Exploring Challenges in Embedding Metadata of Licence Information in Digital Work

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1. Introduction

1.1 Research Questions

- 2. Theoretical Background
 - 3. Methodology
 - 4. Results
 - 5. Discussion
 - 6. Recommendations

Introduction

Key words:

Digital work,
Attribution of copyright,
Licence,
Metadata

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Introduction

Research Questions:

- RQ1 What are the technological and social challenges of building an end-user tool, which can embed metadata of licence information in digital work?
- RQ2 What are the suggestions to address these challenges?

Introduction

Identifying and tracking the metadata:

- 1. "Which author is it?"
- 2. "How to attribute this author?"
- 3. "Under which licence was this work released?"

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Theoretical Background

Licences

- Rights Expression Language (REL)
 E.g.
 - Creative Commons Right Expression Language (ccREL)
 - Open Digital Rights Language (ODRL)

- Digital Rights Management (DRM)
 - Digital Rights Enforcement (DRE)

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Methodology

- Qualitative case study
- Five semi-structured interviews

Methodology

- Sound recording
- Transcription
- Thematic analysis
- Prototype

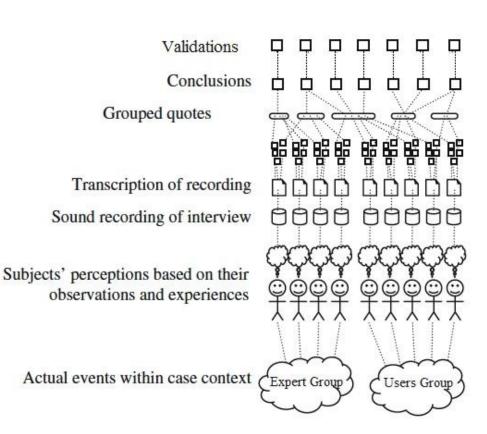


Fig. 1 Modified version of data collection and analysis process (Runeson and Höst, 2009)

Methodology

- Expert group (3 ppl.)
 - ODRL Community Group
 - Creative Commons
 - Europeana
- End user group (2 ppl.)
 - Independent photographers

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Results

7 Challenges

• The potential challenges in embedding metadata of licence information in digital work from the **experts' perspectives.**

7 Problems

• The practical problems encountered in the current way in which attribution is handled from the **potential end users' perspectives.**

11 Suggestions

 The suggestions to address such potential challenges and practical problems, given by **both experts and end users.**

Suggestions (S)											
Potential Challenges (C) and Practical Problems (P)	SI. Embedding metadata	S2. Reusing existing tools	S3. Integrating with CMS	S4. Improving user experience using logos	S5. Using GUI pop-ups	S6. Embedding during content creation	S7. Verifying the authenticity of the source metadata	S8. Resolving conflicts in composite work	S9. Storing metadata separately	S10. DRM issues	S11. Use simple constraints
C1. Increasing end-users' awareness		X	X	X	X						
C2. Increasing the adoption of the end-user tool		X	X								
C3. Integrating the end-user tool with existing software		X									
C4. Embedding licences with too many constraints						х					X
C5. Attributing multiple right holders in composite work								X			
C6. Rework effort									х		
C7. Verifying the authenticity of the source metadata							X			X	
P1. Informal attribution standard	X		X		X	X					
P2. Users not providing attribution	X			X	X						
P3. Low awareness of licensing			X	X	X						
P4. Lack of attribution support in CMS	X		X								
P5. Issues using a watermark	X										
P6. Issues keeping track the attribution	X										
P7. Verifying the authenticity of the source metadata							X			X	

Fig. 2 Mapping of Suggestions to Challenges/Problems

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 - 4.2 Problems
 - 4.3 Suggestions
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Challenges

- C1. Increasing end-users' awareness
- C2. Increasing the adoption of the end-user tool
- C3. Integrating the end-user tool with existing software

C1 C4 C2 C5 C3 C6 C7

Challenges

- C4. Embedding licences with too many constraints
- C5. Attributing multiple right holders in composite work
- C6. Rework effort

• C7. Verifying the authenticity of the source metadata

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P1 P5 P2 P6 P3 P7 P4

Problems

• P1. Informal attribution standard

• P2. Users not giving attribution

• P3. Low awareness of licensing

P4. Lack of attribution support in CMS

Problems

• P5. Issues using a watermark

• P6. Issues keeping track the attribution

• P7. Verifying the authenticity of the source metadata

P5

P6

P7

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 S1
 S4
 S7
 S10

 S2
 S5
 S8
 S11

 S3
 S6
 S9

Suggestions

- S1. Embedding metadata
- S2. Reusing existing tools
- S3. Integrating with CMS

 S1
 S4
 S7
 S10

 S2
 S5
 S8
 S11

 S3
 S6
 S9

Suggestions

- S4. Improving the user experience using icons
- S5. Using GUI pop-ups
- S6. Embedding during content creation

 S1
 S4
 S7
 S10

 S2
 S5
 S8
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Suggestions

- S7. Verifying the authenticity of the source metadata
- S8. Resolving conflicts in composite work
- S9. Storing metadata separately

 S1
 S4
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 S9

Suggestions

• S10. DRM issues

• S11. Use simple constraints

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C1. Increasing end-users' awareness		X	X	X	X						
C2. Increasing the adoption of the end-user tool		X	X								
C3. Integrating the end-user tool with existing software		X									
C4. Embedding licences with too many constraints						х					X
C5. Attributing multiple right holders in composite work								X			
C6. Rework effort									х		
C7. Verifying the authenticity of the source metadata							X			X	
P1. Informal attribution standard	X		X		X	X					
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P4. Lack of attribution support in CMS	X		X								
P5. Issues using a watermark	X										
P6. Issues keeping track the attribution	X										
P7. Verifying the authenticity of the source metadata							X			X	

Fig. 2 Mapping of Suggestions to Challenges/Problems

Software Requirements

RQ1. The application should be able to read *.xmp file into XMP Meta objects.

RQ2. The application should be able to embed XMP Meta objects into images (preliminarily *.jpg and *.png).

RQ3. The application should be able to read previously embedded XMP metadata in the image file.

RQ4. The application should support ccREL syntax.

RQ5. The application should be based on Adobe XMP Toolkit SDK.

RQ6. The application should be able to run locally (offline).

RQ7. The application should integrate with WordPress as a plug-in.

RQ8. The application should use icons.

RQ9. The application should use GUI pop-ups.

RQ10. The application should support embedding licence at content creation.

RQ11. The application should have a trust mechanism that verifies the authenticity of the source metadata.

RQ12. The application should resolve licence conflicts in composite work.

RQ13. The application should be implemented in a DRM-free environment.

RQ14. The application should avoid complex constraints on rights statements.

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Licence: CC BY-SA 2.5 SE (http://creativecommons.org/licenses/by-sa/2.5/se/)

Title of work: TheTitle

Attribute work to name: The Author

Attribute work to URL: http://theurl

More permissions URL: http://permissionurl

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<?xpacket begin='' id=''?>
<x:xmpmeta xmlns:x='adobe:ns:meta/'>
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          <xmpRights:UsageTerms>
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          <cc:license rdf:resource='http://creativecommons.org/licenses/by-sa/2.5/se/'/>
          <cc:attributionName>TheAuthor</cc:attributionName>
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Before Embedding

After Embedding

- 1. Introduction
- 2. Theoretical Background
 - 3. Methodology
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Discussion

- Embedding metadata improves user's experience of identifying and attributing the original author.
- The lack of awareness of licence and attribution is a fundamental challenge. Increasing user's awareness of licence and attribution is a long-term process.

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Recommendations

To consider in future research:

- Explore more challenges and investigate further from wider perspectives.
- Build and evaluate a complete end-user tool.

Recommendations

Future prototype development is suggested to consider:

- Support authentication
- Support multi-licences in composite work
- Compare interpreting licence information with different REL standards
- Develop strategies to increase awareness for attribution
- Transform image-watermarking solutions to embedding metadata
- Promote usage by integration with mainstream social network CMS.

Acknowledgement

We would like to dedicate this paper to the memory of our academic supervisor: **Lars Pareto**, who had been a constant source of support and inspiration.

We would also like to thank:

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References

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Thank you!

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