Employing Diffusion of Innovation Theory for Examining Adoption and Implementation of Preservation Metadata in the Cultural Heritage Community: An Exploratory Study

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Information resources are increasingly being produced digitally in a wide variety of formats. Addressing the long-term access issues for these huge and ever expanding multiple sources of digital information resources is a significant challenge for repositories of digital heritages. This exploratory study examines the adoption and implementation of digital preservation metadata in the cultural heritage communities using the framework provided by diffusion of innovation theory. Various researchers (Podenius, 2005; Moore, 1999; Swanson, 1994; Davis, 1989; Tomarchio and Klein, 1982 among others) have examined the diffusion of information technologies and best practices using the framework from diffusion of innovation theory. According to Rogers, (2003) there are five elements that will each partly determine whether adoption or diffusion of a new activity will occur:

1. Relative advantage: the degree to which an innovation is perceived as being better than its precursor;
2. Compatibility: the degree to which an innovation is perceived as being consistent with the existing values, needs, and past experiences of potential adopters;
3. Complexity: the degree to which an innovation is perceived as being difficult to use;
4. Trialability: the degree to which an innovation may be experimented with before adoption; and
5. Observability: the degree to which the results of an innovation are observable to others.

Digital preservation metadata is part of digital technology innovation, and it would be expected that factors which have been found to be related to other digital technology innovations would also explain the adoption and extent of implementation of preservation metadata in the cultural heritage communities.

Current Preservation Strategies

<table>
<thead>
<tr>
<th>Strategies</th>
<th>Objectives</th>
<th>Metadata Requirements</th>
<th>Issues</th>
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<tbody>
<tr>
<td>Migration</td>
<td>To overcome hardware and software inaccessibility without necessarily changing version, and supporting documentation useful to its preservation and functionality</td>
<td>Detailed information about original content and supporting documentation, useful for its preservation and functionality</td>
<td>Separation of digital content from its environmental context can result in the content becoming unusable due to loss of hardware and software infrastructure.</td>
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<tr>
<td>Evaluation</td>
<td>To overcome hardware and software inaccessibility, whilst retaining aspects of &quot;dry and dark&quot; and its functionality</td>
<td>Detailed information about the software environment required to create, access, or use the object (rights management, information, etc.)</td>
<td>Requires developing new software tool to allow original software to be used on current system.</td>
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<td>Restoration</td>
<td>To overcome hardware and software inaccessibility, whilst retaining aspects of &quot;dry and dark&quot; and its functionality</td>
<td>Detailed examination of the components of a complex object along with their interrelationships, or the repair of any process applied to digital resource</td>
<td>Requires terminology and management of the structure of complex objects.</td>
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Data collection methods include:

- Document analysis,
- In an earlier article by Rogers et al. (2001) a preliminary review of preservation metadata. The 2004 PREMIS survey data provide an initial look at the process. However, considering the dynamic nature of technology-based standards and procedures, an analysis of the most current preservation metadata schemas in light of the existing technology infrastructure is needed.
- Survey questionnaires,
- A follow-up survey instrument is developed based on the result of the preliminary content analysis of the PREMIS data.

Structured telephone interviews and site visits. Individual interviews and site visits will provide the opportunity for in-depth discussions with the diverse stakeholder communities who are knowledgeable about issues, problems, and solutions. As their experiences are first hand and current, the opinions of these interviewees may be of great value for examining the factors affecting stakeholders in adopting and implementing preservation metadata in a cultural heritage community.

Such triangulations of methods help the researcher in examining the topic from a range of perspectives and increase the possibility of collecting valid and reliable data.

Background

Research Questions

To identify factors that affect the rate of adoption and gain a broad understanding of the extent of preservation metadata implementation in the cultural heritage communities, the following research questions will be addressed:

1. What are the more widely adopted preservation metadata methods for management of long-term preservation activities of heterogeneous digital resource in the diverse cultural heritage community?
2. What are the factors that experts in a diverse stakeholder community believe are important in facilitating or inhibiting the adoption of digital preservation metadata?
3. Are there relationships among the identified factors that may affect the adoption and implementation of preservation metadata across the diverse cultural heritage community?
4. Are there commonalities among the diverse stakeholder communities in the decision making process?

Summary

Understanding impediments of adoption and implementation of any given information technology innovation in any given situation requires identifying and analyzing factors that may facilitate the adoption and those that may operate as barriers to adoption. The theory of diffusion of innovations provides a framework for conceptualizing the acceptance and adoption of preservation metadata from the stakeholders’ perspective. The multiple data collection techniques should provide a framework for factors and their relationships that tell the story of adoption of preservation metadata in the cultural heritage community.