Effective CI using Automated Quality Checker

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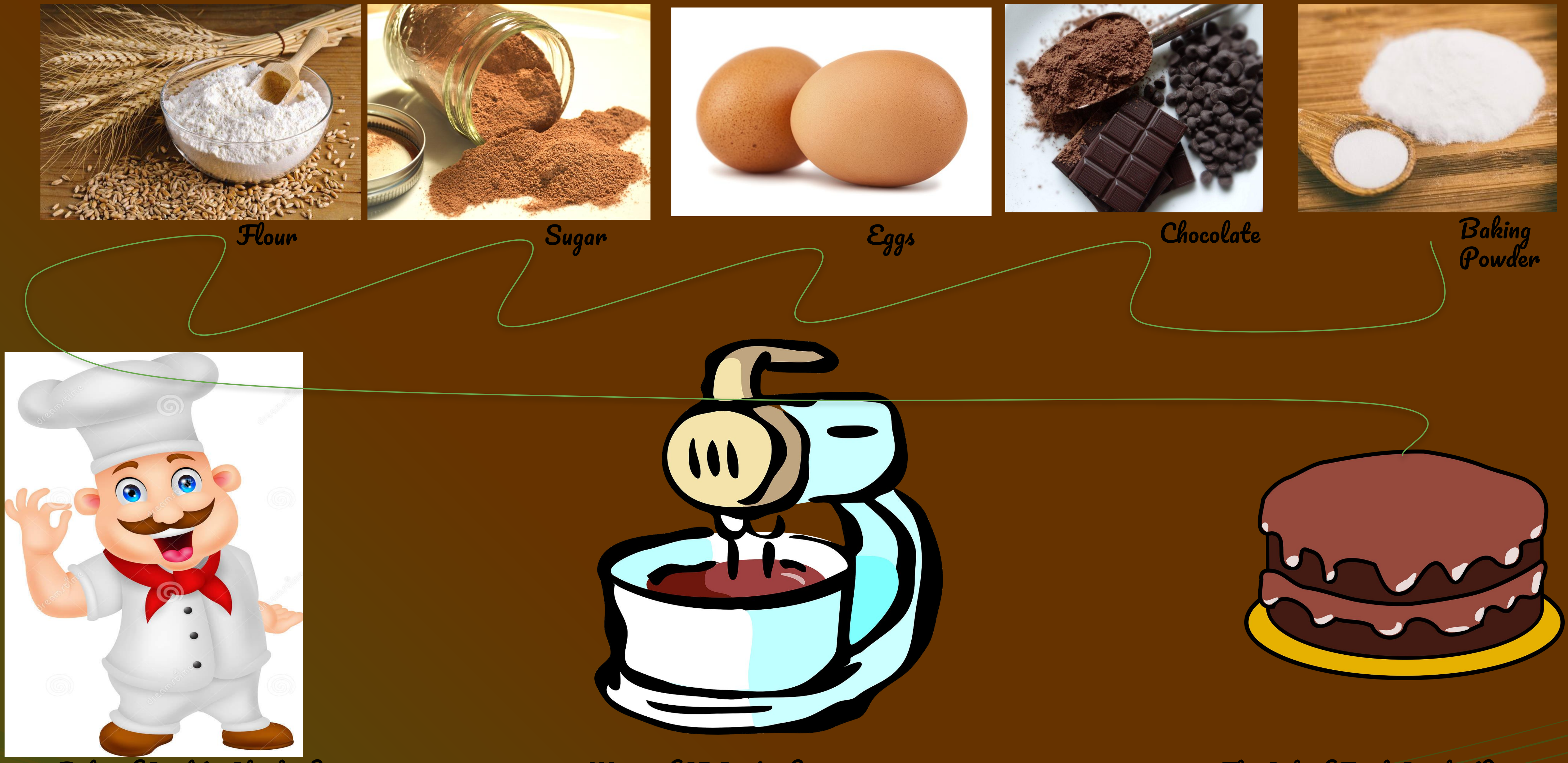
October 8th, 2018



Flour

Sugar

Eggs

Chocolate

Baking Powder

Baker (Quality Checker)

Mixer (CI System)

The Cake (Final Product)

Qualities of a great baker

- Quick decisions (uses automation)
- Eye for bad eggs (avoids regression)
- Measures precisely (avoids technical debt)
- Follows the recipe (adheres to process)
- Rejects unwanted ingredients (ignores non-production code)
- Records observations (provides metrics for improvements)

Quality Checker (The Baker)

- Fully automated system
- Part of the CI system
- Improves the effectiveness of the CI system

Let us explore how….

Avoid technical debt

- New code accepted only with new tests
- Builds a habit
- No technical backlog

HOW

- Define tests directories
- Checker looks for tests committed along with production code
- Merge Requests (MRs) / Pull Requests (PRs) are blocked if no tests are found

...Avoid technical debt

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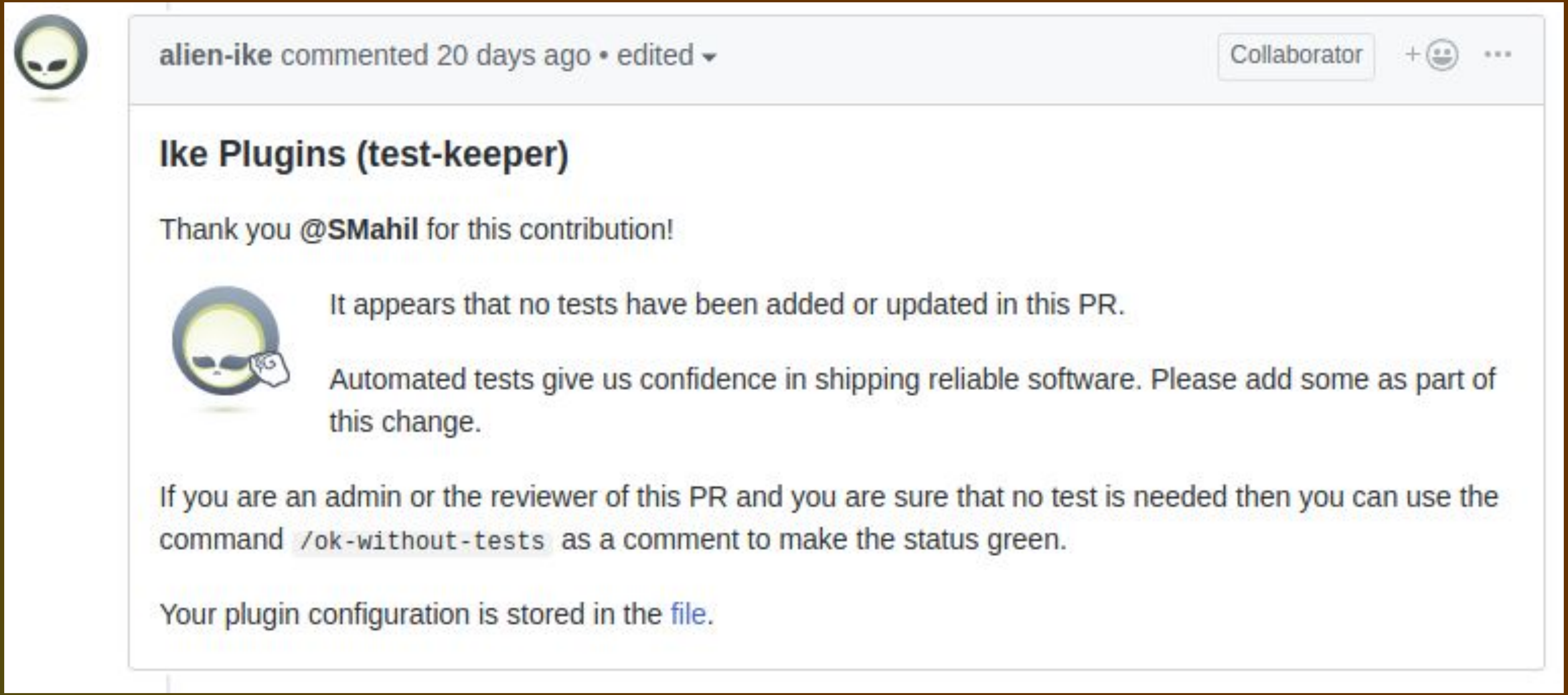


alien-ike commented 20 days ago • edited ▾

Ike Plugins (test-keeper)

Thank you **@SMahil** for this contribution!

It appears that no tests have been added or updated in this PR.

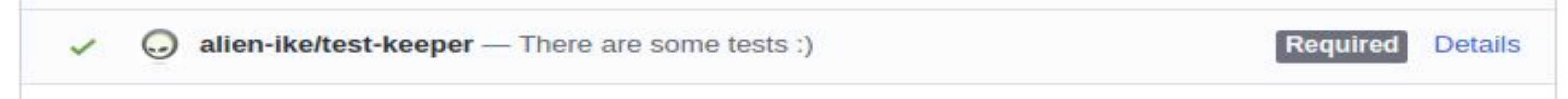
Automated tests give us confidence in shipping reliable software. Please add some as part of this change.

If you are an admin or the reviewer of this PR and you are sure that no test is needed then you can use the command `/ok-without-tests` as a comment to make the status green.

Your plugin configuration is stored in the file.

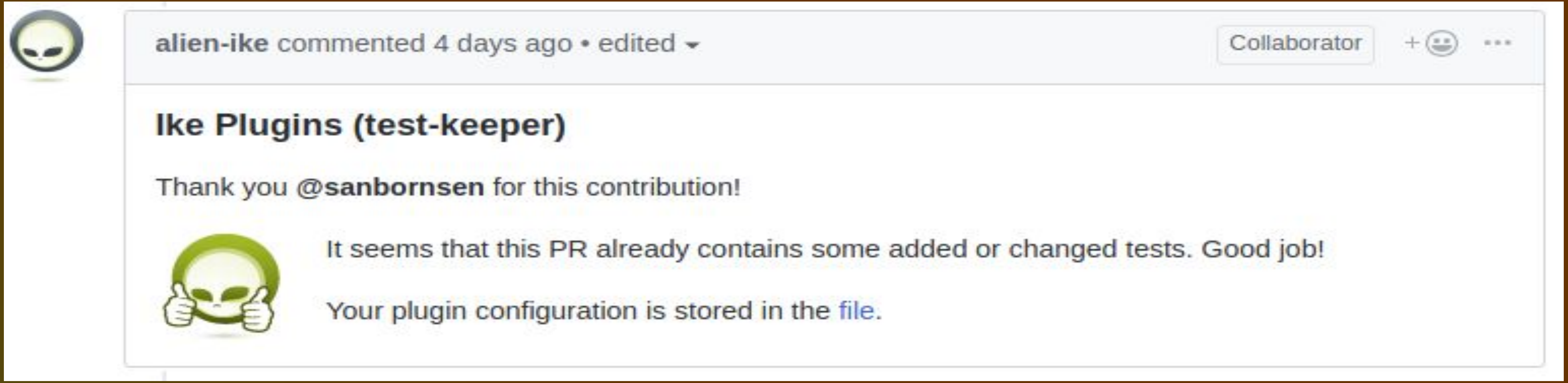
Checker blocking a merge request due to missing tests

...Avoid technical debt



✓ alien-ike/test-keeper — There are some tests :)

Checker marking the request when the author adds some tests



Ike Plugins (test-keeper)

Thank you **@sanbornsen** for this contribution!

It seems that this PR already contains some added or changed tests. Good job!

Your plugin configuration is stored in the file.

Checker lauding the author when the code is submitted along with the tests

Don’t break the working code

- New code must pass the regression tests
- Unit tests, integration tests, functional tests
- Safety net adds confidence

HOW

- The checker validates the result of regression tests
- Build is marked failed on a test failure
- MRs / PRs are blocked

Maintain code coverage

- Add **sufficient** new tests
- Ensures code coverage is maintained

HOW

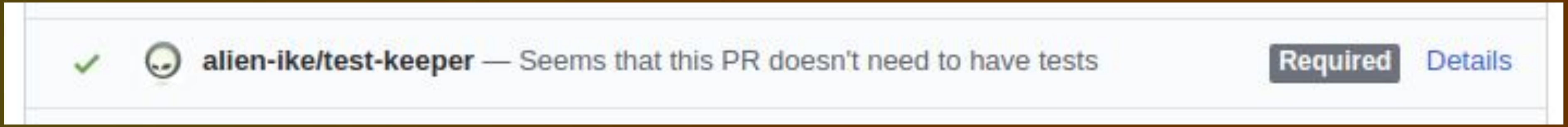
- Code coverage is measured using tools like *Codecov*
- If coverage lowered, MRs / PRs are blocked

Ignore non-production code

- Rules meant only for production code

HOW

- Define directories that contain non-production code
- Checker skips all such directories
- Manual override is available for exceptions



✓ **alien-ike/test-keeper** — Seems that this PR doesn't need to have tests

Checker skipping a merge request containing only non-production code

Master the process

Reviewer's accountability

- Manual review by reviewer is necessary
- Review feedback must be provided in time
- The checker can ensure this through a timer/notification

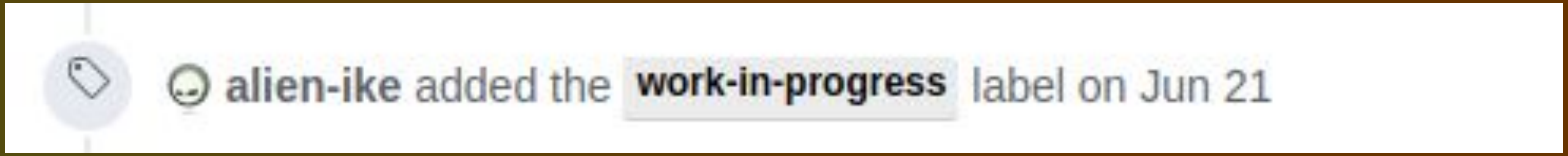
...Master the process

Work-in-progress = Ignore

- MRs / PRs are often marked WIP/work-in-progress
- Ensures efforts are not wasted on incomplete code

HOW

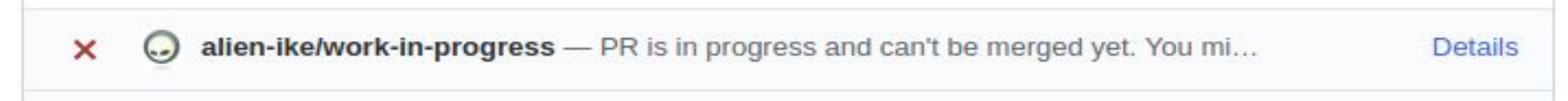
- The checker looks up such strings and marks the MRs
- The checker then skips scanning such MRs and blocks the merge



alien-ike added the work-in-progress label on Jun 21

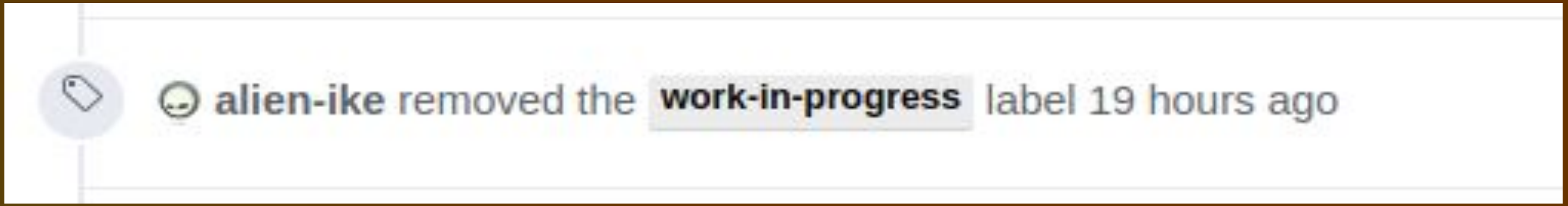
Checker adding a “work-in-progress” label to the merge request

…Master the process



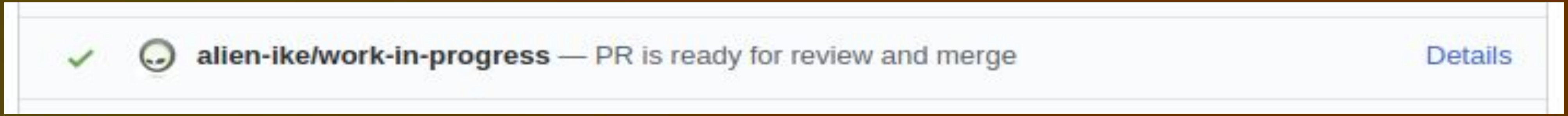
✕ alien-ike/work-in-progress — PR is in progress and can't be merged yet. You mi… Details

Checker blocking the merge request unless the "work-in-progress" label is removed



alien-ike removed the **work-in-progress** label 19 hours ago

Checker removing the "work-in-progress" label from the merge request



✓ alien-ike/work-in-progress — PR is ready for review and merge Details

Checker unblocking the merge request

...Master the process

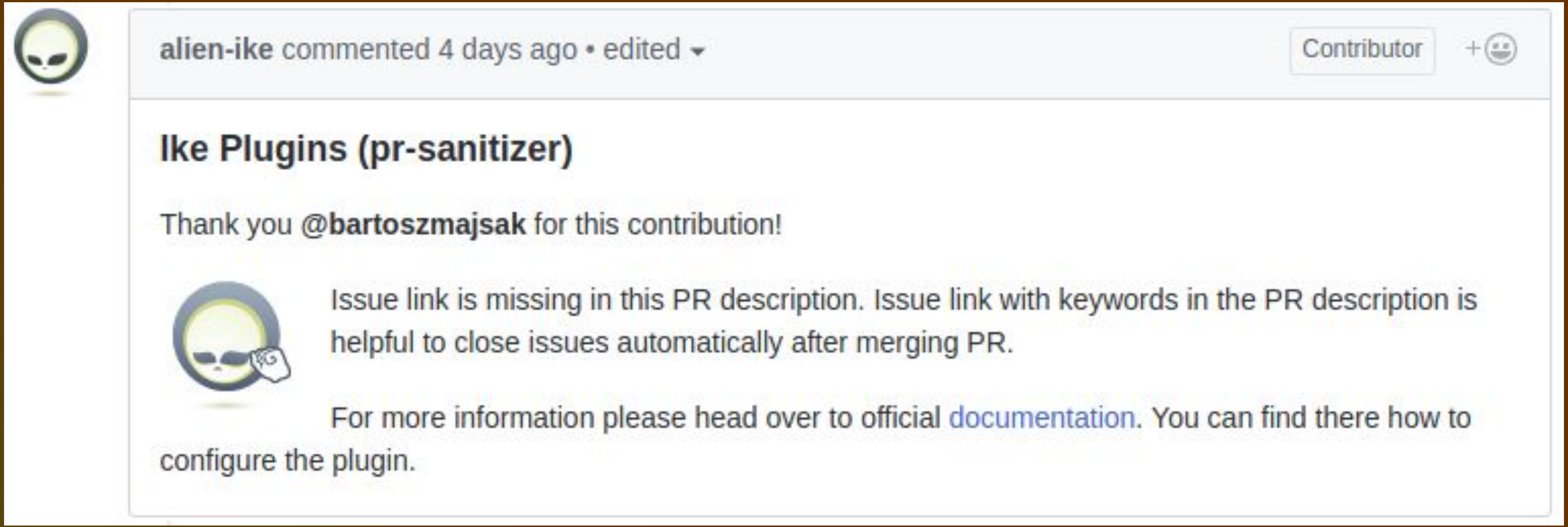
Provide reason for the merge request

- MRs / PRs are usually submitted in context of a task or an issue
- References help reviewers with a context

HOW

- The checker looks up MR’s description for a reference
- The checker then marks such MRs
- Optionally, minimum description text could be mandated

...Master the process



alien-ike commented 4 days ago • edited

Ike Plugins (pr-sanitizer)

Thank you **@bartoszmajsak** for this contribution!

Issue link is missing in this PR description. Issue link with keywords in the PR description is helpful to close issues automatically after merging PR.

For more information please head over to official documentation. You can find there how to configure the plugin.

Checker marking a merge request, as a link to the issue it fixes, is missing

Deep insights

- Checker not only provides quality software, but also quality metrics
- Such data can provide deep insights into problem areas

HOW

- All quality check failures are recorded

Let us explore how....

...Deep insights

Symptom: A significant number of MRs blocked due to missing or insufficient tests

Insight: Skill gap

Symptom: Significant MRs that failed regression tests

Insight: Carelessness or lack of design knowledge

Additional Insight: This also indicates the number of defects that could have entered production, but didn’t

...Deep insights

Symptom: A significant number of defects were found during MR’s review process

Insight: The review process is working and is very effective

Additional Insight: All defects found during review are early defects

...Deep insights

- Changes requested via manual review could be tracked as individual defects
- Special tags like */defect-high Missing null check* could be used for tracking
- Author can mark a defect resolved */defect-high-fixed Missing null check*
- The checker keeps a count of such defects
- For a MR/PR to merge, all defects reported against it must be zero
- Option to manually override

...Deep insights

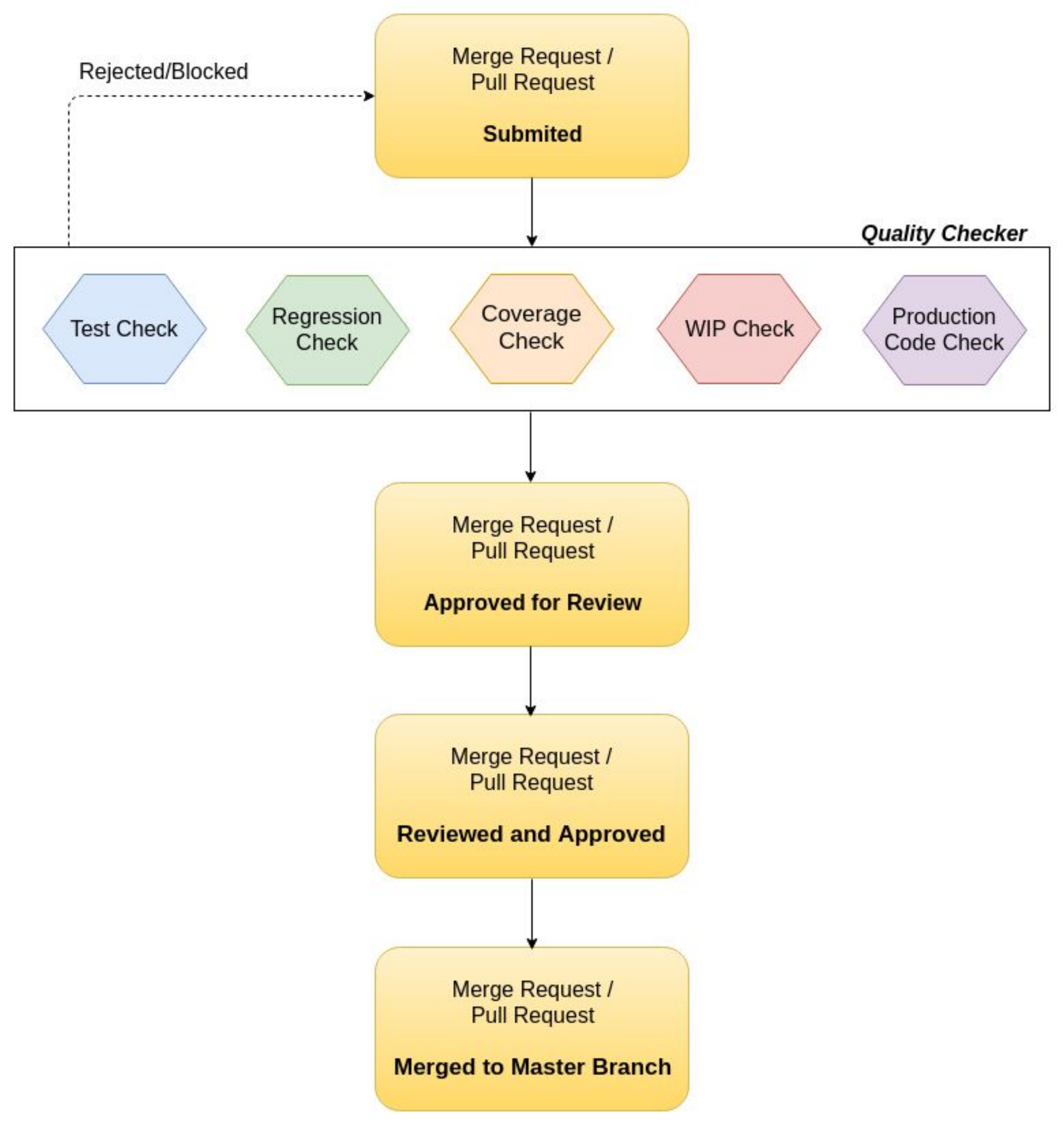
Insight: Code-to-test matrix is possible if both reside in a common system

Benefit: This could be used for smart regressions

Insight: A defect could be traced back to its origin if code and defects are managed in a common system

Benefit: This could be used to learn about the common causes of defect injection

Process recap



Final thoughts

- Checker not only enables quality software, but also process compliance and quality metrics
- Self-sustaining model of quality that keeps pace with development
- A system like this need to be invested in and developed as readymade solutions aren’t available
- Folks using GitHub have a head start. You can look at the following open source tool developed by engineers at Red Hat:

Arquillian – Ike-prow-plugin:
http://arquillian.org/ike-prow-plugins/

References

Codecov
https://codecov.io/

Arquillian – Ike-prow-plugin
http://arquillian.org/ike-prow-plugins/

GitHub
https://github.com/

Reach me @

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