Applying the Analytic Hierarchy Process to an Institutional Repository Collection

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Problem Statement

It is difficult to select strategies to grow and enrich the institutional repository when success depends upon unique factors of the local context.
Strategies need to:

- Relate to goals of the IR for the library and the institution
- Include sound and objective measurements of success
- Provide a roadmap for implementation
How to decide? Partnerships
The decision-making method should...

- Compare a **variety** of variables
- Incorporate **priorities and values** of the IR staff
- Incorporate the **institution’s contexts**
- Ground these values into the **IR operations**
- Result in a **spectrum** of strategies
Enter AHP
Goals of this study

1. To select a set of strategies for growing and enriching our institutional repository that is specific to our library and institutional contexts.
2. To evaluate the potential of using the analytic hierarchy process for this purpose.
Background & Literature Review

IR STRATEGIES AND ANALYTIC HIERARCHY PROCESS
Sustainable Practices for Populating Repositories

- 2013 environmental scan
- identified barriers to depositing works
- faculty awareness, motivation, time, and permissions

2017 COAR Next Generation Repositories

- Working group report
- shift toward discussing IR infrastructure, roles, and functionality over promotion and outreach.
IR Strategies: Coalition for Networked Information (CNI)

**Rethinking Institutional Repository Strategies**
- 2017 roundtable session summary

Range of issues that overlap with IR collection development strategies
- Existential
- Definitional
- Operational
- Technical

"Few institutions discussed assessment of repository programs and no institution present had stated goals or metrics for what constituted success."
Background on IR Strategies

Broad surveys of IRs

Dubinsky (2017)
• Snapshot of IRs
• Slow but steady growth since 2007

Tillman (2017)
• Few faculty self-deposit
• IR staff do not feel successful

Difficulties of Broad Surveys

Variations in
• Content
• Collection strategies
• Growth
• Focus
  • Specialty IRs have a higher item count
  • Faculty deposit IRs have fewer items
Key Points on Analytic Hierarchy Process

- Mathematical model
- Paired-comparisons...
- Decision-making
  
“How does A compare with B?”

...of heterogeneous variables
Analytic Hierarchy Process Method

Weight criteria
- Paired-comparison of criteria to assign weights of importance

Assess options
- Paired-comparison of alternative choices' impact on the weighted criteria.

Analyze results
- Synthesis of matrices of weighted comparisons result in ranking of choices.
AHP Literature Review

Developed by Thomas Saaty early 1970's

Used in engineering, business management, and operations research fields

More prominent in European and Asian countries
AHP in LIS

Harshan, Chen and Shi, 2016
- To evaluate quality of library websites.
- Identified attributes that prioritized improvements to the quality of library websites.

Xi, et al., 2015
- To evaluate interlibrary loan service
- Used objective measures as criteria for evaluating their ILL service.
- The weights of the criteria were derived from scores by experts in the field.
Research Questions

What are the best strategies for us to take to improve the quality of our institutional repository?

How useful is the AHP method for making these strategic decisions?
Methodology
Example AHP Model
Decision Goal

To have a rich and useful institutional repository.
## Criteria

<table>
<thead>
<tr>
<th>AHP Level</th>
<th>Description of Criteria</th>
</tr>
</thead>
<tbody>
<tr>
<td>Criterion 1</td>
<td>Dissemination of knowledge</td>
</tr>
<tr>
<td>Criterion 2</td>
<td>Impact on reputation</td>
</tr>
<tr>
<td>Criterion 3</td>
<td>Efficiency</td>
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## Sub-Criteria

<table>
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<tr>
<td>Criterion 1</td>
<td>Dissemination of knowledge</td>
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<tr>
<td>Sub-criterion 1.1</td>
<td>Rarity of items</td>
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<tr>
<td>Sub-criterion 1.2</td>
<td>Distribution of subjects</td>
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<tr>
<td>Sub-criterion 1.3</td>
<td>Direct uses</td>
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<tr>
<td>Criterion 2</td>
<td>Impact on reputation</td>
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<tr>
<td>Sub-criterion 2.1</td>
<td>Indirect measures of use</td>
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<tr>
<td>Sub-criterion 2.2</td>
<td>Grant-funded research outputs</td>
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<tr>
<td>Criterion 3</td>
<td>Efficiency: Time &amp; labor to deposit (CPU)</td>
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<tr>
<td>AHP Level</td>
<td>Mediation Strategies</td>
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<td>---------------------------</td>
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<tr>
<td>Alternative Decision 1</td>
<td>System-focused practices</td>
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<tr>
<td>Alternative Decision 2</td>
<td>Partner-focused practices</td>
</tr>
<tr>
<td>Alternative Decision 3</td>
<td>Champion-focused practices</td>
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Overview of Process

1. Weight the criteria
2. Score the strategies
3. Test the model
4. Implement the strategy
5. Assess the success
Applications of AHP for IR Decision-Making

- Thoughtful, targeted approach
- Provides evidence
- Systematic
Future Directions/Summary

Apply locally and test

Collaborate with others
- Same criteria
- Different results?

Collaborate with others
- Different criteria
- Different strategies
Questions?
References


• Qingkui Xi, Qian Zhang, Feng Ni, Guiting Cha, and Ping Bao. 2015. Interlending & Document Supply 43, 4 (August 2015), 182-188. DOI: 10.1108/ILDS-08-2015-0024


References


Enrique Mu and Milagros Pereyra-Rojas. 2016. Understanding the Analytic Hierarchy Process. Practical Decision Making. Springer. 7-22. DOI: 10.1007/978-3-319-33861-3_2