the following, four topics are discussed in more detail: the implications of the present study for managing creativity-intensive processes, the process of process management (process life-cycle), software support, and the modeling of creativity-intensive processes. The relevance of these areas for the practice of BPM has been widely discussed in the literature (e.g. Dumas et al., 2005; Becker et al., 2003; Harmon, 2007; Broadbent et al., 1999). A set of normative statements (guidelines) is proposed. These guidelines are grounded in the present study; yet, it must be noted that they are the researcher's conclusions and have not been subject to evaluation.

9.3.2.1 Managing Creativity-intensive Processes

This section provides a number of conclusions that are discussed with relationship to the main stages of creativity-intensive processes; i.e. understanding and refining the requirements, doing work, and evaluation. For these conclusions also compare (Seidel et al., 2009 forthcoming). The following general guidelines with regard to managing creativity-intensive processes are proposed. The study suggests that process managers must

- recognize the high uncertainty in both process and outcome and view it as a chance to generate highly creative and valuable outputs,

- structure the process around its creative parts as these are the sections where the organization creates business value and distinguishes itself from its competitors,
- use risk mitigating strategies in all stages of the process to ensure that client expectations are met, and
- constantly re-evaluate and re-align processes.

Understanding the Requirements

Understanding the requirements of a creative product (e.g. a VFX shot) as clearly as possible reduces uncertainty with regard to outcome, required resources, and process structure, as the creative organization can develop a better understanding of what is needed to carry out the process. The challenge of understanding requirements is two-fold: First, the creative organization needs to understand what the client expects them to do. Second, it must be ensured that the organization has the technical and creative capabilities to meet the client's requirements. The study suggests that process managers must

- understand the requirements of the creative product early in the process so as to mitigate creative risk and use a variety of tools and strategies in order to create a mutual understanding of the requirements,
- view the phase of understanding the requirements as a highly iterative process of negotiation between client and creative organization,
- match the requirements to the organization's capabilities; know what can be done and validate early that they are capable of meeting the client's expectations, as being caught up in operational problems is one of the greatest risks to creativity, and
- understand what features of the product are most important to the client.

Doing Work

Allowing freedom for a particular task increases variance – and thus uncertainty – and decreases predictability. This leads to greater creative potential but also to greater operational and creative risk. The process manager must carefully decide what freedom she allows for each and every task to achieve high creativity and innovation while still ensuring everybody works towards one aim. The study suggests that process managers must

- find a balance between project goals and the personal creative agenda of creative people,
- try to not restrict creativity but channel it down the right path,
- not overload key artists,
- leverage people with less experience by allocating them to challenging tasks and letting them work with more senior people, and
- avoid resource shortage particularly where people are expected to be creative. Thus, resources must be channeled towards the more creative parts of the process.

Evaluation

Wrong decisions with regard to review and approval can have serious consequences for the overall process. Due to differing subjective perceptions of creative products, for example the exclusion of key stakeholders may consequently lead to expensive product revisions. The study suggests that process managers must

- understand who they work with and what the client's ability is in assessing a creative product,
- review at the right stage as this is critical in order to mitigate creative risk,
- keep communication open when reviewing in order to not compromise creativity.

The arrows in Fig. 9.1 illustrate how successful reviews and ongoing communication with the client, for example, can impact on the development of risk and the level of understanding of the requirements of the creative product. Thus, it is concluded that the application of the various strategies can positively influence creative and operational process performance, while simultaneously mitigating creative and operational risk.

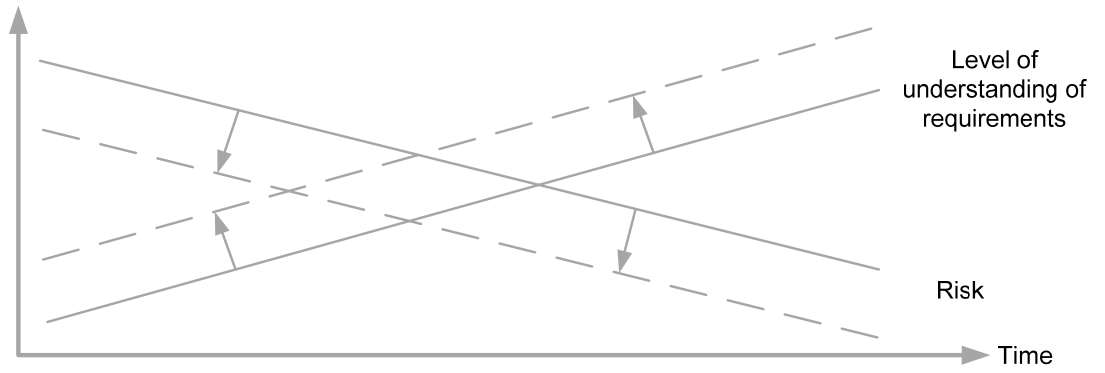

Fig. 9.1: Development of level of requirements specifications and risk in creativity-intensive processes

9.3.2.2 Software Support for Creativity-intensive Processes

Davenport (2005) claims that technology may be the most important intervention in the performance of knowledge workers over the last couple of years. This observation is also likely to hold for processes in the creative industries. The proposed theoretical model provides guidance on how to support different strategies with IT. The study suggests that existent technologies such as asset management systems, knowledge management systems, group communication systems, and workflow-related technologies are appropriate means to enhance both operational and creative process performance. Particularly when introducing process support such as workflow management systems the challenge can be seen in supporting or even automating the non-creative tasks of the processes while not compromising creativity. Thus, existent technologies such as workflow management, group communication systems, and systems supporting the generation of creative products (artist systems) can be integrated in order to successfully manage creativity-intensive processes. It is further believed that the theoretical comprehension of creativity-intensive processes can help system designers to design and implement IT systems for supporting creativity-intensive processes.

The study suggests that the use of IT should not be mandatory; creative people need freedom in order to act creatively. The orchestration of IT tools that are used depends on the specific situation at hand. Moreover, as with other resources in creativity-intensive processes, it is hard to predict what tools will actually be required throughout the process. Summarizing, the study suggests that

- technology should be scalable. A lack of scalability may compromise creativity,

- organizations should not try to automate creative parts of the process as this may lead to too rigid processes,

- technology should be accessible in a pull-principle; that is, creative people can access a tool or software tools in order to solve their problem at hand. The use of software tools should not be forced unless it is actually required to carry out a certain process.

9.3.2.3 Implications for the Process of Process Management

Particularly those sections within a business process that rely on creativity are to be considered by process managers. It is thus proposed that the management of these creativity-intensive sub-processes (or pockets of creativity) needs to be an integral part of the process of process management. It is thus suggested to integrate the following steps into the process of process management:

1. *Analysis:* Analyzing creativity-intensive processes demands the analyst to recognize that creativity significantly impacts on business processes. The organization is thus forced to be cautious that process design and managerial practices do not compromise creativity. Three stages of analysis are proposed:

    a. *Identification of pockets of creativity:* The process starts with an early identification of pockets of creativity (creativity-intensive sub-processes). To enable the identification of suitable strategies and IT systems, the identified pockets of creativity are characterized (what skills are needed, who is involved, what communication is needed).

    b. *Task-level-analysis:* Task-level-analysis focuses on what has been referred to as human performance analysis (e.g. Harmon, 2007) with a particular emphasis on how creative performance can be supported. In contrast to ‘conventional’ knowledge-intensive tasks, in pockets of creativity divergent thinking plays a prominent role. For example, process managers decide on the creative freedom they want artists to have. This freedom will also be constrained by available resources such as time and budget, for example.

    c. *Process-level-analysis:* Within process-level analysis the process manager focuses on how the overall process can be supported and managed. This includes the consideration of strategies in internally managing creativity and in communicating with clients as well as the application of IT systems (e.g. the use of workflow-related systems).

2. *Implementation and execution:* The execution of creativity-intensive processes requires process managers to be authorized to quickly respond to changing requirements. They apply strategies in communicating with the client (understanding and refining the requirements of the creative product, ongoing communication, approval and review) and in internally managing creativity-intensive processes (e.g. flexible resource allocation, task allocation, managing the scope of creativity). Many decisions have to be made at run time as much information is not available at the stage of analysis and design.

3. *Monitoring:* As with conventional process lifecycle models (e.g. Neumann et al., 2003), creativity-intensive processes require monitoring and controlling procedures. Though it is unlikely that this will take the form of log-based process monitoring, for example, it is required to capture the success of certain resource and data allocations to certain types of pockets of creativity in order to facilitate reuse in future similar scenarios. Process managers have to monitor both operational and creative process performance.

Fig. 9.2 provides an overview of the proposed process of creativity-aware BPM.

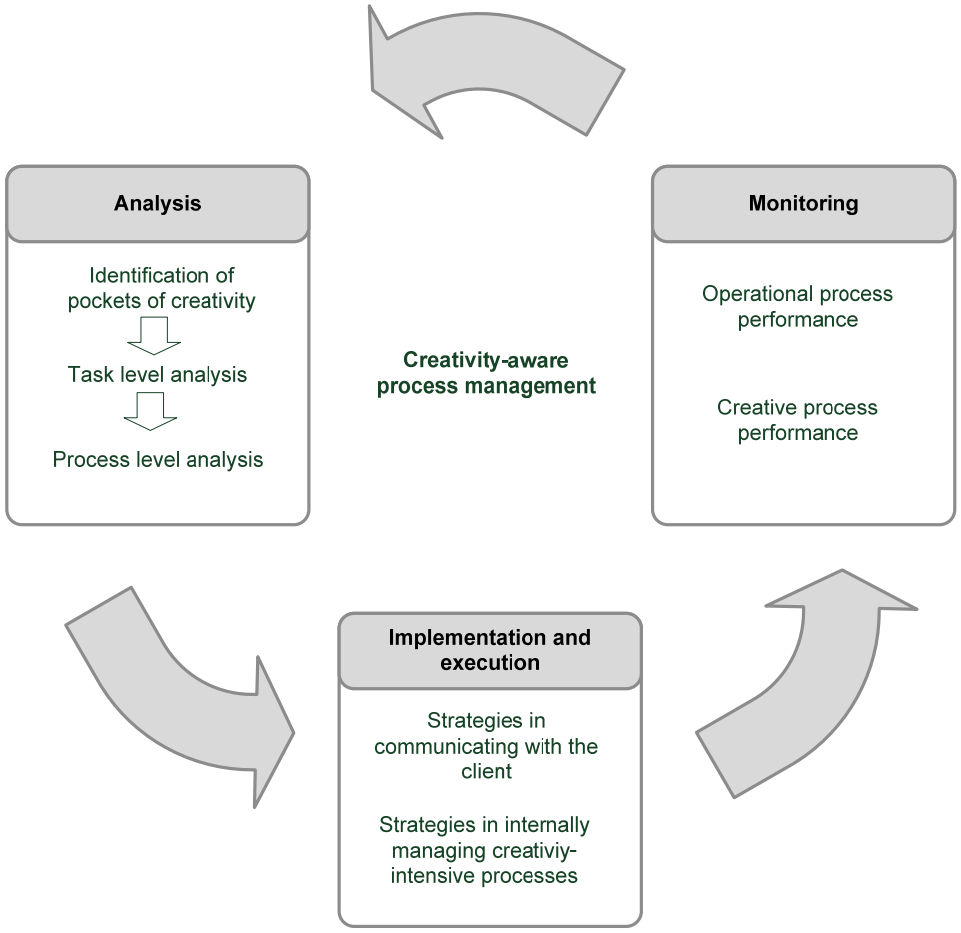

Fig. 9.2: The process of creativity-aware BPM

9.3.2.4 Process Modeling

EPC were used in order to model processes in the case organizations. While these models provided insights into the processes that were studied, it became also apparent that EPC does not provide sufficient means to model much of the characteristics of creativity-intensive processes. For example, the process structure is often not entirely known in advance. Put simply, EPC is not capable of modeling the flexibility that is needed in order to model creativity-intensive processes.

Consequently, one challenge must be seen in developing process modeling grammars that provide means to model the creative nature of business processes. As Hevner (2004) et al. state, such design science research can be grounded in existent theory. It is thus suggested that the substantive theory that was developed in this study can be a starting point for the development of modeling languages for creativity-intensive processes.

9.4 Reflections on the Research Approach

The experiences that were made in the present study suggest the applicability of the grounded theory method to the phenomenon that was studied.

The inductive design of the study allowed for the emergence of concepts the researcher had not considered before. The study started with no a-priori concepts or constructs. A number of major categories could be identified. These were developed in terms of their properties and dimensions. The categories could be related to the creativity-intensive process as the core category of this research.

Particularly the involvement of multiple data sources enabled to gain an in-depth understanding of the processes that were studied. The use of process modeling as a means to collect data may seem unconventional at the first sight; yet, it helped the researcher in getting a good understanding of the processes that were investigated. This understanding proofed to be very valuable for the semi-structured interviews, as the researcher ‘spoke the respondent’s language’. In summary, the triangulation across methods helped to consider various viewpoints onto a particular phenomenon (namely that of creativity-intensive processes), and, in turn, to develop rich and comprehensive insights.

While the paradigm as proposed by Strauss (1987) and Strauss and Corbin (1990; 1998) has received much criticism, for the present study the approach turned out to be quite appropriate. The notions of conditions, actions/interactions, and consequences appeared to naturally fit to the phenomenon that was studied. Of course, this raises the question of whether the phenomenon that was studied exhibits particular characteristics that are conducive to the use of the paradigm. Put simply, for the present study the paradigm worked.

The experiences that were made within this study can be summarized as a number of issues that advocate the use of grounded theory in order to study BPM-related phenomena (adopted from Seidel & Recker, 2009 forthcoming). Tab. 9.4 provides an overview along with illustrating examples from the present study.

Tab. 9.4: Reflections: using the grounded theory method for studying BPM issues (adapted from Seidel & Recker, 2009 forthcoming)

# Issue	Description	Example
Practical Relevance	The grounded theory method aims at producing substantive theory of high practical relevance.	The substantive theory that was developed is applicable to the particular context. It provides practitioners with profound knowledge about factors that need to be considered when managing creativity-intensive processes. Moreover, the theory explains what strategies and IT can be used and combined in order to handle specific situations.
Starting point for developing formal theory	Substantive theory can be the starting point to proceed to more general theory.	In the present study, a theory on business processes applicable to the substantive area of the creative industries was generated. By engaging with existent theory it was proceeded to a more general theory. In future work the theory may be formalized and/or tested.
Accounting for contextual factors	The grounded theory method produces theory that accounts for both intervening and causal conditions and thus recognizes the context of business processes and BPM-related issues.	Particular attention was paid to the various factors that impact business processes in creative environments. It turned out that processes highly depend on both internal and external factors that must be considered when managing these processes.
Inductive nature	The inductive, emergent nature of grounded theory enables researchers to discover new concepts and relationships that have not been considered in previous studies.	The grounded theory method led to the development of complex categories with great explanatory power. For each category a number of properties was identified that enabled to explain a variety of situations. Thus, the method enabled not only to identify 'obvious' concepts (e.g. the creative product) but also other, rather specific, concepts (e.g., personal traits and abilities of actors) that need to be considered when managing creativity-intensive processes.
Using multiple methods of data collection	Grounded theory enables the researcher to include a variety of data sources; for examples, process models, process descriptions or voiced process experiences, that can often be found in organizations.	Various techniques of data collection were used, including semi-structured interviews and the usage of process modeling techniques and the analysis of related process documentations. This triangulation across methods provided rich insights incorporating different viewpoints.
Studying processes	The grounded theory method is particularly fitting in order to study process-related issues.	It turned out that the method could capture the dynamic nature of creativity-intensive processes. Different stages could be identified and various strategies and the use of IT could be linked to these stages.
Guidelines	The grounded theory method provided guidelines how to actually conduct a study.	The detailed procedures of the grounded theory method helped the researchers to rigorously develop theory without being lost in vast amounts of data.

In summary, grounded theory was found to be conducive to the researcher's creativity and imagination. It is argued that being creative does not contradict the claim of doing rigorous research. In many cases creativity means to diverge; in the case of research and science, this means to discover. The research approach that was chosen for this study helped to discover as it allowed concepts to emerge. The emergence of concepts was intimately connected to the act of conceptualization, which is a highly creative act. Researchers conceptualize in order to makes sense of the world. However, the stimuli for these conceptualizations rest in empirical observations. The conceptualizations are then deductively applied to incoming data. Research thus iterates between the two aspects of *what the data tells* and *the researcher's creativity in conceptualizing*.

9.5 Limitations

This study has some limitations. Due to its interpretive nature it cannot be claimed that the phenomenon of business processes that rely on creativity has been described exhaustively. Potentially relevant contextual factors, strategies, and consequences may not have been accounted for.

9.5.1 Limitations with Regard to the Literature Review

This research investigated a phenomenon that is related to various strands of literature, including organizational sciences, psychology, sociology, IS, and computer science. It particularly aimed at linking diverse literatures, most specifically literature on organizational creativity and literature on BPM. However, given the vast amount of potentially relevant literature from different disciplines, it cannot be claimed that the attempt of considering existent theory has been exhaustive. Moreover, due to the inductive design of this research, literature was considered relatively sparingly in the beginning of the study. Thus, the bulk of the literature review was done throughout the study. Consequently, not only the data collection, but also the literature review was driven by the emergent theory. One may also argue that the selected journal and conference sources were biased by the researcher's personal and educational background.

9.5.2 Limitations with Regard to Data Collection

The role of the researcher in this study can be described as that of an "outside observer" (Walsham, 1995, p. 77). Whilst this may have helped to get views expressed to someone who did not have a "direct personal stake," (Walsham, 1995, p. 77) obviously, the researcher was only present at relatively view occasions, and there are

also many stakeholders who could not be interviewed. Consequently, it cannot be excluded that a more comprehensive process of data collection would have led to different results. In response to this, it was sought to make the process of data collection traceable for the reader.

9.5.3 Limitations with Regard to Data Analysis

Given the large number of categories, subcategories and dimensionally qualified properties, obviously it was not possible to hypothesize and deductively validate all possible relationships among concepts (Sarker et al., 2001). Instead, it was rather focused on the main recurrent and seemingly most important patterns. These major patterns were deductively validated through incoming data and eventually expressed by a set of integrated propositions.

Regarding the analytic scheme it has to be acknowledged that codes may be interpreted differently by other researchers. Also two analysts were involved in the coding process, only one analyst conducted the entire coding phase. Thus, much of the analysis depended on the author of this study. However, given the interpretive stance of this research, the main concern is whether the codes are plausible.

The role of existent theory within the process of inductively building theory was discussed in depth in the present study. It was argued that a sensitizing device was used in order to stimulate the researcher's theoretical sensitivity. It is, however, not safe to say whether the sensitizing device negatively impacted on the emergence of theory from the data. It can only be subsumed that the researcher tried to remain open and unbiased in order to discover what was relevant in the data.

9.6 Recommendations for Future Research

This exploratory study included only a limited number of organizations from one particular industry. Such substantive theory explains the phenomenon of creativity-intensive processes under certain circumstances in a certain area (Urquhart, 2001; Strauss & Corbin, 1998). Opportunity now exists to proceed to a more general theory by (a) extending the study to organizations from different domains, and (b) by further engaging with existent theory. It will be interesting to see whether and how creativity-intensive processes from other domains differ. It has been asserted in the existent literature that whether the creative process depends on the domain is still an unanswered question (Lubart, 2001). Thus, the model that was developed in this study can serve as a basis for future research. Two strategies for further research are proposed:

- First, more empirical evidence is required to show whether the proposed framework is applicable to other domains as well. Of particular interest are those industries where creativity and innovation play a crucial role. Prominent examples for such industries are software development or research and development of drugs and biotech products. Existent literature nurtures this assertion; Maiden et al. (2004), for example, highlight the function of creativity within the process of requirements engineering in software development. Generally, software development aims at generating products that are both novel and purposeful. Thus, there are parallels to what was identified as creativity-intensive processes in the substantive area of film and VFX production. Moreover, it is proposed to examine organizations that are not creative at first sight but increasingly rely on creativity. Examples include industries such as banking or insurance, which also employ creativity-intensive processes in product development. Summarizing, there is need to investigate different contexts where creativity is part of business processes. It is hoped that this will enable researchers to draw conclusions with regard to managing creativity-intensive processes in general. For example, it may turn out that categories and relationships have to be refined or that additional dimensions are required to account for differences in contextual settings (Orlikowski, 1993). The proposed theoretical framework can serve as a sensitizing device for such empirical research.

- Second, besides collecting and analyzing further empirical evidence, another way of proceeding to a more general substantive theory is to further engage with existent theory, which has been done to some extent in the present study. However, it is not claimed that this attempt has been exhaustive. For example, another approach will be to engage with meta theories from the IS discipline (Urquhart, 2007). A potential example is the actor network theory (Callon, 1986) that may help to further substantiate the constituent role of the introduced categories within the complex interplay and contextual setting of creativity-intensive processes.

Moreover, during the course of this research, some specific areas emerged as both being relevant and under-researched:

- First, the study has shown that creativity-intensive processes are characterized by flexibility and thus in most cases cannot be entirely predetermined. This raises particular issues with regard to modeling these

processes. Put simply, existent modeling languages such as EPC or the business process modeling notation (BPMN) do not provide sufficient means to appropriately model these types of processes. Thus, a potential research question is: How can creativity-intensive processes be modeled?

- Second, traditional workflow systems do not provide ample means to handle the flexibility required in creativity-intensive processes (Seidel et al., 2007). More flexible approaches such as case handling (v.d.Aalst et al., 2005) may provide solutions for some processes. However, one main challenge can be seen in integrating what has been referred to as creativity-intensive sub-processes (or pockets of creativity) with the overall process.

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APPENDIX

A Data Collection Overview

This appendix provides an overview of the interviews that were conducted in the course of the study. Including the preliminary interviews well above 30 people were interviewed. An overview of preliminary interviews has already been provided in chapter 4.3.1.

Relatively long time spans between several interviews were due to the researcher's schedule, availability of respondents, and the need for additional interviews in order to theoretically sample. Also note that last preliminary interviews were conducted on 28-06-2006 when process modeling already had started.

Organization A was one of the initial case organizations. Thus, preliminary interviews, process-interviews and semi-structured interviews were conducted. For the purpose of process modeling, the author of this thesis was supported by a second researcher.

Tab. A.1: Interviews with *Organization A*

Date	Description	Interviewee
04-05-2006	Process modeling (post-production processes)	*Interviewee A.6*
16-06-2006	Process modeling (post-production processes)	*Interviewee A.2*
23-06-2006	Process modeling (post-production processes)	*Interviewee A.2*
30-06-2006	Process modeling (post-production processes)	*Interviewee A.2*
03-07-2006	Process modeling (discussion of value chain model)	*Interviewee A.2*
06-07-2006	Process modeling (post-production processes)	*Interviewee A.2*
07-07-2006	Process modeling (post-production processes)	*Interviewee A.2*
24-10-2006	Process modeling (post-production processes)	*Interviewee A.2*
14-02-2007	Semi-structured interview	*Interviewee A.2*
19-03-2007	Semi-structured interview	*Interviewee A.2*
19-03-2007	Semi-structured interview	*Interviewee A.1*
19-03-2007	Semi-structured interview	Interviewees *A.1* and *A.2*
01-05-2008	Semi-structured interview	Interviewees *A.3* and *A.4*

Date	Description	Interviewee
19-11-2008	Semi-structured interview	*Interviewee A.5*

Organization B was also part of the initial set of case organizations. Thus, with members of *Organization B* preliminary interviews, process interviews, as well as semi-structured interviews were conducted. There were a number of process interviews that resulted in a complex set of process models that was considered during analysis. The author of this thesis was supported by a second researcher who spent two months with *Organization B* in order to set up a complex set of process models.

Tab. A.2: Interviews with *Organization B*

Date	Description	Interviewee
12-2006 to 02-2007	Process modeling (VFX production processes)	Interviewees *B.1*, *B.3*, *B.4*, *B.5*, *B.6*
05-08-2008	Semi-structured interview	*Interviewee B.2*
25-11-2008	Semi-structured interview	*Interviewee B.1*
25-11-2008	Semi-structured interview	*Interviewee B.3*

At *Organization C* no preliminary interviews were conducted, but only process interviews and semi-structured interviews. *Organization C* was chosen in 2007 as a case study partner for the purpose of theoretical sampling.

Tab. A.3: Interviews with *Organization C*

Date	Description	Interviewee
20-03-2007	Process modeling (production of interactive media)	*Interviewee C.4*
20-03-2007	Semi-structured interview	*Interviewee C.1*
20-03-2007	Process modeling (VFX production process)	*Interviewee C.5*
20-03-2007	Process modeling (post-production process)	*Interviewee C.6*
20-03-2007	Process modeling (DVD production process)	*Interviewee C.7*
20-03-2007	Process modeling (project specification process)	*Interviewee C.8*
21-03-2007	Process modeling (TVC Distribution)	Interviewees *C.9* and *C.10*
21-03-2008	Semi-structured interview	*Interviewee C.3*
21-03-2008	Semi-structured interview	*Interviewee C.2*

For the purpose of theoretical sampling, additional cases were selected. Two additional interviews focused on the role of IT within the film industry.

Tab. A.4: Additional interviews

Date	Type	Interviewee
06-08-2007	Semi structured interview on IT use in creative organizations	*Interviewee D.2*
29-07-2008	Semi structured interview on IT use in creative organizations	*Interviewee D.3*

B Code Tree

The following table provides an overview of the code tree that was generated throughout the study. Some of the lower levels codes could be drawn upon different concepts. However, concepts (categories and properties) were deemed to be mutually exclusive. In some cases there are no lower level codes; i.e. the lower level codes became a concept in their own right.

Tab. B.1: Code tree

Node/concept (categories, subcategories, properties)	**Open codes**
(1) Core category	-
(1.1) Creativity-intensive process	-
(1.1.1) Uncertainty with regard to outcome	*Conflict potential, disagreement, individual opinion, judgment, making creative judgments, no objective way in defining the outcome, variance in outcome, bringing something individual to it*
(1.1.2) Uncertainty with regard to process	*Bringing something individual to it, individuality, latitude, low predictability, tackling new work, variance in process, doing things differently, flexibility, jumping process steps, process choices, varying numbers of iterations, not having a pre-structured guide, thinking laterally*
(1.1.3) Uncertainty with regard to required resources	*Flexibility of resource use, doing things differently*
(1.1.4) Varying levels of structure	*Creative tasks, technical tasks, granularity, inherent process steps, sub-processes, recurrent elements, patterns*
(1.1.5) Iterative nature	*Communicating back and forth, convergence and divergence, iterative loop, matching subjective opinions, recurrent stages, iteration time*
(1.1.6) Collaboration-intensity	*Client involvement, intensive involvement of creative supervisor, working through it together, collaborative team, winning trust*
(1.1.7) Communication-intensity	*Passing information back and forth, negotiating, steering the client*
(1.1.8) Varying client touch points	*Coming in for approval, feedback points, stopping for approval, timing of inviting feedback*
(1.1.9) Varying internal review points	-

Node/concept (categories, subcategories, properties)	Open codes
(1.1.10) Knowledge-intensity	*Areas of expertise, getting access to information, hub of information, required implicit knowledge, required explicit knowledge, knowledge reuse, knowledge transfer, making decisions*
(1.1.11) Creative risk	*Changing mind, client dissatisfaction, conflict situation, generating no outcome, lack of approval, lack of communication, no obvious metric of completion*
(1.1.12) Operational risk	*Exceeding time and budget, getting caught focusing on execution, mismatch between requirements and capabilities*
(1.1.13) Creative potential	*Level of creativity, open end, space for exploration, creativity constraints*
(2) Contextual factors	-
(2.1) Artist	*VFX artists, editor, sound editor, compositor*
(2.1.1) Process expertise	*Ability to break problems down, ability to carry out a process, ability to assess a process, experience, capability, creative problem solving*
(2.1.2) Creative skills	*Ability to see, aesthetic judgment, creativeness, experience, having an eye, creative problem solving*
(2.1.3) Working style	*Preferences*
(2.1.4) Motivation	*Being attached to a project, feeling happy, negative criticism*
(2.1.5) Creative agenda	*Craving for creativity, fulfilling personal expectations, desiring a free reign*
(2.1.6) Location	-
(2.1.7) Understanding of the requirements of the creative product	*Seeing things differently, no objective way in defining the outcome, differing interpretations*
(2.2) Creative supervisor	*Lead, VFX supervisor, producer, team leader*
(2.2.1) Acting as process intermediary	*Enabling people, getting feedback from clients, interface to client, mediating between client and artist, mediating different creative points of view, passing information back and forth, passing on information, delivering to the client*

Node/concept (categories, subcategories, properties)	**Open codes**
(2.2.2) Accountability	*Creative control, financial accountability, having the final say, level of the hierarchy, making final decisions, making sure that creative objectives are being hit, reporting back, responsibility, passing accountability down*
(2.2.3) Supervising expertise	*Communication skills, experience, negotiation skills, people skills, unintrusivness*
(2.2.5) Understanding of the requirements of the creative product	*Differing interpretations, no objective way in defining the outcome, understanding what the client wants*
(2.3) Client	*Director, marketing agency, feature film studio*
(2.3.1) Expertise	*Visual literacy, visual knowledge, familiarity with the process, creative ability, creative potential, being able to meaningfully contribute, understanding where the process is going*
(2.3.2) Client processes	-
(2.3.3) Location	*Co-location, geographical distance, face-to-face*
(2.3.4 Understanding of requirements of the creative product)	*Client vision, creative input, having an idea of what something should be*
(2.4) Constraints	-
(2.4.1) Time	*Spending appropriate time, time constraints, lack of time, time for creative exploration, being overburdened*
(2.4.2) Budget	*Budget constraints, lack of money, putting in more money*
(2.5) IT Context	-
(2.5.1) Knowledge management systems	*Accessing documentation, blogging, organizing information, populate the knowledge base, search engine, understand how other people solved problems, wiki, decentralization of knowledge, searching for information, shared ontology*
(2.5.2) Asset management systems	*Free texture sites, getting reference, Google search, Internet, reference library, drawing on existent assets*
(2.5.3) Group communication systems	*Communication channels, dissemination of feedback, enabling iterations, richness in communication*

Node/concept (categories, subcategories, properties)	Open codes
(2.5.4) Workflow-related systems	*Job tracking system, process support, providing deadlines, providing templates, scheduling, task lists, tracking the process, giving people time to be creative, ticketing system for technical support*
(2.5.5) Artist systems	*Computer-aided design, editing suite, 2D modeling, 3D modeling, graphics editor, rendering*
(2.6) Creative product	
(2.6.1) Intermediate product specifics	*Getting an image out quickly, not leaping to the solution too soon, testing out*
(2.6.2) Final product specifics	*Getting something subjective final, sign-off*
(2.6.3) Quality	*Measuring product quality, novelty, perceived creative quality, subjectivity, technical quality*
(3) Strategies	-
(3.1) Strategies in communicating with the client	-
(3.1.1) Understanding and refining requirements	*Understanding the client vision, getting a cohere vision, negotiating requirements*
(3.1.1.1) Creative brief	-
(3.1.1.2) Matching requirements with capabilities	*Negotiating, steering the client, validating early*
(3.1.1.3) Providing stimuli	*Bouncing ideas, forming the client opinion, changing ideas, presenting alternatives*
(3.1.1.4) Showing references	*Visual artifacts as part of the language*
(3.1.2) Ongoing communication	*Collaborating with client, explaining the process, getting feedback, managing expectations, multiple iterations*
(3.1.2.1) Showing work in progress	*Showing the client as much as possible, making clear what you are trying to achieve*
(3.1.2.2) Direct interaction between artist and client	-
(3.1.3) Approval and review	*Getting clarity, getting feedback from client, reporting to a client, showing the right things, intruding the process*
(3.1.3.1) Finality	*Final approvals, temporary approvals, could be better approval*

Node/concept (categories, subcategories, properties)	Open codes
(3.1.3.2) Frequency	*Review schedule, dailies*
(3.1.3.3) Communication channel	*Approval logistics, face-to-face, digital approval*
(3.1.3.4) Involved people	*Excluding people from review, including people involved in the creative process*
(3.2) Strategies in internally managing creativity-intensive processes	-
(3.2.1) Task allocation and team building	*Challenge creativity, finding a balance between technical and creative, identification of complementary skill sets, task allocation, trial and error, getting the right team, knowledge induction process, knowledge transfer*
(3.2.2) Resource allocation	*Artifact reuse, leveraging people, optimize use of resources, over-commit resources, overloading key resources*
(3.2.3) Managing the scope of creativity	*Avoid endless exploring, channeling creativity, encouraging creativity, creative buy-in, giving latitude, granting bending rights and responsibilities, providing stimuli to creative people, putting people under time pressure, restricting creativity, setting up creative atmosphere*
(3.2.4) Internal reviews	*Communicating standards, dailies, friction losses, providing feedback, gathering creativity from the group, reporting back to a supervisor, tech checks, informal reviews*
(3.2.4.1) Finality	*Final approvals, temporary approvals, could be better approval*
(3.2.4.2) Frequency	*Review schedule, dailies*
(3.2.4.3) Communication channel	*Approval logistics, face-to-face, digital approval*
(3.2.4.4) Involved people	*Excluding people from review, including people involved in the review process*
(3.2.5) Internal break down	*Final approvals, temporary approvals, could be better approval*
(4) Consequences	
(4.1) Mutual understanding of requirements	*Determining requirements specifications, having a cohere vision, being on the same page*
(4.2) Mitigating operational and creative risk	-

Node/concept (categories, subcategories, properties)	**Open codes**
(4.3) Operational process performance	*Making good use of resources, exceeding time and budget, getting caught on execution*
(4.4) Creative process performance	*Blowing the client away, exceeding expectations, individuality, originality*
(4.5) Client satisfaction	*Addressing what the client wants, being in a service industry, blowing the client away, delivering to a client, delivering to the world standard, exceeding expectations, making the client feel comfortable, thinking about the client, working toward's the client's goal,*
(4.6) Keeping ownership over creative product	*Client trust, making the client feel comfortable, confidence*

C Cross Case Comparison

The following table provides an overview of how consistent the data from the case organizations were in terms of the categories, subcategories, and properties that emerged. The table thus provides an overview of the distribution of codes. Where there was clear evidence for a concept, a ✓ is shown.

Tab. C.1: Distribution of codes

Node/concept (categories, subcategories, properties)	***Organization A***	***Organization B***	***Organization C***
(1) Core category			
(1.1) Creativity-intensive process	✓	✓	✓
(1.1.1) Uncertainty with regard to outcome	✓	✓	✓
(1.1.2) Uncertainty with regard to process	✓	✓	✓
(1.1.3) Uncertainty with regard to required resources		✓	✓
(1.1.4) Varying levels of structure	✓	✓	✓
(1.1.5) Iterative nature	✓	✓	✓
(1.1.6) Collaboration-intensity	✓	✓	✓
(1.1.7) Communication-intensity	✓	✓	✓
(1.1.8) Varying client touch points	✓	✓	✓
(1.1.9) Varying internal review points	✓	✓	✓
(1.1.10) Knowledge-intensity	✓	✓	✓
(1.1.11) Creative risk	✓	✓	✓
(1.1.12) Operational risk	✓	✓	✓
(1.1.13) Creative potential		✓	✓
(2) Contextual factors			
(2.1) Artist	✓	✓	✓
(2.1.1) Process expertise	✓	✓	✓
(2.1.2) Creative skills	✓	✓	✓

Node/concept (categories, subcategories, properties)	***Organization A***	***Organization B***	***Organization C***
(2.1.3) Working style		✓	✓
(2.1.4) Motivation		✓	✓
(2.1.5) Creative agenda	✓	✓	✓
(2.1.6) Location	✓	✓	✓
(2.1.7) Understanding of the requirements of the creative product	✓	✓	✓
(2.2) Creative supervisor	✓	✓	✓
(2.2.1) Acting as process intermediary	✓	✓	✓
(2.2.2) Accountability	✓	✓	✓
(2.2.3) Supervising expertise	✓	✓	✓
(2.2.5) Understanding of the requirements of the creative product	✓	✓	✓
(2.3) Client	✓	✓	✓
(2.3.1) Expertise		✓	✓
(2.3.2) Client processes		✓	✓
(2.3.3) Location	✓	✓	
(2.3.4 Understanding of requirements of the creative product)	✓	✓	✓
(2.4) Constraints	✓	✓	✓
(2.4.1) Time	✓	✓	✓
(2.4.2) Budget			✓
(2.5) IT Context	✓	✓	✓
(2.5.1) Knowledge management systems		✓	✓
(2.5.2) Asset management systems		✓	✓
(2.5.3) Group communication systems		✓	✓
(2.5.4) Workflow-related systems	✓	✓	✓
(2.5.5) Artist systems	✓	✓	✓
(2.6) Creative product	✓	✓	✓

Node/concept (categories, subcategories, properties)	*Organization A*	*Organization B*	*Organization C*
(2.6.1) Intermediate product specifics	✓	✓	✓
(2.6.2) Final product specifics	✓	✓	✓
(2.6.3) Quality	✓	✓	✓
(3) Strategies			
(3.1) Strategies in communicating with the client			
(3.1.1) Understanding and refining requirements	✓	✓	✓
(3.1.1.1) Creative brief		✓	✓
(3.1.1.2) Matching requirements with capabilities		✓	✓
(3.1.1.3) Providing stimuli		✓	✓
(3.1.1.4) Showing references		✓	✓
(3.1.2) Ongoing communication	✓	✓	✓
(3.1.2.1) Showing work in progress		✓	✓
(3.1.2.2) Direct interaction between artist and client		✓	
(3.1.3) Approval and review	✓	✓	✓
(3.1.3.1) Finality		✓	✓
(3.1.3.2) Frequency		✓	✓
(3.1.3.3) Communication channel	✓	✓	
(3.1.3.4) Involved people	✓	✓	✓
(3.2) Strategies in internally managing creativity-intensive processes			
(3.2.1) Task allocation and team building	✓	✓	✓
(3.2.2) Resource allocation	✓	✓	✓
(3.2.3) Managing the scope of creativity	✓	✓	✓
(3.2.4) Internal reviews	✓	✓	✓
(3.2.4.1) Finality		✓	✓

Node/concept (categories, subcategories, properties)	***Organization A***	***Organization B***	***Organization C***
(3.2.4.2) Frequency		✓	✓
(3.2.4.3) Communication channel		✓	
(3.2.4.4) Involved people		✓	✓
(3.2.5) Internal break down	✓	✓	
(4) Consequences			
(4.1) Mutual understanding of requirements	✓	✓	✓
(4.2) Mitigating operational and creative risk	✓	✓	
(4.3) Operational process performance	✓	✓	✓
(4.4) Creative process performance	✓	✓	✓
(4.5) Client satisfaction	✓	✓	✓
(4.6) Keeping ownership over creative product			✓

D Overview of Propositions

This appendix provides an overview of the propositions.

Tab. D.1: Propositions

#	Short description	Proposition
1	Characteristics of CIP	*Creativity-intensive processes are characterized by uncertainty with regard to process structure, required resources and process outcome. This uncertainty is caused and influenced by various factors, particularly the understanding of the requirements of the creative product of involved clients, artists, and creative supervisors, as well as their individual characteristics (e.g. working style, expertise*
2	Characteristics of CIP	*High levels of uncertainty in process and outcome are associated with high levels of creative potential as they tend to lead to the generation of products that are characterized by novelty, but also with high levels of operational and creative risk as there may be undesirable consequences such as client dissatisfaction or a mismatch between capabilities and requirements.*
3	Characteristics of CIP	*High levels of expertise and creative skills of artists, creative supervisors, and clients are associated with lower levels of operational and creative risk. On the contrary, low levels of expertise and creative skills of artists, creative supervisors, and clients are associated with higher levels of operational and creative risk.*
4	Strategies	*Creative organizations seek to achieve both operational process performance and creative process performance. In doing so, they apply strategies pertaining in internally managing creativity-intensive processes and in communicating with clients.*
5	Strategies in communicating with clients	*Strategies in communicating with the client can further the mutual understanding of requirements of the creative product as well as matching the requirements to the organization's capabilities and available resources, which in turn leads to risk mitigation and higher client satisfaction.*
6	Strategies in communicating with clients	*Particularly tasks with high levels of uncertainty (and thus high creative potential) require intensive communication with the client in order to create a mutual understanding of process goals and thus mitigate creative risk, that is, the occurrence of unwanted consequences such as client dissatisfaction.*
7	Strategies in communicating with clients	*Group communication systems allow for higher numbers of iterations of the creative product as well as ongoing communication, thereby facilitating the process of creating a mutual understanding of the requirements of a creative product, which in turn leads to risk mitigation and improved client satisfaction.*
8	Strategies in communicating with clients	*Asset management systems can be used to access existing assets that can then be applied in the process of communicating with clients, thereby facilitating the process of creating a mutual understanding of requirements of the creative product, which in turn leads to risk mitigation and improved client satisfaction.*

#	Short description	Proposition
9	Strategies in internally managing CIP	*Strategies in matching capabilities with requirements, managing the scope of creativity, resource allocation, and internal review lead to enhanced operational and creative process performance and the mitigation of creative and operational risk.*
10	Strategies in internally managing CIP	*Asset management systems can be used in order to facilitate access to existing assets and contents that can be used to provide reference and can also be reused. Thus, these systems can facilitate the process of generating the creative product and positively influence creative and operational process performance.*
11	Strategies in internally managing CIP	*Workflow-related systems such as task lists can be utilized to facilitate the process performance of creativity-intensive processes by handling the complexity of creative artifacts and supporting the well-structured and predetermined parts of the processes. In turn, such systems provide creative people with more time to be creative, thereby resulting in higher creative and operational process performance, which in turn leads to increased client satisfaction.*
12	Strategies in internally managing CIP	*The use of knowledge management systems enables to store and access explicit knowledge that can be applied in creativity-intensive processes, thereby leading to enhanced operational process performance.*