



# NCSA Software Open Source Server

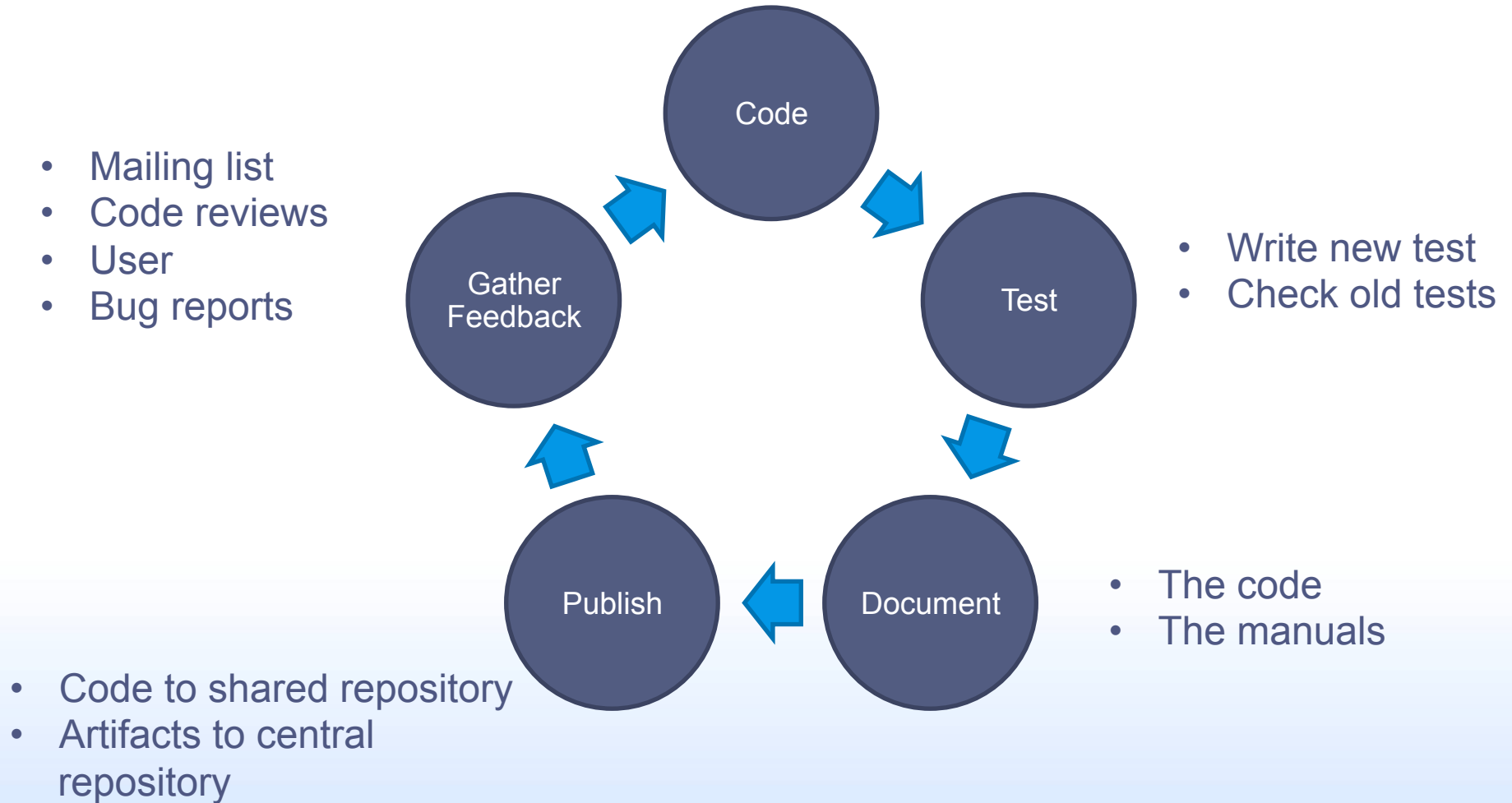
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This presentation is not just about the **technology** used but also about the **process** that is followed.

# Iterative Development



# The process

- Process described is used by ISDA
  - Including collaborators outside of NCSA
- Refined over time
  - But can still be improved!
- Not set in stone
  - Not all projects are the same
  - This might not fit your project
  - We are still learning to do this

# What tools do we need?

- For code
  - Source code management system and code review system
- Testing
  - Continuous build system with tests
- Documentation
  - Project Info, Documentation, API documentation
- Publish
  - Place to download source code and artifacts
- Feedback
  - Questions, bug tracking system, mailing lists

# Available Software Resources

- Full Atlassian Stack
  - CONFLUENCE, JIRA, STASH, BAMBOO, FISHEYE, CROWD
- Sonatype Nexus repository
  - Maven artifact repository
- All available on <https://opensource.ncsa.illinois.edu/>
  - Intel I7 processor, 2.8Ghz
  - 16GB memory
  - 1TB of storage (700GB free)
  - Continuous backup using crashplan

# Opensource Software 1/2

- Projects Page
  - <https://opensource.ncsa.illinois.edu>
  - Custom front end showing all projects
- CONFLUENCE
  - <https://opensource.ncsa.illinois.edu/confluence>
  - Wiki
- JIRA
  - <https://opensource.ncsa.illinois.edu/jira>
  - Bug tracking software
- STASH
  - <https://opensource.ncsa.illinois.edu/stash>
  - Source code management

# Opensource Software 2/2

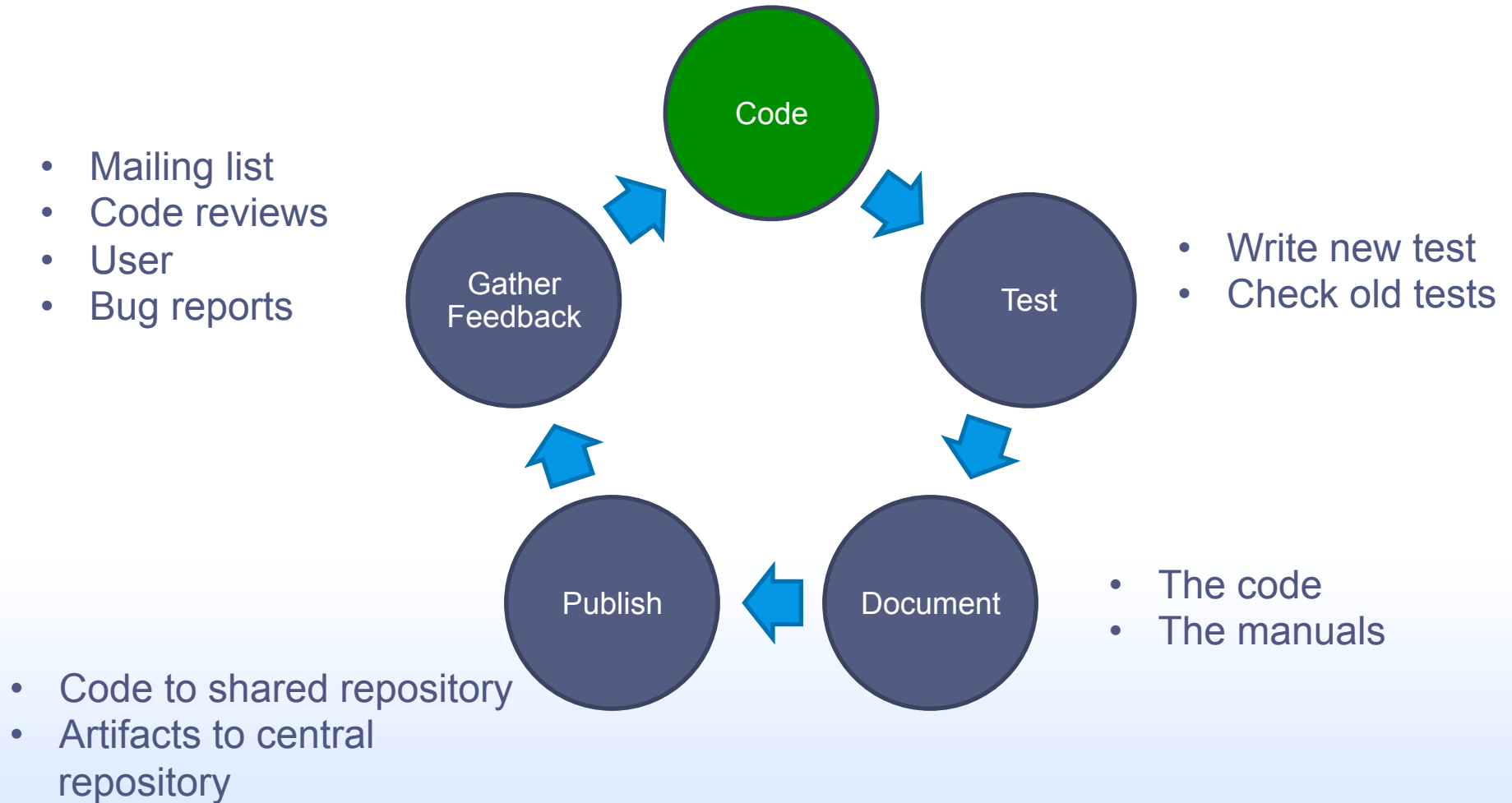
- BAMBOO (replaced Jenkins)
  - <https://opensource.ncsa.illinois.edu/bamboo>
  - Continuous build software
- Questions
  - <https://opensource.ncsa.illinois.edu/questions>
  - Confluence plugin to ask questions
- CROWD
  - <https://opensource.ncsa.illinois.edu/crowd>
  - Account management
- Nexus
  - <https://opensource.ncsa.illinois.edu/nexus>
  - Java artifact repository (for use with maven)



# Before you begin to code

- Create a roadmap
  - Group issues together to create a version
  - Pick a release date
  - Can be linked to a milestone/presentation
- Create multiple versions into the future
  - Yes things will change
  - But this will tell users what to expect and when

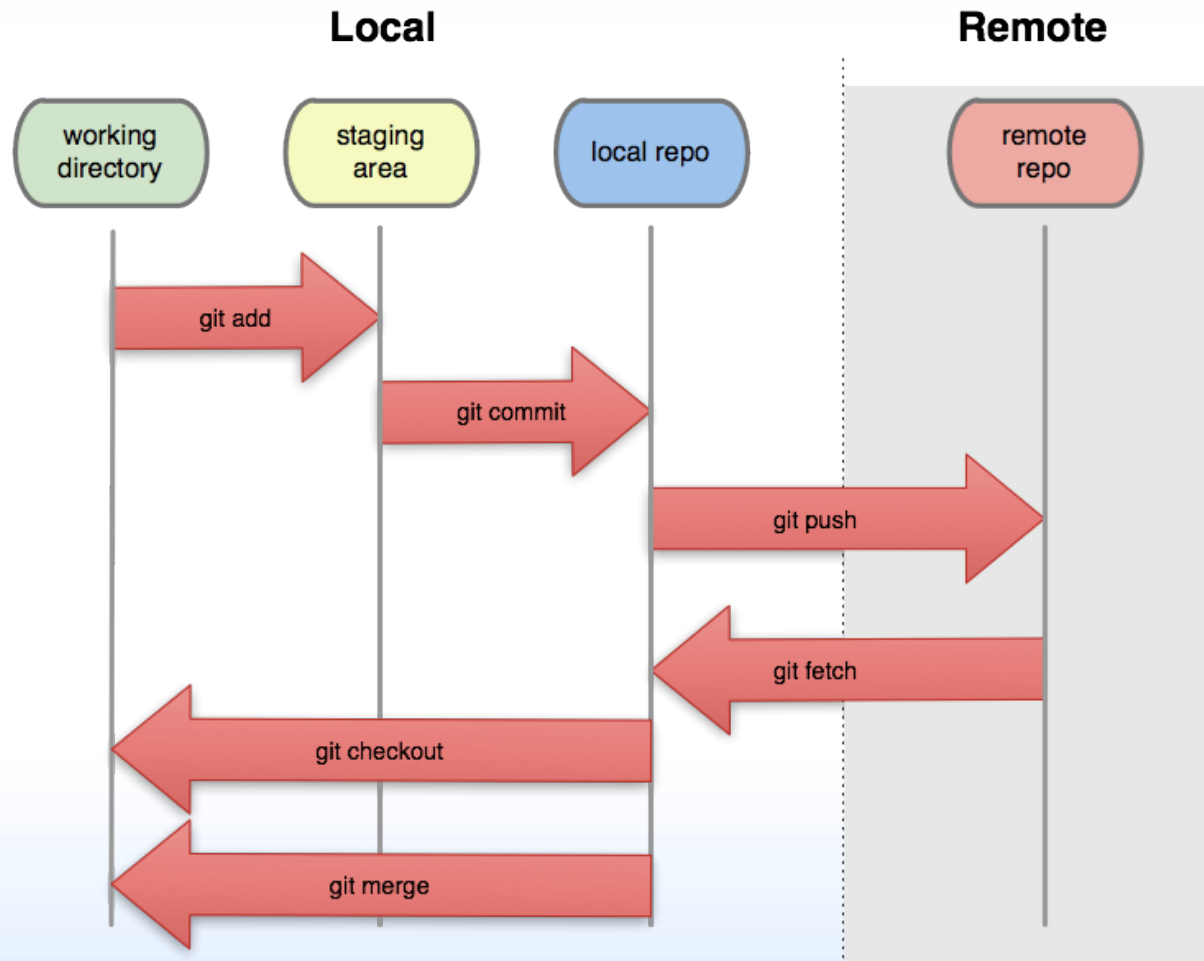
# Iterative Development



# Source Code Management (SCM)

- SCM is NOT an option
- All our code should be in a repository from day 1
  - NO EXCUSES!
- SCM's have existed for decades
  - SCCS released in 1972
  - SCCS, RCS, CVS, SVN centralized systems
    - Can have a single server to checkin/checkout from
  - GIT/HG/BAZAAR distributed version control systems
    - developed around same time (2005)
    - Everybody has all code at all times
    - No single master
- At ISDA we use GIT (and sometimes SVN)

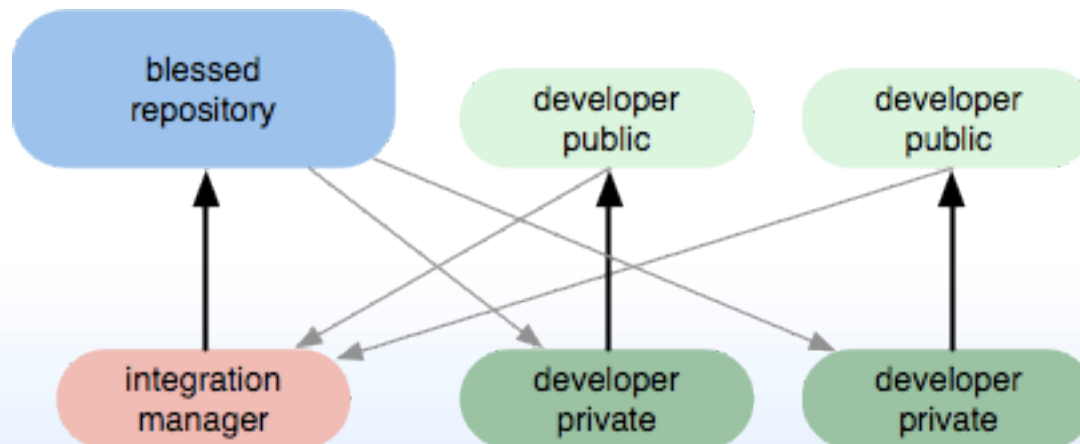
# GIT local and remote



<http://thkoch2001.github.io/whygitisbetter/>

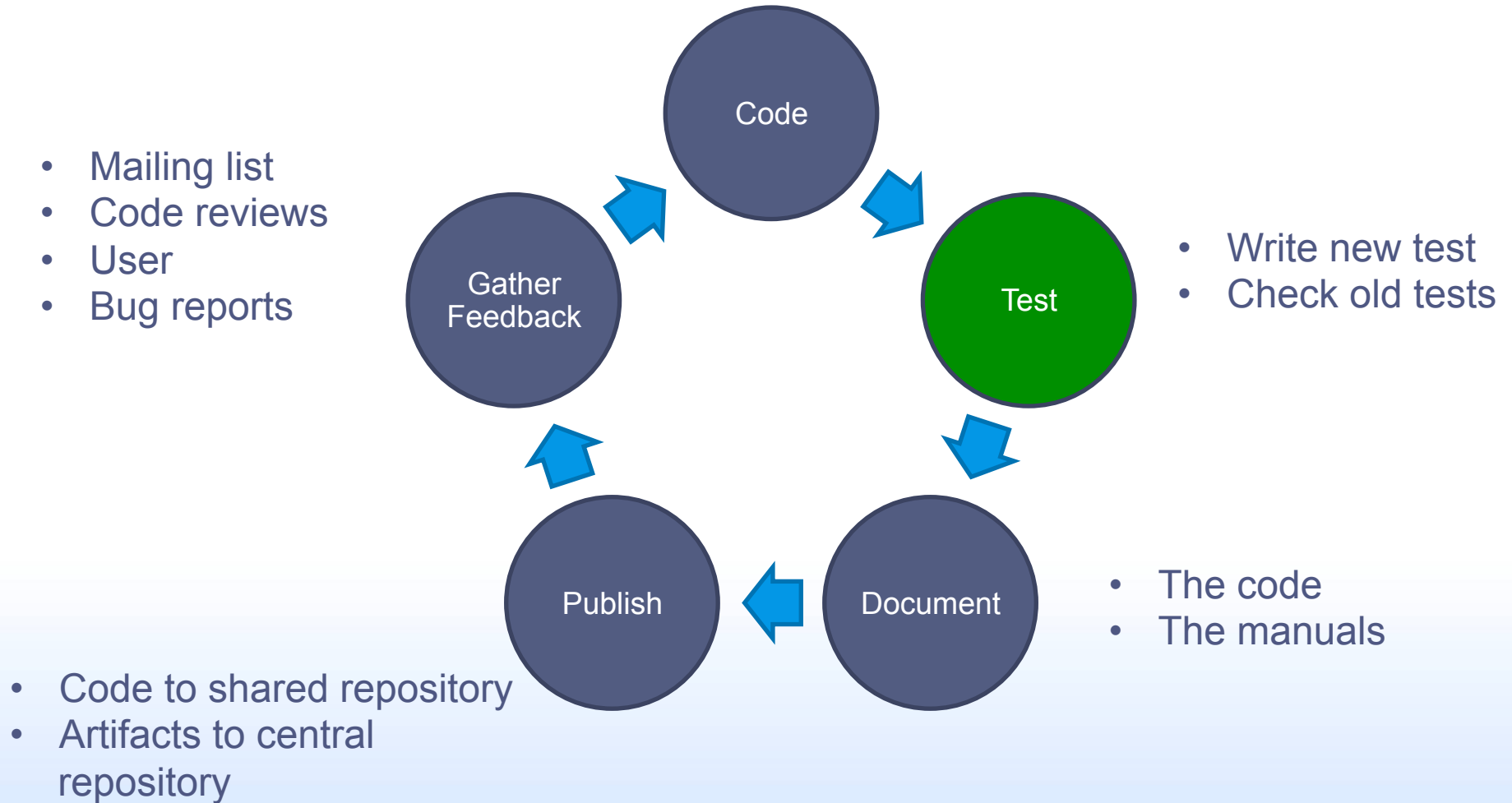
# Proposed GIT Workflow

- Integration manager
  - Many developers cloning central/blessed repository
  - Many developers writing to their own repository
  - Many developers doing pull requests
  - One (or more) people that do code review
  - One (or two) people that can write to blessed repository



<http://thkoch2001.github.io/whygitisbetter/>

# Iterative Development



# Testing

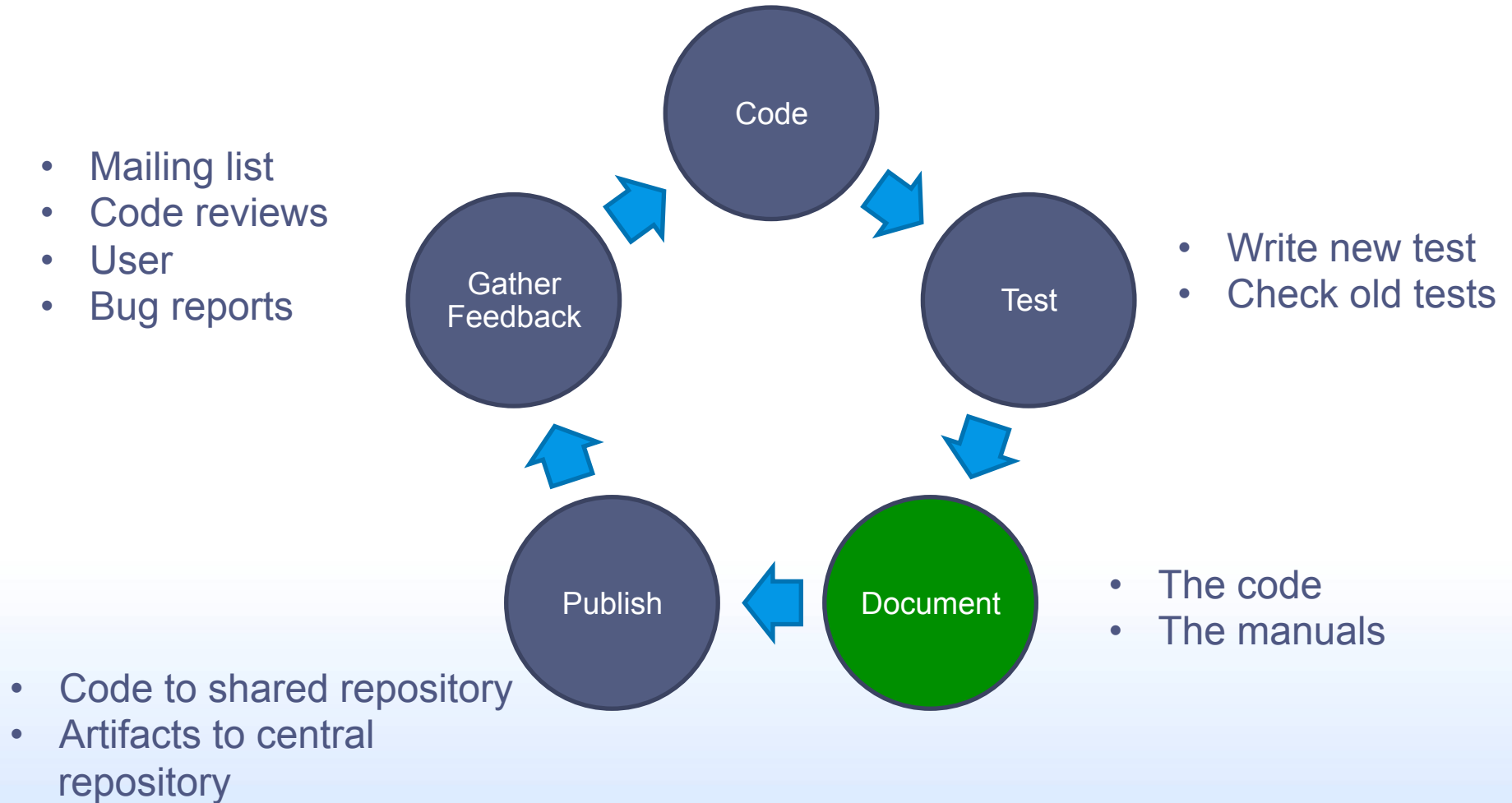
- Create tests early
  - Ideally create a test before you implement
- Create regression tests
  - Based on a bug create a test, so it does not come back
- Automatic build system
  - Can build not only main branch but other branches
- Run tests for every build
  - Builds should fail if tests fail
- Tests should not require user interaction
  - Tests are run headless on a server

# Build Tools

- Build tools make it easier for others build
  - No more messy readme's with missing steps
- Build tools are needed for continuous integration
  - Automatic builds to test compilation of check-ins
- C/C++ : Make and Makefiles
- JAVA : Maven and ANT
- SCALA : SBT



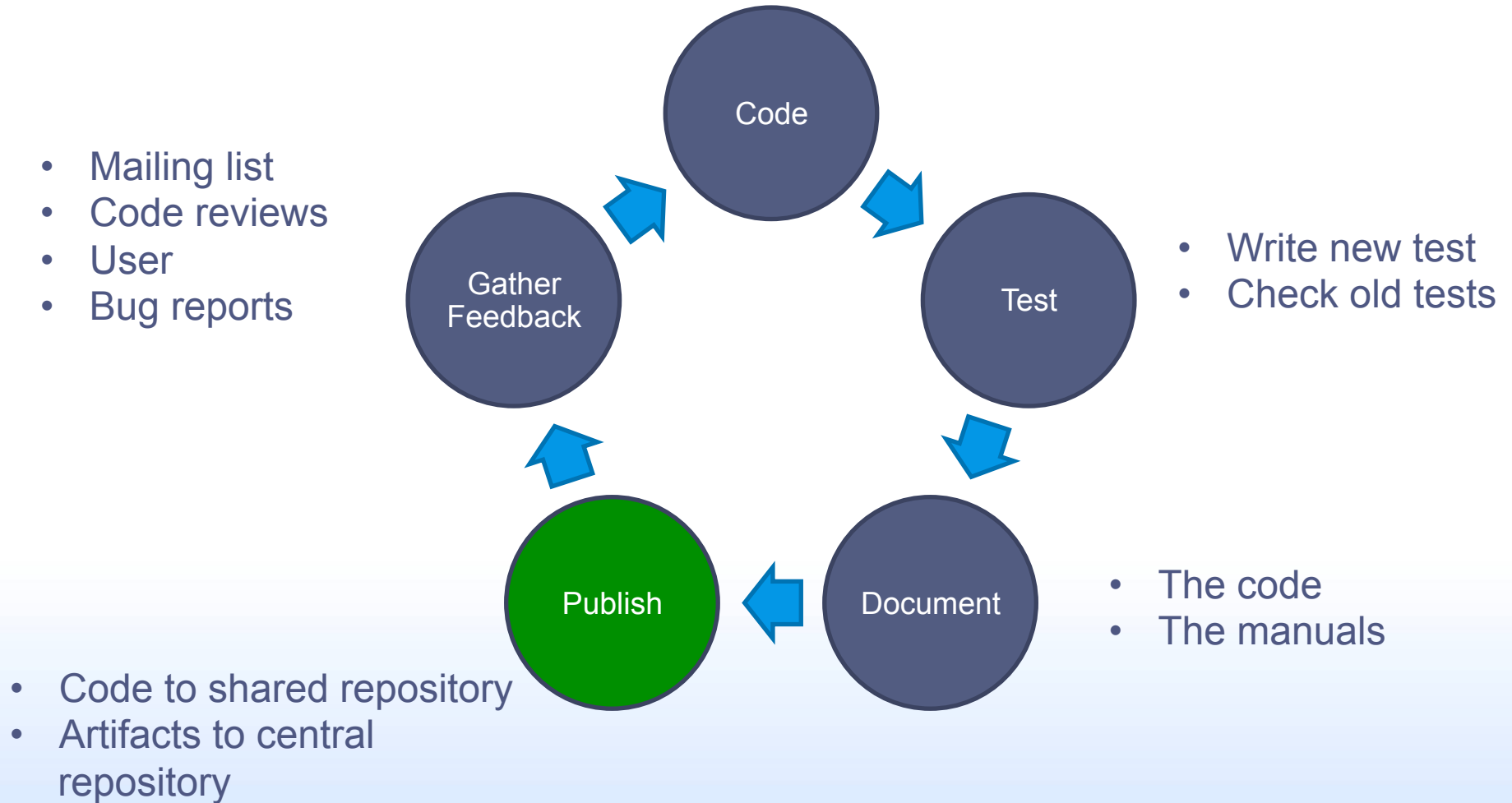
# Iterative Development



# Documentation

- Many different parts of documentation
  - Source code comments
  - API of the code
  - Manuals (installation and use)
  - Frequently Asked Questions
  - README (markdown)
  - Video's (YouTube)

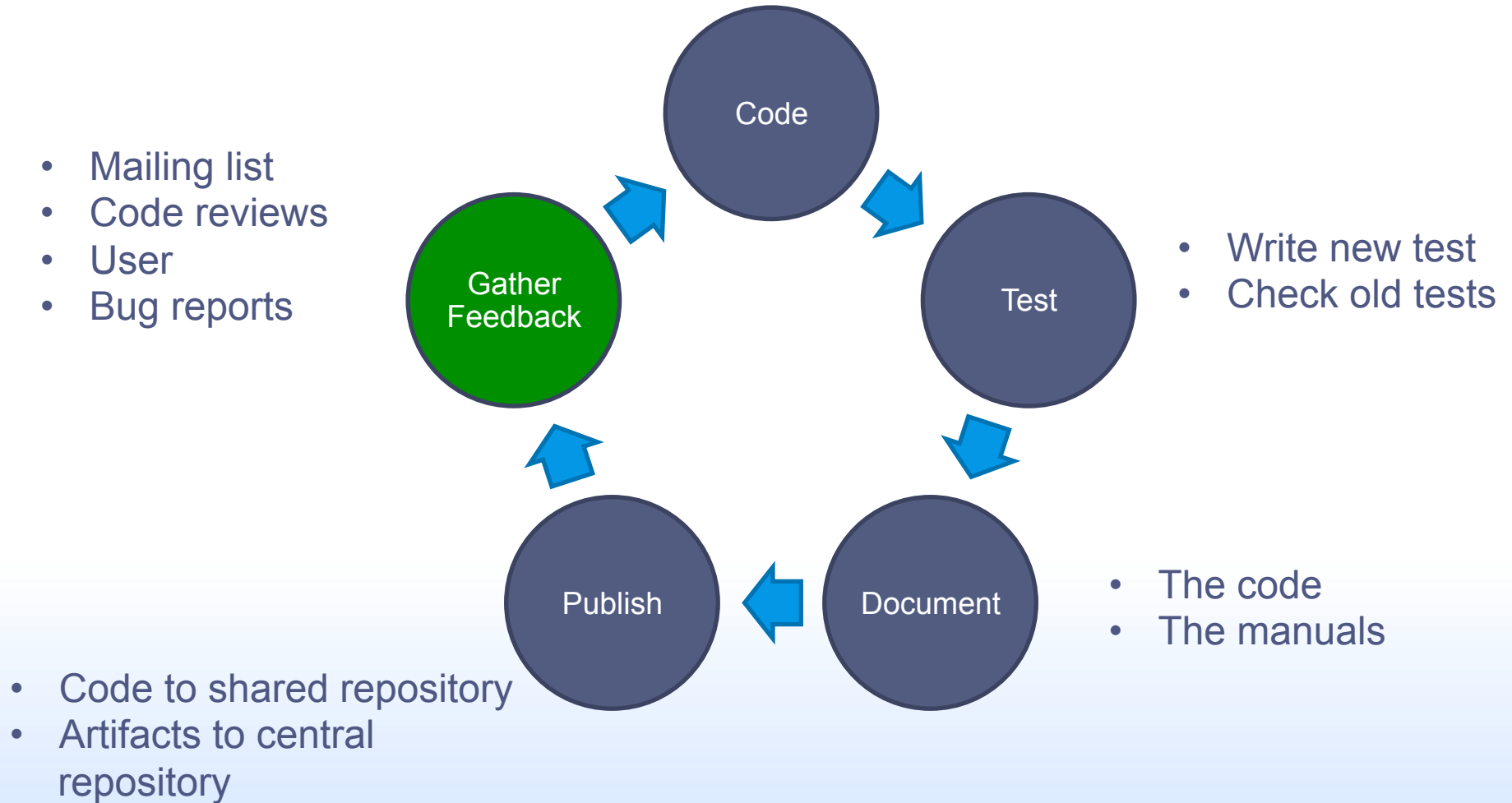
# Iterative Development



# Sharing

- Source code is available
  - People can contribute back
- Artifacts are available
  - Publish to maven repository
  - Builds can be downloaded

# Iterative Development



# Feedback

- Bugs and feature requests
- Questions asked
  - Can lead to bug reports
- Other people looking at code
  - Better code
- Sharing stories and questions
- Fast account creation
  - Sign-up, file bug, no waiting
- Mailing lists
  - [opensource+ergo@ncsa.illinois.edu](mailto:opensource+ergo@ncsa.illinois.edu)
- Chat rooms

# How do I get access?

- Register for an account
  - Signup at the confluence page
- Ask for a project
  - Need OpenSource license (NCSA OpenSource)
  - Need Title and KEY
  - Short description
- What do you get
  - Project in stash
  - Project in JIRA
  - Project in Confluence
  - Groups in Crowd (admin, dev, users, alumni)

# DEMO

- <https://opensource.ncsa.illinois.edu/>
- Example Medici (key MMDB)
  - [Project Page](#)
  - [JIRA \(Issue MMDB-1542\)](#)
  - [Stash \(Pull Request 64\)](#)
  - [Bamboo builds \(Branch Build\)](#)
- Example Polyglot (key POL)
  - [Project Page](#)
  - [API Documentation](#)



# Questions?

- Send email to
- `opensource@ncsa.illinois.edu`
  
- Or check it out at
- <https://opensource.ncsa.illinois.edu>
  
- Rob Kooper (`kooper@illinois.edu`)
- Luigi Marini (`lmarini@illinois.edu`)
- Jong Lee (`jonglee1@illinois.edu`)
- Kenton McHenry ([mchenry@illinois.edu](mailto:mchenry@illinois.edu))