Abstract

[Context.] Requirements engineering is the starting point of every software development project with the overall goal of establishing the vision of the system in its relevant context. The establishment of the vision requires that all parties involved disclose, discuss, and align their mental models of the system by explicitly communicating their objectives, ideas, needs, and expectations. This process serves to develop and negotiate shared understanding and is called requirements communication. Stakeholders and the development team can communicate more effectively if they use practices that enable synchronous, proximate, and proportionate interaction for proactive information exchange. However, requirements engineering practices mainly rely on the use of written documentation, including textual and pictorial representations. This documentation option is in conflict with the required type of interaction among the parties involved since it reinforces asynchronous and distant communication that is often disproportionate to develop and negotiate shared understanding. Although videos are known as a documentation option for rich and effective communication, software professionals neglect this medium as a documentation option for effective requirements communication. Videos that are used to support requirements communication for shared understanding are called vision videos. **[Objective.]** In the context of this thesis, I analyze the application of videos as a documentation option in requirements engineering for integrating them into requirements engineering practices to support effective requirements communication for shared understanding. **[Method & Results.]** I apply the technology transfer process to develop a candidate solution for the objective of this thesis. First, I use a survey to investigate why software professionals neglect videos as a documentation option. The insights of this survey substantiate three main issues that impede the production and use of videos as a communication mechanism in requirements engineering by software professionals: (1) An alleged high effort, (2) a lack of knowledge and skills, and (3) a lack of videos with sufficient quality. Based on the issues found, I develop the candidate solution consisting of the two concepts *video as a by-product* and *awareness and guidance*. The concept *video as a by-product* supports the revision of requirements engineering practices by integrating video production and use to obtain videos as a by-product with low effort and in sufficient quality. The concept *awareness and guidance* guides software professionals when they produce and use videos by creating awareness regarding video quality and providing guidance with a condensed guideline for video production and use. I first validate each concept in academia to ensure the fundamental relevance of the candidate solution before validating the entire candidate solution using a case study in the industry. **[Conclusion.]** The findings in academia and industry indicate that the developed candidate solution helps software professionals to obtain the required awareness, knowledge, and ability to produce and use vision videos at moderate costs and with sufficient quality. These vision videos are suitable for their intended purpose of supporting requirements communication for shared understanding. I am confident that the current version of the candidate solution is a viable and stable basis for future extensions and refinements to extend the application of videos to support effective requirements communication for shared understanding in requirements engineering and beyond.

Keywords: Requirements communication, shared understanding, vision video, video production, by-product, quality model for videos, video production guideline

Zusammenfassung

[Kontext.] Requirements Engineering ist der Ausgangspunkt jedes Softwareentwicklungsprojekts mit dem übergeordneten Ziel, die Vision des Systems in seinem relevanten Kontext zu etablieren. Die Etablierung der Vision erfordert, dass alle beteiligten Parteien ihre mentalen Modelle des Systems offenlegen, diskutieren und aufeinander abstimmen, indem sie ihre Ziele, Ideen, Bedürfnisse und Erwartungen explizit kommunizieren. Dieser Prozess dient der Entwicklung und Aushandlung eines gemeinsamen Verständnisses und wird als Anforderungskommunikation bezeichnet. Stakeholder und das Entwicklungsteam können effektiver kommunizieren, wenn sie Praktiken anwenden, die eine synchrone, unmittelbare und angemessene Interaktion für einen proaktiven Informationsaustausch ermöglichen. Allerdings beruhen die Requirements Engineering Praktiken hauptsächlich auf der Verwendung schriftlicher Dokumentation, einschließlich textueller und bildlicher Darstellungen. Diese Dokumentationsoption steht im Konflikt mit der geforderten Art der Interaktion zwischen den beteiligten Parteien, da sie eine asynchrone und distanzierte Kommunikation verstärkt, die oft unverhältnismäßig ist, um ein gemeinsames Verständnis zu entwickeln und auszuhandeln. Obwohl Videos als eine Dokumentationsoption für eine reichhaltige und effektive Kommunikation bekannt sind, vernachlässigen Software-Fachleute dieses Medium als Dokumentationsoption für eine effektive Anforderungskommunikation. Videos, die zur Unterstützung der Anforderungskommunikation für das gemeinsame Verständnis eingesetzt werden, werden als Vision Videos bezeichnet. **[Ziel.]** Im Rahmen dieser Arbeit analysiere ich die Anwendung von Videos als Dokumentationsoption im Requirements Engineering, um sie in Requirements Engineering Praktiken zu integrieren und eine effektive Anforderungskommunikation für gemeinsames Verständnis zu unterstützen. **[Methode & Ergebnisse.]** Ich wende den Technologietransferprozess an, um einen Lösungskandidaten für das Ziel dieser Arbeit zu entwickeln. Zunächst untersuche ich anhand einer Umfrage, warum Software-Fachleute Videos als Dokumentationsoption vernachlässigen. Die Erkenntnisse dieser Umfrage untermauern drei Hauptprobleme, die die Produktion und Verwendung von Videos als Kommunikationsmechanismus im Requirements Engineering durch Software-Fachleute behindern: (1) Ein angeblich hoher Aufwand, (2) ein Mangel an Wissen und Fähigkeiten und (3) ein Mangel an Videos mit ausreichender Qualität. Basierend auf den gefundenen Problemen entwickle ich die Kandidatenlösung, die aus den beiden Konzepten *Video als Nebenprodukt* und *Bewusstsein und Anleitung* besteht. Das Konzept *Video als Nebenprodukt* unterstützt die Überarbeitung von Requirements Engineering Praktiken, indem es die Videoproduktion und -nutzung integriert, um mit geringem Aufwand und in ausreichender Qualität Videos als Nebenprodukt zu erhalten. Das Konzept *Bewusstsein und Anleitung* leitet Software-Fachleute bei der Produktion und Nutzung von Videos an, indem es ein Bewusstsein für die Videoqualität schafft und mit einer komprimierten Richtlinie für die Videoproduktion und -nutzung Anleitung gibt. Ich validiere zunächst jedes Konzept im akademischen Bereich, um die grundlegende Relevanz der Kandidatenlösung sicherzustellen, bevor ich die gesamte Kandidatenlösung anhand einer Fallstudie in der Industrie validiere. **[Fazit.]** Die Ergebnisse aus Wissenschaft und Industrie deuten darauf hin, dass die entwickelte Kandidatenlösung Software-Fachleuten hilft, das erforderliche Bewusstsein, Wissen und die Fähigkeit zu erlangen, Vision Videos zu moderaten Kosten und in ausreichender Qualität zu produzieren und zu verwenden. Diese Vision Videos eignen sich für ihren beabsichtigten

Zweck, die Anforderungskommunikation für ein gemeinsames Verständnis zu unterstützen. Ich bin zuversichtlich, dass die aktuelle Version der Kandidatenlösung eine tragfähige und stabile Basis für zukünftige Erweiterungen und Verfeinerungen ist, um die Anwendung von Videos zur Unterstützung einer effektiven Anforderungskommunikation für ein gemeinsames Verständnis im Requirements Engineering und darüber hinaus auszubauen.

Keywords: Anforderungskommunikation, gemeinsames Verständnis, Vision Video, Videoproduktion, Nebenprodukt, Qualitätsmodell für Videos, Richtlinie zur Videoproduktion

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1

Introduction

Requirements engineering (RE) is a systematic and disciplined approach to specify and manage requirements to deliver a system that satisfies the stakeholders' needs and thus provides value [196]. Besides a process- and value-oriented facet, requirements engineering focuses on the stakeholders with their needs [58,91]. One central task of requirements engineering is to understand, document, and convey these needs among all parties involved [41,196]. These needs are the basis for system development [208]. One primary measure for project success and the quality of a software-based system is the degree to which the system satisfies the stated and implied needs of its various stakeholders [112,182].

The process of coordinating and communicating the needs of stakeholders so that a development team can implement a solution that the stakeholders accept is called *requirements communication*[1] [80]. Requirements communication involves developing and negotiating a *shared understanding*[2] of the goals, plans, status, and context of a project among all project partners [11,86]. Shared understanding requires all parties involved to disclose, discuss, and align their *mental models*[3] of the future system, i.e., their *visions*[4], by explicitly stating their objectives, ideas, needs, and expectations [11,58]. A common vision can accelerate software development and increase the likelihood of developing a successful system [92,161]. "*Only when they all* [stakeholders and development team] *share a common vision, scope, and desired outcome is the project likely to be successful*" [38, p. 1]. Therefore, shared understanding is one of the most important objectives in requirements engineering [84]. Shared understanding enables the stakeholders and the development team to assess and agree on what the relevant requirements are [58,85] and what the meaning of these requirements is regarding the future system [82,202].

[1]For the definition of the term "requirements communication" used in this thesis, see section 2.1.3, Definition 2.5.
[2]For the definition of the term "shared understanding" used in this thesis, see section 2.2.1, Definition 2.6.
[3]For the definition of the term "mental model" used in this thesis, see section 2.2.1, Definition 2.7.
[4]For the definition of the term "vision" used in this thesis, see section 2.2.3, Definition 2.10.

Effective requirements communication is a central problem of requirements engineering [58, 82, 189]. The effective coordination and communication of stakeholders' needs is difficult due to (1) an overwhelming amount of information to parse, (2) the need for tacit, complex, and specialized knowledge, and (3) the exploratory and creative nature of software projects [11]. In requirements engineering activities such as elicitation and validation effective requirements communication cannot be reliably achieved due to the three previously mentioned reasons [82, 210, 259]. As a consequence, the establishment of a common vision is a challenging task in requirements engineering [25, 60, 193], regardless of whether stakeholders meet in person [154, 184] or not [8,81]. In such situations, effective requirements communication depends on the use of suitable communication mechanisms [11, 92, 154]. Stakeholders and the development team can achieve a shared understanding more easily if they use practices for a proactive information exchange which support synchronous, proximate, and proportionate interaction [11, 210].

Requirements engineering practices rely mainly on the use of written specifications, which may also include images, for communication [124, 248]. However, this documentation option often conflicts with the required type of interaction since textual documentation is an asynchronous, distant, and disproportionate communication mechanism [11]. This conflict is discussed in more detail below to clarify the considered problem statement of this thesis.

1.1 Problem Statement

Although written specifications are suggested by standards, e.g., ISO/IEC/IEEE 29148:2011 [113], their use for communication is cumbersome [139]. Textual and pictorial representations, including digital versions, have low communication richness and effectiveness [8]. Fricker and Glinz [81] investigated the practice of handing over a written specification to a development team. Their results show that the supposedly simple handover insufficiently supports the rich knowledge transfer which is necessary to develop an acceptable system [81]. The readers of the specification were not able to build a consistent mental model of the system. Thus, the readers did not understand the impact of the requirements on the design well enough to assess the suitability of tentative designs [81].

Textual artifacts attempt to communicate and establish a body of knowledge that specifies the important information of which all stakeholders and the development team need to be aware of and whose understanding all of them need to share [11]. However, textual documentation cannot fully meet these goals due to different issues [11]. First, the sender of a document often tacitly equates the handover with the fact that the recipient read and understood the corresponding content. Different studies [157, 220] showed that this assumption is not correct. Recipients often do not read the obtained documents completely since they perceive the documents as too complex, untrustworthy, out of date, and poorly written [79, 157]. Second,

documents are written primarily in natural language [84,172]. This notation impedes effective communication due to its inherent restrictions [5], such as ambiguity [208, 229] and abstraction [32, 75, 132]. These restrictions increase the likelihood of undetected misunderstandings that limit shared understanding [75, 92, 154]. Third, a document cannot capture all necessary information that is relevant to the stakeholders and the development team [11]. A lot of relevant information is tacit and thus requires other communication mechanisms [85, 210, 219].

In consideration of these issues, text-based communication can be subject to a variety of noises that impede the achievement of shared understanding [224]. The communication partners may counteract these noises by conferring directly with each other [208, 210]. However, the use of textual artifacts for requirements communication leads to an increased temporal and spatial distance between the communication partners [8, 11]. Thus, this documentation option reinforces an asynchronous and distant communication which is often disproportionate to develop and negotiate shared understanding [11]. Several studies [2, 5, 48, 84, 157] investigated requirements engineering practices in terms of documentation and communication over the years. All of them indicated a still-existing need for improving documentation for requirements communication which exceeds pictorial representations in textual artifacts. In accordance with each other, the corresponding researchers suggested supplementing specifications, for example with multimedia documentation such as videos, to turn them into an effective means of communication [2,5,48]. They concluded the necessity to focus on power and simplicity to increase the relevance of documentation for effective requirements communication [84, 157].

At first, a video is just another documentation option and is therefore associated with similar issues as textual documentation. However, videos offer a better opportunity to achieve effective requirements communication since videos can transfer information more richly and effectively [8, 124]. In contrast to textual artifacts, a video is more concrete due to the required visualization of its content [32, 136, 218, 246]. As a consequence, key concepts such as a vision can be exemplified by videos to detect misunderstanding whose resolving increases the likelihood of shared understanding systematically and significantly [31, 92]. Thus, videos help to bridge the gap between abstraction and detail [31, 165]. Furthermore, a video combines the auditory and visual channel for information transfer. This combination leads to more intensive information processing which, in turn, supports a better understanding of the presented content for a single person as well as a group [208, 238]. While a textual artifact is read by each recipient individually, a video can be viewed together, allowing all viewers to perceive the same image and sound at the same time. This opportunity can facilitate to communicate more closely in terms of time and space. In consideration of power and simplicity, the use of videos may be more proportionate to develop and negotiate a shared understanding. Thus, the use of videos might enable the correspondingly required type of synchronous, proximate, and proportionate interaction for proactive information exchange.

Videos are a promising communication mechanism for shared understanding since they require that mental models, i.e., visions of a system, are visualized [259]. The visualization discloses the tacit representation of a future system in the minds of parties involved by externalizing the video producer's mental model and thus making it tangible [92, 158, 238, 246]. A video following this idea is hereinafter referred to as *vision video*[5] [126, 139]. The use of videos in requirements engineering has been discussed in recent years and their contributions have been found to have interesting potential [86, 130, 136, 218]. However, videos are not an established documentation option in requirements engineering [84, 136]. As a consequence, videos are neglected as a means of documentation for effective requirements communication among stakeholders and a development team [124,136]. In summary, the following problem statement arises which I consider in this thesis:

Problem Statement

While textual artifacts reinforce asynchronous, distant, and disproportionate communication, videos offer a better opportunity for synchronous, close, and proportionate communication. Videos may enable the proactive development and negotiation of shared understanding that is necessary for effective requirements communication.
Despite the known benefits of videos, this medium is neglected as a documentation option for effective requirements communication among stakeholders and a development team. It is necessary to research the issues that prevent the production and use of videos in requirements engineering. When these issues are known, concepts can be developed that overcome them and thus use the potential of videos in requirements engineering.

1.2 Research Objective

Based on the problem statement, this thesis pursues the Research Goal 1.1 to investigate the application of videos as a documentation option for effective requirements communication. I apply the goal definition template [18] to ensure that the scope of this thesis is well-defined.

Research Goal 1.1

Analyze *the application of videos as a documentation option*
for the purpose of *integrating videos into requirements engineering practices*
with respect to *support effective requirements communication*
from the point of view of *this researcher*
in the context of *requirements engineers who coordinate and communicate the stakeholders' needs among stakeholders and a development team to proactively develop and negotiate shared understanding by aligning their mental models of a future system.*

[5] For the definition of the term "vision video" used in this thesis, see section 2.3, Definition 2.11.

This thesis aims at understanding the reasons that prevent the production and use of videos for requirements communication to develop concepts that overcome these issues to integrate videos into requirements engineering practices. Based on the Research Goal 1.1, I ask the following two research questions.

Research Question 1.1

> *Why are videos neglected as a documentation option for coordinating and communicating stakeholders' needs among stakeholders and a development team in requirements engineering?*

As a first step for integrating videos as a documentation option for communication into requirements engineering practices, it is necessary to understand the reasons why videos are neglected as a communication mechanism. Research Question 1.1 addresses this topic to explain the issues that impede the use of videos in requirements engineering.

Research Question 1.2

> *How can videos be integrated into requirements engineering practices to support the coordination and communication of stakeholders' needs among stakeholders and a development team?*

The answer to Research Question 1.1 provides the basis for answering Research Question 1.2 which focuses on solving the identified issues for using videos in requirements engineering. Based on the insights obtained, concepts for a candidate solution can be developed that overcome these issues so that videos can be more easily integrated into requirements engineering practices to support effective requirements communication.

1.3 Scientific Approach

This section explains the selected scientific approach of this thesis to find answers to the research questions to reach the Research Goal 1.1. For a better understanding of the selected scientific approach, it is important to be explicit about the philosophical stance of this thesis. According to Easterbrook et al.,"*the stance you adopt affects which methods you believe lead to acceptable evidence in response to your research question(s)*" [69, p. 290]. Understanding the adopted stance helps to understand the reasons for selecting the scientific approach.

This thesis is based on the assumption of *postpositivism* and *pragmatism* [62]. Knowledge results from the interpretation of actual, sensible, and verifiable findings (*postpositivism*). These findings originate from "*careful observation and measurement of the objective reality that exists 'out there' in the world*" [62, p. 7], i.e., from empirical science. However, knowledge must also be judged by how useful it is for solving practical problems (*pragmatism*) [69]. Therefore, *pragmatism* values practical knowledge over abstract knowledge which means adopting an engineer-

ing approach to research [69]. Under the assumption of *postpositivism* and *pragmatism*, empirical science is part of a knowledge transfer between academia and industry [257]. As Wohlin et al. stated: "*Software engineering is an applied research area, and hence to perform research on industrially relevant problems is expected. It is in many cases insufficient to just do academic research on, for example, requirements engineering* [...]" [257, p. 30].

Following the statement of Wohlin et al. [257], I decided to apply an empirically-based technology transfer model as the scientific approach for this thesis. The technology transfer process demands the transfer of knowledge acquired in academia to the industry as part of the research process [93]. An empirically-based technology transfer model is one possible instantiation of the technology transfer process. Such a model focuses on the use of empirical methods to develop a candidate solution to an industrial problem. This candidate solution must be initially validated in academia before it is transferred to the industry. Figure 1.1 presents the technology transfer model applied in this thesis which consists of the following six steps:

1. **Problem**: Identification of a problem in the industry
2. **Problem statement**: Formulation of the identified problem as a problem statement, including the specification of research questions
3. **Study of practice and science**: Investigation of practice and science regarding the problem statement
4. **Candidate solution**: Development of a solution for the considered problem statement
5. **Validation in academia**: Initial validation of the candidate solution to ensure its fundamental relevance, validity, and soundness before it is presented to the industry
6. **Validation in industry**: Validation of the candidate solution with industry representatives in a real project context

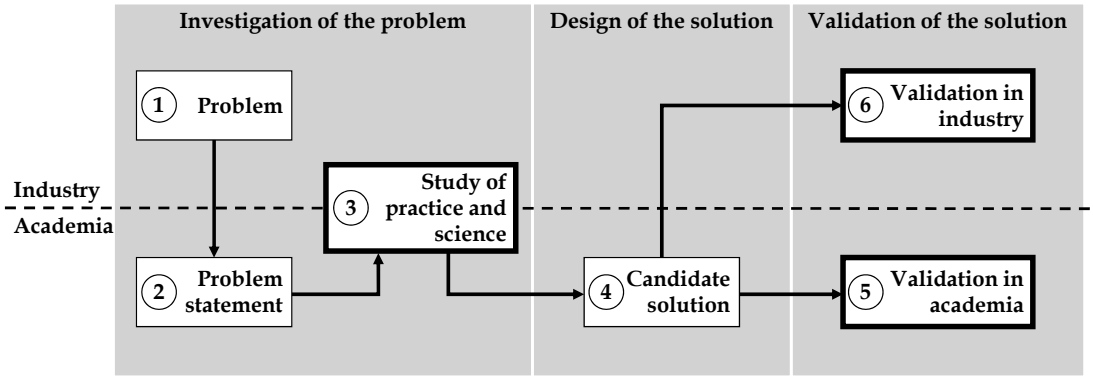

Figure 1.1: Scientific approach: Empirically-based technology transfer model

Based on the previously described central problem of effective requirements communication in requirements engineering (Figure 1.1, (1)), I formulated the problem statement (see

section 1.1; Figure 1.1, (2)) and research questions (see section 1.2). The study of practice and science (Figure 1.1, (3)) investigates the problem statement more closely to find an answer to the Research Question 1.1. Based on the insights obtained, I develop concepts for a candidate solution to integrate videos as a documentation option for requirements communication into requirements engineering practices and thus answer Research Question 1.2 (Figure 1.1, (4)). This candidate solution is first validated in academia (Figure 1.1, (5)) before it is validated in the industry (Figure 1.1, (6)). In particular, the steps (3), (5), and (6) (bold-framed) require the selection of suitable empirical methods to examine the problem statement more closely and to validate the developed candidate solution. This selection of suitable methods for the individual steps is done in the respective following chapters.

1.4 Contribution of the Thesis

Based on the scientific approach, this thesis provides a candidate solution consisting of the two concepts *video as a by-product* and *awareness and guidance*. These two concepts address the three main issues for the production and use of videos as a communication mechanism in requirements engineering, that emerged from the study of practice and science.

The three main issues found can be summarized as follows: (1) an alleged high effort for video production and use, (2) a lack of knowledge and skills of software professionals to produce and use videos, and (3) a lack of videos with sufficient quality. The concept *video as a by-product* provides an approach to revise requirements engineering practices for producing and using videos as a by-product at low effort (issue (1)) and with sufficient quality (issue (3)). The concept *awareness and guidance* provides a quality model for videos and a condensed guideline for video production and use to impart software professionals with the knowledge and skills to produce and use videos (issue (2)) with sufficient quality (issue (3)).

This candidate solution is designed to counteract unsafe decisions and actions of software professionals in the production and use of videos as a communication mechanism to support effective requirements communication for shared understanding. Each concept was validated with experiments in academia before the entire candidate solution was transferred to the industry for validation by means of a case study. This thesis offers the following three contributions:

(1) An identification of three main issues why videos are neglected as a documentation option in requirements engineering

(2) An approach to revise requirements engineering practice for producing and using videos as a by-product at moderate cost and sufficient quality

(3) An approach to create awareness regarding video quality and provide guidance of software professionals for producing and using videos at moderate cost and sufficient quality

1.5 Structure of the Thesis

Chapter 2 presents the background of this thesis. The main part of this thesis is structured along the steps of the applied technology transfer model (see Figure 1.2). In chapter 3, I discuss related work that deals with the *support of communication for shared understanding* and the *application of vision videos in requirements engineering*. Chapter 4 presents a survey on *videos as a documentation option in requirements engineering* to investigate the issues that prevent the use videos as a communication mechanism in requirements engineering. Based on the issues found, I develop the candidate solution consisting of the two concepts *video as a by-product* and *awareness and guidance*. In chapter 5, I provide an overview of the candidate solution and the two concepts. Chapter 6 describes the details of the concept *video as a by-product* that offers an approach to revise requirements engineering practice for producing and using videos as a by-product. This approach is applied to the two practices *facilitated meetings* and *prototyping* each of which is validated with experiments in academia. In chapter 7, I present the details of the concept *awareness and guidance*. This concept provides two artifacts to support software professionals when producing and using video: A *quality model for videos* to create awareness regarding video quality and a *condensed guideline for video production and use* to provide guidance. I adapt both artifacts to vision videos due to the specific context of this thesis. While the quality model is validated with an experiment in academia, the guideline is validated with a content validation study. Chapter 8 presents the case study that validates the entire candidate solution in a real project context in the industry. In chapter 9, I conclude this thesis, discuss its limitations, and propose starting points for future work.

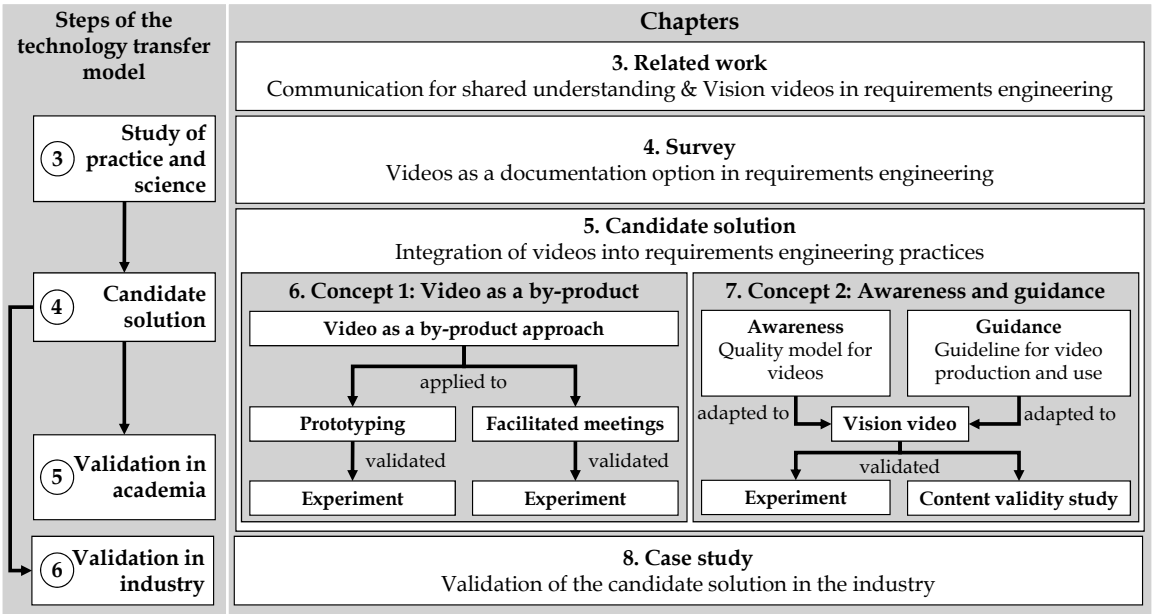

Figure 1.2: Structure of the thesis along the steps of the applied technology transfer model

2

Background

This thesis addresses the integration of videos into requirements engineering practices to support requirements communication for shared understanding. The context of this thesis is defined by the discipline requirements engineering, in particular, the requirements analysis, with its specific objectives. It is also necessary to take a closer look at the application of videos as a documentation option including their production and quality assessment. This chapter provides the necessary information to facilitate the understanding of this thesis.

2.1 Requirements Engineering

There are several definitions, frameworks, and reference models that give an overview of requirements engineering [7,30,66,91,195,196,251]. Although all of them differ slightly from each other, they share the same main goals and activities. This thesis uses the following definition of *requirements engineering* according to Glinz [91], which is also the official definition of the *International Requirements Engineering Board* (IREB).

Definition 2.1 (*Requirements engineering (RE); according to Glinz [91, p. 18]*)

Requirements engineering is a systematic and disciplined approach to the specification and management of requirements with the following goals:

(1) *Knowing the relevant requirements, achieving a consensus among the stakeholders about these requirements, documenting them according to given standards, and managing them systematically,*

(2) *Understanding and documenting the stakeholders' desires and needs;*

(3) *Specifying and managing requirements to minimize the risk of delivering a system that does not meet the stakeholders' desires and needs.*

This definition introduces the two main areas of requirements engineering which are called *requirements analysis* and *requirements management*. These areas include specific *activities* (see Definition 2.2) that focus on particular *practices* (see Definition 2.3) which are implemented through concrete *techniques* (see Definition 2.4).

Definition 2.2 (*Activity; based on Dörr et al. [66, p. 7]*)

An activity is the overall classification of a single phase of a typical requirements engineering process.

Definition 2.3 (*Practice; based on Dörr et al. [66, p. 7]*)

A practice is an abstract task that in most contexts leads to a qualitative improvement of the requirements engineering process.

Definition 2.4 (*Technique; based on Dörr et al. [66, p. 8]*)

A technique is a concrete method that is directly applicable to implement a practice.

Figure 2.1 presents the reference model of Börger et al. [30] which provides an overview of requirements engineering with its two main areas and their respective activities. Below, the activities are briefly described in terms of their practices and goals. The subsequent explanations refer to Börger et al. [30] supplemented by information from Alexander and Stevens [7], Nuseibeh and Easterbrook [182], Pohl [195], Rupp et al. [208], as well as Wiegers and Beatty [251].

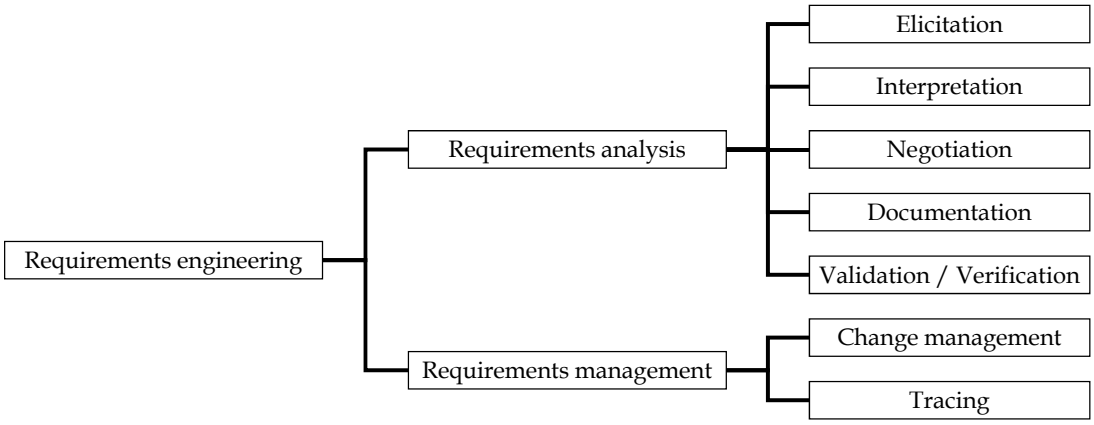

Figure 2.1: Reference model of requirements engineering; based on Börger et al. [30, p. 30]

2.1.1 Requirements Analysis

Requirements analysis is subdivided into elicitation, interpretation, negotiation, validation / verification, and documentation. These five activities encompass all practices involved with exploring, evaluating, documenting, and confirming the requirements for a system.