

Enriching Requirements Specifications with Videos

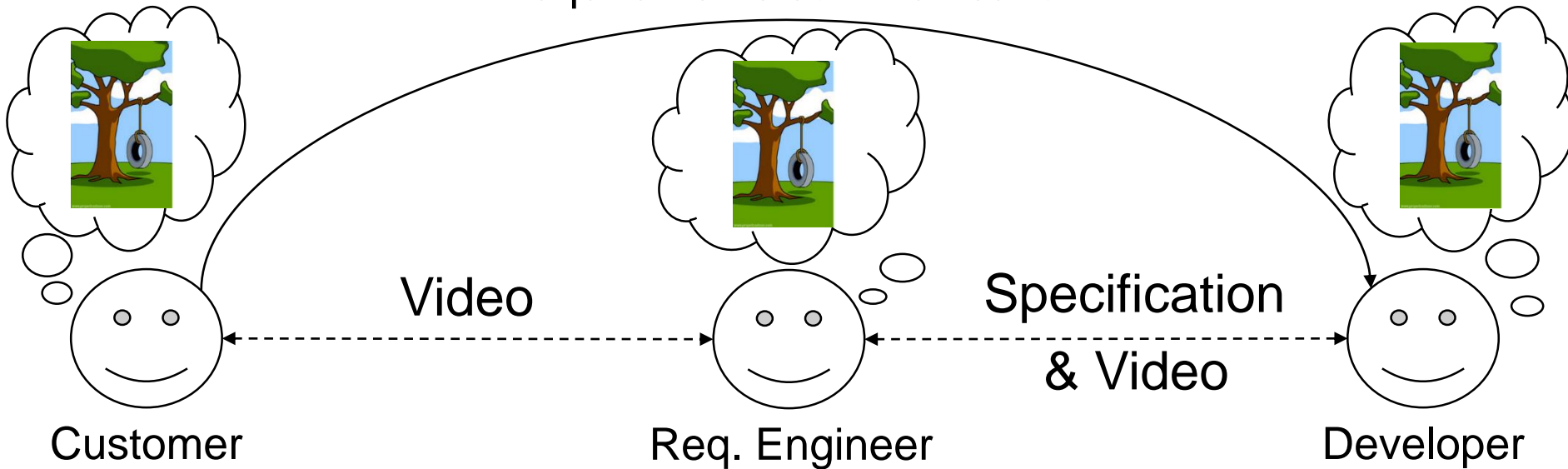
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11/28/2017

Requirements communication



Requirements Engineering Goals

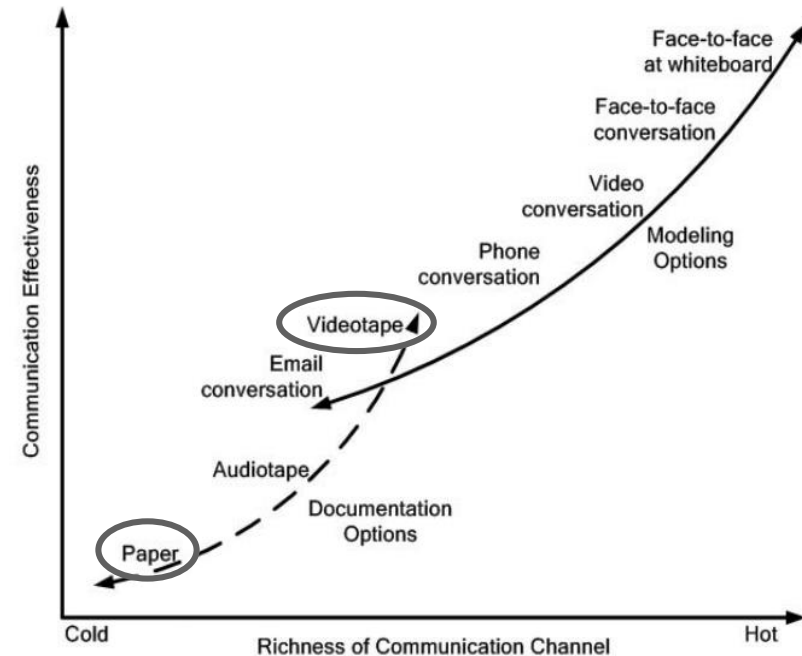
1. Shared understanding
 - Successful requirements communication
2. Specification quality
 - Appropriate documentation options

Fricker et al., "Requirements Engineering: Best Practice", 2015

Specification and Video

- Specification
 - Unstructured natural language (79%)
 - Potential for misinterpretation
- Knowledge visualization in RE
 1. Diagrams
 2. Graphical objects
 3. Interactive presentations
 4. Images / sketches

} Paper



- Video
 - + Comprehensive information
 - + Appreciated for communication
 - Production
 - Modification

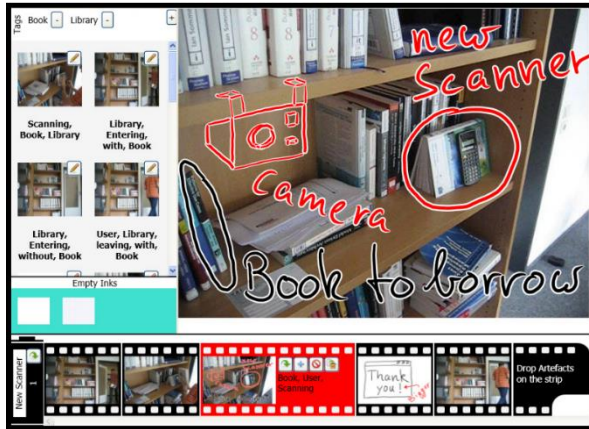
Ambler, "Agile Modeling: Effective Practices for eXtreme Programming", 2002;

Mich et al., "Market Research for Requirements Analysis Using Linguistic Tools", 2004;

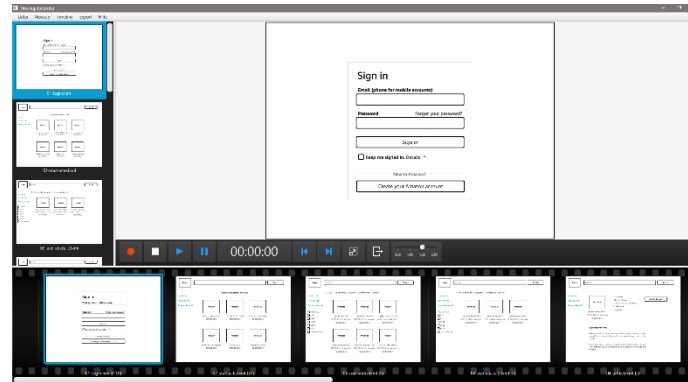
Shakeri Hossein Abad et al., "Requirements Engineering Visualization: A Systematic Literature Review", 2016

Use of Videos in Requirements Engineering

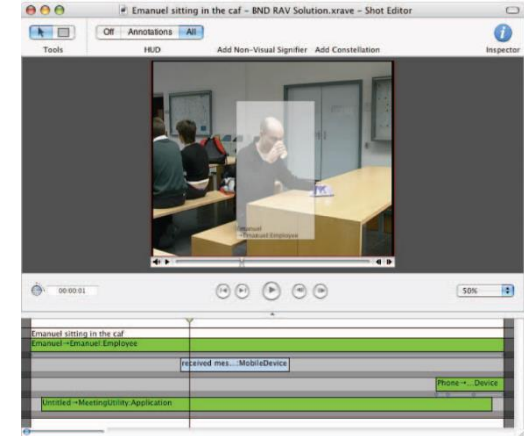
- Several approaches produce videos of a product vision



Pham et al.



Karras et al.



Creighton et al.

Question

Can requirements communication benefit from such videos by using them beyond their original purpose to supplement a specification?

Pham et al., "Interactive Multimedia Storyboard for Facilitating Stakeholder Interaction", 2012;

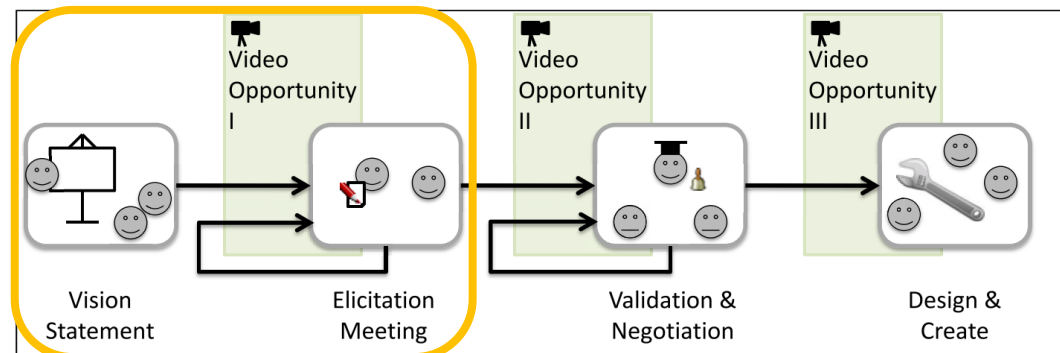
Karras et al., "Video as a By-Product of Digital Prototyping: Capturing the Dynamic Aspect of Interaction", 2017;

Creighton et al., "Software Cinema - Video-based Requirements Engineering", 2006

Definition

A vision video shows how a future system may work in its envisioned target environment even though the system does not exist yet.

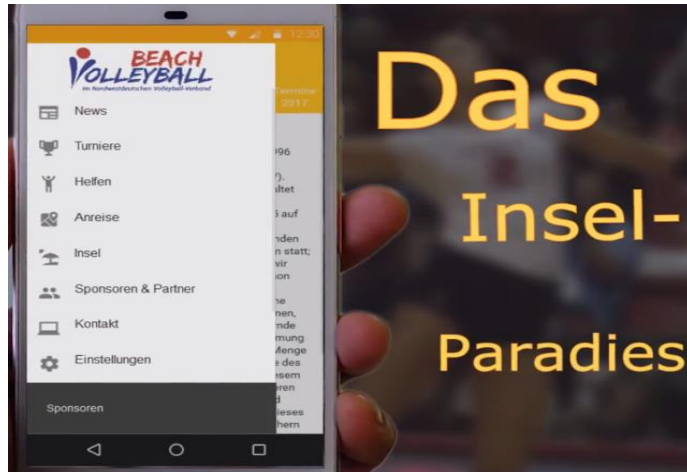
- Basis
 - Opportunities for using videos in RE (Op. 1)
- Production
 - Actors
 - Development team
 - Low-effort
 - Smartphone & simple video processing tools
 - Short duration
 - 2-minute video



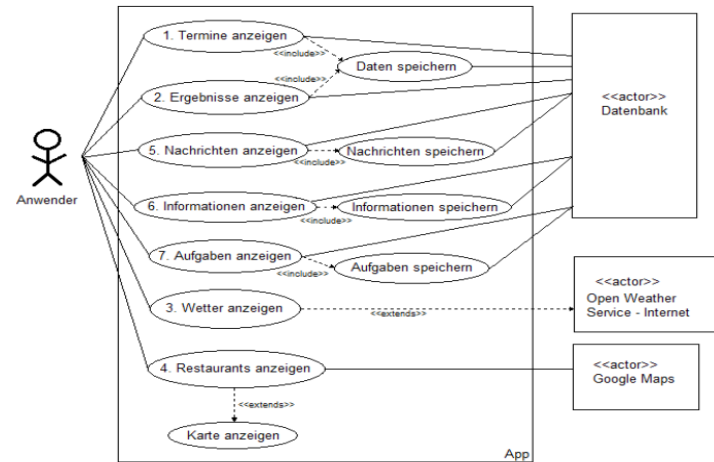
- Vision
 - Important for project success
 - Low specification level
 - Less frequent changes

Brill et al., "Video vs. Use Cases: Can Videos Capture More Requirements under Time Pressure?", 2010

Pre-Study – Selection of Vision Videos



Video



Specification

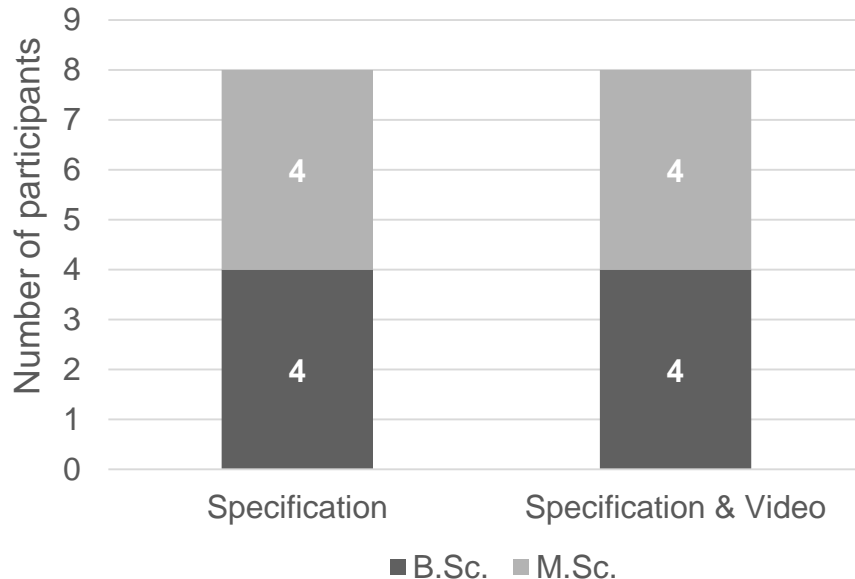
- Matching between vision video and use cases
 - 12 vision videos
 - 2 independent raters
- Goal
 - Find the best matching materials
- Selection criterion
 - Number of contained use cases based on shared agreement

Can developers understand a specification faster and better with a supplementary video of the product vision?

$H1_0$: No speed difference in extracting information

$H2_0$: No difference in the number of correct answers

H_{i1} : Specification supplemented by a video leads to better results than only a specification, $i \in \{1,2\}$

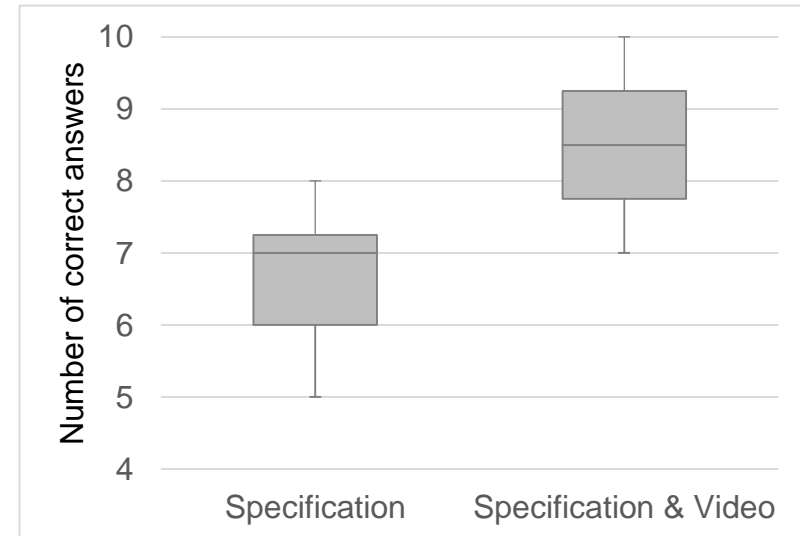
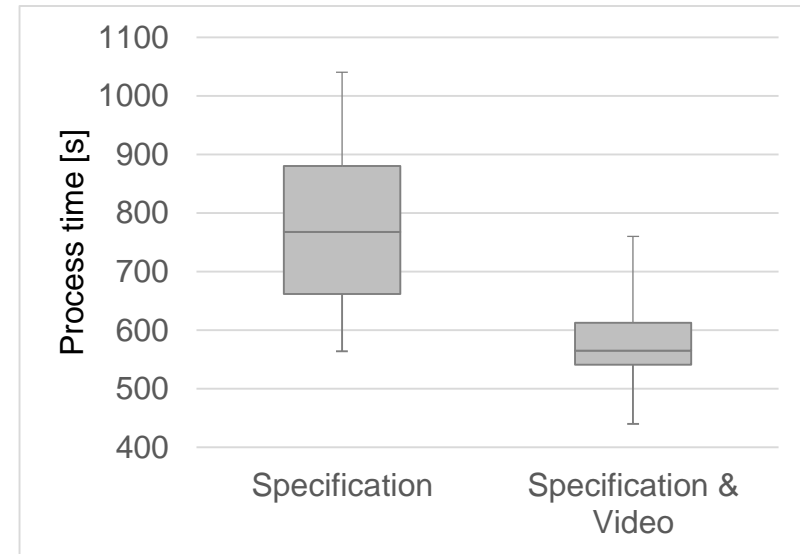


- Task
 - Extraction of information from material to answer questionnaire
 - Process time
 - Number of correct answers



Evaluation – Results

- Process time
 - 100% of group S&V faster than 50% of group S
 - $t(7) = 2.77, p = 0.008 < 0.05$
 - S&V shortens time to extract information

- Number of correct answers
 - 100% of group S&V more correct than 50% of group S
 - $t(7) = 3.13, p = 0.004 < 0.05$
 - S&V increase number of correct answers



Evaluation – Finding

- Evaluation results
 1. Process time to extract information
 - Reduction of **24.67%**  by specification & video
 2. Number of correct answers
 - Improvement of **20.59%**  by specification & video

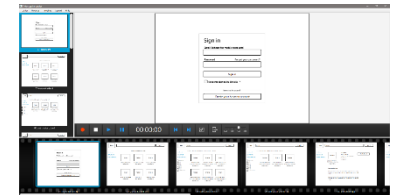
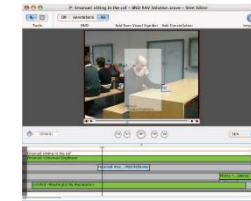
Finding

Developers understood a specification faster and better with a supplementary video of the product vision.

1. Improved understanding due to imagination of overall goals
2. Simplifies and enhance comprehension of textual concepts
3. Watching a 2-minute video is faster than reading 18 pages

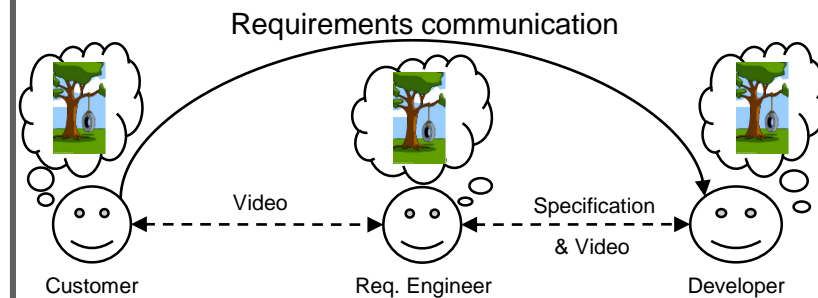
Conclusion

- Requirements communication
 - Paper worst documentation option
 - Video best documentation option
- Several approaches use videos
 - Benefit by using them beyond original purpose



Enriching Requirements Specifications with Videos

1. Supports understanding a of developers
2. contributes to shared understanding and specification quality
3. can help to accomplish need for support of knowledge visualization in RE, especially requirements communication



Survey – Call for Participation

- Exploring researchers' and practitioners'

Attitudes Towards the Medium Video

in requirements engineering and software development

- Survey topics
 - Demographics
 - Attitude towards the medium video including **advantages**, **disadvantages**, **potentials** and **concerns**
 - Application of video including **creation** and **usage**

<http://survey.se.uni-hannover.de/index.php/759661?lang=en>



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