

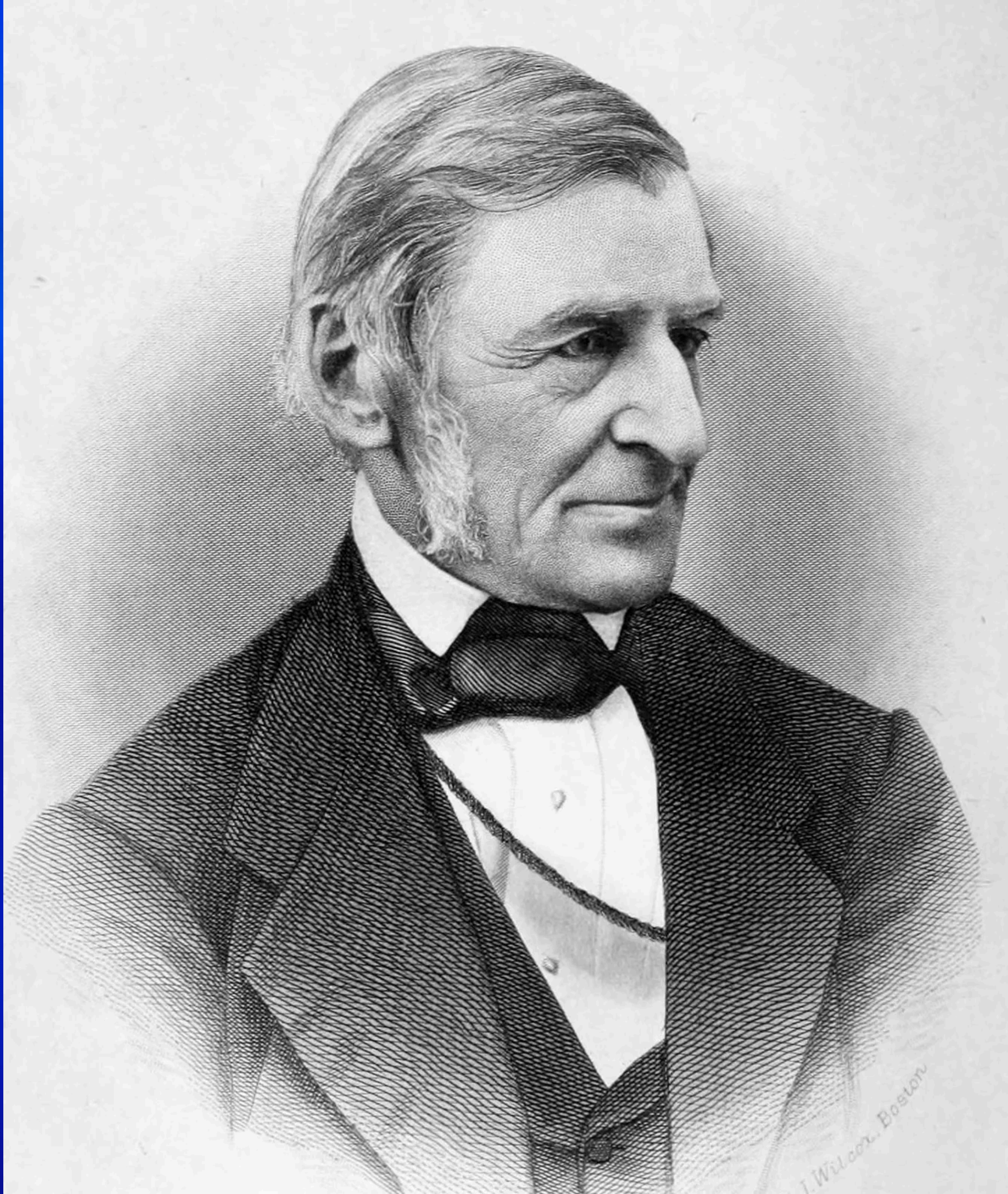


One Rule to Rule Them All

Dave Thomas

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*A foolish consistency is the
hobgoblin of little minds*

Ralph Waldo Emerson

*"I never said most of the
things I said"*

— Yogi Berra



BACK 
TO THE 1990S

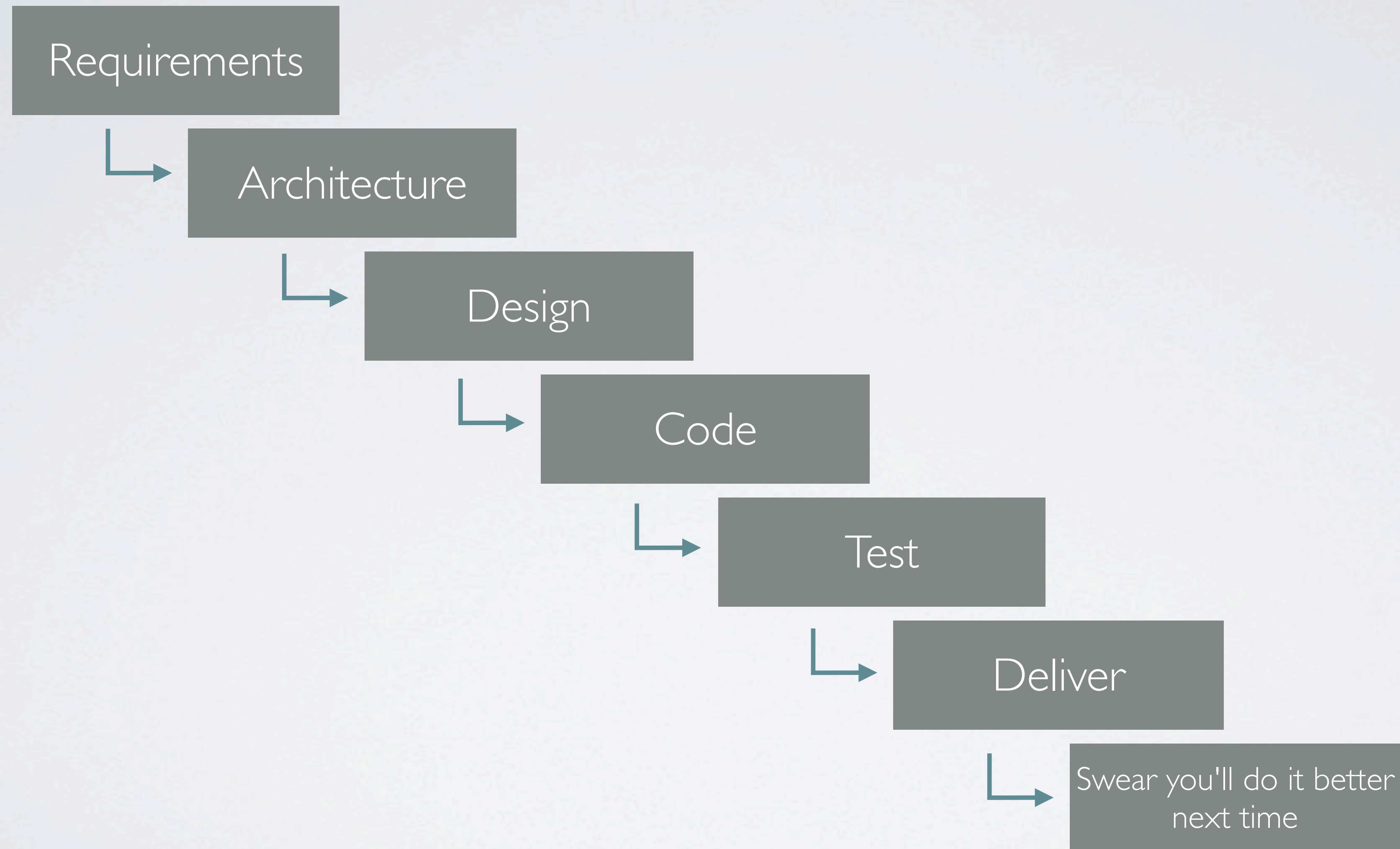
"We're lost, but we're
making good time."

— Yogi Berra



CLASSIC WATERFALL

(AS COMMONLY MISUNDERSTOOD)

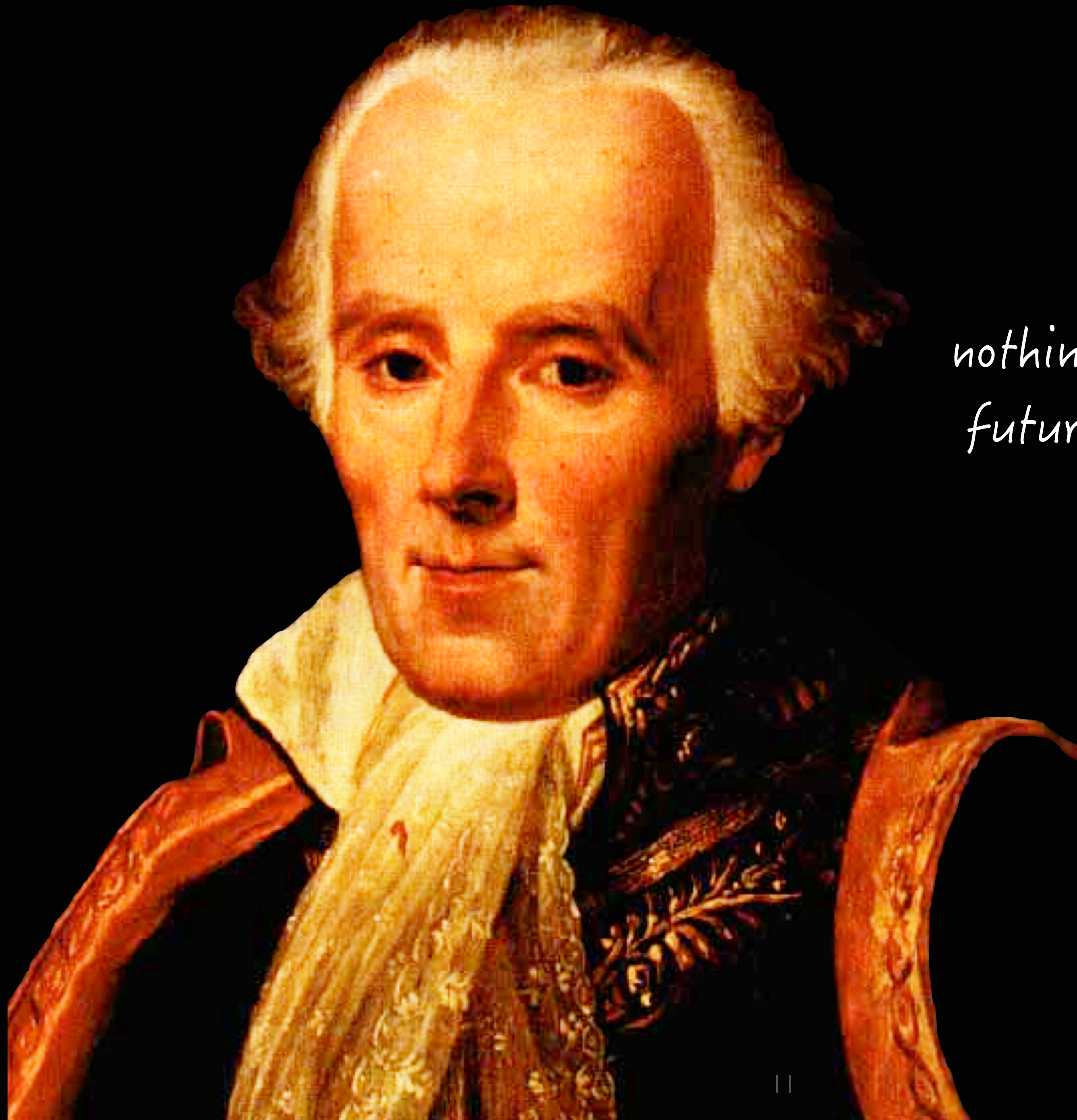


HIGHER ORDER TYPE SYSTEMS

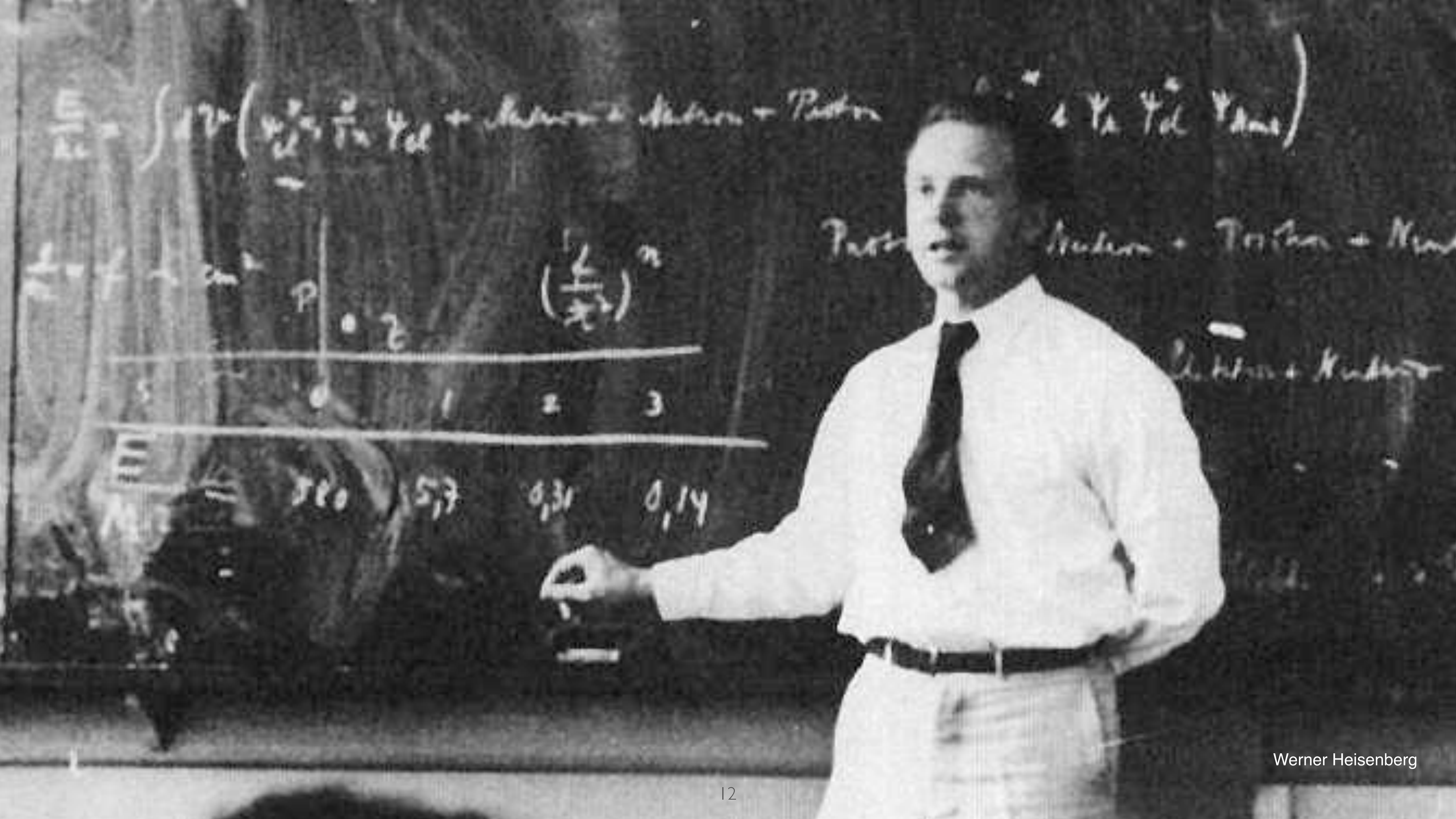
THEOREM PROVING

100% TEST COVERAGE

Correct



*nothing would be uncertain and the
future just like the past would be
present before its eyes.*



$$\frac{E}{hc} = \int dV \left(\psi^* \nabla^2 \psi + \text{Neutron} + \text{Neutron} + \text{Positron} + \psi^* \psi \psi^* \psi \right)$$

$\frac{E}{hc} - \frac{1}{\lambda_0}$	p	z	$(\frac{z}{\lambda_0})^n$	
		0		
		1		
		2		
		3		
$\frac{E}{hc}$	380	5,7	0,31	0,14

Proton Neutron + Positron + Neutron
Neutron + Neutron

Werner Heisenberg

A black and white portrait of Kurt Gödel. He is an older man with thinning hair, wearing round-rimmed glasses, a dark suit jacket, a white shirt, and a dark tie. He is resting his head on his right hand, with his fingers spread, looking thoughtfully towards the left. The background is dark and out of focus.

Kurt Gödel

*no consistent system of axioms ... is
capable of proving all truths about
the arithmetic of natural numbers*

*a system cannot demonstrate
its own consistency*

"If the world were perfect,
it wouldn't be."

— Yogi Berra



Correct



Deal with uncertainty

Dave's Postulate #1:

In all but the most trivial cases,
there is no such thing
as correct code.

Correct



Deal with change

Correct



Change

Change

- Policy
- Law
- Markets
- Strategies
- Resources
- People
- Understanding
- Consensus
- Nature

Change

- New products
- New features
- New integrations
- A/B testing
- New workflows
- Regulations
- Site layout
- Bugs
- Elon Musk

Things that are perfect

Everything else

Don't Change

Changes



Everything else



Everything
Changes



Manifesto for Agile Software Development

We are uncovering better ways of developing software by doing it and helping others do it.
Through this work we have come to value:

Individuals and interactions over processes and tools

Working software over comprehensive documentation

Customer collaboration over contract negotiation

Responding to change over following a plan

That is, while there is value in the items on the right, we value the items on the left more.

Kent Beck
Mike Beedle
Arie van Bennekum
Alistair Cockburn
Ward Cunningham
Martin Fowler

James Grenning
Jim Highsmith
Andrew Hunt
Ron Jeffries
Jon Kern
Brian Marick

Robert C. Martin
Steve Mellor
Ken Schwaber
Jeff Sutherland
Dave Thomas



GOTO Conferences

1.4M views
7 years ago

GOTO 2015

Agile Software Development

What

- Find out where you are
- Take a small step towards your goal
- Adjust your understanding based on what you learned
- Repeat

How

- When faced with two or more alternatives that deliver roughly the same value, take the path that **makes future change easier**

- When faced with two or more alternatives that deliver roughly the same value, take the path that **makes future change easier**

~~Correct~~

Easy to Change

Easy to Change

Mostly correct today



Update tomorrow

Our Job

- Create things today that can change
- So they can survive to be changed tomorrow



How?

Sales Module

```
tax = price * 0.10
```

Refund Module

```
tax = price * 0.10
```

Tax Module

```
tax = price * 0.10
```


Sales Module

```
tax = price * 0.10
```

Refund Module

```
tax = price * 0.10
```

Tax Module

```
tax = price * 0.10
```

Sales Module

```
tax = price * TAX
```

Refund Module

```
tax = price * TAX
```

Tax Module

```
tax = price * TAX
```


Sales Module

```
tax = price * 0.10
```

Refund Module

```
tax = price * 0.10
```

Tax Module

```
tax = price * 0.10
```

Sales Module

```
tax = price * TAX
```

Refund Module

```
tax = price * TAX
```

Tax Module

```
tax = price * TAX
```

Sales Module

```
tax = Tax_for(price)
```

Refund Module

```
tax = Tax_for(price)
```

Tax Module

```
tax = Tax_for(price)
```


Sales Module

```
tax = price * 0.10
```

Sales Module

```
tax = price * TAX
```

Sales Module

```
tax = Tax_for(price)
```


Common Sense?

DRY?

Single place to express concept
and implementation

Easier to change:

- rate changes
- rule changes

```
Sales Module

total = price * 1.10
```

```
Sales Module

total = price * TAX
```

```
Sales Module

total = Tax_for(price)
```


Sales Module

```
total = tax_for(price)
```

Easier to change:

- rate changes
- rule changes

Tax Calculator

```
tax_for(price) {  
    ...  
}  
  
rule_table = {  
    exempt_goods = [  
        {  
        },  
        ...  
    ],  
    tax_holidays = [  
        {  
        },  
        ...],  
    ...  
}
```


Sales Module

```
total = tax_for(price)
```

Easier to change:

- rate changes
- rule changes

Tax Calculator

```
tax_for(price) {  
  ...  
}  
  
rule_table = {  
  exempt_goods = [  
    {  
    },  
    ...  
  ],  
  tax_holidays = [  
    {  
    },  
    ...],  
  ...  
}
```

Code	Description	Eff. date	End date
B76913	Infant milk	2013-01-01	2022-12-31
B78142	Prescription medicine	2013-01-01	2022-12-31
B90167	Hearing aids	2015-01-01	2028-12-31
D48203	Mobility devices	2015-01-01	2028-12-31
F73721	School supplies	2022-08-25	2022-09-02
G00143	Passport application fee	2012-06-01	2031-05-31
G01078	Bail bonds	2019-03-15	2025-01-01

Save

Cancel

Sales Module

```
total = tax_for(price)
```

Tax Calculator

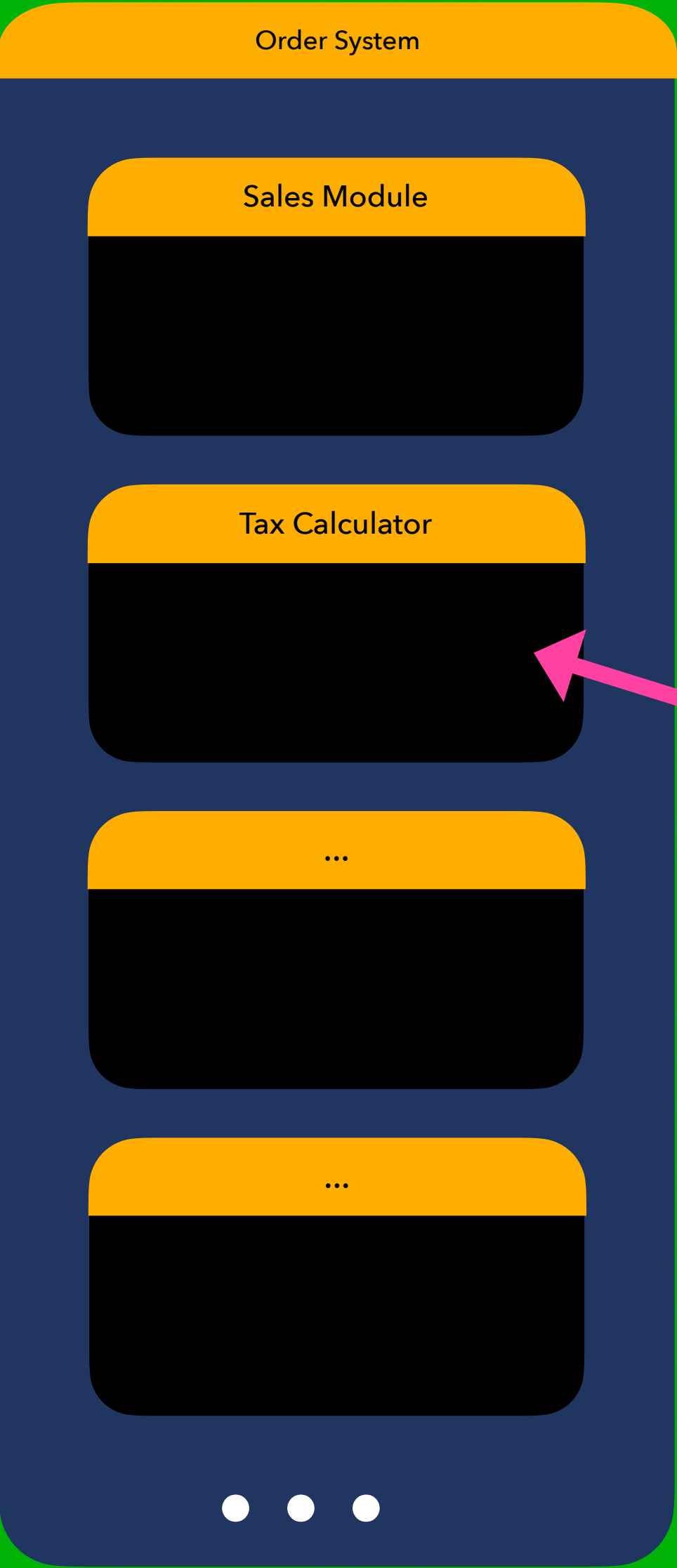
```
tax_for(price) {  
  ...  
}  
  
rule_table = {  
  exempt_goods = [  
    {  
    },  
    ...  
  ],  
  tax_holidays = [  
    {  
    },  
    ...],  
  ...  
}
```

Code	Description	Eff. date	End date
B76913	Infant milk	2013-01-01	2022-12-31
B78142	Prescription medicine	2013-01-01	2022-12-31
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F73721	School supplies	2022-08-25	2022-09-02
G00143	Passport application fee	2012-06-01	2031-05-31
G01078	Bail bonds	2019-03-15	2025-01-01

Save

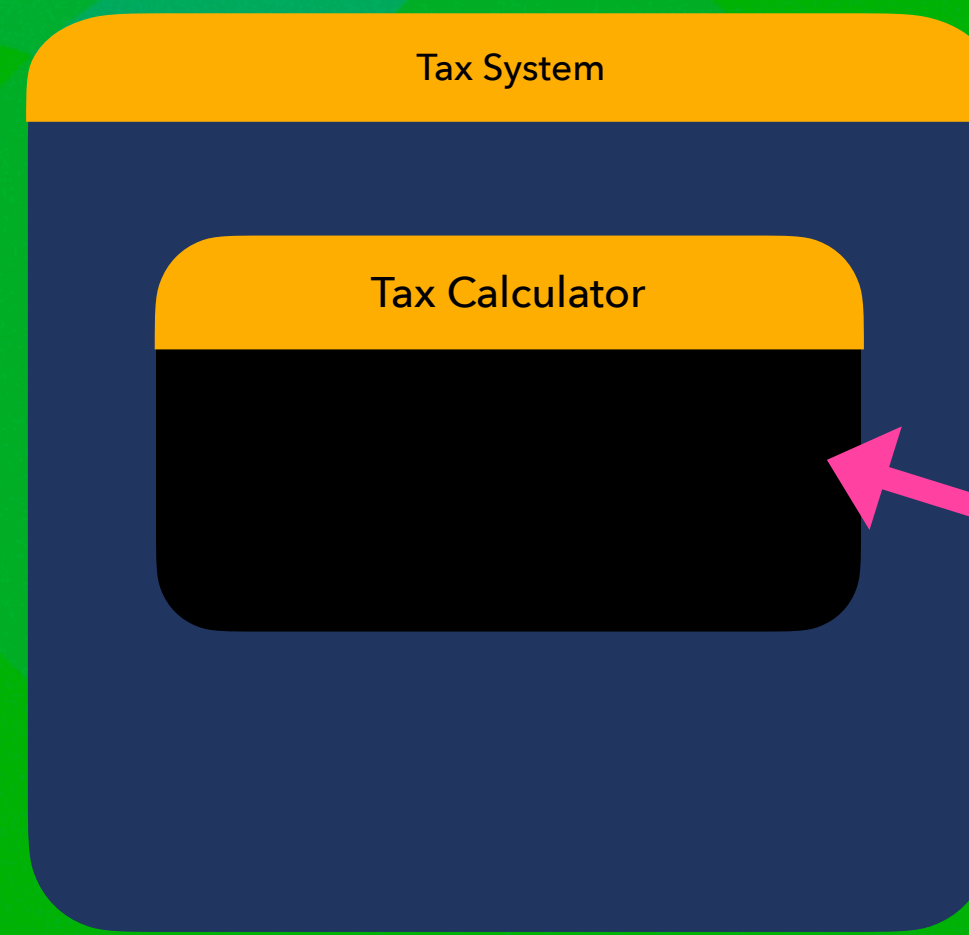
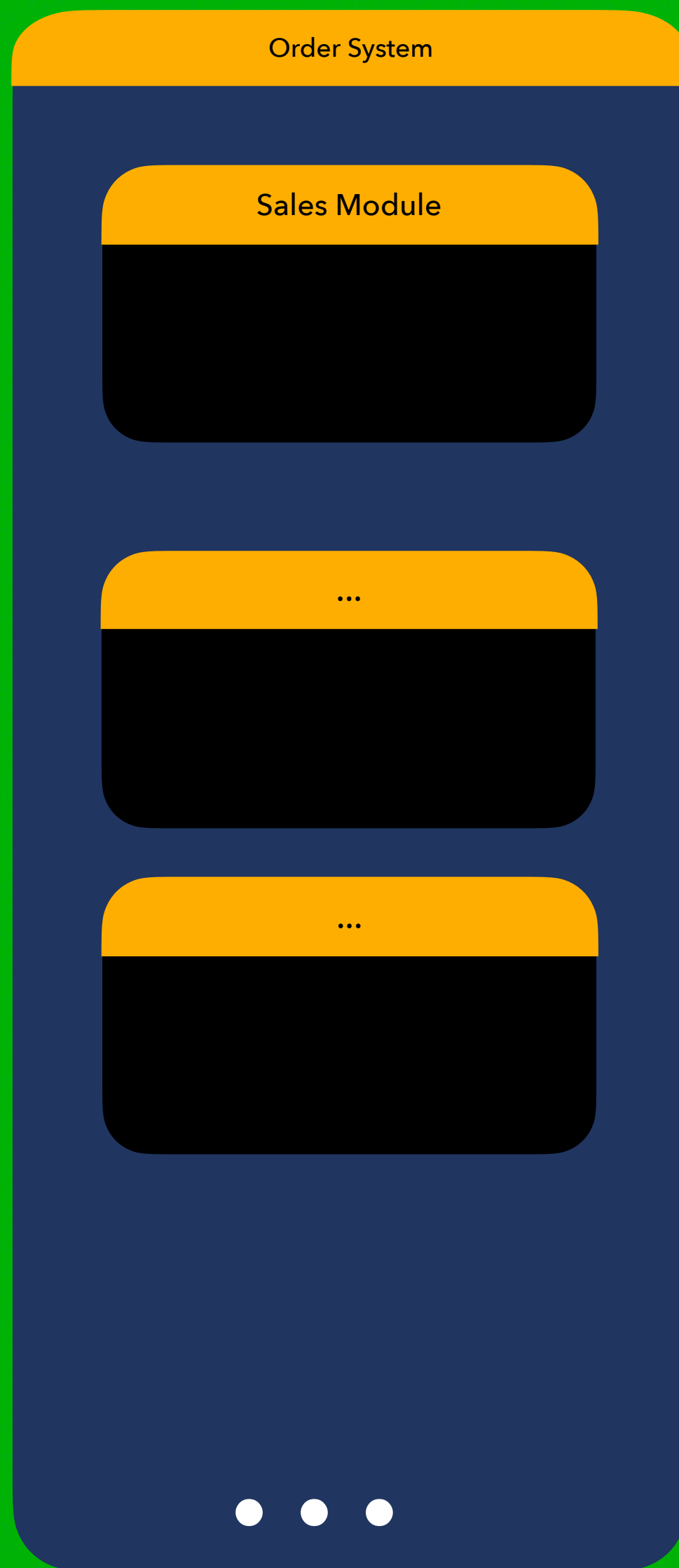
Cancel

- Maybe start with spreadsheet
- Code a UI if
 - it works
 - it's needed



Code	Description	Eff. date	End date
874913	Infant milk	2013-01-01	2022-12-31
878142	Prescription medicine	2013-01-01	2022-12-31
890167	Hearing aids	2015-01-01	2028-12-31
D48203	Mobility devices	2015-01-01	2028-12-31
F73721	School supplies	2022-08-25	2022-09-02
G00143	Passport application fee	2012-06-01	2031-05-31
G01078	Ball bonds	2019-03-15	2025-01-01

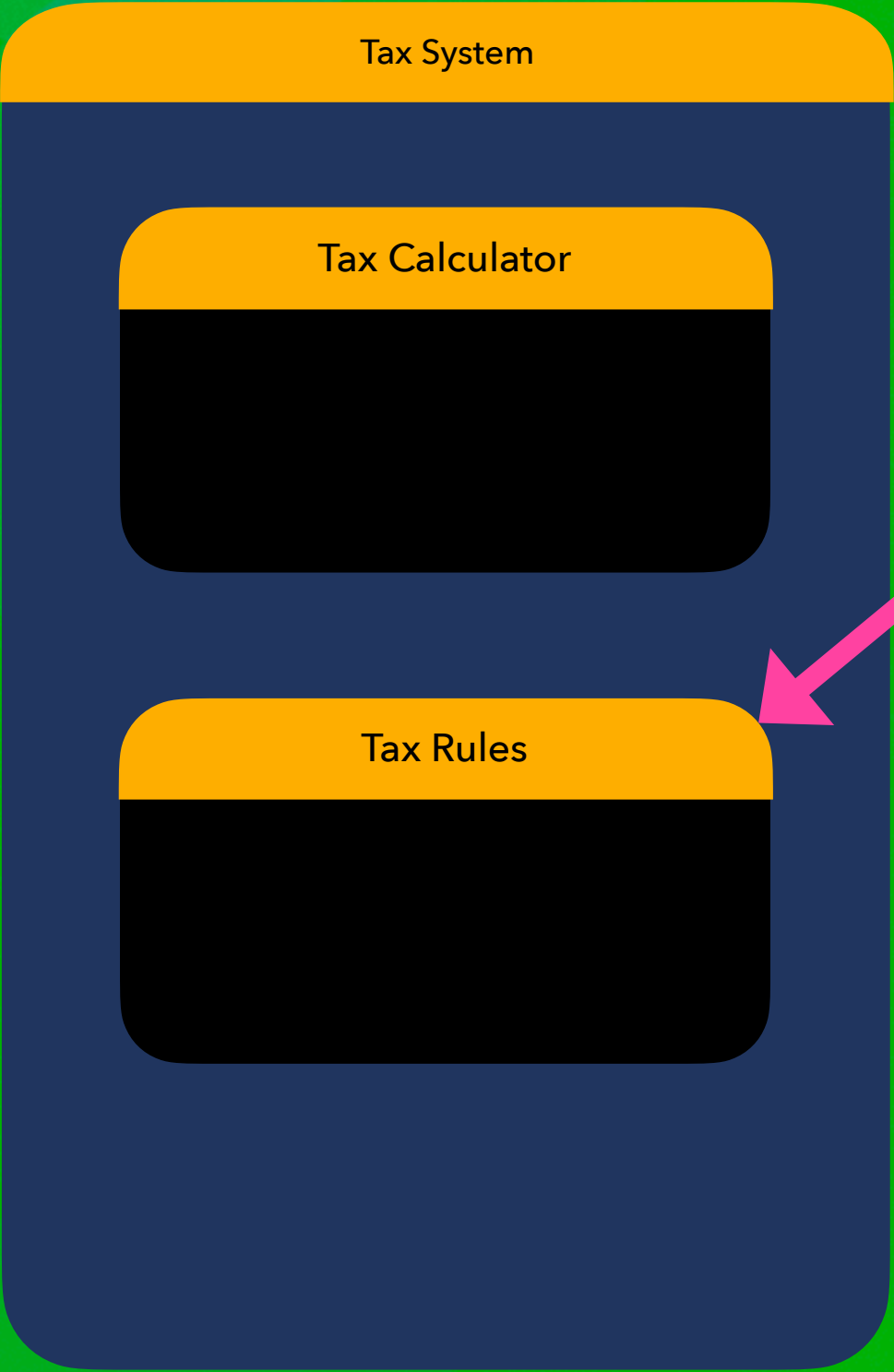
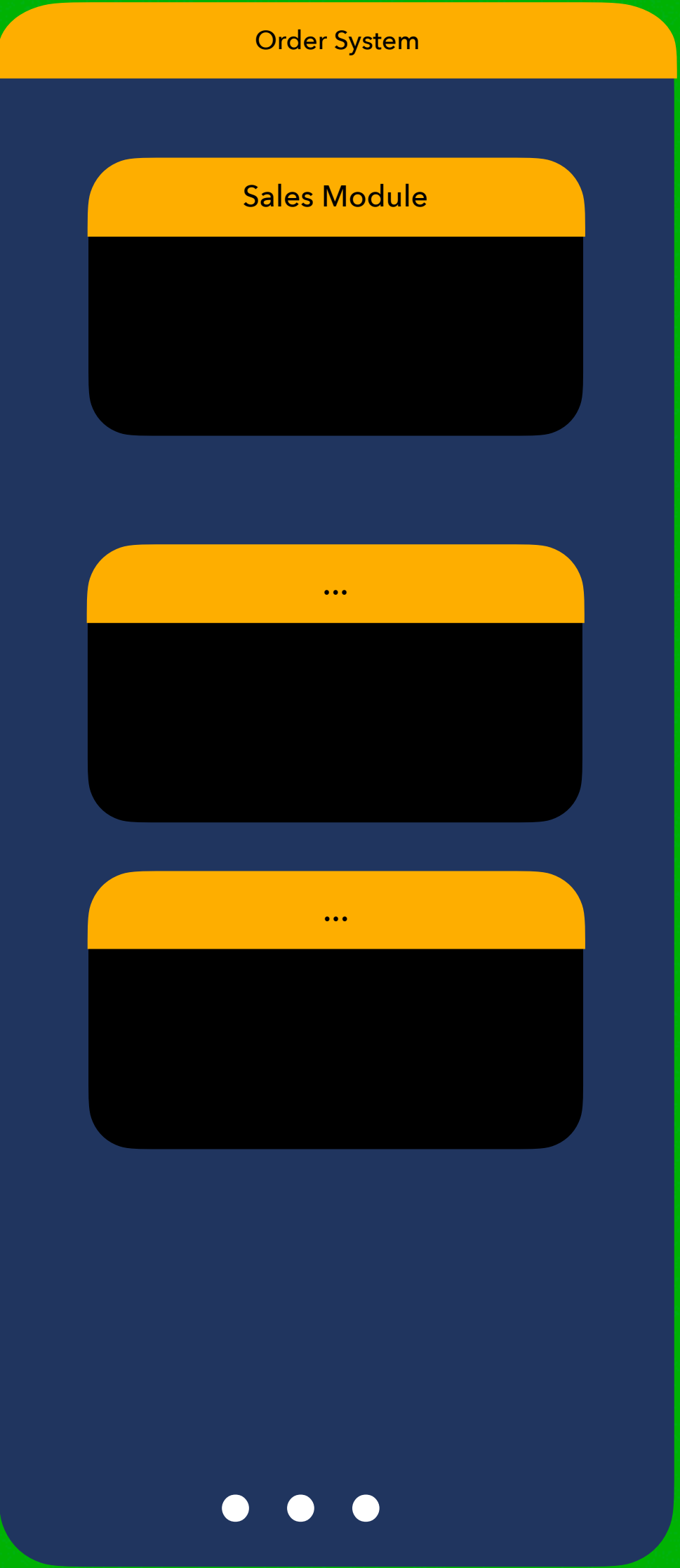
Apply SRP



Code	Description	Eff. date	End date
76913	Infant milk	2013-01-01	2022-12-31
878142	Prescription medicine	2013-01-01	2022-12-31
890167	Hearing aids	2015-01-01	2028-12-31
048203	Mobility devices	2015-01-01	2028-12-31
F73721	School supplies	2022-08-25	2022-09-02
000143	Passport application fee	2012-06-01	2031-06-30
001078	Bail bonds	2019-03-15	2025-01-01

Save Cancel

Apply
modularity



Code	Description	Eff. date	End date
876913	Infant milk	2013-01-01	2022-12-31
878142	Prescription medicine	2013-01-01	2022-12-31
890167	Hearing aids	2015-01-01	2028-12-31
048203	Mobility devices	2015-01-01	2028-12-31
F73721	School supplies	2022-08-25	2022-09-02
000143	Passport application fee	2012-06-01	2031-05-31
001078	Bail bonds	2019-03-15	2025-01-01

Save Cancel

Apply SRP

Order System

Sales Module

...

...

Tax System

Tax Calculator

Tax Rule Maintenance

Tax Rules

Code	Description	Eff. date	End date
B76913	Infant milk	2013-01-01	2022-12-31
B78162	Prescription medicine	2013-01-01	2022-12-31
B90167	Hearing aids	2015-01-01	2028-12-31
D48203	Mobility devices	2015-01-01	2028-12-31
F73721	School supplies	2022-08-25	2022-09-02
G00143	Passport application fee	2012-06-01	2031-05-31
G01078	Bal bonds	2019-03-15	2025-01-01

Save

Cancel

DRY

SRP

Cohesion

Decoupling

Modularity

Demeter

Dependency Injection

etc

etc

DRY

SRP

Cohesion

Decoupling

Modularity

Demeter

Dependency Injection

etc

etc

*All make it
Easier to Change*



How?

Common Practices

- Version control
- Automated Testing
- Short iterations
- Pair programming
- etc

All make it
Easier to Change

- Version control
- Automated Testing
- Short iterations
- Pair programming
- etc

Thomas's Postulate #2

All design principles
(and most project practices)
are special cases of

**Make It
Easier to Change**

Agile Software Development

What

- Find out where you are
- Take a small step towards your goal
- Adjust your understanding based on what you learned
- Repeat

How

- When faced with two or more alternatives that deliver roughly the same value, take the path that **makes future change easier**

- When faced with two or more alternatives that deliver roughly the same value, take the path that **makes future change easier**

future change easier

How Do You Know?

*"It's tough to make predictions,
especially about the future."*

— Yogi Berra





Photo by [Hulki Okan Tabak](#) on [Unsplash](#)

But....

You can already
predict the future!



Conscious



Subconscious

self aware

agency/choice

stuff we can't deal with
automatically

Conscious



automatic (no control)

Subconscious

**Look at the next slide,
but don't read it**

I TOLD YOU NOT TO READ IT!

self aware

agency/choice

stuff we can't deal with
automatically

Conscious



automatic (no control)

faster than conscious thought

builds/recognizes patterns

Subconscious

Conscious

self aware

agency/choice

stuff we can't deal with
automatically



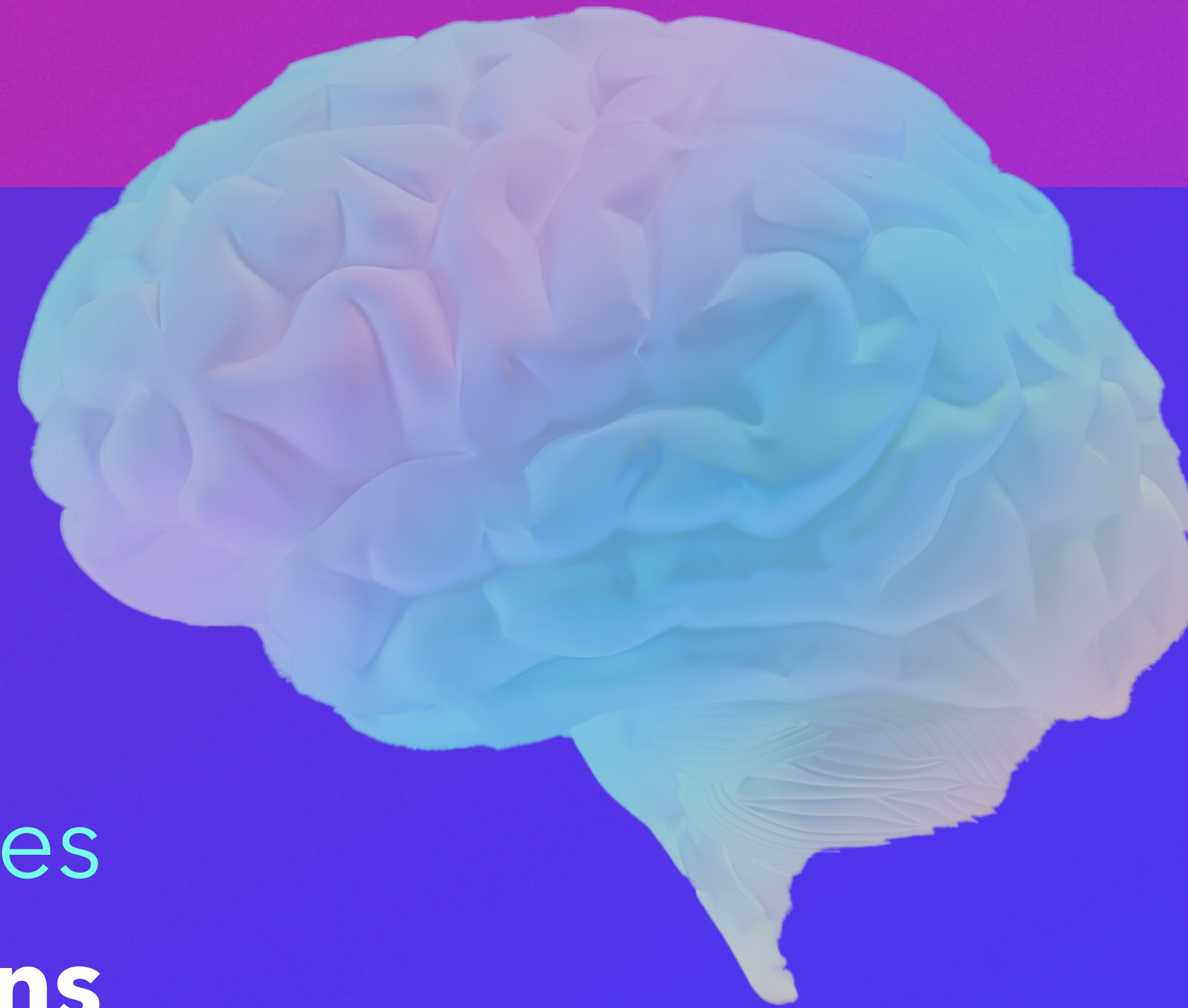
Subconscious

automatic (no control)

faster than conscious thought

builds/recognizes patterns

builds/recognizes
patterns



that's a lion in the long grass

there's a storm coming

this code is wrong

THINKING, FAST AND SLOW



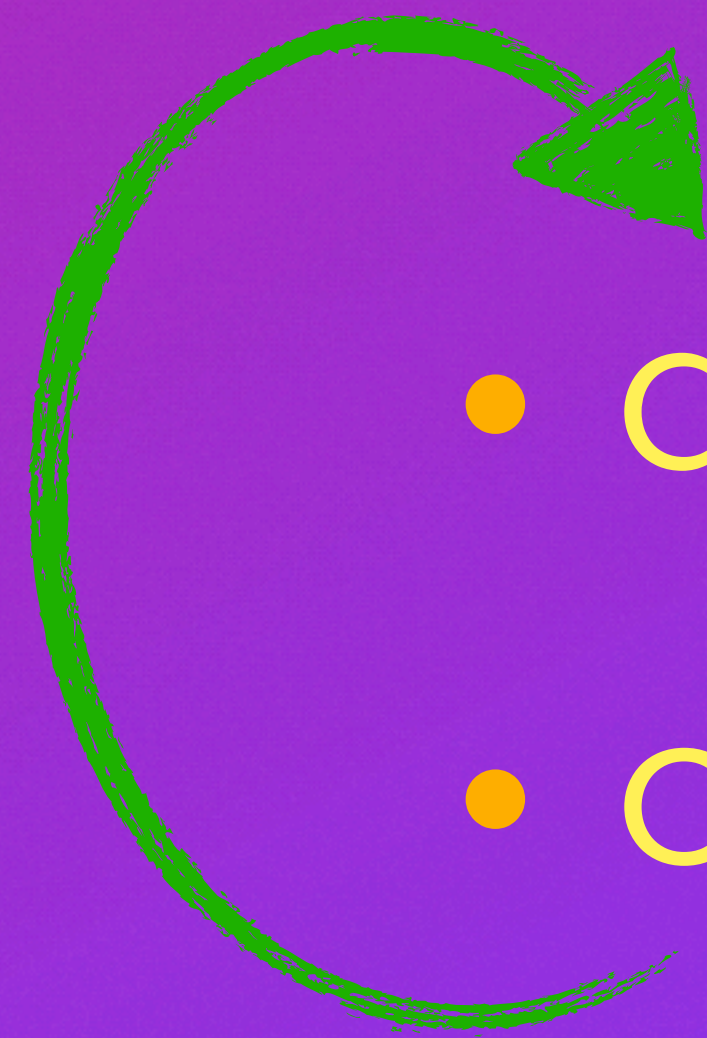
DANIEL
KAHNEMAN

WINNER OF THE NOBEL PRIZE IN ECONOMICS

Intuition is how
your subconscious
shouts at you

Develop Your Subconscious

Experience



- do stuff
- observe results



.....

The Inner Game of Tennis

*The Classic Guide to the
Mental Side of Peak Performance*

W. Timothy Gallwey

Foreword by Pete Carroll

What is the change?

One sentence summary

Likely Effort

functions changed
estimated time

Actual Effort

functions changed
actual time

Observations

Learn anything?

What is the change?

One sentence summary

Likely Effort

functions changed
estimated time

Actual Effort

functions changed
actual time

Observations

Learn anything?

Handwrite, don't type

Ideally read aloud

Stick 'em in a file and
forget about them

Start listening to your gut

*"You can observe a lot
just by watching."*

— Yogi Berra



One Rule
to Rule
Them All

Make It
Easier To Change

One Rule
to Rule
Them All

ETC

and remember to

Make it Fun

"If you ask me anything I don't know, I'm not going to answer."

— Yogi Berra



Ring the bells that still can ring
Forget your perfect offering
There is a crack, a crack in everything
That's how the light gets in

Leonard Cohen, Anthem