
Nothing New Under the Sun

**Techniques that still work no matter how hard we try
to forget them**

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Context

**“I come as an entertainer,
not as a salesman. I want
you to enjoy these ideas
because I enjoy them” –
*Alan Watts***

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If IT were a person...



It would be diagnosed with

- ADHD
- Retrograde amnesia
- OCD

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If IT were a person...



It would be diagnosed with

- ADHD
 - We have difficulty retaining focus on the job at hand
 - We are very easily distracted by *ooh, shiny!*
- Retrograde amnesia
- OCD

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- OCD

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 - We don't recall our past
- OCD
 - We follow rituals independent of their effectiveness

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 - We don't recall our past
- OCD
 - We follow rituals independent of their effectiveness

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Tony Hoare said...



“If we could only learn the right lessons from the successes of the past we would not need to learn from the failures ”

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Zombies



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Zombies



Given half a chance they *will* eat your brain

- Code the works “first time”
- Structured Programming

These, and others, we should forget

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Code that works “first time”



City and Guilds COBOL

- 3 attempts to compile, run and test or fail

There was a time when this sort of thing made sense

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Code that works “first time”



There was a time when this sort of thing made sense



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Code that works “first time”



Jerry Weinberg tells of being told that

- The computer (singular) earns more than you do, so behave accordingly

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Code that works “first time”



The computer learns more than you, behave accordingly

- $\text{cost}(\text{processor time}) \gg \text{cost}(\text{developer time})$
- Cycle time to get feedback—hours to days

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Code that works “first time”



The computer learns more than you, behave accordingly

- $\text{cost}(\text{processor time}) \gg \text{cost}(\text{developer time})$
- Cycle time to get feedback—hours to days

In fact, you earn much more than the computer

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Code that works “first time”



The computer learns more than you, behave accordingly

- $\text{cost}(\text{processor time}) \gg \text{cost}(\text{developer time})$
- Cycle time to get feedback—hours to days

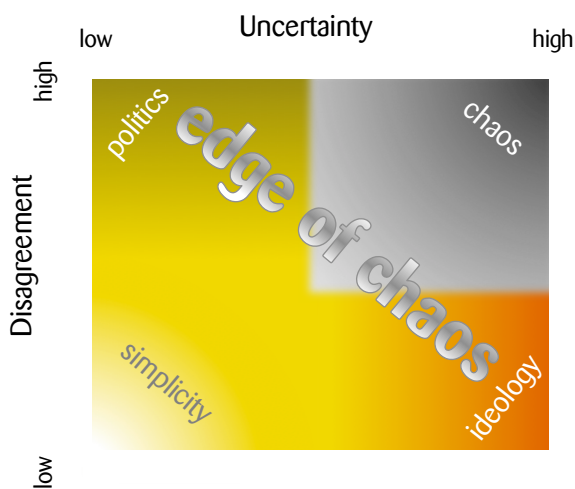
You earn much more than the computer, behave accordingly

- $\text{cost}(\text{processor time}) \ll \text{cost}(\text{developer time})$
- Cycle time to get feedback—milliseconds to minutes
- A top-end dev workstation amortised over 3 years
 - £1 per day
 - 2 or 3 *orders of magnitude* cheaper than a programmer

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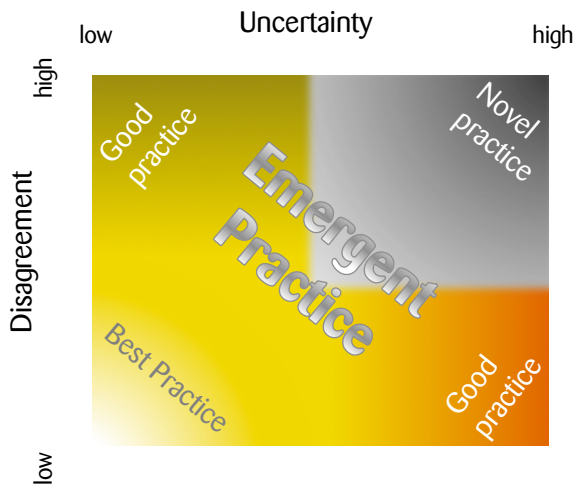
Code that works “first time”



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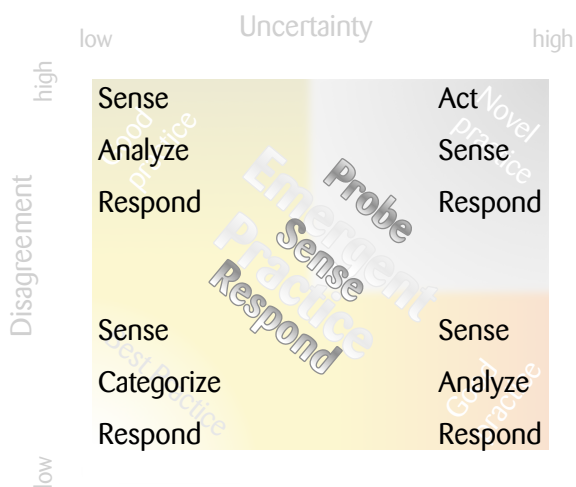
Code that works "first time"



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Code that works "first time"



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On the other hand...



“Requests start to come in faster, and with more urgency. By the end of a few months, it takes half a day for me to even respond to all of them. Every request is an emergency. I get nothing done, and without much notice, programming isn't what I get to do anymore. I love writing software, but the work is unbearable. I could never stop seeing myself as a software engineer, but I'm wondering if the industry as I had envisioned it does not really exist.”

– *redditor deltnurgsid*

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On the other hand...



“Some advice from the world of book publishing [...] multiple sales people all wanting different things, all bugging me over and over. I gathered them at a meeting and said that I'd be happy to help them but they had to decide amongst themselves which projects and features got priority [...] when a salesperson came to me mid-week and pushed for something outside the list, I could say no and refer them to the list. They'd beg but eventually everyone got onboard with the manta of "If it's not on the list, don't even ask" [...] I can work on that but I can only do it tonight after 5:30pm so I'll have to work overtime. If I do, then you have to be here with me until it's done." [...] I never got a yes to this. [...] Arrive on time and leave on time and take your lunch break every single day no matter what [...] Make some unilateral decisions. This is the hardest one but it can also work incredibly well. I simply said no to some people [...] Make it very clear to everyone in a single meeting that each request cuts away time and they will personally be responsible.” – *redditor mathewferguson*

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redditor [mathewferguson](#)

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Structured Programming



A “sub-program” had:

- One entry point
- Sequence
- Iteration
- Alternation
- One exit point

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Structured Programming



That was a big improvement over spaghetti code

- Especially when flow of control was DIY

```
10 IF (SUM .LE. LLIMIT) THEN
    NUMBER = NUMBER + 1
    SUM = SUM + NUMBER
GO TO 10
END IF
```

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Structured Programming



But this sort of thing makes no sense:

```
public Object doTrickyStuff(Object a, Object b) {
    Object result = null;
    try {
        if (obscureCondition()) {
            result = getStuff();
        } else {
            result = getStuff();
        }
    } catch (Exception e) {
        result = specialResult();
    }
    return result;
}
```

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Old School: things we got right

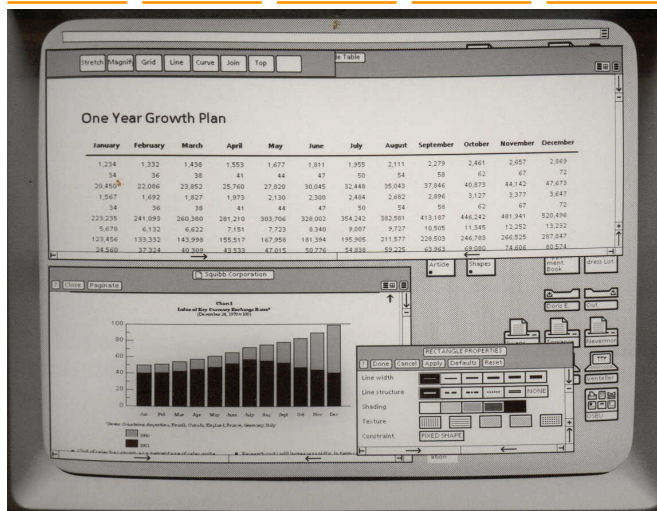


http://commons.wikimedia.org/wiki/File:Vincent_Series_C_Black_Shadow_1950.jpg

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Old School: things we got right



<http://www.digium.com/collections/screenshots/xerox-star-8010/xerox-star-8010-02.jpg>

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Old School: things we got right



Analysis

Architecture

Modelling

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15 years and Counting



I've been a professional programmer for about 15 years

- And an amateur for years before that

What follows are ideas that I learned very early on

- And still use day-by-day

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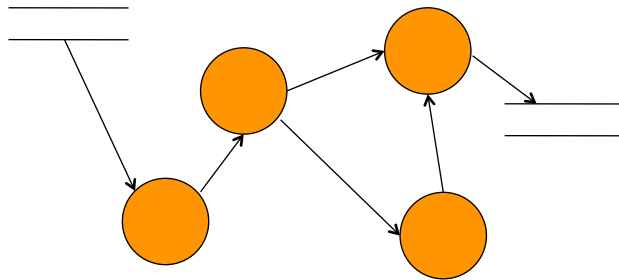
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Analysis



There used to be this thing called Systems Analysis

- It used to be a core skill
- But it got a bad name



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Analysis



So, we stopped doing it

- Agile gave some of us an excuse

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Analysis



We had to re-invent *understanding*

- behaviour driven development
 - (AKA TDD the way you were always supposed to do it)
- Domain Driven Design
 - “Until I started working in "enterprise IT" I didn't realise that people *didn't* do this. I suppose that this is an important book, but it's depressing that this is so” –Nat Pryce

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Analysis



Domain Driven Design

“Leading software designers have recognized domain modeling and design as critical topics for at least 20 years, yet surprisingly little has been written about what needs to be done or how to do it.” –Evans



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Analysis



These days we “conquer and divide”

- We can discover the domain
- Which is great!

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Analysis



But still...

- Objects in the world have states that they move between
 - We might want to talk explicitly about them
- Some events must occur in certain orders
 - We might want to talk explicitly about that

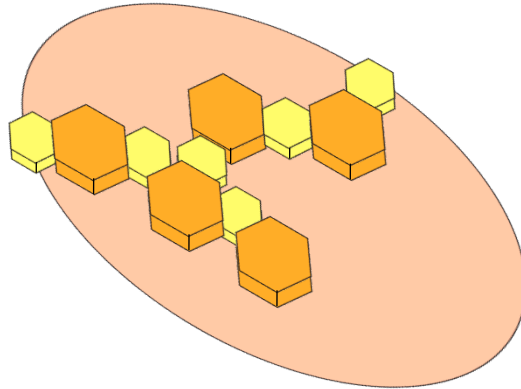
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Analysis



Consider a system built out of domains with various intents



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Analysis



Then we would know where to put the analysis

There's an echo of this in Enterprise stacks

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Architecture



No-one quite agrees on what this is
So it has become everything and nothing

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Architecture



Seems as if it should have something to do with:

- Compromise
- Communication
- Habitability
- Reconciliation
- Comfort
- Ease of construction

And not:

- Which stack to fit in between the web server and database

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Architecture



“Stacks” an over-used metaphor



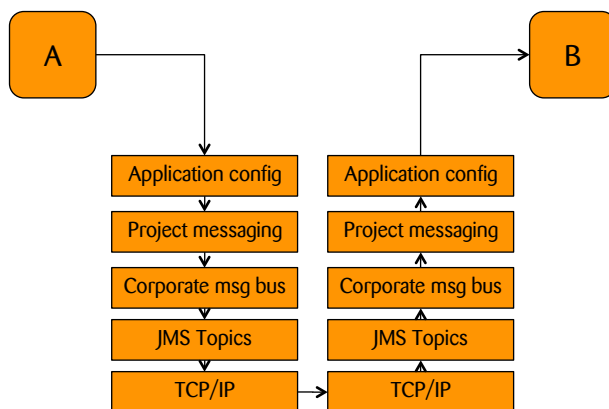
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Architecture



“Stacks” an over-used metaphor



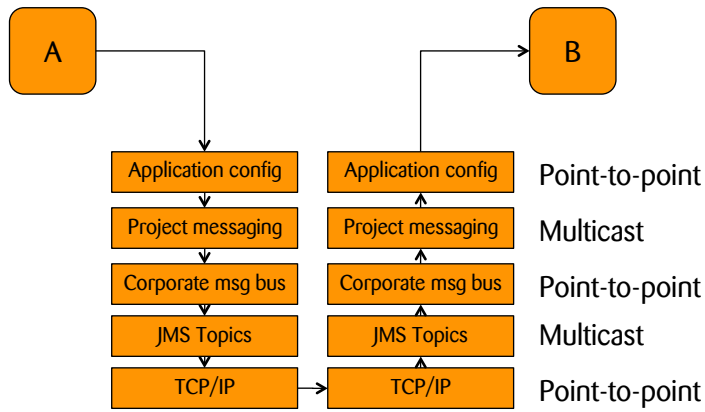
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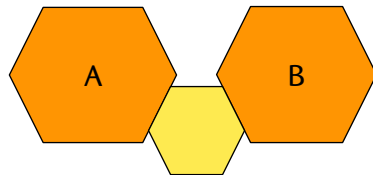
“Stacks” an over-used metaphor



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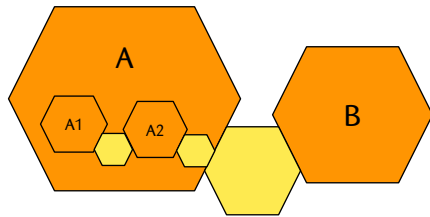
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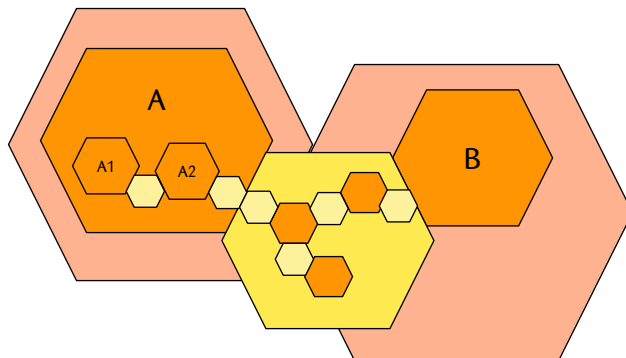
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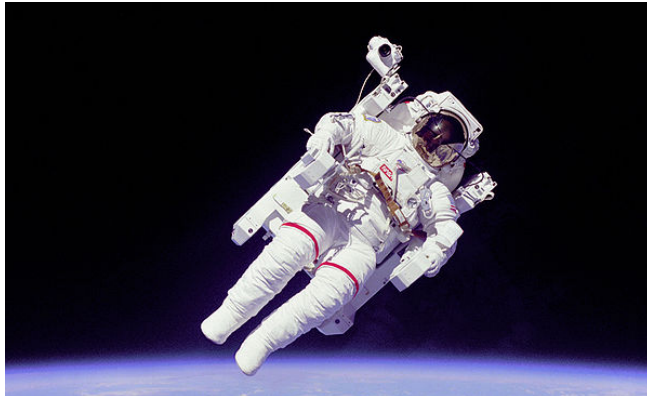
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Architecture got a bad name



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Non-the-less, every system has an architecture

- It might be worth knowing how to talk about that

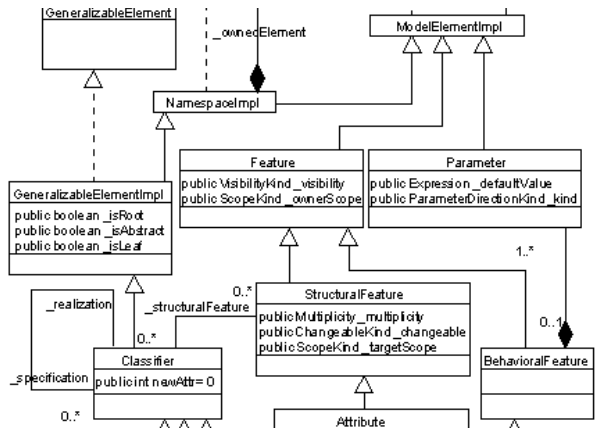
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Modelling



We really lost the plot on this one



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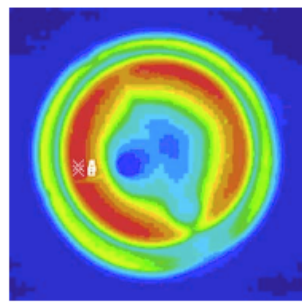
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Modelling



Engineers Model



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Modelling



Engineers Model

- Models are useful for what they *leave out*
- Faster, cheaper than building a prototype

Models Answer Questions

- More quickly and easily than the real thing would

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Modelling



Engineers Model

- Models are useful for what they *leave out*
- Faster, cheaper than building a prototype

Models Answer Questions

- More quickly and easily than the real thing would

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Modelling



We got this wrong

- We tried to make our models useful by *adding* stuff
- Our models are often harder to build, and slower
- Our models too often don't answer questions

```
STATE ::= patients | fields | setup | ready | beam_on
EVENT ::= select_patient | select_field | enter | start | stop | ok | intlk
FSM == (STATE × EVENT) → STATE
```

```
no_change, transitions, control: FSM
```

```
control = no_change @ transitions
```

```
no_change = { s: STATE; e: EVENT • (s, e) → s }
```

```
transitions = { (patients, enter) → fields,
```

```
(fields, select_patient) → patients, (fields, enter) → setup,
```

```
(setup, select_patient) → patients, (setup, select_field) → fields, (setup, ok) → ready,
```

```
(ready, select_patient) → patients, (ready, select_field) → fields, (ready, start) → beam_on, (ready, intlk) → setup,
```

```
(beam_on, stop) → ready, (beam_on, intlk) → setup }
```

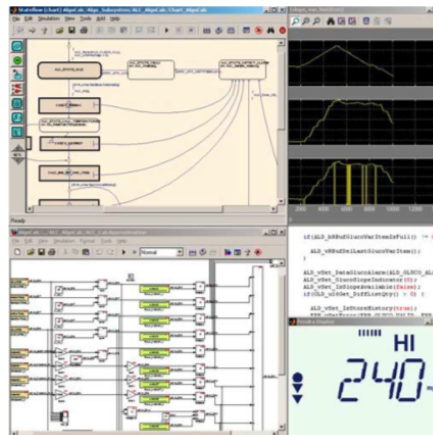
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Modelling



There is a way forward, when appropriate



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Modelling



But life, sadly, turns out to be too short

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Conclusion



These *were* good ideas

- They still are good ideas

We turned against them because they were misapplied

- We can do better than that

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