

Earth Science Informatics Community Requirements for Improving Sustainable Science Software Practices: User Perspectives and Implications for Organizational Action

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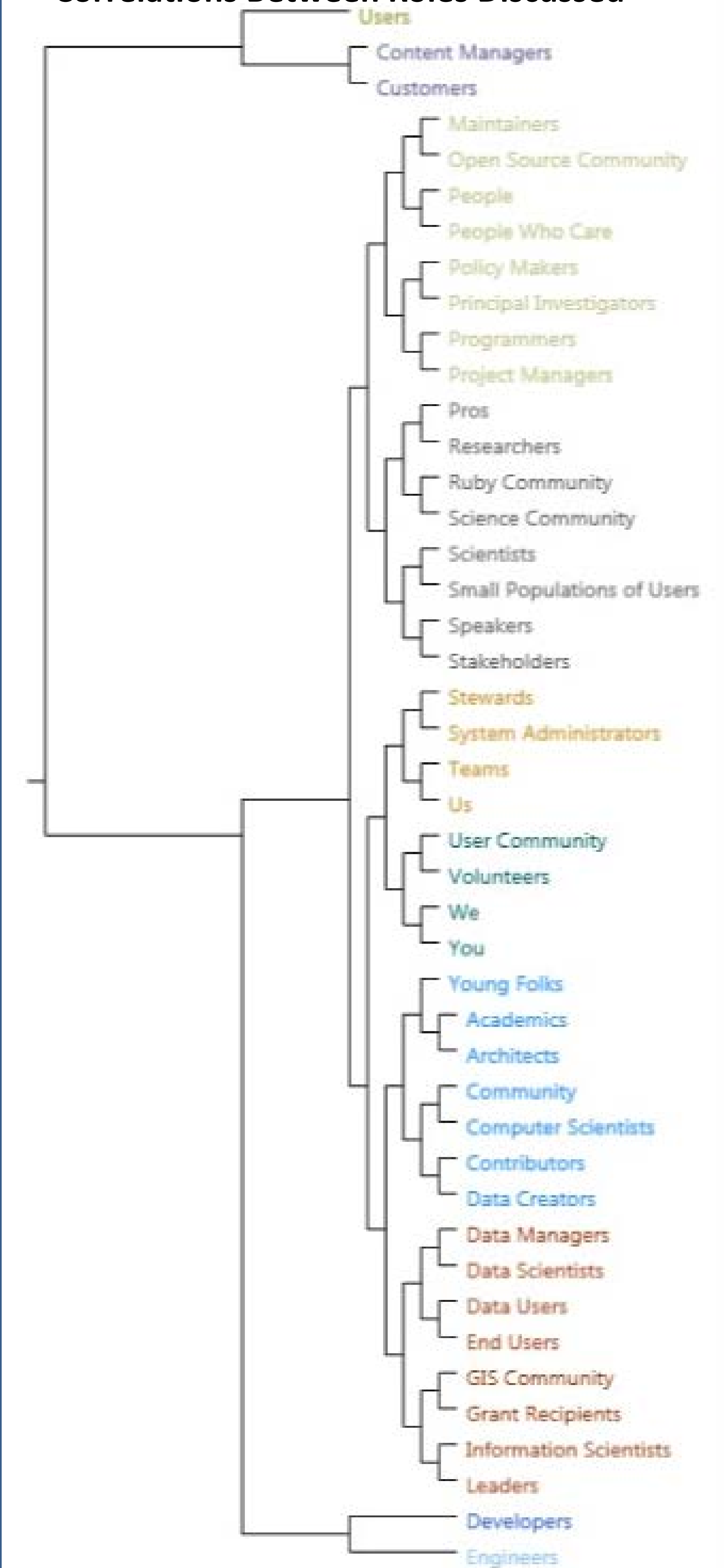
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Correlations Between Roles Discussed



Abstract: Science software is integral to the scientific process and must be developed and managed in a sustainable manner to ensure future access to scientific data and related resources. Organizations that are part of the scientific enterprise, as well as members of the scientific community who work within these entities, can contribute to the sustainability of science software and to practices that improve scientific community capabilities for science software sustainability. As science becomes increasingly digital and therefore, dependent on software, improving community practices for sustainable science software will contribute to the sustainability of science.

Members of the Earth science informatics community, including scientific data producers and distributors, end-user scientists, system and application developers, and data center managers, use science software regularly and face the challenges and the opportunities that science software presents for the sustainability of science. To gain insight on practices needed for the sustainability of science software from the science software experiences of the Earth science informatics community, an interdisciplinary group of 300 community members were asked to engage in simultaneous roundtable discussions and report on their answers to questions about the requirements for improving scientific software sustainability. This paper will present an analysis of the issues reported and the conclusions offered by the participants. These results provide perspectives for science software sustainability practices and have implications for actions that organizations and their leadership can initiate to improve the sustainability of science software.

Methodology

Focus Groups: ~ 8 people per table (lunchtime roundtable activity at 2014 Summer ESIP Meeting)

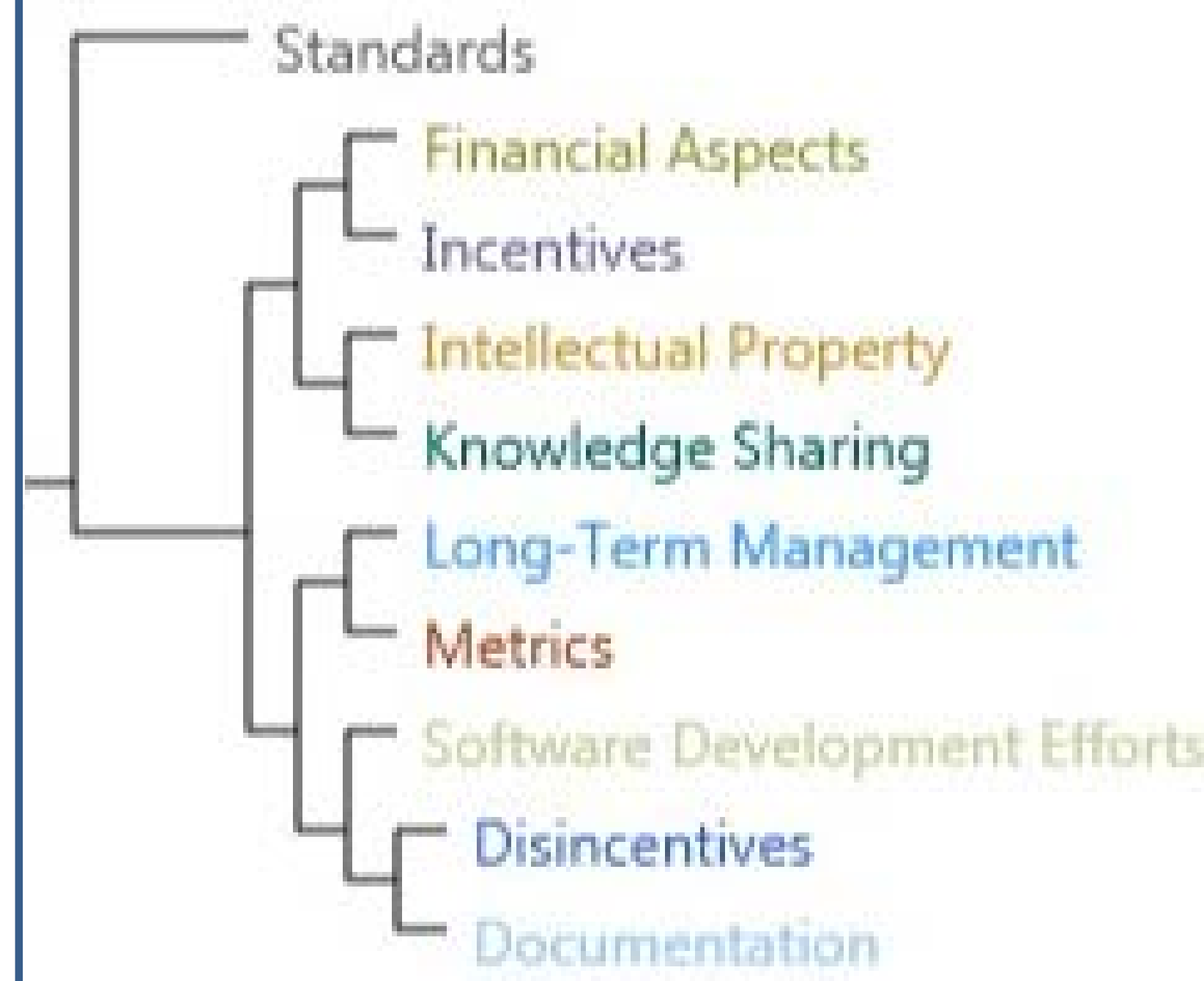
- 1 facilitator assigned to each table
- 36 focus groups invited to participate
- 28 focus groups responded (78%)

3 Discussion topics / questions on sustainable scientific software

- Definition
- Aspects
- Recommendations

Discussion period: < 90 Minutes
Tables submitted written responses

Correlations Between Issues Discussed



Recommendations for the Earth science community

- Improve Collaboration and Community Engagement
 - Work with diverse communities that contribute to the sustainability of scientific software
 - Encourage more scientists & other end users to attend ESIP meetings and share perspectives
- Increase Awareness and Understanding of Scientific Software Sustainability
 - Produce non-technical publications and presentations to inform the Earth science community
 - Develop workshops and training modules (agile development and software carpentry)
 - Document best practices and examples of software management plans, use cases, impact metrics, provenance, modularity, and version control, metadata standards, workflow profiles
- Create Incentives and Motivation for Scientific Software Sustainability
 - Recognize contributions through 'best of...' awards, consider virtual badges
 - Provide attribution by encouraging software citation
 - Develop guidance for citing software and templates for improving attribution
 - Identify funding opportunities to improve software sustainability

Recommendations derived from the following sources:
Downs, RR, Lenhardt, WC, Robinson, E, Davis, E, and Weber, N. 2014. Community Recommendations for Improving Sustainable Scientific Software Practices. 2nd Workshop on Sustainable Software for Science: Practice and Experiences (WSSSPE2), New Orleans, Louisiana, 16 November 2014. <http://dx.doi.org/10.7916/D8Q52NBC>

Downs, RR, Lenhardt, WC, Robinson, E, Davis, E, and Weber, N. 2014. Community Recommendations for Sustainable Scientific Software. Accepted for the 2nd Workshop on Sustainable Software for Science: Practice and Experiences (WSSSPE2) held in New Orleans, LA, Nov 16 2014. ESIP Federation Commons. <http://dx.doi.org/10.7269/P3VX0DFX>



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