7 techniques to tame a Legacy Codebase

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Software Crafters Romandie

Legacy Code is profitable code you are afraid to change

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000000000 023
No test
Outdated docs
YOU
Short deadline

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understandlegacycode.com

1. ADRs
2. Brain Dump
3. Over-committing
4. Mikado Method
5. Hotspots Analysis
6. Approval Testing
7. Coding Katas

Architecture Decision Records

Never gets outdated!

- Log decision taken now to revisit in the future

- Detail the context around the decision

- You can't be wrong

3. Never read on master DB

Date: 2020-05-06

Status

Accepted

Context

We noticed that the master database was acquiring locks due to read requests, using heroku pg:locks and heroku pg:outliers. It prevented some migration to run because the level of lock it required was conflicting with the locks those other queries were acquiring.

This PR for instance needed to drop a constraint (which is supposedly a fast operation) but couldn't due to this: https://github.com/busbud/napi/pull/6774

Decision

The decision taken is to never use master DB for reads, and make this an "opt-in" solution rather than "opt-out", by removing the `useMaster: true` from Sequelize models' default scopes.

See https://github.com/busbud/napi/pull/6787

Consequences

- We only use master for write operations
- We have to choose to use master explicitly and back up this decision

Start now!

There's a CLI to iron everything

- Use adr-tools CLI
- Great additions to PRs!
- Keep it simple

0001-record-architecture-decisions.md	Add ADR TOC generator	2 years ago
0002-secure-JSON-output.md	Accept JSON security ADR (#30)	2 years ago
0003-files-in-JSON-output-diagram.p...	Image and markup change to display image	16 months ago
0003-files-in-JSON-output.md	Update 0003-files-in-JSON-output.md	16 months ago
0004-microservice-authentication-me...	add 0004-microservice-authentication-method (#49)	15 months ago
0005-integration-with-github.md	Add ADR for Github integration	11 months ago
0006-reduce-number-of-emails-per-...	ADR Reduce number of emails per form submission	10 months ago
0007-formatron3000.jpg	Added new ADR 7. Changing the storage for form metadata.	4 months ago
0007-replacing-the-storage.md	Added new ADR 7. Changing the storage for form metadata.	4 months ago
0008-the-runner.jpg	New ADR for the new runner.	2 months ago
0008-the-runner.md	New ADR for the new runner.	2 months ago
README.md	New ADR for the new runner.	2 months ago

Example: UK Ministry of Justice

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Your brain can't hold much

Short-term memory capacity: 7 items

What if you had a second brain?

- It holds information
- You tap into at any time
- You can focus on thinking

such flexible

wow.

very low tech

i haz one!

Use Pen & Paper

But use it properly

1. Stay Focus
2. Avoid Tunnel Effect
3. Do One Thing

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Commit more often

Then, commit even more!

- Every 5 minutes
- Every 2 minutes
- At every change

Add response to error details
nicoespeon committed 2021-02-02T15:17:30Z

Extract variable
nicoespeon committed 2021-02-02T15:17:42Z

Add response to error details
nicoespeon committed 2021-02-02T15:17:55Z

Create ImpossibleResponse class
nicoespeon committed 2021-02-02T15:18:49Z

Use ImpossibleResponse class directly
nicoespeon committed 2021-02-02T15:19:19Z

Remove redundant mutation
nicoespeon committed 2021-02-02T15:19:32Z

Inline variables
nicoespeon committed 2021-02-02T15:19:44Z

Remove TODO ···
nicoespeon committed 2021-02-02T15:22:33Z

Extract function
nicoespeon committed 2021-02-02T15:26:22Z

Re-use extracted function
nicoespeon committed 2021-02-02T15:26:49Z

Rename variables for consistency
nicoespeon committed 2021-02-02T15:27:07Z

Try it for 1h

Can you feel the benefits?

- It's faster to retreat and try something different
- Prevents "while we're at it" moments
- Easier to review

vanessa 13:10

reviewed! no worries about the size of the PR. your changes usually aren't hard to follow because your commits are really well-organized.

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Brain Dump, with a process

1. Write down your goal

2. Start a 5min timer

3. Try to complete your goal

THANK YOU MARIO!

BUT OUR GOAL IS IN
ANOTHER CASTLE!

Timer rings, that's fine!

Stop, revert, think

1. Note what's blocking you = sub-goals

2. Revert (seriously, do it)

3. Pick a sub-goal, start over

THANK YOU MARIO!

YOUR QUEST IS OVER.
WE PRESENT YOU A NEW QUEST.

You completed the goal!

Yay, commit, repeat

1. Celebrate!
2. Now it's a good moment to Commit
3. Pick another sub-goal, start over
MARIO
022600
×16
WORLD
1-2
TIME
371

Phase 1: map the terrain

Refactor calculate
Intermediate charges

Phase 1: map the terrain

Phase 1: map the terrain

Phase 1: map the terrain

Phase 1: map the terrain

Phase 2: Productivity strikes

Phase 2: Productivity strikes

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There's a book!

- Avoid Tunnel Effect
- Stop & ship any time
- mindmup.com to collaborate

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When everything is urgent,
nothing is

Eisenhower Matrix

A tool to prioritize stuff

	Urgent	Not Urgent
Important	DO IT NOW	DO IT LATER
Not Important	DELEGATE IT	DROP IT

Static Analysis tools

They can't save you

- They give you the Importance

Can we stop delivery for 8 years
and fix these 2,219 critical issues?

- But where to find the Urgency?

Version Control metadata

Git knows it all!

- How often you touch the code => Code Churn

- 50 files most touched in the past year (that's enough):

```
git log --name-only --since=12.month --format=format: \
 | egrep -v '^$' \
 | sort \
 | uniq -c \
 | sort -nr \
 | head -50
```

Prioritize Tech Debt

Best ROI for all stakeholders

Analysis of the Docker engine

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What the system does is more important than what it should do

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Fastest way to write missing tests

High-level recipe 🗑️

1. Generate an output you can put in a file

```
it("should update quality", () => {
  expect(updateQuality("foo", 0, 0)).toMatchSnapshot()
})
```

Fastest way to write missing tests

High-level recipe

2. Use tests coverage to find missing inputs

```
14        updateQuality() {
15  1x      for (var i = 0; i < this.items.length; i++) {
16  1x        E if (
17            this.items[i].name != "Aged Brie" &&
18            this.items[i].name != "Backstage passes to a TAFKAL80ETC concert"
19          ) {
20  1x        I if (this.items[i].quality > 0) {
21              if (this.items[i].name != "Sulfuras, Hand of Ragnaros") {
22                this.items[i].quality = this.items[i].quality - 1;
23              }
24            }
25          } else {
26            if (this.items[i].quality < 50) {
27              this.items[i].quality = this.items[i].quality + 1;
28              if (
29                this.items[i].name == "Backstage passes to a TAFKAL80ETC concert"
```

Fastest way to write missing tests

High-level recipe

3. Use mutations to verify snapshots

```
it("should update quality", () => {
  expect(updateQuality).toVerifyAllCombinations(
    ["foo", "Aged Brie", "Sulfuras"],
    [-1, 0],
    [0, 1, 2, 50]
  )
})
```

Testing 24 combinations

Now you are safe!

You can quickly:

- Refactor the code
- Write unit tests on the code you create
- Change behavior using these new tests
- Remove approval tests you don't need

Detailed version: bit.ly/approval-testing

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Coding Katas

Exercises to practice your skills

5 stages to practice working with Legacy Code:

1. Gilded Rose kata
2. Tennis Refactoring kata

3. Trip Service kata
4. Trivia kata

5. Baby Steps Timer kata

When to practice?

- At home, if you're lucky
- Use company's training budget
- 1h "meeting" every Sprint, with other devs
- Code Retreat:
  - Full day practice, free
  - Friday and/or Saturday (Global Day, November)

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Bonus Stage ❤ Going Further

Get into a Flow State

- Decide what to work on
- Turn off notifications
- Put some music
- Start a timer
- Take regular breaks
- FOCUS

Centered

2 free months on Premium with the code LEGACY

> use before Oct 31st

Legacy Code: First Aid Kit

> understandlegacycode.com/first-aid-kit

- 14 techniques to quickly rescue a codebase
- ~200 pages
- PDF, EPUB, and MOBI
- Light & Dark themes
- 3 printable cheat sheets + 1 exercise sheet

30% discount with this link > bit.ly/first-aid-romandie

End Credits

- https://www.fontmirror.com/determination
- http://pixelartmaker.com/
- http://www.addletters.com/
- https://vectorpixelstar.itch.io/
- https://www.pinclipart.com/
- https://nostalgic-css.github.io/NES.css/
- https://josiahmoore.tumblr.com/post/170277397936