Purpose of Research

Identify the properties of distributed version control systems that adhere to the principles of open source software development

Discuss the fundamental differences between centralised and distributed version control

Discuss the criticisms levied against distributed version control systems
Distributed Version Control

Each user maintains a local clone of the primary repository

Simplified forking and merging (O'Sullivan, 2009)

Allows for development in the absence of access to the server containing the primary repository
Distributed Version Control

Large-scale projects utilising distributed version control systems

Perl  (“Getting and Working With the Perl Source”, 2012)


LibreOffice  (Getting and Working" 2012, "Development » LibreOffice", 2012)
Distributed Version Control

Figure 1: Distributed Version Control
Centralised Version Control

- Utilises a client-server model
- Repository stored on a single server
- All clients interact directly with the primary server
- Creates a linear chronology of development activities
Centralised Version Control

Figure 2: Centralised Version Control
Five anticipated benefits (de Alwis et al., 2009)

"To provide first-class access to all developers”

“To support atomic changes”

“Simple automatic merging”

“Improved support for experimental changes”

“Support disconnected operation”
Open source projects tend to prefer incremental change (Oezbek et al., 2010)

Distributed version control systems better support 'bazaar' project structure (de Alwis et al., 2009)

Projects may transition version control system but not repository structure (Rigby et al. 2011)
Absence of a centralised server reduces ability to comprehensively backup entire project state  
(Koc, 2011)

Managed by governance of project

Hierarchical project structure allows there to exist a primary repository
Criticisms

Multiple local repositories at various stages of development reduce the possibility that there can exist a coherent version numbering system (Koc, 2011)

Managed by governance of project

Hierarchical project structure allows there to exist a primary repository
Criticisms

Distributed version control systems may be perceived as unwieldy from a user experience perspective (Pennington, 2006)

Study of distributed version control systems with students revealed the opposite was true (Rocco & Lloyd, 2011)

Centralised systems may require additional infrastructure knowledge (Rocco & Lloyd, 2011)
Criticisms

Increased storage overhead when tracking large binary files \( (O’Sullivan, 2009) \)

Quantifiable concern

Source of future research
Conclusions

There exists technological and ideological considerations in transitioning from centralised to distributed version control.

Lower barrier-to-entry and distribution does not preclude an increase in perceived openness.

Criticisms are typically subjective.
Conclusions

Necessary to consider the requirements of the project in the determination of the suitability of the utilisation of centralised or distributed version control systems.

Study was qualitative, no means of quantifying the success, or lack thereof.
Future Research

Useful to conduct a series of case studies

Involve a broad range of project complexities, governances and purposes

Measure quantitatively the effect of the version control system on the participating project or projects

Include suitable control cases
References


References


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Questions

Please direct any questions to the front
Distributed Version Control

Repository

Public repository

Server

Repository

Repository

Repository