Inner-Source: The Lesson of Linux for Enterprises

Guy Martin, Samsung

Phil Odence, Black Duck

Agenda

- **From Open Source Use to Methods**
- Introduction to Inner-Source
- Inner-Source Examples
  - Thomson Reuters 'Corporate Source'
  - Translating Inner-Source at Samsung
- Going Forward

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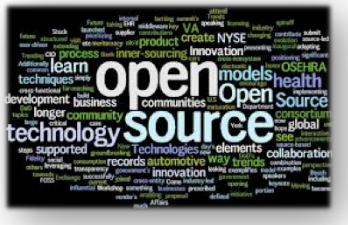
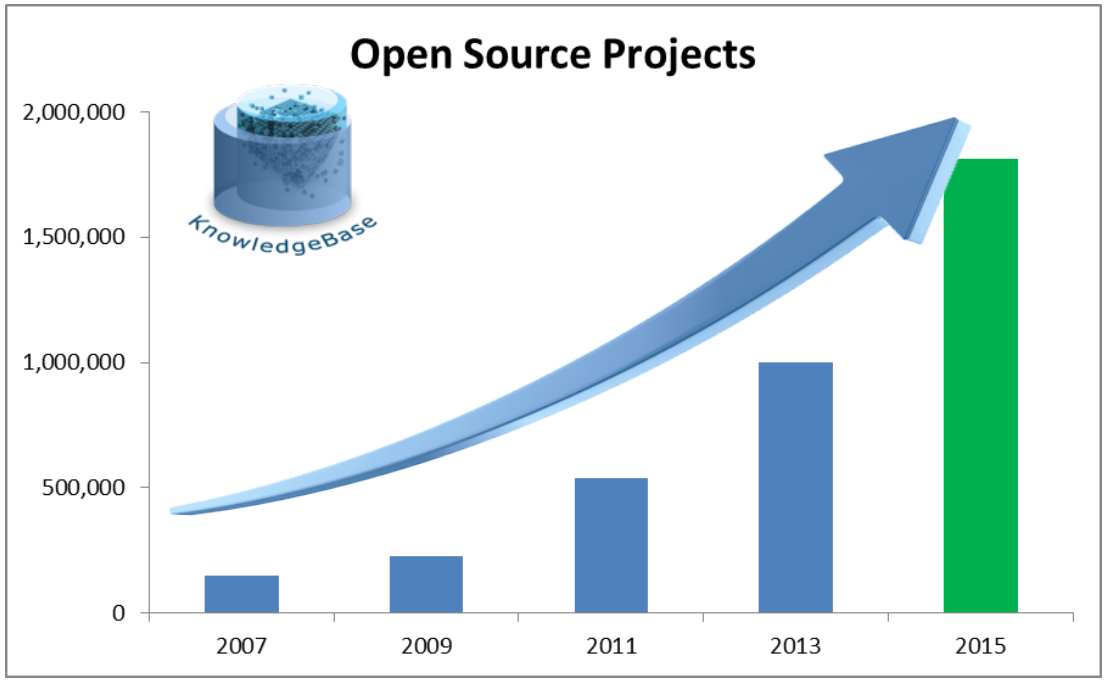
The Global State of Open Source

"*Software is Eating the World*"

Marc Andreessen



And the Appetite for Open Source is Growing



- **1M Projects**
- **100B LoC**
- **10M person**

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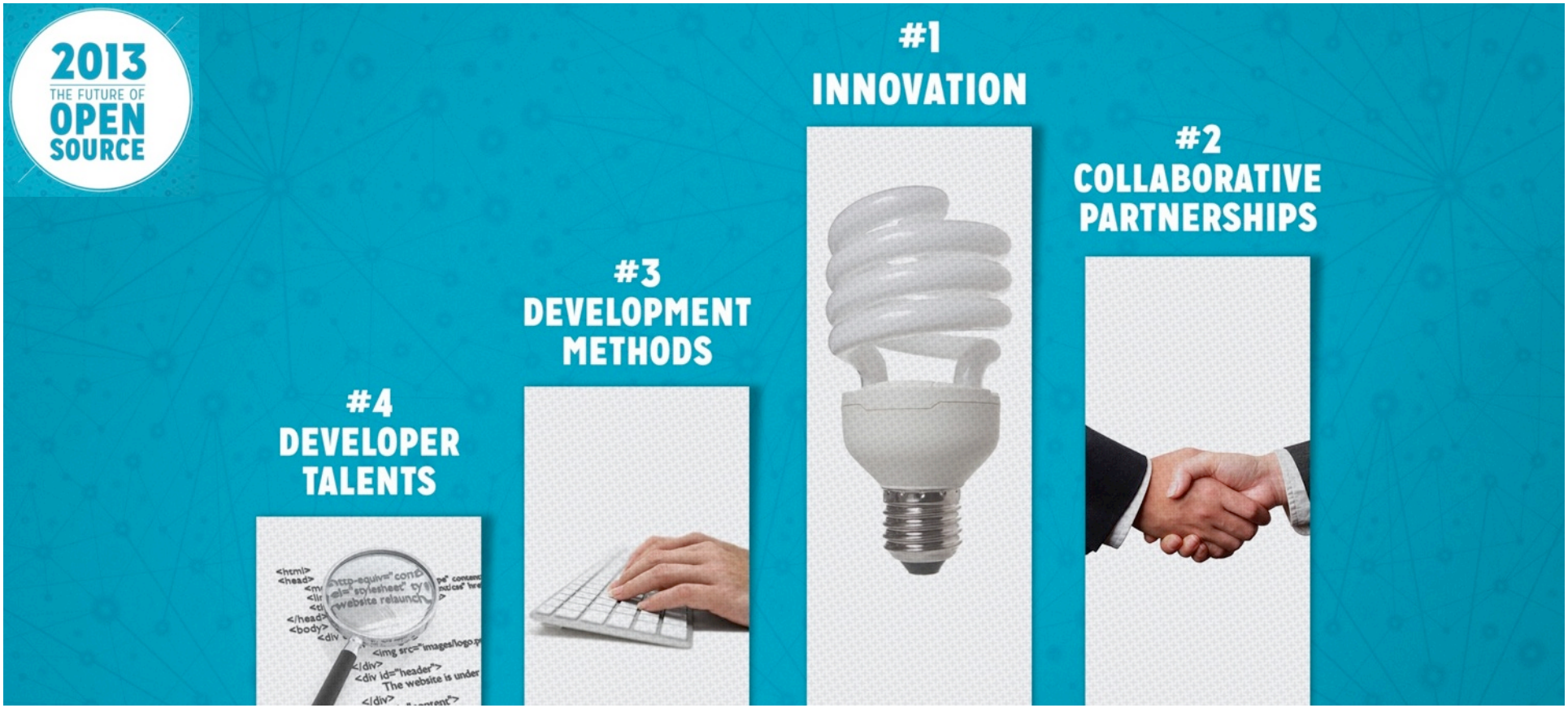
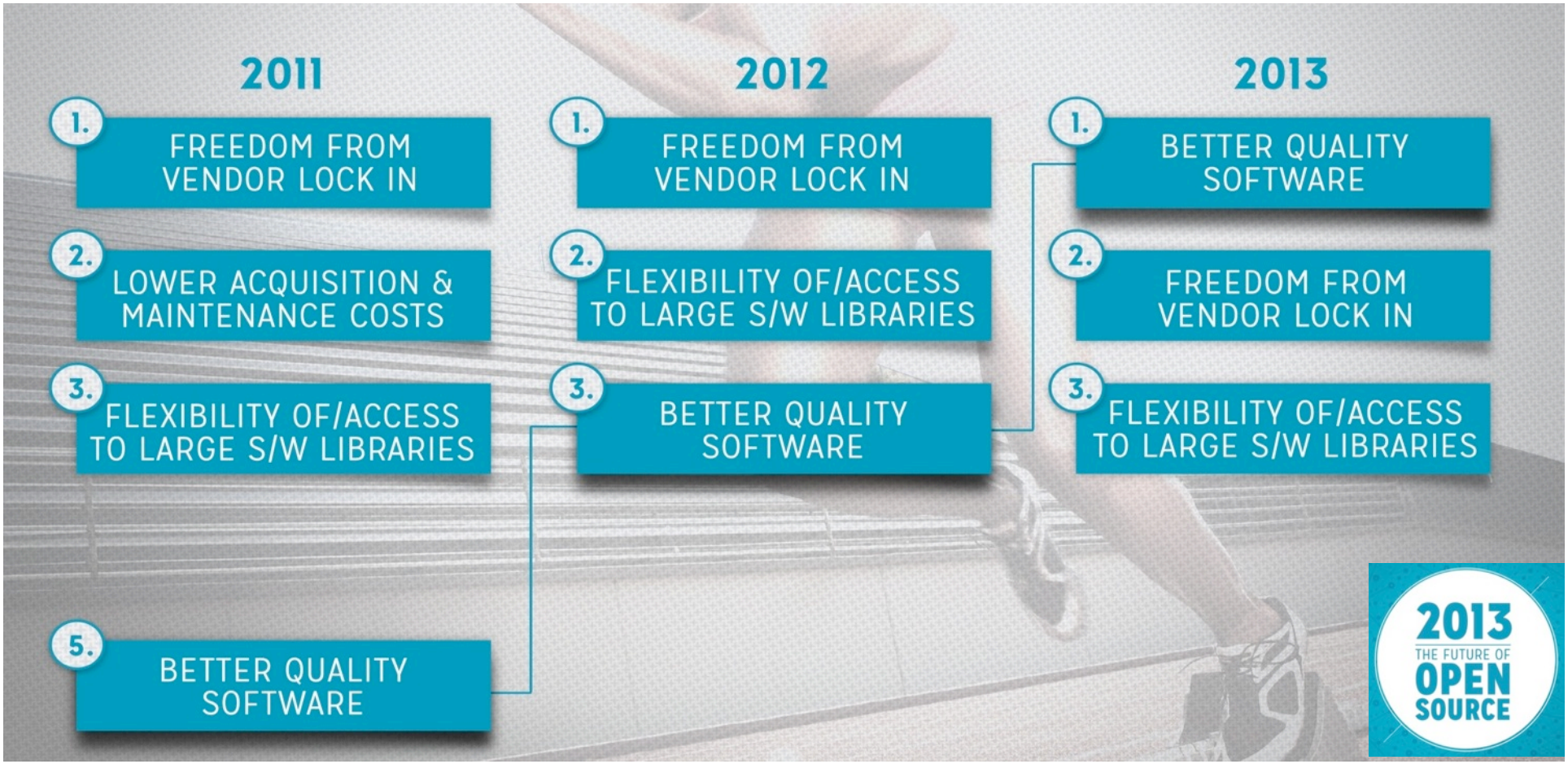
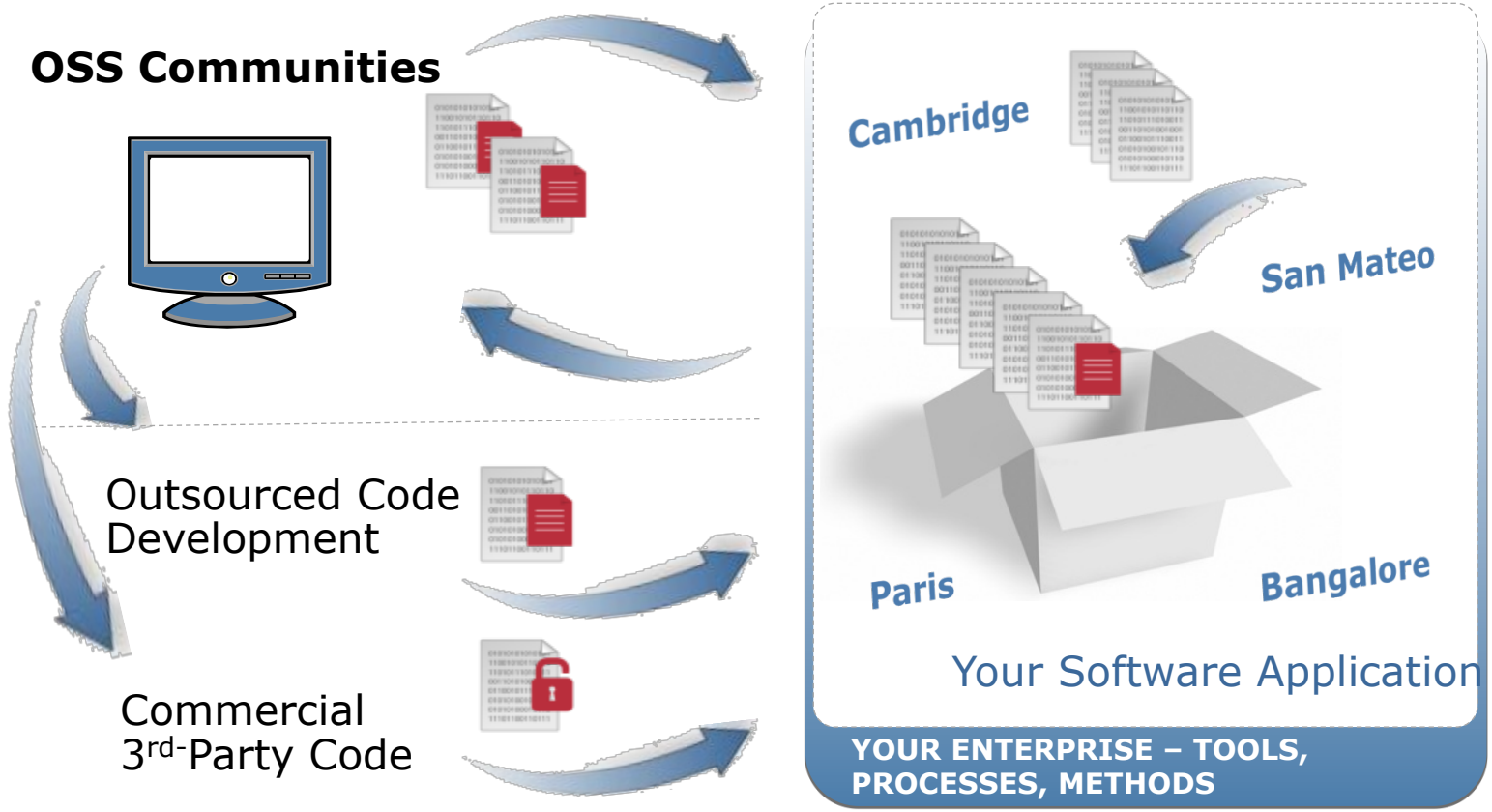
Why is FOSS Important?



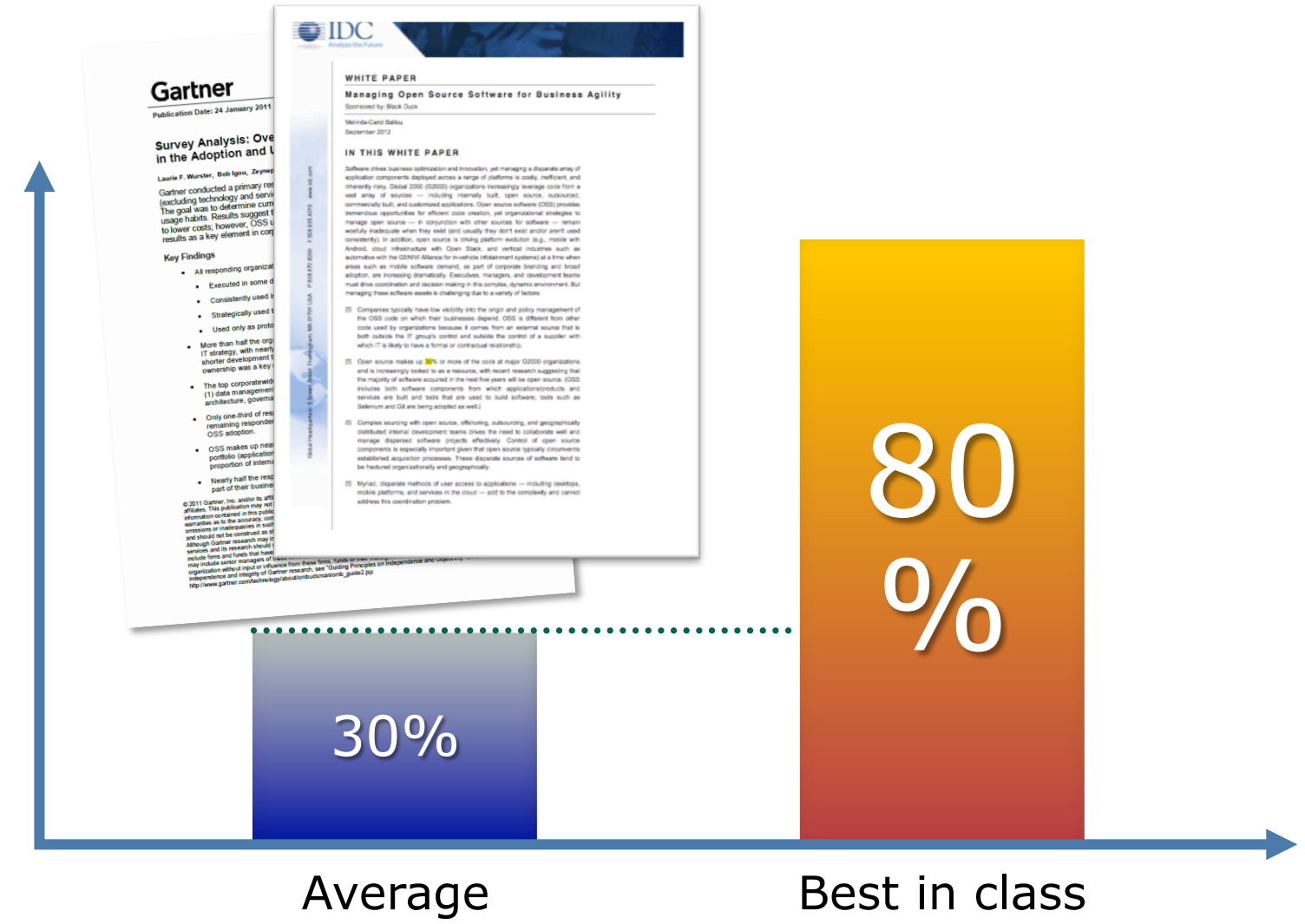
Evolving Drivers of FOSS Adoption



Multi-source Development



Company Benefit: Less is More



Community and Co-opetition

Financial Services

THE LODESTONE FOUNDATION

Open Source for Capital Markets and Beyond

openMAMA

Mobile

Healthcare

OSEHRA

Open Source Electronic Health Record Agent

Aerospace

Polarsys

Automotive

AUTOMOTIVE GRADE LINUX

GENIVI

Infrastructure

OPEN DAYLIGHT

openstack™ CLOUD SOFTWARE

The Apache Foundation

ALLSEEN ALLIANCE

eclipse

mozilla FOUNDATION

The LINUX Foundation

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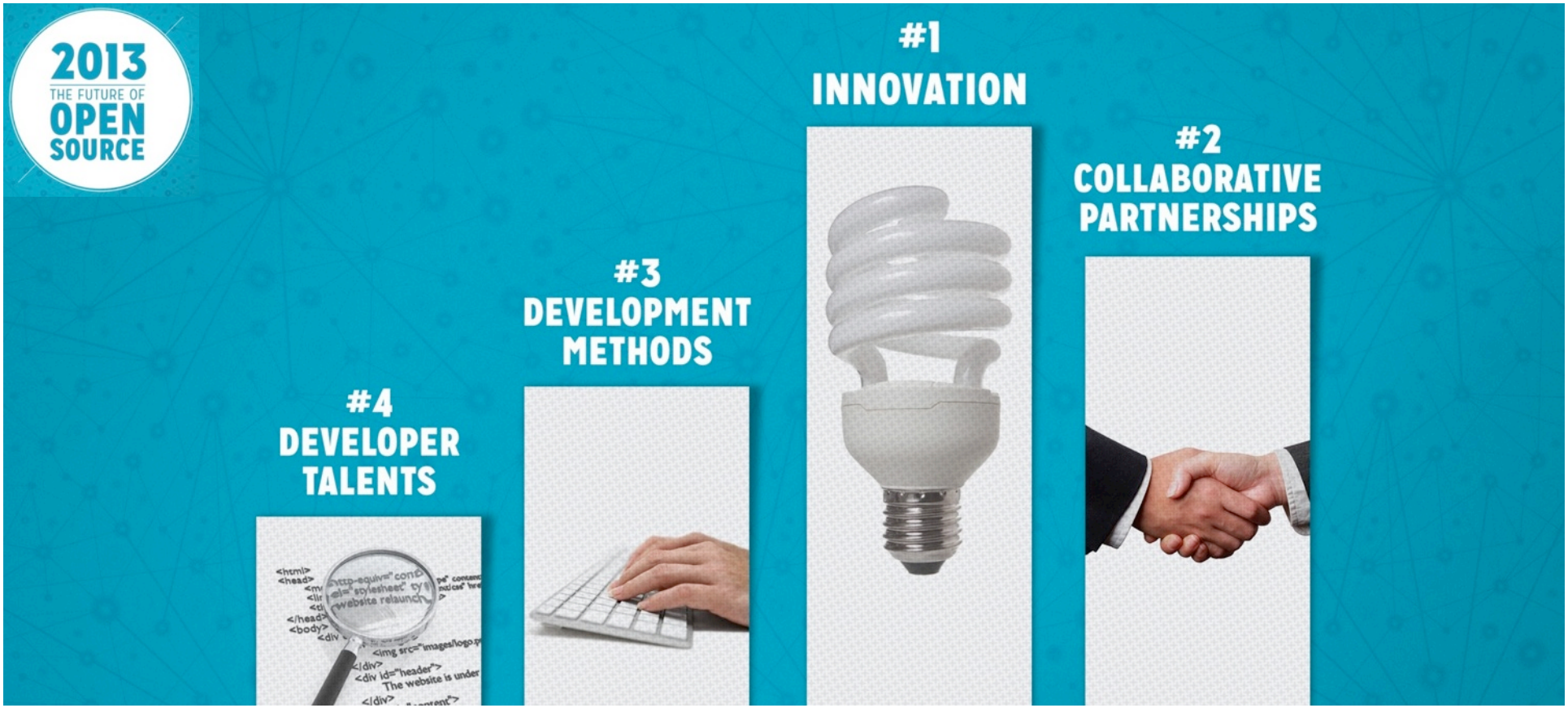

The Lessons of Linux

- 800 companies have contributed over time
- Past year- 3200 developers, 370 companies
- 80% Kernel developers are paid
- Red Hat, Intel, Linaro, Texas Instruments, IBM, Samsung, Google and many others

– Jon Corbet's 2013 Linux Weather Forecast

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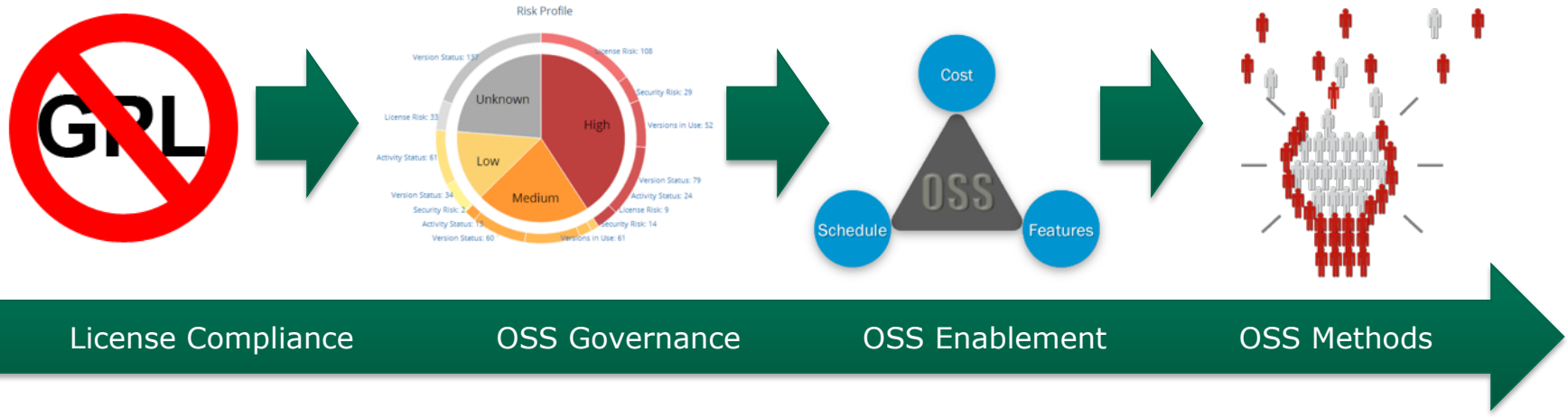
Trends: Managing OSS



Legal risk

Visibility & Control

Leverage

Inner-Source

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- Inner-Source Examples
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  - Translating Inner-Source at Samsung
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What Is Inner-Source

The application of **best practices, processes, culture and methodologies** taken from the open source world and applied to internal software development and innovation efforts.

http://www.keepcalm-o-matic.co.uk/

Why Inner-Source?

- Increased velocity
  - Faster time-to-release
- Improved code
  - Peer-reviewed/security verified
- Reduced costs
  - Code reuse/API development
  - Shared development/maintenance costs
- Increased innovation
  - Component teams collaborating
  - Increased cross-organizational awareness
- Enhanced human capital efficiencies
  - Improved morale, retention and recruitment

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Pillars of Inner-Source

Ethos

Processes

Tools & Technology

Inner-Source

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Thomson Reuters:
Inner-Source = Corporate Source

CORPORATE SOURCE VISION

Increase ***software velocity, cost savings*** *and* ***innovation***

while enhancing employee ***retention*** *&* ***recruitment*** *through the harnessing of* ***collaborative*** *energy, expertise and code from* ***across the enterprise****.*

THOMSON REUTERS

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Thomson Reuters:
Inner-Source = Corporate Source

Thomson Reuters: Corporate Source Accomplishments

- Increased uptake of corporate source components
  - Reduced duplication of effort, especially in APIs
- Adoption moving from basic component to standard distribution and outright collaboration
- A registry of API's across the company's development efforts
- Integration with other company development services

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Translating Inner-Source ("Open Source Model") at Samsung

- Communication
- User Involvement
- Peer Review
- Staffing Methods

A 'work in progress', starting with formation of Samsung OSG (Open Source Group) in 2013 & launch of internal OSS Leadership Program last week!

Communication: How it Differs

Traditional Development Model:

- Primary methods of communication
  - F2F meetings, conference calls, and private emails
- Clear communication hierarchy
- Less reliance on mailing lists and group messaging systems

Open Source Model:

- **Open communication methods**
  - **Mailing lists, IRC, wikis**
- Point-to-point communication
- **Open archives of decision making process and outcomes**

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Open Communication: Benefits

- Greater visibility encourages collaboration and cooperative planning
  - Improved project planning and coordination boosts productivity
  - New innovations at the intersection of separate projects
  - Faster resolution of dependencies

- **The documentation process is greatly enhanced**
  - Discussions often are the documentation
  - Archives provide important historical context to decisions

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Communication: Actions

- For internal projects:
  - Create internal, archived mailing lists for team discussions instead of using cc: lists
  - Document key project maintainers and contributors on corporate intranet so other teams can find them

- For external projects:
  - Require all development discussions regarding an open source project to happen on the project's mailing lists

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User Involvement: How it Differs

Traditional Development Model:

- Core development team has sole access to development artifacts
  - Source code
  - Requirements documents
  - Bug and issue lists
- Little user involvement in development process before release

Open Source Model:

- **Development artifacts available outside of core development team**
  - Source code is available
  - Requirements are published
  - Bug tracking system open for searching and submitting new issues
- Beta testers are empowered to find, diagnose, and report issues

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Open User Involvement: Benefits

- Tighter user integration with earlier feedback loops
  - Development teams are better informed of requirements before release

- Early users are empowered to find and fix bugs
  - Users may discover and diagnose issues outside of official test cases

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User Involvement: Actions

- For internal projects:
  - Make source code available in an accessible system (git, SVN, etc)
  - Publish documentation sufficient for an off-team contributor to get involved
  - Publish requirements and tentative roadmaps
  - Track bugs in bugzilla or JIRA
  - Encourage other teams in the company to test betas and report bugs
- For external projects:
  - Encourage developers to submit bugs
  - Monitor project communication channels (mailing lists, IRC, forums)
  - Actively participate in discussions

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Peer Review: How it Differs

Traditional Development Model:

- Peer review accepted as an excellent way to produce quality code, however it is not widely practiced
- Reviews typically happen by members of the same team

Open Source Model:

- Requests for comments expected
- Subsystem/maintainer model with multi-layer hierarchy
  - By the time code is released, it has typically been reviewed many times
- Not all contributors are regular or even previously known by the project team

Open Peer Review: Benefits

- Consistent review cycles
  - Code is always reviewed prior to being committed
- Higher quality code
  - Submitters refine their style over time to increase likelihood of acceptance
  - Peer review helps reduce variations in style
- Enables projects to accept code from a much wider range of contributors
  - Establishes a web of trust

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Peer Review: Actions

- For internal projects:
  - Restrict DCVS commits to maintainers only
  - Establish a hierarchy of maintainers (if necessary)
  - Adopt the Signed-off-by: process
  - Require code be sent to internal mailing list for submissions and review
  - Require reply-all for reviews
- For external projects:
  - Encourage developers to review patch submissions for relevant subsystems in strategic projects

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Staffing Methods: Differences

Traditional Development Model:

- Developers assigned to specific set of projects
- Little official incentive to contribute to other teams' deliverables

Open Source Model:

- Each project has a clear owner
- Developers have a primary project, but are encouraged to contribute elsewhere
- Developers are incentivized to contribute to other projects
- Role of code committer is a major leadership role

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Staffing Methods: Benefits

- Employees are more productive when the model is established
  - Developers can work on the tasks they are best suited to do

- Employee retention may improve
  - Natural effect of cross training across multiple products/ projects
  - Continual internal opportunity for recognition by peers and management

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Staffing Methods: Actions

- For internal projects:
  - Assign each project or subsystem a maintainer
  - Give developers leeway to submit patches to other teams' maintainers
  - During reviews, reward behaviors that result in collaborative development
- For external projects:
  - Require developers to participate directly in open source projects
  - Do not aggregate submissions for submission through a single individual
  - Reward developers who attain positions of leadership
  - To the greatest extent possible, mimic communication styles of the project

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Real importance of FOSS may be Inner-Source

Getting Started

- Define clear community goals, vision, behaviors & expectations
- Identify 'seed-collaborators' and catalysts
- Choose 1-2 small/common technologies/projects to start
- Deploy Inner-Source Platform
- Define governance model
- Consider human resources ramifications

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Questions