Engineers for Designers

or “How to appease the code monkeys”

Kevin Leung

4/8/16, Whitespace

Who I am

- Software Engineer at Zanbato
- 8 years web startup experience
- 3 years complaining to Deny
- 0 years of design experience

My goal today is to explain

- the motivation of software engineers
- how engineers will interact with designers
- how to make everyone happy
  - (and maybe convince engineers to say “yes”)

How do you perceive engineers?

- (What’s your name?)
- Personality?
- Strengths?
- Flaws?

How do you perceive engineers?

Credit: The Princess Bride

How do engineers perceive engineers?

How do eng neers?

Credit: The Matrix

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- How do engineers view product and design?
- How do engineers work with designers?
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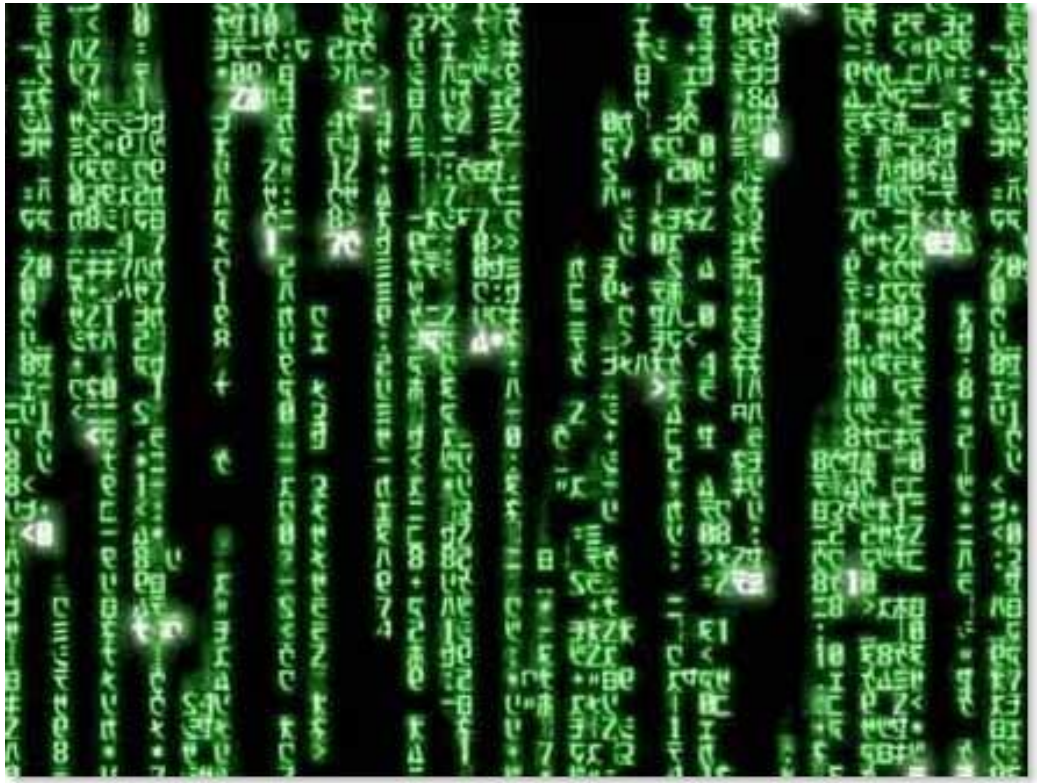
Why are engineers like Neo?



Credit: The Matrix

Every engineer is the chosen one

What we say	What we mean
Horrible hack	Horrible hack that I didn't write
Temporary workaround	Horrible hack that I wrote
It's broken	There are bugs in your code
It has a few issues	There are bugs in my code
Obscure	Someone else's code doesn't have comments
Self-documenting	My code doesn't have comments
That's why it's an awesome language	It's my favorite language and it's really easy to do something in it.
You're thinking in the wrong mindset	It's my favorite language and it's really hard to do something in it.
I can read this Perl script	I wrote this Perl script
I can't read this Perl script	I didn't write this Perl script
Bad structure	Someone else's code is badly organized
Complex structure	My code is badly organized
Bug	The absence of a feature I like
Out of scope	The absence of a feature I don't like
Clean solution	It works and I understand it
We need to rewrite it	It works but I don't understand it
emacs is better than vi	It's too peaceful here, let's start a flame war
vi is better than emacs	It's too peaceful here, let's start a flame war
IMHO	You are wrong
Legacy code	It works, but no one knows how
^X^Cquit^\[ESC][ESC]^C	I don't know how to quit vi

Credit: Linux for Geeks
https://plus.google.com/102342595285863325267/posts/NWqidcg

Fighting for the sake of the world...

- of complexity
- Interpret the messy world into a beautiful masterpiece

Beauty according to an engineer

```
quicksort(A, i, k):
  if i < k:
    p := partition(A, i, k)
    quicksort(A, i, p - 1)
    quicksort(A, p + 1, k)
 partition(array, left, right)
     pivotIndex := choosePivot(array, left, right)
     pivotValue := array[pivotIndex]
     swap array[pivotIndex] and array[right]
     storeIndex := left
     for i from left to right - 1
         if array[i] < pivotValue
             swap array[i] and array[storeIndex]
             storeIndex := storeIndex + 1
     swap array[storeIndex] and array[right]  // Move pivot to its final place
     return storeIndex
```

Credit: wikipedia http://en.wikipedia.org/wiki/Quicksort

You’re an artist? We are too!

- Don’t see themselves as builders
- Engineers see themselves as artists
- We want the world to appreciate our genius
  - (or at the very least create cool things)

So what do engineers do?

Write code.

So what do engineers do?

Write code.

And usually not a lot.

What it actually takes to write code

1. Researching
2. Architecting
3. Writing
4. Testing

Research

1. What is the requirement?
2. What code has already been written?
3. What libraries can I use?

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CANCEL SAVE

Architecting

1. What is the best approach?
2. What affordances does this allow?
3. How can I manage complexity?
4. How does this affect existing code?
5. What prerequisites are necessary?

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Coding

1. What language features exist?
2. How can the code be readable for the future?
3. Why isn’t this working?
4. Why is this still not working?
5. Why the f*ck is this not working?

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Testing

1. What edge cases haven’t been considered?
2. How well is it covered by unit tests?
3. Does it meet the requirements?
4. Is the code stable?

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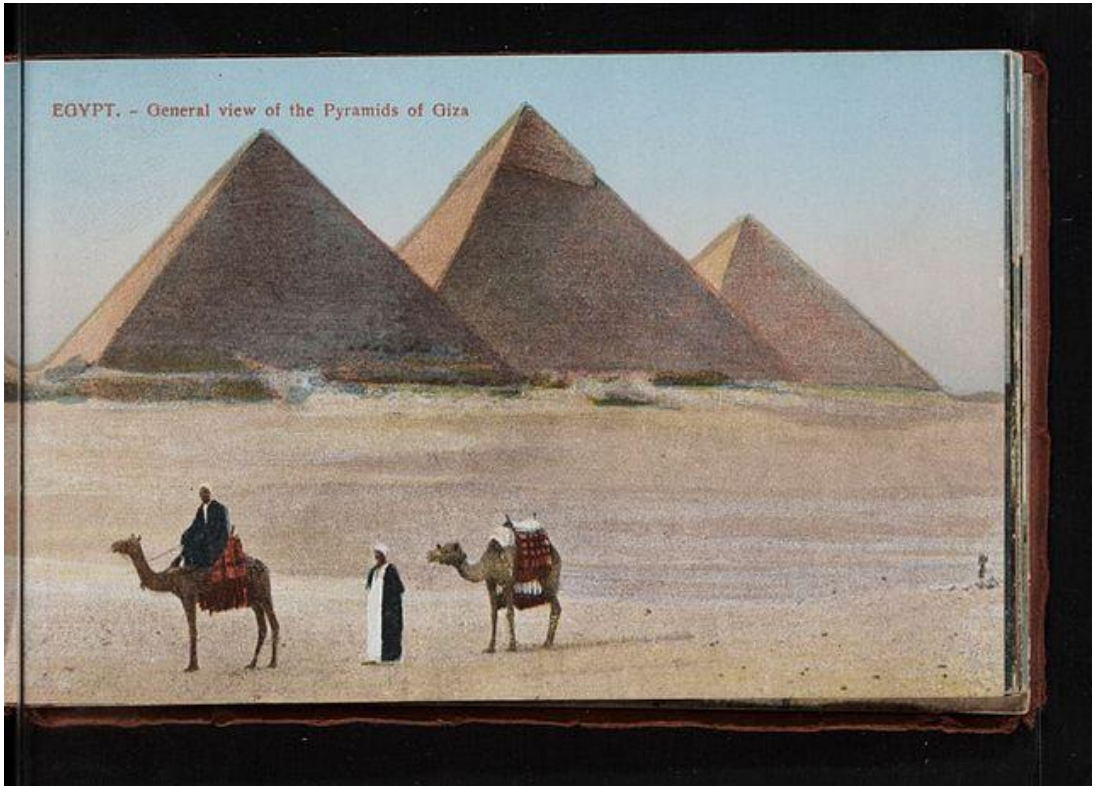
What do engineers really care about?

Stability



Credit: wikimedia

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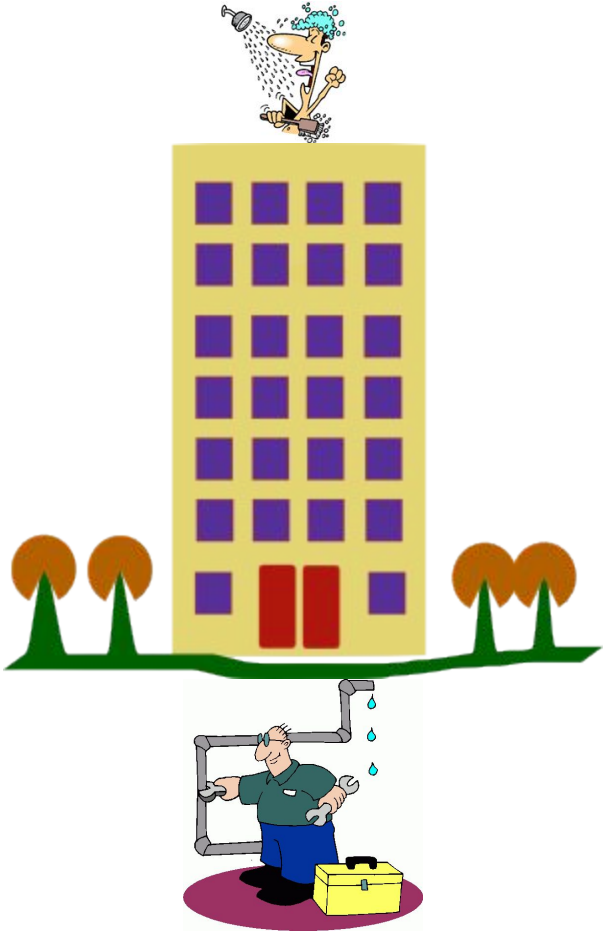
Bad Analogy

- End-users are on the roof
  - They have a leak in their washroom
- Engineers are in the basement
- Where is design and product?



Engineers are on the ground floor

- Product and design largely come first
- Are you plugging leaks or taking a leisurely shower?

Everyone is on the same side

- End users just create work
- Tension: customer needs v. architecture
- Save your engineers work

Think through the system

- Sketch out workflows
- Write up use cases
- Draw storyboards
- and share all of the documentation with your engineers

If you don’t...

- You’re making work for them
- Engineers will make assumptions
- *Every* possibility must be accounted for
  - “That won’t happen very often” isn’t good enough
- Specs and mockups should be consistent

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Rough flow with engineers

1. Talk about the next project
2. Send mockups
3. Wait for engineers to complete work
4. Review their work and send feedback
    a. Repeat until it is shippable
5. Evaluate design in production

We will start at the mockups

- Everything before mockups is gravy
  - We will get to early communication later
- Pre-mockup work is often unstructured

Work from a style guide

- Engineers write reusable and modular code
  - avoids redundant work
  - improves maintainability
  - reduces errors
- And love if designers work the same way
- Poke around online for style guides and frameworks
- It should save you work, too

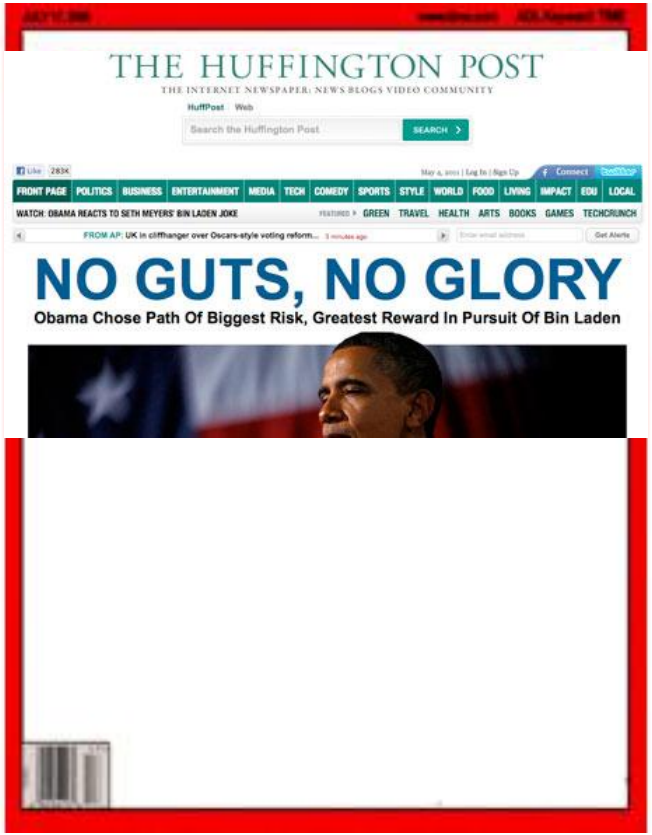
Wide variation in expectations

- Different types of engineers expect different mockups
- Level of detail can vary
  - pixel-by-pixel measurements
  - high-level description
  - “just send the illustrator file”
- Work with each one individually

Meet IRL, Document Online

- Embrace the conflict
  - but walk away not taking anything personally
- 5 minutes can save 5 days
- Always leave a paper trail

Understand the interface



Credit: The Princess Bride, HuffPo, Time, T-Shirts

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Be Specific

- Engineers aren’t intentionally negligent
- Engineers can miss details

Be Flexible

- Both of you have already invested a lot of effort
- Don’t invest a lot of ego into it, too

Be Positive

- Almost all reviews are bad reviews
- Be appreciative when engineers do it right
- Be really appreciative if they add something

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Don’t take it personally

It’s going to happen.

Again.

And again.

And again.

Engineers are always coding

credit: The Princess Bride

Engineers are always coding

What are the processes that created this?

What variables could be tweaked?

credit: The Princess Bride

A codebase is like a house

credit: random web clip art

It’s stable

It has some affordances...

But not every affordance...

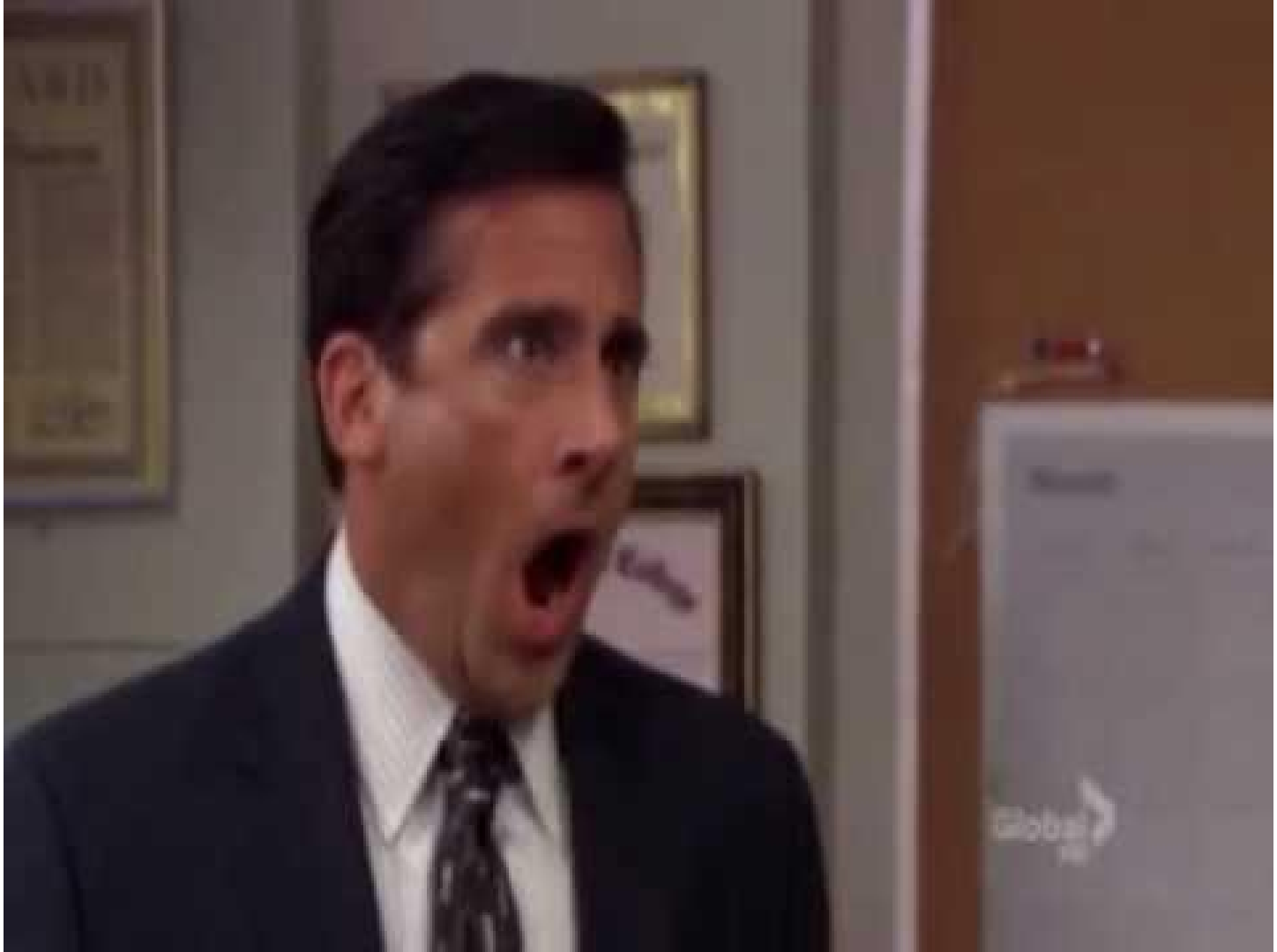
And it just goes on endlessly

Until it is completely different

- House -> H.O.U.S
  - House Of Unusual Size

So when you ask for something

- I have already started thinking
  - but I’m not done
  - and don’t have complete context
- and I don’t want over-promise
  - because I’m liable
- and it might compromise the system
  - if the change doesn’t fit with the affordances
- so what do I say?



credit:
the office

But don’t feel bad about it

- This *is* Agile development
- Engineers know how to live with this

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Give engineers time

- in 10 minutes, the no becomes yes*
  - “Yes, but…”
  - “Yes, if…”
  - “Yes, unless…”
- ease them into it and start talking early
- engineers can warn you about blockers

Warn them whenever possible

- Engineers love to build extensible systems
- If they know what’s coming a long ways off, they can build a system to accommodate it

Pick through the details

- A “no” might be “no” for a small part of it
- Code complexity doesn’t always correlate with design complexity

Show them an example

- Engineers can copy others
  - (remember the forest?)
- Engineers love a challenge
  - Prove they can do anything anyone else can

But the answer might still be no

1. 3rd party libraries
   a. not everything is mutable
2. Entailment may be logically inconsistent
   a. you can’t have it both ways
3. The implementation may be computationally impossible to do efficient
   a. “NP-complete” or “NP-hard”

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Waterfall versus Iteration

- Complete spec means an extensible system
  - at the expense of external validity
- Iteration means real-world testing
  - at the expense of wasted work
- How much of an engineer’s work is meaningful?

Responsive versus Technical Debt

- Almost anything can be done with an if statement
  - but these incur technical debt (complexity)
- A system can be redesigned
  - but it takes a long time and may be over-engineered
- How can a system be built to the right level of complexity?

System versus User Complexity

- Who pays when things are hard?
- Systems can be complex
  - but users are mystified
- Users must be explicit
  - but users are turned off
- How do you model a messy world in a clean system?

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Use the house analogy

- A codebase is like a house
- How can everyone work together to build a house as pleasantly and effectively as possible?

Engineering is all absolutes

- A system must be
  - complete
  - logical
  - consistent
  - understandable

Communication and Empathy

- Talk it out!
- Understand their motivations and concerns
- Share your own thinking

Treat them like

Not

References

- http://blog.zanbato.com/tag/engineers-for-designers/
- https://www.nczonline.net/blog/2012/06/12/the-care-and-feeding-of-software-engineers-or-why-engineers-are-grumpy/
- https://library.gv.com/how-designers-and-engineers-can-play-nice-and-still-run-with-scissors-8df20e65c2c1#.ewepzp9ip

Questions?

- Kevin Leung
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- Reach out whenever you want!