

Carnegie Mellon
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A framework for evaluating governance styles in Open Source projects

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- **The Software Project Governance Framework**
- **Conclusions**

Open Source has three different faces

 Focus of the research

Ideological model

Distribution model

Development model

Goals of the research

Define a framework to assess the “openness” of a project according to different significant dimensions

Apply the framework to a sample of open source projects to provide a managerial categorization

Practical applications

Audience

Researchers


Benefits from this research

- Select homogeneous samples of projects for surveys and analysis
 - Correlate other variables (e.g., cost, quality) to managerial style
-
- Pre-screen and assess open source applications when evaluating their adoption
-
- Clearly present and position different typologies of open source projects

End users

**Developers
and project
leaders**

Methodology

 Focus of this presentation

Preliminary analysis

- Literature analysis
- Brainstorming
- Educated guessing
- Preparation of interview guide and online questionnaire

Elaboration of the framework

- Structured interviews with 26 key figures of open source projects of different typologies
- Identification of the dimensions along which evaluate “openness”
- Definition of metrics for each dimension

Application of the framework

- Extension of the sample to 75 data points by means of an online survey
- Application of the framework to the sample to provide a managerial categorization

Characteristics of the sample

<u>Variable</u>	<u>Value</u>
Projects	<ul style="list-style-type: none">• 75
Interviews	<ul style="list-style-type: none">• 26
Developers	<ul style="list-style-type: none">• 80 on average
Size	<ul style="list-style-type: none">• 900 KLOC on average

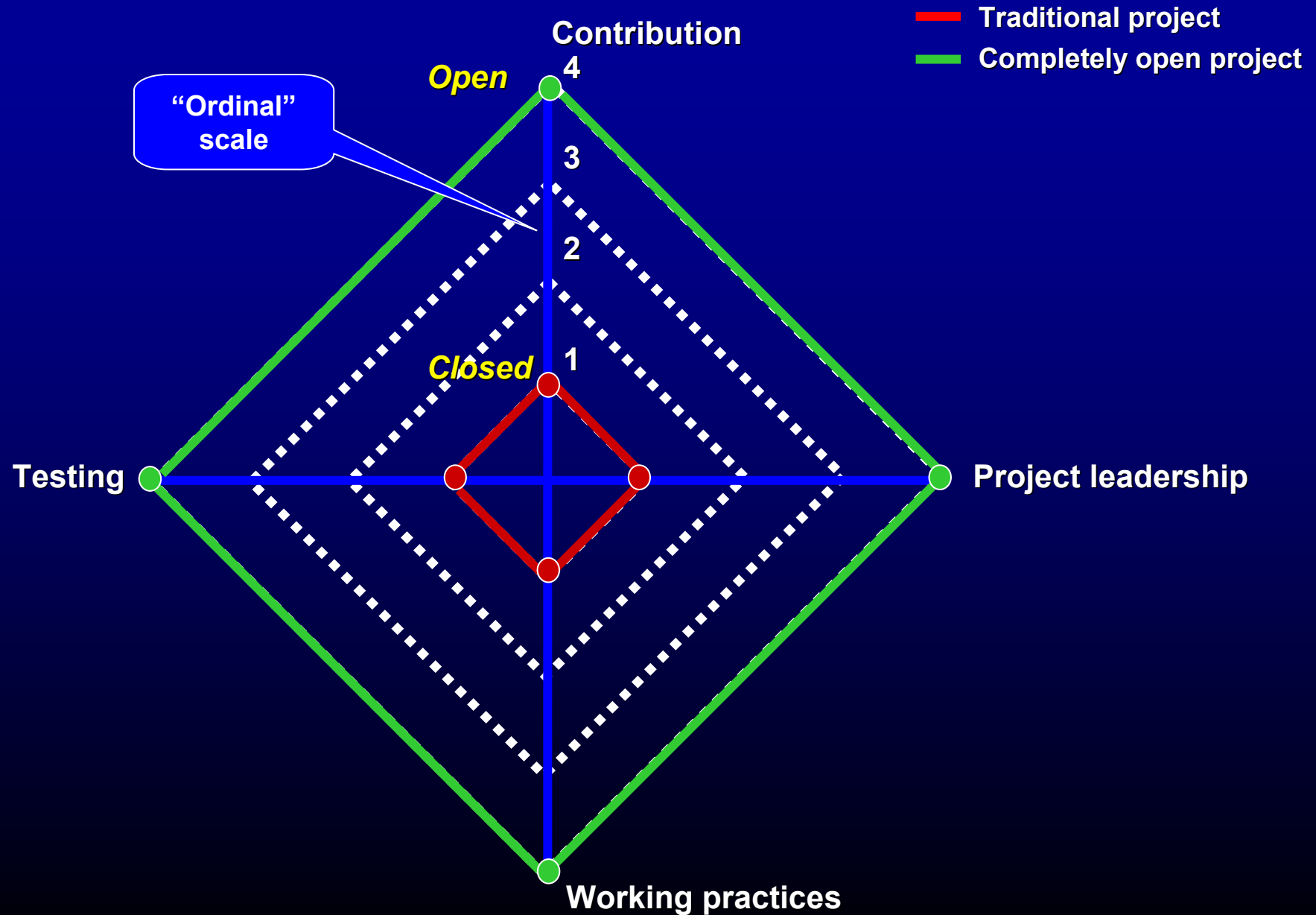
Examples of projects

- MySql
- SugarCRM
- OpenOffice
- Mozilla
- JavaDB
- OpenSolaris
- Eclipse
- Subversion
- DoJo toolkit
- ...

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The Software Projects Governance Framework



Notes about the framework

- The framework defines quantitative and qualitative criteria to assign a project to an ordinal category for each dimension
- The framework applies to projects rather than to applications, as it assesses the whole development process
- Score 4 is not better than score 1: it simply denotes a different category

Contribution dimension



Possible situations

Traditional

Blended

Completely open

Leading questions

- Which percentage of the code is contributed by hired developers?
- How easy is to contribute to the project?

- All the code is developed by employees

- Most of the code is developed by employees or persons hired by stakeholders
- Commit right is reserved to specific persons only

- All the code is contributed on a voluntary basis
- Everybody can contribute if he proves he is valuable

Examples

- Salesforce

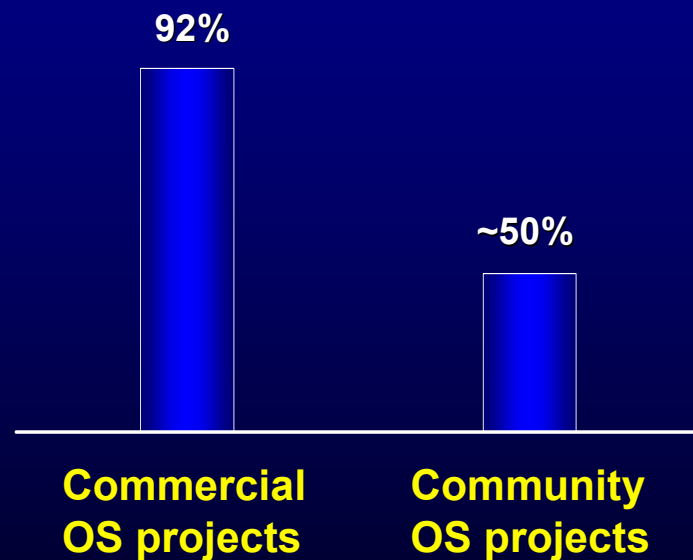
- MySQL
- OpenOffice

- Tomcat
- Drupal

Open source is not written by geeks overnight



Code developed by hired developers



Evidence gathered from interviews

- Core development needs overall vision and full time commitment
- Complex applications require developers to understand the overall structure and to have a deep knowledge of the code base
- Communities need management
- Firms pay developers to pursue their objectives without stepping to the front line

Project Leadership dimension



Possible situations

Traditional

Blended

Completely open

Leading questions

- Does the project have a formal organization?
- How are decisions made?
- How structured is the development process?

- Led by a company
- Hierarchical structure
- Codified process
- Roadmap and deadlines

- Governance bodies elected or selected based on merit
- Voting system
- General roadmap, but not strict

- No structure or organization
- Issues discussed informally
- “Lazy consensus” decisions

Examples

- MySql
- SugarCRM

- Mozilla

- DoJo Toolkit

Working Practices dimension



Possible situations

Traditional

Blended

Completely open

Leading questions

- How do people communicate?
- How geographically dispersed is the team?
- How often do developers meet?

- Most of the developers work in the same location
- Regular meetings

- Some people work in the same location, but others work remotely
- Use of online tools

- Developers never meet in person
- Wide use of online tools (e-mail, IRC, forum, etc.)

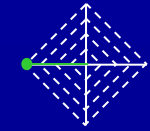
Examples

- SugarCRM

- OpenOffice

- MySql

Testing dimension



Possible situations

Traditional

Blended

Completely open

Leading questions

- How much of the testing rely on the community?
- Are alpha or beta versions released?

- All the testing is done in-house
- The product is released only when thoroughly tested

- Some testing is done by committers or by dedicated resources
- A lot of testing relies on the community
- Beta versions

- All the testing is done by the community
- The community tests the code at every stage of the development process

Examples

- Military and safety-critical applications

- MySql
- Mozilla

- DoJo Toolkit

SPGF applied: MySql

EXAMPLE

Testing:

- Functional and cross-platform tests are done internally
- Integration tests are left to the community
- Overall, more than 50% of testing is done by the community

Contribution:

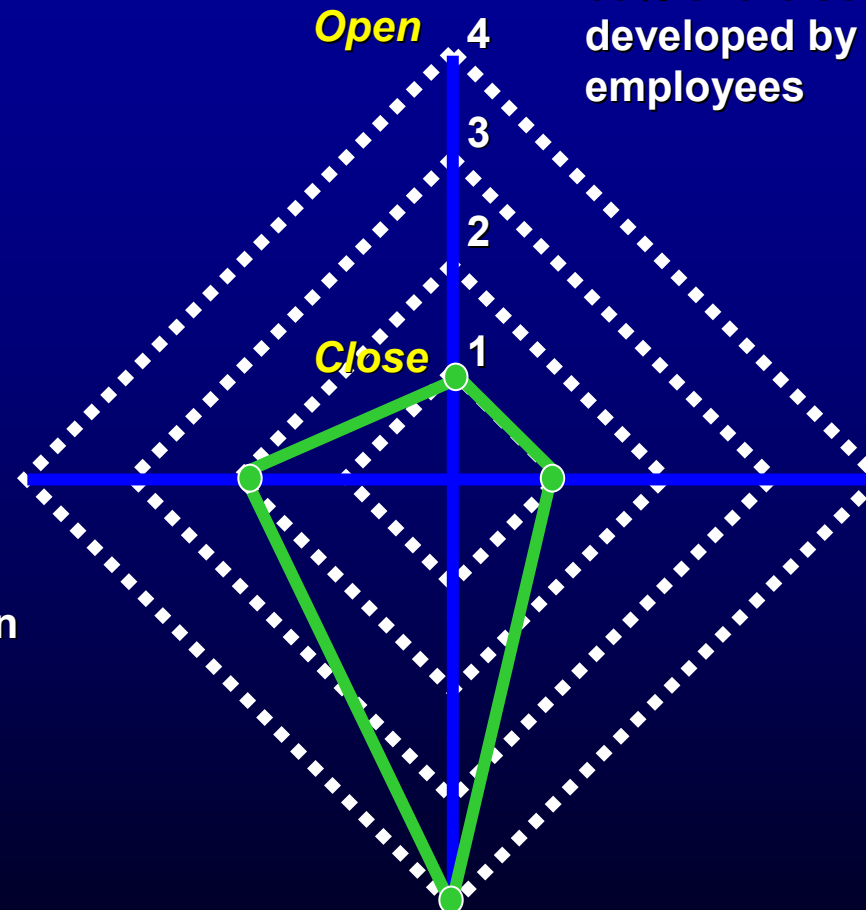
- 99% of the code is developed by employees

Project Leadership:

- MySql as a company controls the governance of the project and makes decisions

Working Practices:

- Developers are located in 26 countries and work from home
- Developers widely use IRC channels combined with e-mails and online shared task lists to keep track



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A managerial categorization for open source projects

Average SPGF score

Categories

Characteristics

- <2

Commercial Open Source

- Led and governed by a company

- $2 < x < 3.5$

Community Open Source

Managed communities

- Based on a community, but with formal organization and governance bodies
- Indirectly led by companies or institutions, which hire developers to accomplish specific tasks

- >3.5

Unmanaged communities

- Entirely based on the community
- No formal organization

Work in progress and future works

- **Refine SPGF scales**
- **Correlate SPGF with quality and effort**
- **Analyze the impact of firms' involvement in open source communities**
- **Add social networking dimensions**

Thank you for your attention

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