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14th International Conference on Open Source Systems

How can OSS Projects be compared with Organizations?

Remo Eckert

University of Bern

Institute of Information Systems



Agenda

Introduction

The Elements of an Organization

Organizational Framework of OSS Projects

> Concepts

- OSS research often uses different concepts of a collective that works together to reach a common goal:
 - Community
 - Project
 - Foundation
 - Organization
- Those concepts around OSS and their relations to each other are often not clarified.

> **OSS Governance**

- Has been widely discussed in literature [2-4].
- “the means of achieving the direction, control, and coordination of wholly or partially autonomous individuals and organizations on behalf of an OSS development project to which they jointly contribute [5].”
- What exactly is to be governed? What is a project?

> **Research Question**

- What are the different elements comprised within an OSS project?



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Introduction

The Elements of an Organization

Organizational Framework of OSS Projects

> Luhmann [6]

- An organization can decide which **people** are part of it and which are not.
- Organizations have **goals** and the decisions are oriented around these goals.
- Goals are reached with organized **processes** that can be structured either in [8]:
 - core processes (central to earn money)
 - management processes (structure the processes to achieve those core processes)
 - supporting processes (are necessary to run the core processes, but are not central to an organization)
- Processes can be formal and informal

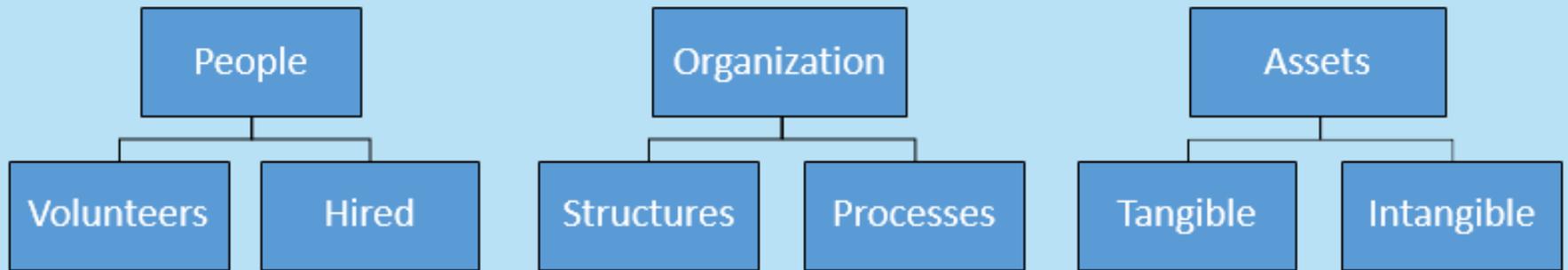
> **Luhmann [6]**

- Organizations have **structures**, which regulate the position of members within the organization
- hierarchies enable an organization to coordinate its people.
- Structures can be formal and informal.

> Assets

- Besides people, common goals, roles, rules and structures, most, if not all, organizations are in need of assets.
- From an accounting viewpoint, an asset is a resource controlled by an entity as a result of past events and from which future economic benefits are expected to flow to the entity [10].
- IFRS [10] distinguishes between:
 - Tangible assets
 - Intangible assets

Legal Entity



Although this figure implies a well-defined structure, each element is closely interlinked with the other elements.



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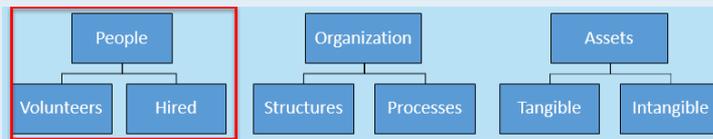
The Elements of an Organization

Organizational Framework of OSS Projects



The People-Dimension

- > **Motivation to contribute**
 - Contributors can either be paid or are volunteers.
 - Motivations behind employees and volunteers contributing to an OSS projects differ [14].
 - A developer’s “itch worth scratching”, might be not as strong for a paid developer as for a volunteer [15].
- > Some tasks are less attractive for volunteers and could therefore be carried out by hired people [16].



The People-Dimension

> Volunteers

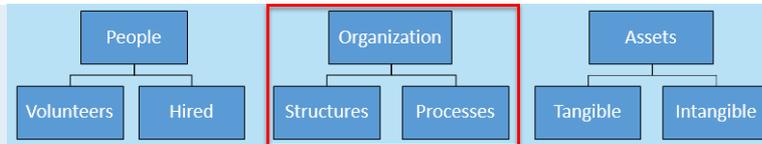
- The involvement of a community in an OSS project is a vital factor [17, 18].
- Attracting and gaining volunteers for an OSS project is an important aspect of community building.
- The community can ease the way for new volunteers by defining guidelines, wikis and answering their questions [19].
- With the help of issue trackers, potential new contributors can get in touch with the existing community.
- Increasing modularity of the source code is another way to attract new contributors [21].



The People-Dimension

> Hired

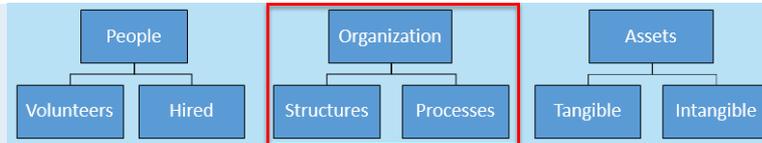
- A high number of developers are paid by an employer for their OSS efforts [24].
- In a study by O'Mahony and Bechky [25], 63% of respondents were paid by a corporate sponsor.
- Berdou [28] distinguishes different forms of hired people:
 - free sponsorship (no clear instructions, often from contributors)
 - clear mandate (contrast to free sponsorship)
 - OSS-friendly jobs (allowed to spend some time working on OSS)
 - sub-contracting (develop a specific application: bounty program)



The Organization-Dimension

> Bylaws

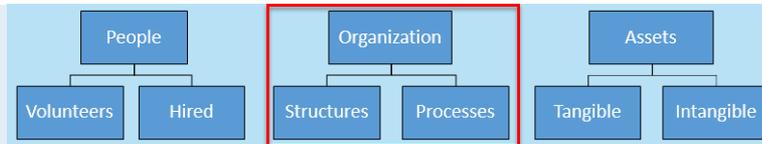
- Bylaws are rules established by the community to regulate itself.
- Some OSS projects have formal membership rules and agreements, such as bylaws with different roles and functions [19].
- As an example, the bylaws of the Eclipse Foundation:
 - regulate the overall purpose of the community
 - the powers and duties of the different roles
 - how and when members are elected
 - how meetings are organized



The Organization-Dimension

> Structures

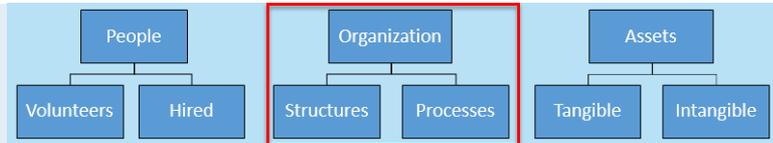
- Relationships with external groups, leadership and control are common sources of conflict [32, 33].
- Structures regulate the coordination efforts between different actors
- Formal / informal structures (“onion-model”)
- From informal to formal [1]
 - spontaneous
 - internal
 - external



The Organization-Dimension

> Core Processes

- Formal rules about the development process ensure that operational tasks, such as requirements elicitation, assignment of people to tasks etc. are organized [5].
- Eclipse Development Process:
 - describes the principles upon which the process should rely: openness, transparency and meritocracy.
- The software development process is often informal [37].



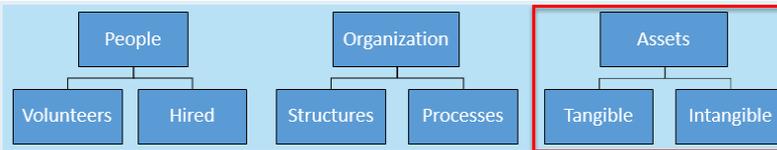
The Organization-Dimension

> **Examples for management processes:**

- Election process
- Decision process
- Voting

> **Examples for supporting processes:**

- Ensuring that contributions do not infringe third-party IP-rights
- Funding process (including bookkeeping)
- Community reports
- Annual reports



The Asset-Dimension

> **Tangible Assets**

- With respect to the development of software, the availability of an IT Infrastructure is an important aspect:
 - PC's
 - Webservers

> **Intangible Assets**

- Although OSS does not fully meet the conditions to be included as an asset in financial reports [44], it can be protected in different ways:
 - Copyright of the source code
 - Trademarks & brands

> Comparison

- Our framework describes the different elements comprised within a single OSS project and shows the broad variety and complex constellation surrounding such a project.
- Each of the three main elements of our framework is enriched with examples from the corresponding OSS research stream.
- Similar to Markus [5], we see formal and informal structures and norms as one of the main elements of OSS governance.

> Discussion

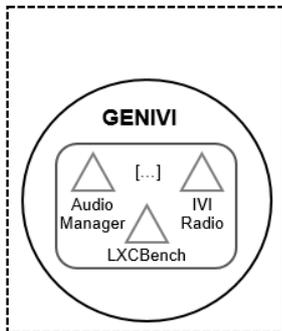
- an OSS community may have different projects and therefore a project does not correspond to the organization (the three dimensions of our framework).
- Moreover, an umbrella organization such as the Linux Foundation may offer their legal entity in order to protect other OSS projects and offer them services relating
- Therefore, the legal aspect of the organization does not need to correspond to the project.

> Further research

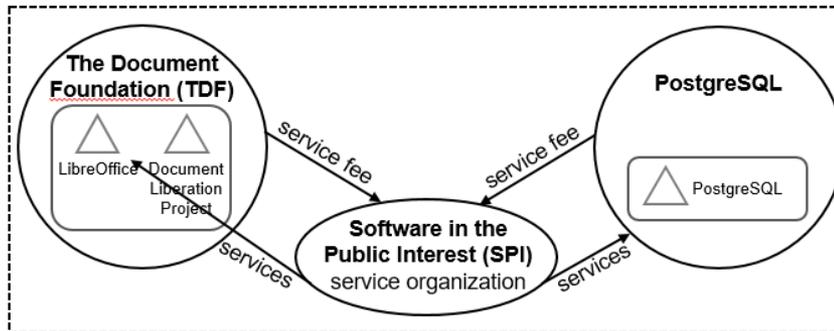
- Our organizational framework broadens the view of Riehle and Berschneider [49] that shows 3 different ways in which a mature OSS project can govern itself in the future:
 - 1) continue as is,
 - 2) create its own legal entity or
 - 3) affiliate with an existing OSS foundation.
- In addition to these 3 forms, an “in-between” solution involving collaboration with different OSS foundations is also possible. Such collaboration can be in all areas of our organizational framework or in specific areas only



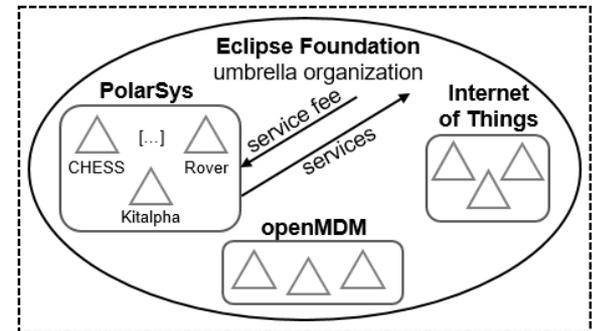
Autonomous approach



Associated approach



Integrated approach



> Implications

- For practitioners, our framework will help to provide a better understanding of the structure an OSS project can have and how the different elements can be organized, similar to an organization.
- Our framework can provide practitioners valuable insights on several managerial aspects relating to OSS governance.

> Definition

- *evolutionary process*
- *individuals and / or organizations in communities*
- *OSS production, distribution and use*
- *creating knowledge how to cooperate in communities¹*

> 3-phase-model

- 1. Spontaneous governance (non-existing explicit and formal coordination)
- 2. Internal governance (enhance efficiency and effectiveness through division of roles, training, modularization)
- 3. institutionalization and the involvement of the outside world²