The structure and priorities of researchers’ scholarly profile maintenance activities:
A case of institutional research information management system

Dong Joon Lee, Texas A&M University
Besiki Stvilia, Florida State University
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RIMS Project (2016 – present)

• Thanks to:
Why study RIMS?

• RIMS are critical components of global as well as local (i.e., institutional) research information infrastructures and ecosystems (OSTP 2022 open access memo; 2022 Open Science requirements from European Commission)

• RIMS are complex, distributed sociotechnical systems that have complex structures and problems

• Examining those complex sociocultural structures, dependencies, and problems helps develop informed system design and policy recommendations, identify opportunities for RIM system evolution and improvement
We have been studying RIMS since 2016 ...

1. Identified researchers’ requirements for information quality in RIMS
   • Types of information quality problems in RIMS
   • Information quality criteria that researchers perceived to be important in RIM systems

2. Developed general theoretical framework for researcher participation in RIMS
   • Activity-related motivations for using RIMS
   • Three levels of participation in RIM systems: Readers, Record Managers, and Community Members.
   • Relationships among researchers’ seniority, discipline, and types and extent of RIMS use
   • Tasks and predictors of higher RIMS use
   • Metadata profiles and priorities for researcher activities and motivations

3. Examined RIM ecosystems on research university campuses from RIMS librarians and managers’ perspective
   • RIM services offered to researchers
   • Types of RIM service provision, problems and contradictions of RIMS adoption and operation

4. Extended the general RIMS participation framework to institutional RIMS
   • Researchers’ priorities for and structure of the scholarly profile maintenance activity in a non-mandatory institutional RIMS
   • Informs the design of profile maintenance action templates for institutional RIMS that can be tailored/parametrized to researchers’ characteristics and can enhance researchers’ engagement in the curation of their research information.
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<thead>
<tr>
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- Researchers’ requirements for information quality in RIMS
- Theoretical framework for researcher participation in RIMS
- RIM ecosystems on research university from RIMS librarians and managers’ perspective
- Extended the general RIMS participation framework to institutional RIMS

- Find relevant literature
- Share manuscripts
- Identify researchers
- Disseminate research
- Interact with peers
- Monitor the literature
- Evaluate
- Curate
RIMS Project

Researchers’ requirements for information quality in RIMS

Theoretical framework for researcher participation in RIMS

RIM ecosystems on research university from RIMS librarians and managers’ perspective

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Motivations

- Share Scholarship
- Enjoyment
- Quality of Recommendations
- External Pressure
- Expertise (Self-efficacy)
- Improve Status
- Support Evaluation
- Build Community Ties

Find relevant literature
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Motivations
- Share Scholarship
- Enjoyment
- Quality of Recommendations
- External Pressure
- Expertise (Self-efficacy)
- Improve Status
- Support Evaluation
- Build Community Ties

Amotivations
- Not required
- No effect on status
- Not useful
- Cost
- Not a norm
- Fad
RIMS Project

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![Diagram](image)

### Diagram Elements

- **Subject - Tool**
- **Action - Motivation**
- **Division of Labor - Motivation**
- **Rules, Norms, Conventions**
- **Community**
- **Object**

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Motivations
# RIMS Project

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![Diagram showing SQL database and VIVO front-end connections]
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#### Scholars@TAMU Diagram

Data Flow:
- **Input:** Researchers' requirements for information quality in RIMS
- **MySQL Database:** SQL database
- **Front-End:** VIVO

Key Technologies:
- **RIMS Project**
- **Data**
- **SQL database**
- **MySQL**
- **DSpace**
- **Elements**
- **VIVO**
- **Input**
- **LOG**
RIMS Project

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Texas A&M University Researchers’ Scholarly Profile
Maintenance Activities

- Scholars@TAMU
- RIMS for Texas A&M University researchers
- User activity log data available
Texas A&M University Researchers’ Scholarly Profile Maintenance Activities

• Record Managers
  • Goal (Activities)
    • Maintain profile (i.e., update profiles)
  • Motivations
    • Share scholarship
    • Improve status
    • Enjoyment
Texas A&M University Researchers’ Scholarly Profile
Maintenance Activities

- Activity 1
- Activity 2
- Activity 3

Readers
- Record Managers
  - Answer Questions
  - Endorse Researchers
- Community Members
Texas A&M University Researchers’ Scholarly Profile Maintenance Activities

Research Questions

1. What are the researchers’ profile maintenance activities in institutional RIMS?

2. What are the relationships between researchers’ maintenance actions and researchers’ characteristics?
Texas A&M University Researchers’ Scholarly Profile Maintenance Activities

Study Design - Log analysis

• Log data: 27,249 user sessions performed by 3,738 A&M faculty members
  • Activity log: 10 different modules & 124 unique events
• Faculty characteristics: seniority, gender, publication count, profile picture, research overview

Snippet from Scholars profile editor log data.

<table>
<thead>
<tr>
<th>ID</th>
<th>UID</th>
<th>Module</th>
<th>Event</th>
<th>Time</th>
</tr>
</thead>
<tbody>
<tr>
<td>84</td>
<td>2ccaf7464213f431bf0c8ff8c2e44b13</td>
<td>Profile</td>
<td>A new picture was uploaded.</td>
<td>8/18/2020 13:16</td>
</tr>
<tr>
<td>85</td>
<td>2ccaf7464213f431bf0c8ff8c2e44b13</td>
<td>Profile</td>
<td>Preferred Email was added.</td>
<td>8/18/2020 13:19</td>
</tr>
<tr>
<td>87</td>
<td>1ae5ae54c7c1a5a5a09ea5996bceeb31</td>
<td>Profile</td>
<td>Preferred Title was added.</td>
<td>8/18/2020 13:22</td>
</tr>
<tr>
<td>88</td>
<td>1ae5ae54c7c1a5a5a09ea5996bceeb31</td>
<td>Profile</td>
<td>Preferred Email was removed.</td>
<td>8/18/2020 13:22</td>
</tr>
<tr>
<td>191</td>
<td>eae7797e8e90aa520272dc921d5dd432</td>
<td>Profile</td>
<td>Research area was added.</td>
<td>8/24/2020 9:47</td>
</tr>
<tr>
<td>192</td>
<td>eae7797e8e90aa520272dc921d5dd432</td>
<td>Profile</td>
<td>Overview was added.</td>
<td>8/24/2020 9:48</td>
</tr>
<tr>
<td>253</td>
<td>71f169cc06a8d480ccf4111d77242d32</td>
<td>Profile</td>
<td>Phone was removed.</td>
<td>8/25/2020 14:21</td>
</tr>
</tbody>
</table>
### Method & Findings

#### Principal Component Analysis (PCA)

- **11 components**

### Users' Events

<table>
<thead>
<tr>
<th>Users' Events</th>
<th>Component</th>
</tr>
</thead>
<tbody>
<tr>
<td>VOLUME WAS UPDATED</td>
<td>0.924</td>
</tr>
<tr>
<td>ISSUE WAS UPDATED</td>
<td>0.871</td>
</tr>
<tr>
<td>JOURNAL TITLE WAS UPDATED</td>
<td>0.865</td>
</tr>
<tr>
<td>START PAGE WAS UPDATED</td>
<td>0.724</td>
</tr>
<tr>
<td>END PAGE WAS UPDATED</td>
<td>0.719</td>
</tr>
<tr>
<td>YEAR WAS UPDATED</td>
<td>0.592</td>
</tr>
<tr>
<td>AUTHOR LIST WAS UPDATED</td>
<td>0.479</td>
</tr>
<tr>
<td>PUBLICATION TYPE WAS UPDATED</td>
<td>0.527</td>
</tr>
<tr>
<td>MONTH WAS UPDATED</td>
<td>0.430</td>
</tr>
<tr>
<td>CITY WAS UPDATED</td>
<td>0.000</td>
</tr>
<tr>
<td>ZIP WAS UPDATED</td>
<td>0.000</td>
</tr>
<tr>
<td>STATE WAS UPDATED</td>
<td>0.004</td>
</tr>
<tr>
<td>ADDRESS LINE 1 WAS UPDATED</td>
<td>0.004</td>
</tr>
<tr>
<td>ADDRESS LINE 2 WAS UPDATED</td>
<td>0.008</td>
</tr>
<tr>
<td>ADDRESS LINE 3 WAS UPDATED</td>
<td>-0.004</td>
</tr>
<tr>
<td>PHONE WAS UPDATED</td>
<td>0.000</td>
</tr>
<tr>
<td>URL WAS UPDATED</td>
<td>0.000</td>
</tr>
<tr>
<td>PUBLISHER NAME WAS UPDATED</td>
<td>0.043</td>
</tr>
<tr>
<td>PLACE PUBLISHER WAS UPDATED</td>
<td>-0.050</td>
</tr>
<tr>
<td>BOOK TITLE WAS UPDATED</td>
<td>0.051</td>
</tr>
<tr>
<td>PROCEEDINGS TITLE WAS UPDATED</td>
<td>0.006</td>
</tr>
<tr>
<td>RESEARCH AREA WAS UPDATED</td>
<td>0.002</td>
</tr>
<tr>
<td>OVERVIEW WAS UPDATED</td>
<td>-0.008</td>
</tr>
<tr>
<td>WEBSITE WAS UPDATED</td>
<td>0.003</td>
</tr>
<tr>
<td>PROCEEDINGS TITLE WAS UPDATED</td>
<td>-0.053</td>
</tr>
<tr>
<td>CONFERENCE NAME WAS UPDATED</td>
<td>-0.088</td>
</tr>
<tr>
<td>PUBLICATION WAS CLAIMED OR REJECTED</td>
<td>0.011</td>
</tr>
<tr>
<td>LOGGED IN</td>
<td>-0.005</td>
</tr>
<tr>
<td>EMAIL NOTIFICATION WAS CLICKED</td>
<td>-0.012</td>
</tr>
<tr>
<td>DOI WAS UPDATED</td>
<td>0.001</td>
</tr>
<tr>
<td>URL WAS UPDATED</td>
<td>0.006</td>
</tr>
<tr>
<td>ISBN WAS UPDATED</td>
<td>-0.181</td>
</tr>
<tr>
<td>PUBLISHED ID WAS UPDATED</td>
<td>0.014</td>
</tr>
<tr>
<td>FIRST NAME WAS UPDATED</td>
<td>0.011</td>
</tr>
<tr>
<td>MIDDLE NAME WAS UPDATED</td>
<td>-0.005</td>
</tr>
<tr>
<td>LAST NAME WAS UPDATED</td>
<td>0.008</td>
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<tr>
<td>KEYWORD WAS EDITED</td>
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</tr>
<tr>
<td>PUBLICATION WAS REQUESTED TO BE UPDATED</td>
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<tr>
<td>ABSTRACT WAS UPDATED</td>
<td>0.010</td>
</tr>
<tr>
<td>PREFERRED POSITION TITLE WAS UPDATED</td>
<td>0.002</td>
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<tr>
<td>POSITION WAS UPDATED</td>
<td>-0.003</td>
</tr>
<tr>
<td>EDUCATION WAS UPDATED</td>
<td>-0.011</td>
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Texas A&M University Researchers’ Scholarly Profile Maintenance Activities

Activities

- Add publication
- Enhance researcher identity
- Improve research discoverability

Actions in Events

1. Add publication with bibliographic metadata
2. Update contact information
3. Add book chapter
4. Share research expertise
5. Add conference information to publication
6. Claim publication
7. Add publication with identifier
8. Update personal name
9. Complete publication metadata (i.e., abstract, keyword)
10. Update position title
11. Update educational background
Findings

• Pairwise importance of the actions among researchers’ seniority
  • Assistant and associate professors had significantly higher mean ranks that full professors for the most actions

Note. An edge between a pair of nodes on the graph indicates a statistically significant difference between the seniority groups for the user actions (p < 0.05).

Seniority group:
6: Assistant Professor
1: Associate Professor
2: Full Professor
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Seniority group:
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  • Assistant and associate professors had significantly higher mean ranks than full professors for the most actions
  • Add book chapter: Monograph and book chapters are published more frequently by senior and established researchers (Verleysen & Ossenblok, 2017)

Note.
An edge between a pair of nodes on the graph indicates a statistically significant difference between the seniority groups for the user actions ($p < 0.05$).

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Findings

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  • Assistant and associate professors had significantly higher mean ranks that full professors for the most actions
  • Add book chapter: Monograph and book chapters are published more frequently by senior and established researchers (Verleysen & Ossenblok, 2017)
  • Full professors had significantly higher mean ranks than assistant and associate professors for the action of Claim publication
Findings & Discussion

• Claim Publication
Findings & Discussion

• Claim Publication
Findings & Discussion

- Claim Publication
  - Has low cost (e.g., time and effort) & provides highly visible results
Findings & Discussion

• Claim Publication
  • Has low cost (e.g., time and effort) & provides highly visible results
  • Only event for full professors had higher mean ranks
Findings & Discussion

• Claim Publication
  • Has low cost (e.g., time and effort) & provides highly visible results
  • Only event for full professors had higher mean ranks

• According to Mathieson et al., (2001),
  seniority is a positive direct effect of information system usage over
  “perceived ease of use” and “perceived usefulness” from the Technical
  Acceptance Model (Davis, 1989)

    perceived user resources, The DATABASE for Advances in Information Systems, 32(3), 86-112.
Findings & Discussion

• Claim Publication

*Claim publication* seems to meet the assumptions of the Technical Acceptance Model. However, this study did not include a usability test of the system in its scope, so it was not able to confirm the results with statistical analyses.
Findings & Discussion

• Mediation Analyses
  • Multiple linear regression model and Sobel test
  • Seniority had significant indirect effects on Claim publication

![Diagram showing mediation analysis with Sobel test results]

Sobel Test for Component 6:
indirect effect (a*b) = 0.0579
Sig. = 0.000

6. Claim Publication
Findings & Discussion - Gender based difference

- The study provides a unique, empirical examination of the gender-based differences in institutional RIMS uses.

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<th>Global RIMS (Elsayed, 2016; Tsou et al., 2016)</th>
<th>Institutional RIMS (Current Study)</th>
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<tr>
<td><strong>Male researchers</strong> use RIMS more actively than female researchers</td>
<td><strong>Female researchers</strong> update their profiles more often than male researchers</td>
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Findings & Discussion - Gender based difference

• Discussion
  
  • Women are more privacy conscious than men when using social networking sites (Lin & Wang, 2020).
  
  • However, privacy concerns can be lessened by using systems within local organizations or when the use of a RIMS is required by the organization (Venkatesh & Morris, 2000).
  
  • In addition, women are more likely than men to commit to a system that they choose (Lin & Wang, 2020) and are more willing to collaborate and respond to peer referrals for information technology use (Hoffman, 1972; Venkatesh & Morris, 2000).

Findings & Discussion - Profile Picture

Researchers with a profile picture made more frequent updates to their profiles.
Findings & Discussion - Profile Picture

Researchers with a profile picture made more frequent updates to their profiles.

Discussion

- The profile picture is a communication tool that provides higher web credibility and trust to social networking site users (Edwards, Stoll, Faculak, & Karman, 2015; Meinert & Krämer, 2020; Sundar, 2008).
Discussion

- The profile picture is a communication tool that provides higher web credibility and trust to social networking site users (Edwards, Stoll, Faculak, & Karman, 2015; Meinert & Krämer, 2020; Sundar, 2008).

- Profile owners with their pictures have a higher chance of being a “Community Member.” Community Members not only update their profiles but are also willing to communicate with other people through RIMS (Lee, Stvilia, & Wu, 2020).
Findings & Discussion - Profile Picture

Researchers with a profile picture made more frequent updates to their profiles.

Discussion

• The findings in the current study and previous literature suggest a new use case for institutional RIMS. They can serve as local research networking sites to help researchers identify local collaborators and mentors for student projects and/or form and maintain local research groups.
Conclusion

• Log Analysis in RIMS
• An extension of the framework for researcher engagement in RIMS
  • Adding publication
  • Enhancing researcher identity
  • Improving research discoverability
• Structure of gender- and seniority-based priorities for RIMS profile maintenance actions
  • Early adopters of institutional RIMS (female and junior researchers)
• A new use case
  • As a local research networking site
Questions!

Project Site: Researcher Participation in RIMS

https://rims.cci.fsu.edu/