LearnUpon

Scaling with **Legacy Code**

Learning as it should be

About me

- Des Anderson - Co-Founder & CTO of **LearnUpon**
- 15+ years experience developing enterprise applications

About LearnUpon

- Founded in 2012
- SaaS/Cloud-based LMS (Learning Management System)
- Headquartered in Dublin, Ireland with offices in Belgrade, Sydney, and Philadelphia
- Awarded Technology Ireland Company of the Year 2018
- 5,000,000 (and growing) users worldwide, over 20,000,000 course enrollments
- 142,062,346 questions answered, 209,471,619 API requests
- Ruby/Rails,/Angular based application

What is Legacy Code?

- Mike Feathers - code that is not tested?
- Perhaps code that we cannot easily change?
- Very old code?
- Valuable code that we are afraid to change?

Legacy code. *The phrase strikes disgust in the hearts of programmers. It conjures images of slogging through a murky swamp of tangled undergrowth… Although our first joy of programming may have been intense, the misery of dealing with legacy code is often sufficient to extinguish that flame.*

~ Robert Martin

Tip 1

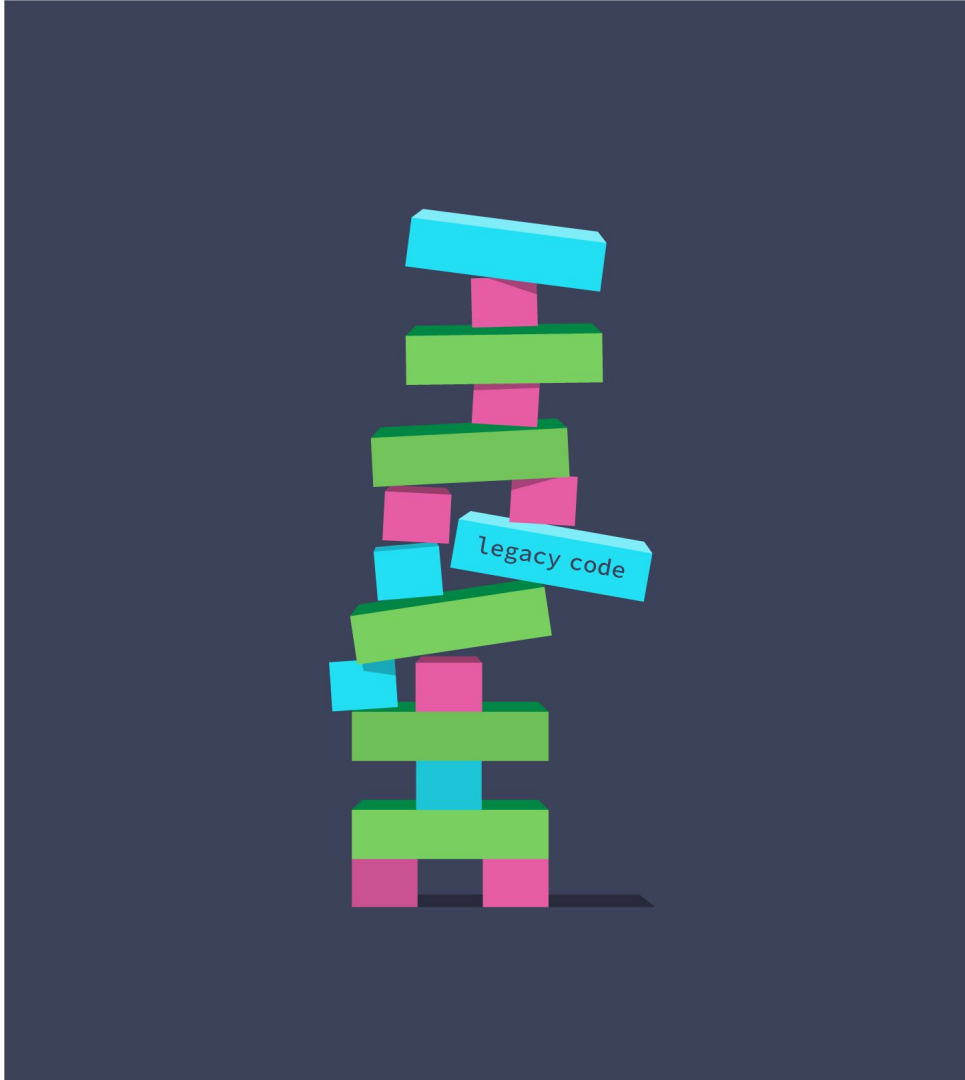
> When a dev sees legacy code, we know because they ask **“Why did they do that?”** and the answer is generally **“don’t ask!”**

What's the source of Legacy Code?

- Create a startup (all companies started up!)
- Build it (ignoring Bertrand Meyer, open to extension, closed to modification) and they (customers) will come.
- Be successful and they (product health police) will come.
- IMO: Ultimately, bad design patterns and code smells (A framework like Rails doesn't help! *User.where?*).

Why Care?

- Software maintenance consumes more than 50% of your team's effort.
- Which equates to 40 to 90% of your costs.
- **Important:** Tech Debt/Legacy Code is a term that not everyone understands.



Tip 2

> Don’t regret early engineering decisions? You overengineered.

Technical “Death”?

- Call it Technical Health, it sounds more positive.
- What does it mean to you? Remember it’s just a metaphor (a bad one!).

Is it Technical Debt?

- Don’t do this: “Compared to ideals, how far are we from them?” Instead: Discover its meaning to you.
- Don’t do this: “Lots of compiler warnings? We have lots of technical health issues!” Instead: Know your indicators.
- Don’t do this: “The code is 7 years old… That has to go. REWRITE” … Instead: Think of it like COBOL…

Tip 3

> It’s anything that prevents you from doing your job (effectively).

Tip 4

> Rewrites are rarely worth it, overly complex, 2 versions supported influx etc.

What does it mean to you?

- Can new team members get stuck into code easily? (High Readability).
- Can you make changes/add features to your code easily? (Highly Extensible).
- Do you have lots of library/version dependencies? (Low Dependencies).

Tip 5

> Tests are a tool. They are not your silver bullet.

It's not easy...

- **Github**: Rails 5 upgrade took 1.5 years.
- **Shopify**: 100 devs for 1 year to get to Rails 5 (with automated tests a go-go).

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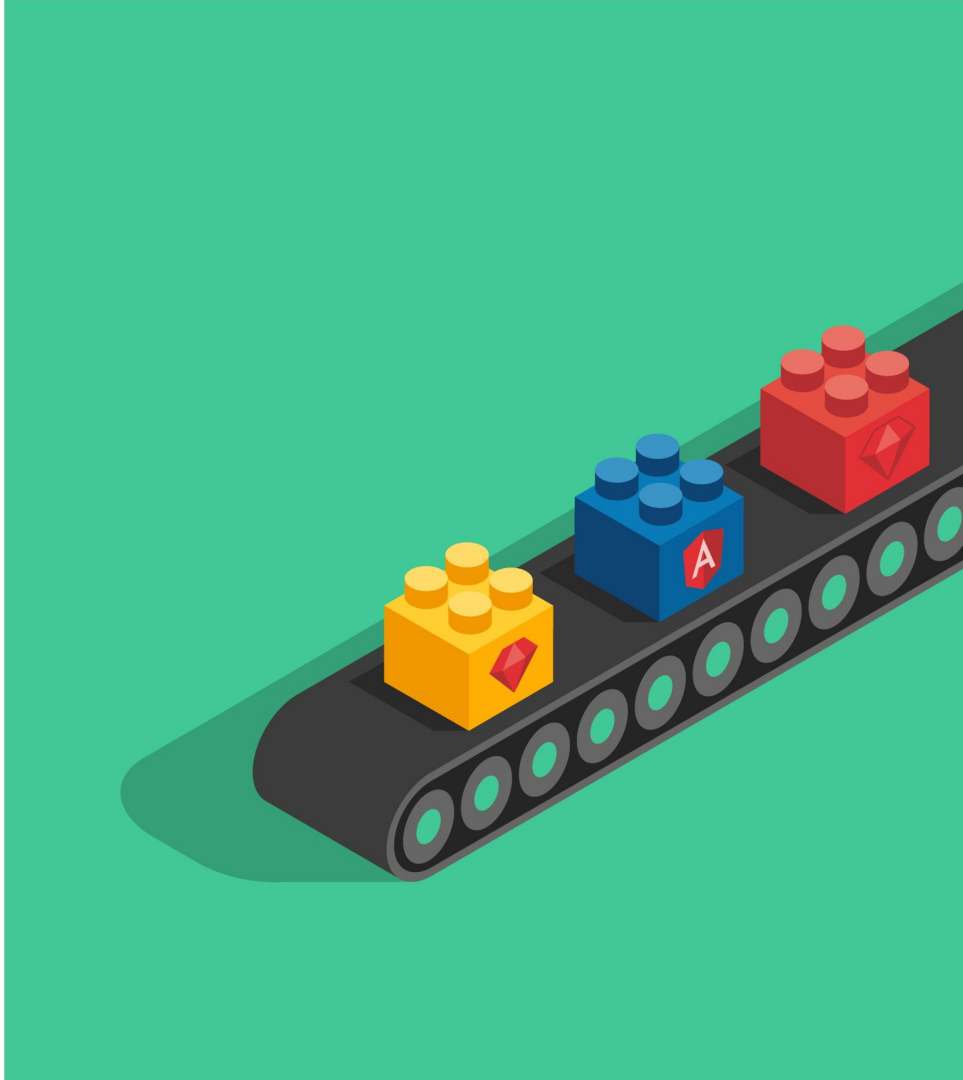
- Replaced JQuery with AngularJS all in one go (mostly).
- Replaced Rails 3.0 with 3.2, while rewriting many gems and moving service providers - **Painful!**
- We upgraded to Rails 5.2 recently - **Less Painful!**
- Now are looking into moving from AngularJS to Angular, Monolith to MicroServices.

Sounds utopian, but did it work?

- The first statement of the upgrade guides for Rails... "*make sure you have tests*". Remember, it's not all about tests.
- Split up preparation and refactoring/upgrading code.
- A nice side effect here is that you promote team discussion
- Ensure your downtime is kept to 0 (ship boxes of small t-shirts).



Tip 6

> It’s a never-ending story, know this, and you’ll be at ease.

Tip 7

> We learned, huddled, talked, teamed, everything and more...
>
> So, “Conway’s Law” is your guide.

How to plan an attack?

1. **Measure the following**:

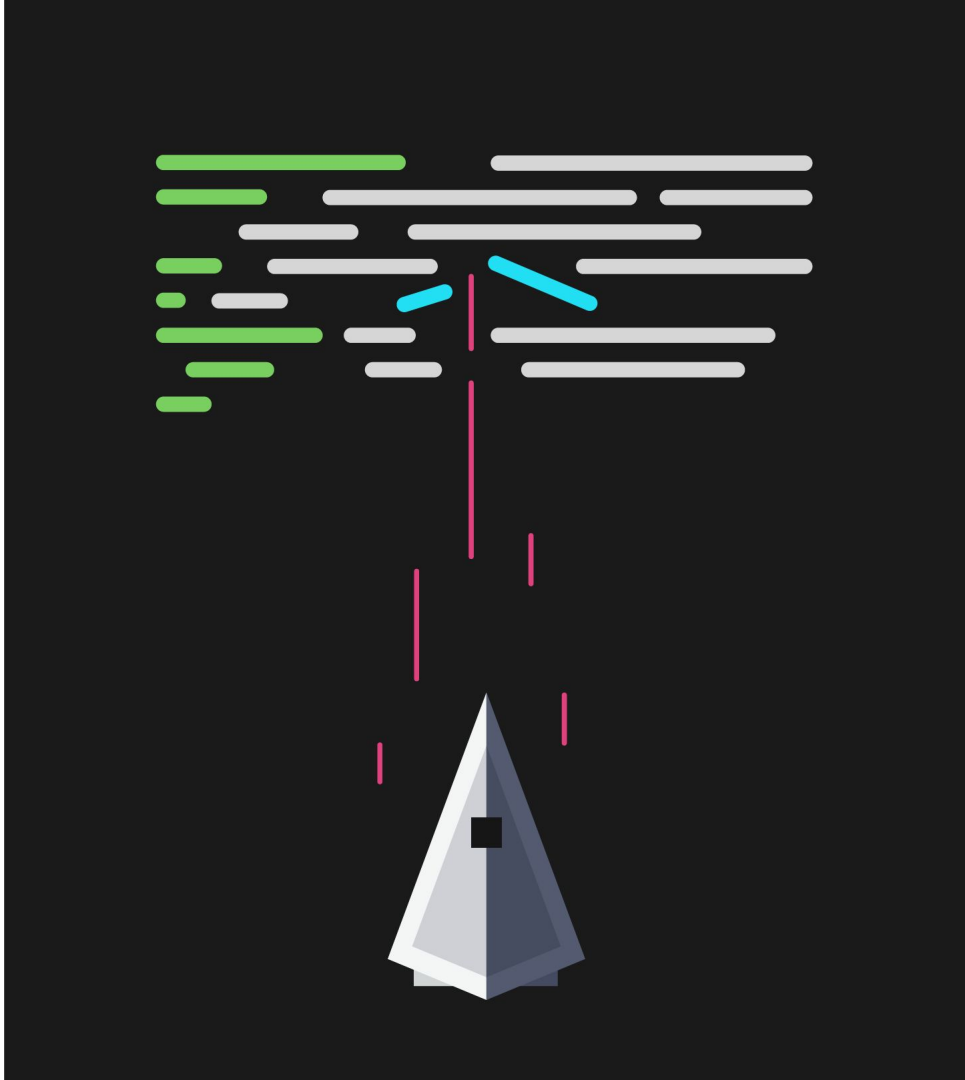
   File Churn, Delivery Time, Dev Speed, #Devs, Function size, Readability (the forgotten gem).

   On the other side, **do not measure**:

   Dev Speed, Completed Tasks, etc. and other such variable metrics.

   * Yes, I mentioned Dev Speed in both categories, why?

2. Know your firewall: Product/Management and most of all procrastination.



Tip 8

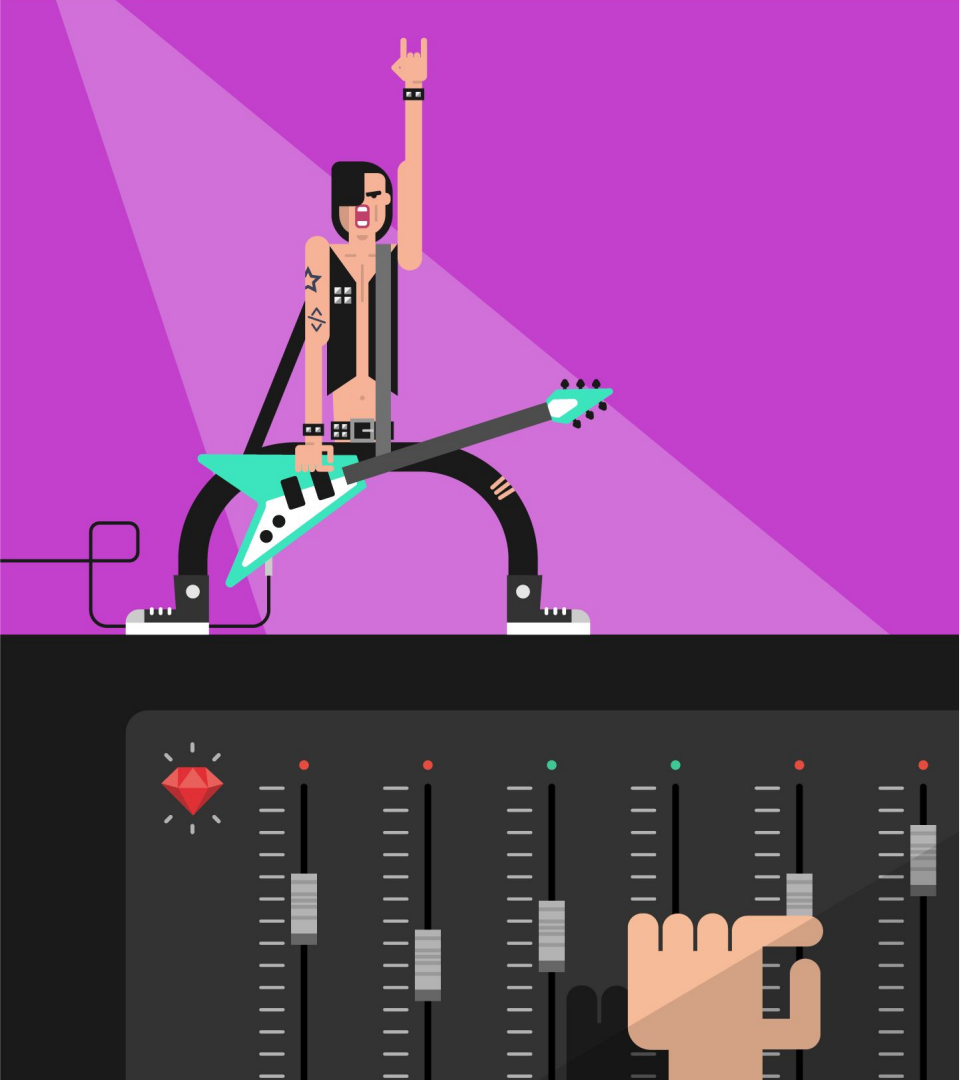
> Find your garden path to the shed, not the BBQ.

The solution is scientific right? Not always...

- Developers source solutions from non-human sources like Stack Overflow.
- To embrace this... set guard rails.
  - 30-minute rules
  - Encourage buddies/rubber ducking
- Peer code reviews and coding.
- Control expectations to management (new team members vs. veterans vs. seniors).
- Agile/Scrum are extroverted tools for introverted personas which doesn't help.

Tip 9

> Stuck in progress (=)== lacking info, it's not that you are inadequate.

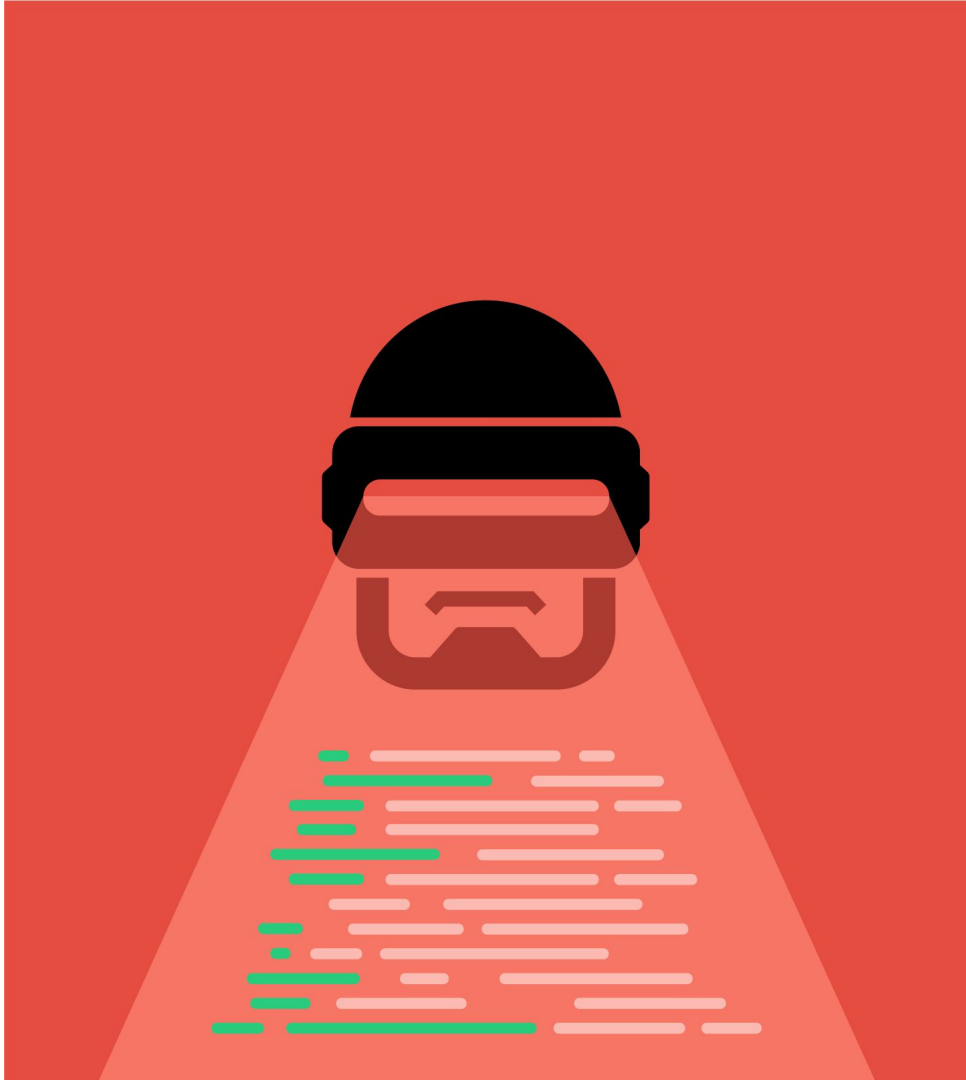


Plan created, now who executes it?!

- Know who are your stables and your volatiles.
- Stables love process, they love to plan. Volatiles don't.
- YOU NEED BOTH. Embrace diversity.
- Know your "rock stars" - they're your stables, not your volatiles.

Surely I can do something NOW!?

- Coding linters/smell detection really help (SonarQube, Rubocop, Reek).
- Start removing code dependency, e.g. Devise, rails gem, Paperclip, etc.
- DelayedJob does not scale. Go for alternatives like Sidekiq/Kafka…. Or write your own.
- Raw SQL, avoid the niceties of AR, it doesn't perform and breaks on upgrades.



Doing it all again would make it better, right? No.

- To start with, we'd probably not have a company to talk about right now.
- Perfectionism holds you back, be "nearly perfect". Remember that engineering factoid from earlier. *Not regretting engineering issues, implies you overengineered it*.
- Attention to detail, Clean Code (Uncle Bob), good behaviours are key - because predicting change is impossible.

Tip 10

> It's only going to get worse. Because tomorrow, there WILL be Rails 7.0, SomethingJS 8.5, YetAnother++ …
>
> **Be brave, dive in, own it. Keep scaling.**

Bored? A TLDR/L slide just for you!

- If this talk feels wasted on you just know this…
- The enemies of scale surrounding your code are selling to management, procrastination and not making it a continued topic.
- If all else fails: Remember, not all code is bad. Measure your ability to add a feature non-invasively, with low file churn.

Questions?

Thank you for listening!

Except for you at the back browsing Instagram.