TECHNICAL DEBT ISN'T TECHNICAL

EINAR W. HØST

WHAT IS TECHNICAL DEBT?

TECHNICAL DEBT AS A MEME

MEMETICS

SELF-REPLICATING
UNIT OF THOUGHT

COPIED FROM
BRAIN TO BRAIN

VIRUS OF THE MIND

WHAT MAKES A MEME SUCCESSFUL?

SURVIVAL OF THE FITTEST?

GREATEST
EXPLANATION
POWER?

MOST EFFECTIVE AT REDUCING COGNITIVE DISSONANCE?

THE BEST IDEAS

VS

THE IDEAS THAT MAKE US FEEL BEST

WHAT IS TECHNICAL DEBT?

SHIPPING FIRST TIME CODE IS LIKE GOING INTO DEBT. A LITTLE DEBT SPEEDS DEVELOPMENT SO LONG AS IT IS PAID BACK PROMPTLY WITH A REWRITE... THE DANGER OCCURS WHEN THE DEBT IS NOT REPAID. EVERY MINUTE SPENT ON NOT-QUITE-RIGHT CODE COUNTS AS INTEREST ON THAT DEBT. ENTIRE ENGINEERING ORGANIZATIONS CAN BE BROUGHT TO A STAND-STILL UNDER THE DEBT LOAD OF AN UNCONSOLIDATED IMPLEMENTATION.

WHAT MAKES TECHNICAL DEBT A GOOD METAPHOR?

GIVES US LANGUAGE
TO TALK ABOUT
SOMETHING IMPORTANT!

PUTS QUALITY ON THE AGENDA!

MAKES THE INVISIBLE VISIBLE!

THANK YOU
WARD CUNNINGHAM!

WHAT MAKES TECHNICAL DEBT A PROBLEMATIC METAPHOR?

MONETARY DEBT IS QUANTIFIED

HOW MEASURABLE IS TECHNICAL DEBT?

HOW BIG IS OUR TECHNICAL DEBT?

ARE WE
TECHNICALLY SOLVENT?

CAN WE GO TECHNICALLY BANKRUPT???

WHAT IS TECHNICAL DEBT REALLY?

HOW IT STARTED

HOW IT’S GOING

WHAT DOES TECHNICAL DEBT LOOK LIKE?

”TECHNICAL”?

”UGLY CODE”?

WHAT CAUSES TECHNICAL DEBT?

WHAT MAKES THE CODE UGLY?

LACK OF TIME?

MY PROJECT MANAGER DOESN'T UNDERSTAND ME?

THE UX PEOPLE ARE UNREALISTIC DREAMERS?

THE PREVIOUS DEVELOPER WAS INCOMPETENT?

WHAT DOES TECHNICAL DEBT LOOK LIKE?

HEAPS OF FLAGS, BRANCHES AND INDIRECTIONS


LOOP THE LOO
STRAPYOURSELVES
I'LL JUST ADD
ANOTHER IF BRANCH

DIFFICULT TO ISOLATE
CODE RELATED TO
A SINGLE FEATURE

DIFFICULT TO DETERMINE
WHERE ONE THING ENDS
AND ANOTHER BEGINS

DIFFICULT TO PREDICT
THE EFFECT OF CHANGES

DIFFICULT TO REASON ABOUT THE CODE

WHAT DOES THIS INDICATE?

DOES IT MATCH OUR EXPLANATIONS?

NOT REALLY

SOMETHING MORE FUNDAMENTAL HAS GONE WRONG

SOMETHING HAS GONE WRONG IN THE PROCESS OF

ESTABLISHING CLEAR BOUNDARIES IN THE CODE

SOMETHING HAS GONE WRONG IN THE PROCESS OF

CAPTURING THE BUSINESS DOMAIN IN SOFTWARE

SOMETHING HAS GONE WRONG IN THE PROCESS OF

LETTING THE CODE CO-EVOLVE WITH THE BUSINESS

WE HAVE A WORD FOR THIS PROCESS

MODELLING

MODELLING HAS FAILED

MODELLING IS APPLYING ABSTRACTION TO A PROBLEM DOMAIN

MODELLING IS
DEFINING WHAT
THE PROBLEM DOMAIN IS

WORKING CONTINOUSLY TO UNDERSTAND AND ARTICULATE THE PROBLEM TO SOLVE IS NOT BIG DESIGN UP FRONT

“YOU'RE WISE TO MAKE THE SOFTWARE REFLECT YOUR UNDERSTANDING AS BEST YOU CAN”

HOW CAN WE PAY OFF TECHNICAL DEBT?

(EVERYBODY NOW)

REFACTORING!

WHICH REFACTORING FIXES A TANGLED MESS OF WEAK ABSTRACTIONS?

Using the Catalog ▶

Tags

- [ ] associations
- [ ] encapsulation
- [ ] generic types
- [ ] interfaces
- [ ] class extraction
- [ ] GOF Patterns
- [ ] local variables
- [ ] vendor libraries
- [ ] errors
- [ ] type codes
- [ ] method calls
- [ ] organizing data
- [ ] inheritance
- [ ] conditionals
- [ ] moving features
- [ ] composing methods
- [ ] defining methods

Books

- [ ] Refactoring
- [ ] Ruby Edition

(•) appear ( ) only explain

#

- Add Parameter
- Change Bidirectional Association to Unidirectional
- Change Reference to Value
- Change Unidirectional Association to Bidirectional
- Change Value to Reference
- Collapse Hierarchy
- Consolidate Conditional Expression
- Consolidate Duplicate Conditional Fragments
- Decompose Conditional
- Duplicate Observed Data
- Dynamic Method Definition
- Eagerly Initialized Attribute
- Encapsulate Collection
- Encapsulate Downcast
- Encapsulate Field
- Extract Class
- Extract Interface
- Extract Method
- Pull Up Constructor Body
- Pull Up Field
- Pull Up Method
- Push Down Field
- Push Down Method
- Recompose Conditional
- Remove Assignments to Parameters
- Remove Control Flag
- Remove Middle Man
- Remove Named Parameter
- Remove Parameter
- Remove Setting Method
- Remove Unused Default Parame
- Rename Method
- Replace Abstract Superclass wit Module
- Replace Array with Object
- Replace Conditional with Polymorphism
- Replace Constructor with Factor

A REWRITE WILL END UP WITH THE SAME PROBLEMS AS THE ORIGINAL UNLESS YOU CLOSE THE UNDERSTANDING GAP.

— @SARAHMEI

NO REFACTORING
WITHOUT REMODELLING

ANYTHING ELSE IS
DEVELOPER HUBRIS

SOFTWARE CRAFTSMAN TO THE RESCUE

SO-CALLED BEST PRACTICES ARE NOT ENOUGH!

CLEAN CODE CAN NOT
AND WILL NOT
SAVE A ROTTEN MODEL!

YOU WILL **WASTE**
TIME AND MONEY!

FIX THE MODEL FIRST
THEN THE CODE

ARE WE DONE NOW?

HOW DO WE FIX THE MODEL?

WHAT CAUSES MODELLING DEBT?

(OMG HERE WE GO AGAIN!)

THE STORY OF EQUEST

A HORSE

A NEW HORSE

A SHORT, STRONG AND STUBBORN HORSE

A HORSE?

A HORSE?

A HORSE?

+

A REGULAR HORSE

A TYPICAL HORSE

A TRUE HORSE

AN OLD-FASHIONED HORSE

A HORSE-HORSE

```
if (horse.IsShort && horse.IsStubborn)
{
  // Logic for the new horse case.
}
else
{
  // Regular horse code here.
}
```

BUGS!

```
if (horse.IsShort &&
    horse.IsStubborn &&
    horse.Sound == Sound.HeeHaw)
{
  // Logic for the new horse case.
}
else
{
  // Regular horse code here.
}
```

A NEW NEW HORSE

THE KIND OF HORSE THAT IS THE OFFSPRING OF A REGULAR HORSE-HORSE

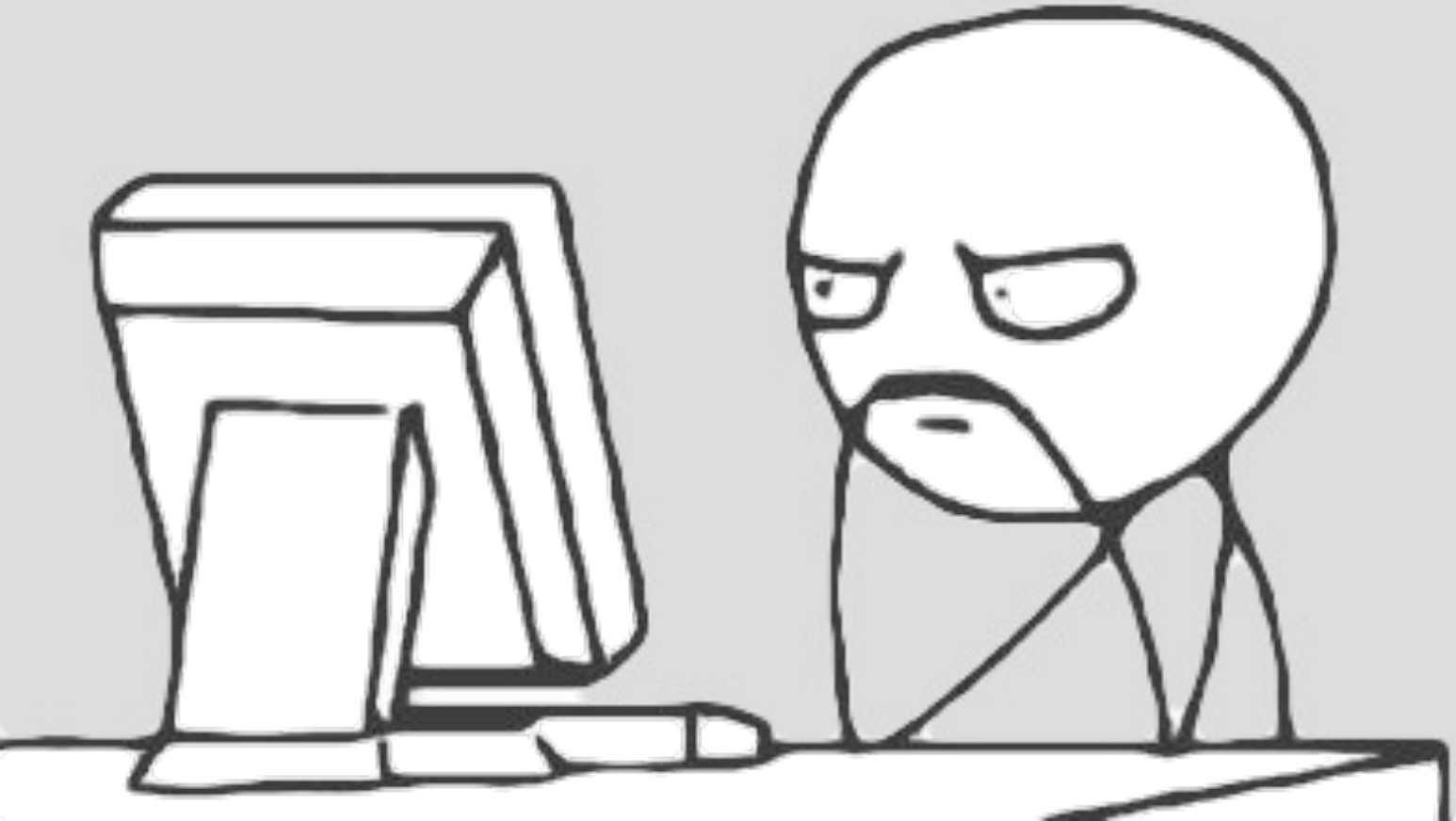
AND A SHORT AND STUBBORN HORSE THAT GOES HEE-HAW

```
if (horse.IsShort &&
    horse.IsStubborn &&
    horse.Sound == Sound.HeeHaw) ||
   (horse.Sire.IsShort &&
    horse.Sire.IsStubborn &&
    horse.Sire.Sound == Sound.HeeHaw) ||
   (horse.Dam.IsShort &&
    horse.Dam.IsStubborn &&
    horse.Dam.Sound == Sound.HeeHaw))
{
    // Logic for both the new horse
    // and the new-new horse!
} else
{
    // Really regular horse code here.
}
```

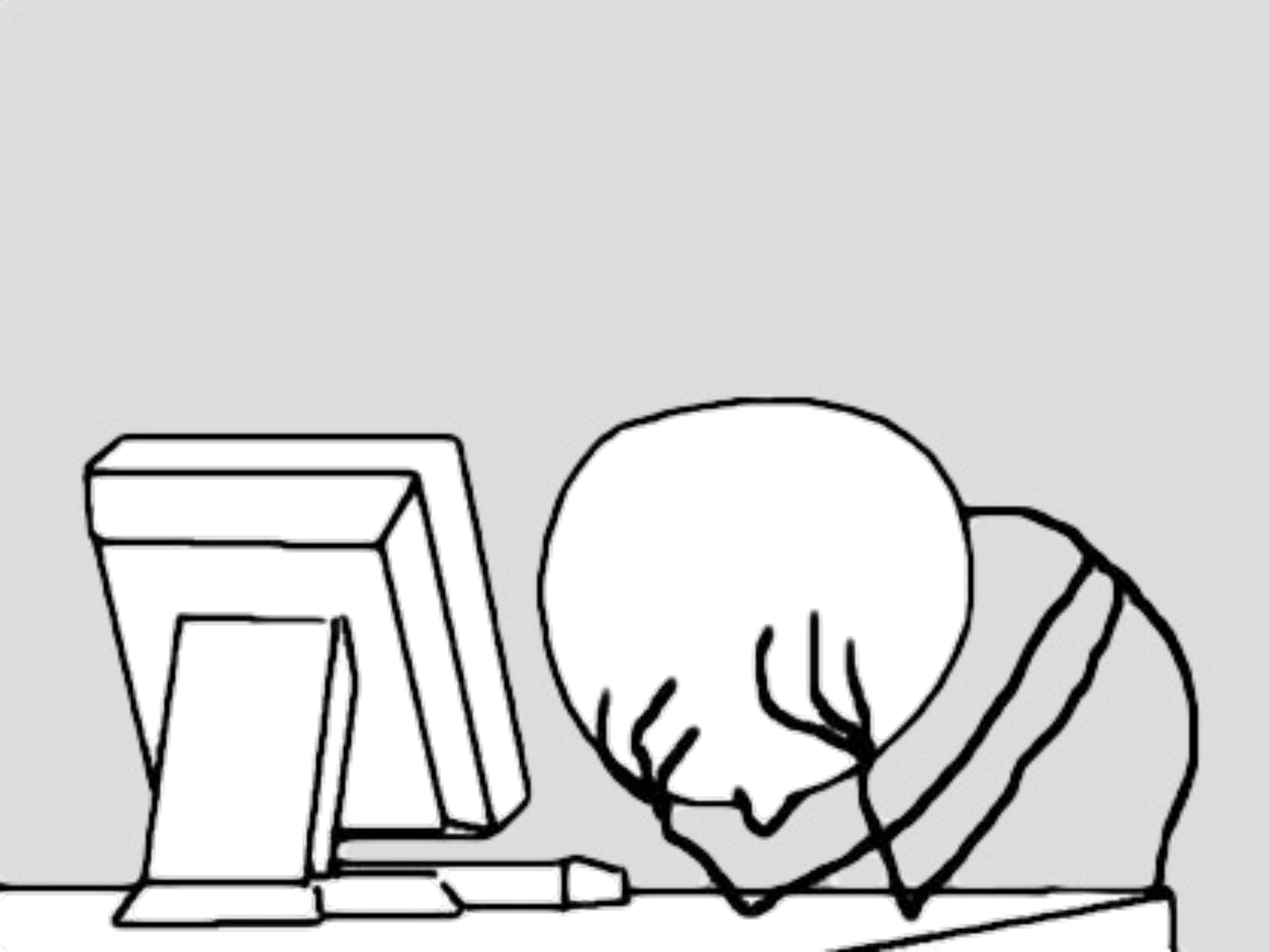
BUGS!

IS IT THE MOTHER OR THE FATHER

THAT IS STUBBORN AND STRONG AND GOES HEE-HAW?



A NEW NEW NEW HORSE



MODELLING IS HARD!

MODELLING IS HARD
FOR THREE REASONS

#1

REALITY

#2

CHANGE

#3

PEOPLE

WHY MODELLING IS HARD

#1

REALITY

REALITY HAS NO INTEREST
IN BEING MODELLED

REALITY IS NOT TIDY
AND ORGANIZED

REALITY IS NOT EVEN
CONSISTENT

REALITY IS MESSY AND ORGANIC, SLIPS AWAY AND EVOLVES

WE ARE TRYING TO IMPOSE STRUCTURE ON SOMETHING UNSTRUCTURED

WE ARE TRYING TO IMPOSE STATIC STRUCTURE ON SOMETHING UNSTRUCTURED AND DYNAMIC

INNOVATION MEANS
BREAKING MODELS

RECOMMENDED READING

DATA AND REALITY

WILLIAM KENT

IDENTITY

(WHAT IS ONE THING?)

EQUALITY

(WHEN ARE TWO THINGS EQUAL?)

(WHEN ARE THEY THE SAME THING?)

CHANGE

(WHEN DO TWO THINGS BECOME DISTINCT?)

(WHEN HAS ONE THING BECOME ANOTHER?)

CATEGORY

(WHICH CATEGORY DOES A THING BELONG TO?)

(CAN A THING CHANGE CATEGORY?)

(IS IT THE SAME THING IF IT CHANGES CATEGORY?)

RECOMMENDED READING

WOMEN, FIRE AND DANGEROUS THINGS

GEORGE LAKOFF

THE CLASSICAL THEORY OF CATEGORIZATION IS BASED ON PROPERTIES

CLASSES IN PROGRAMMING LANGUAGES LIKE SIMULA AND JAVA

NECESSARY AND SUFFICIENT PROPERTIES DETERMINE CATEGORY MEMBERSHIP

WHAT DOES A BIRD LOOK LIKE?

SOME MEMBERS OF A CATEGORY ARE MORE TYPICAL THAN OTHERS

A SPARROW IS MORE BIRDY THAN A PENGUIN

A SPARROW IS MORE BIRDY THAN A SHOEBILL

A SPARROW IS PROBABLY
THE BIRDIEST BIRD THERE IS

ELEANOR ROSCH
PROTOTYPE THEORY

A SPARROW IS
THE PROTOTYPICAL BIRD

HOW UNTYPICAL IS TOO UNTYPICAL?

HOW UNEQUAL IS TOO UNEQUAL?

WHEN DOES A DONKEY BECOME A DONKEY?

IT DEPENDS!

WHO’S ASKING?

WHO’S ANSWERING?

THE DONKEY DOESN'T CARE!

A DONKEY BY ANY OTHER NAME WOULD SMELL THE SAME

WE PUT THINGS IN CATEGORIES TO MAKE SENSE OF REALITY

GENERALIZATION IS
A HYPOTHESIS ABOUT
THE FUTURE

BEWARE ARTIFICIAL AD-HOC GENERALIZATIONS!

WHY MODELLING IS HARD
#2
CHANGE

FEATURES REQUIRE DECISIONS

DECISIONS BUILD
ON ASSUMPTIONS

ASSUMPTIONS
ACCUMULATE OVER TIME

ASSUMPTIONS
LIMIT OUR FREEDOM

ACCUMULATED ASSUMPTION LOAD

CHANGE!

“HOW LONG DOES IT TAKE TO IMPLEMENT THIS FEATURE?”

HOW DOES THIS FEATURE CHANGE OUR DOMAIN MODEL?

HOW MANY ASSUMPTIONS ARE INVALIDATED?

HOW MANY DECISIONS MUST BE UNDONE AND REMADE?

HOW MUCH STRUCTURE RELIES ON OUR OBSOLETE ASSUMPTIONS AND DECISIONS?

TECHNICAL STRUCTURE

ASSUMPTIONS AND DECISIONS ARE WOVEN INTO THE CODE AND THE ARCHITECTURE

ORGANIZATION STRUCTURE

ECONOMIC STRUCTURE

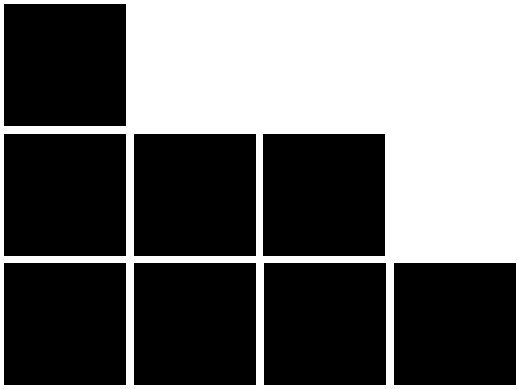
POWER STRUCTURE

INTERTWINED & MUTUALLY REINFORCING STRUCTURES

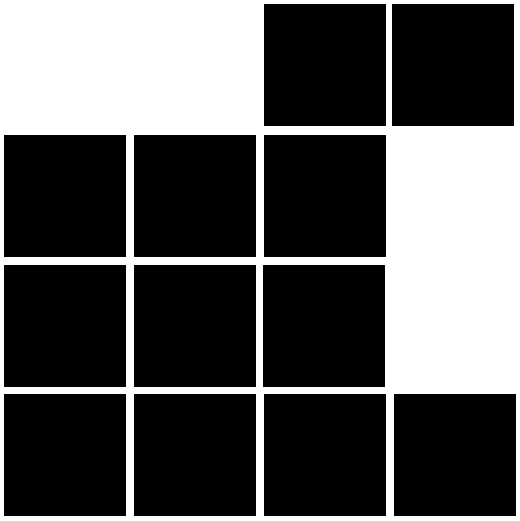
RESPONDING TO CHANGE
UNDER CONSTRAINTS ON TIME AND MONEY

RESPONDING TO CHANGE
TENDS TO BE IMPERFECT
AND LEAVE A RESIDUE

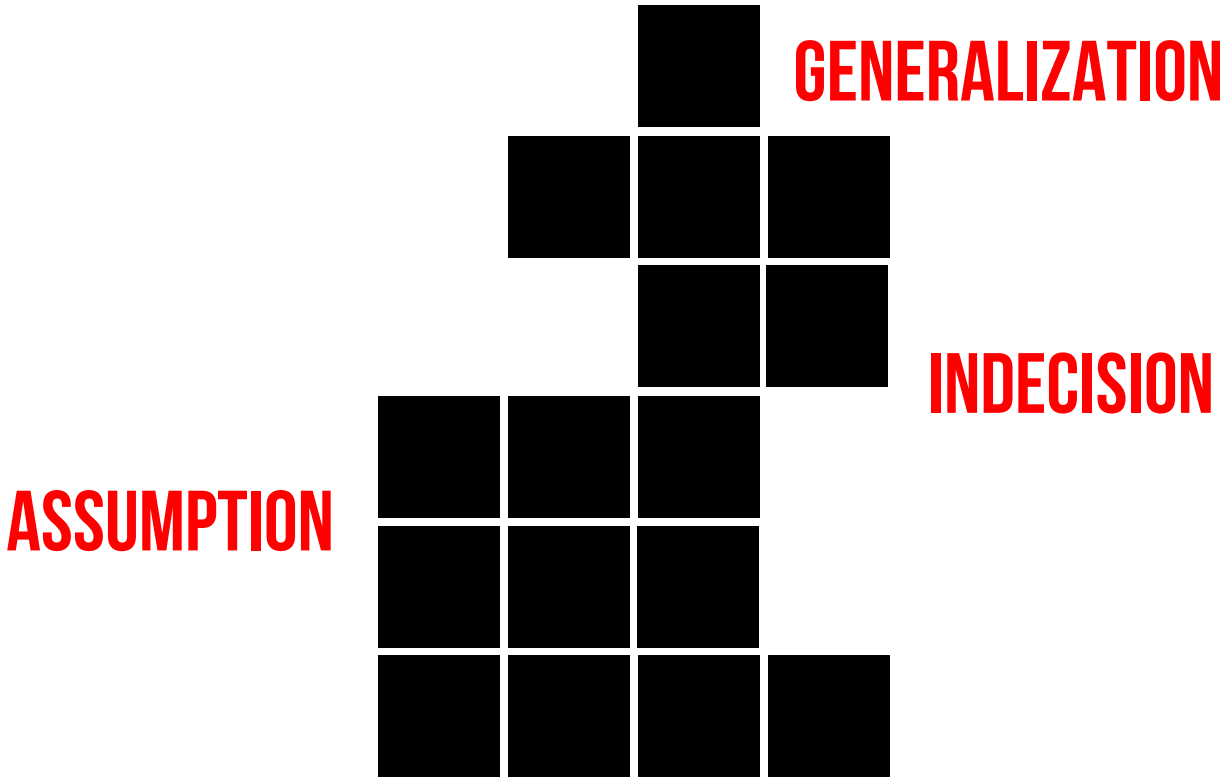
ASSUMPTION

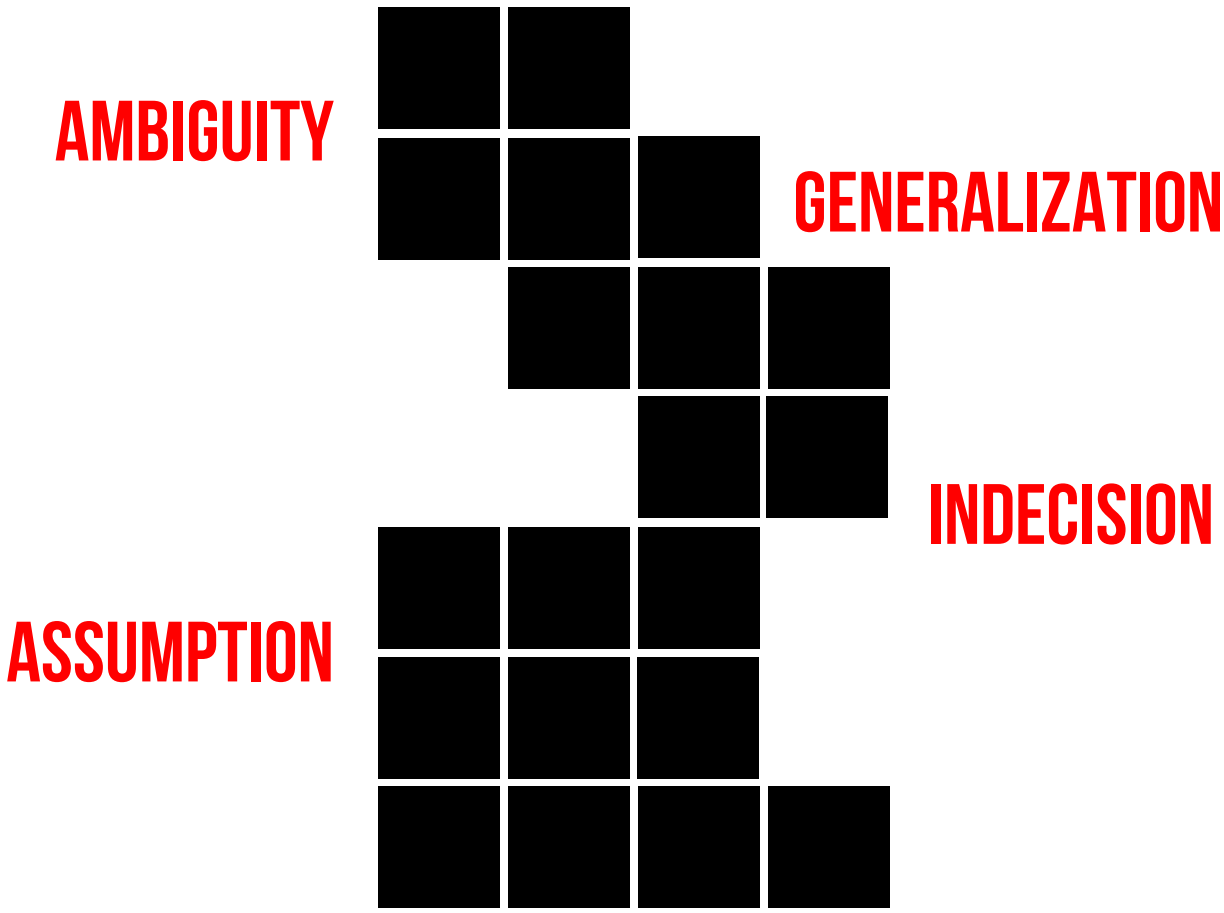


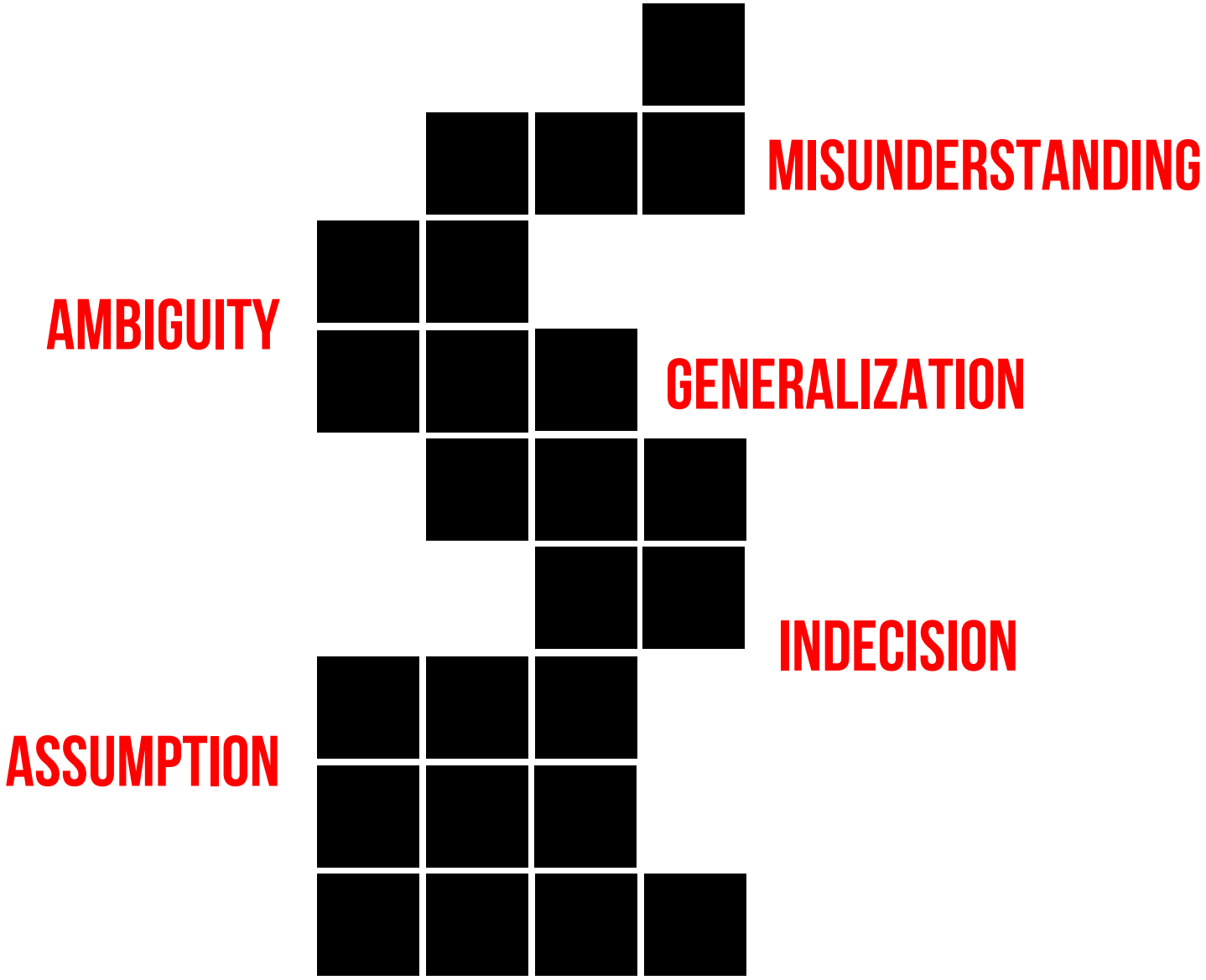
INDECISION

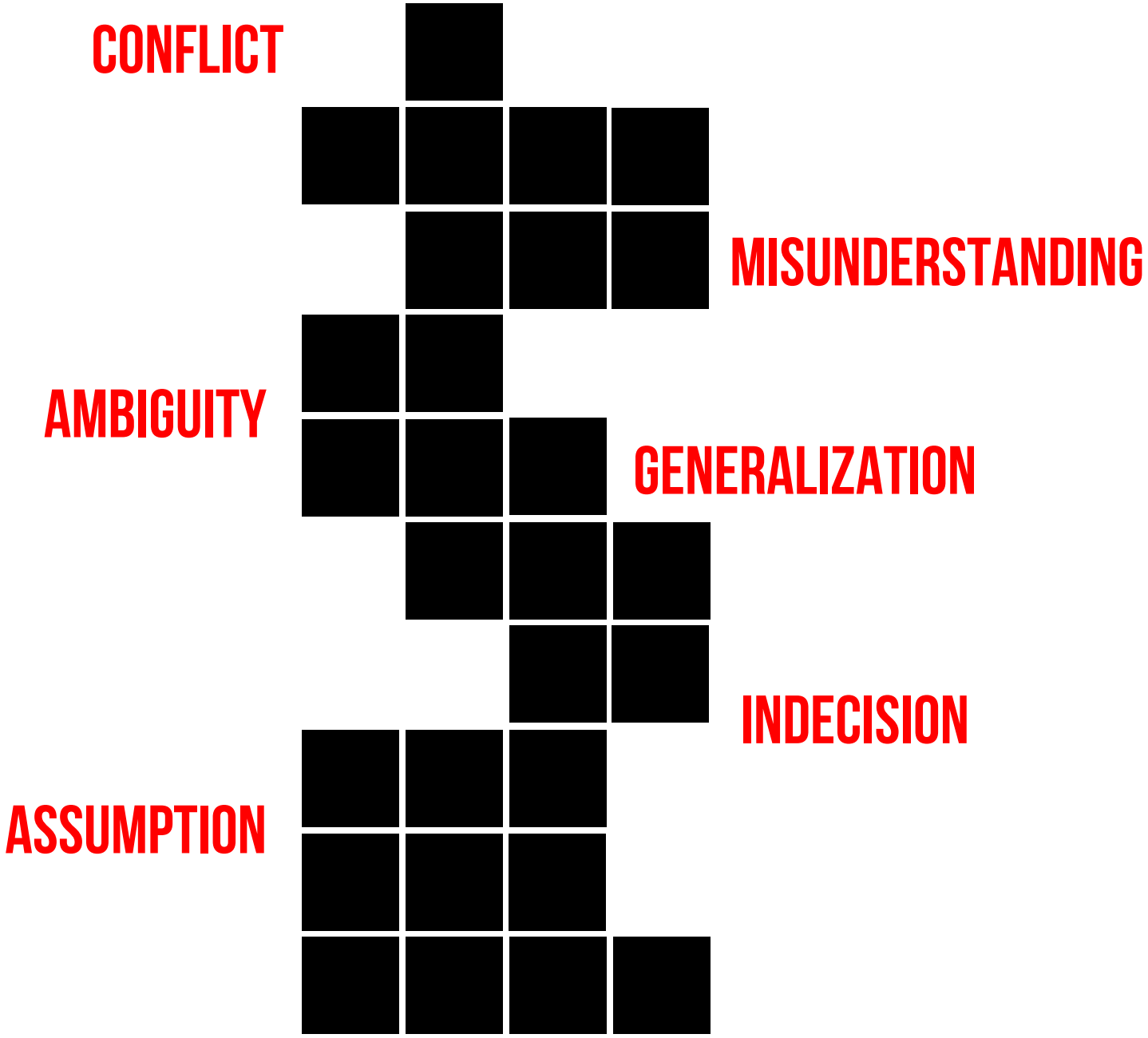


ASSUMPTION


GENERALIZATION
INDECISION
ASSUMPTION


AMBIGUITY
GENERALIZATION
INDECISION
ASSUMPTION


MISUNDERSTANDING
AMBIGUITY
GENERALIZATION
INDECISION
ASSUMPTION


CONFLICT
MISUNDERSTANDING
AMBIGUITY
GENERALIZATION
INDECISION
ASSUMPTION


CONFLICT
MISUNDERSTANDING
AMBIGUITY
GENERALIZATION
GAME OVER
INDECISION
ASSUMPTION

HOW TO PLAY WELL?

WHY MODELLING IS HARD
#3
PEOPLE

MODELLING IS HARD

MODELLING IS
META-PROGRAMMING
THE MIND

WE CHANGE THE BUILDING BLOCKS WE USE TO THINK ABOUT THE PROBLEM

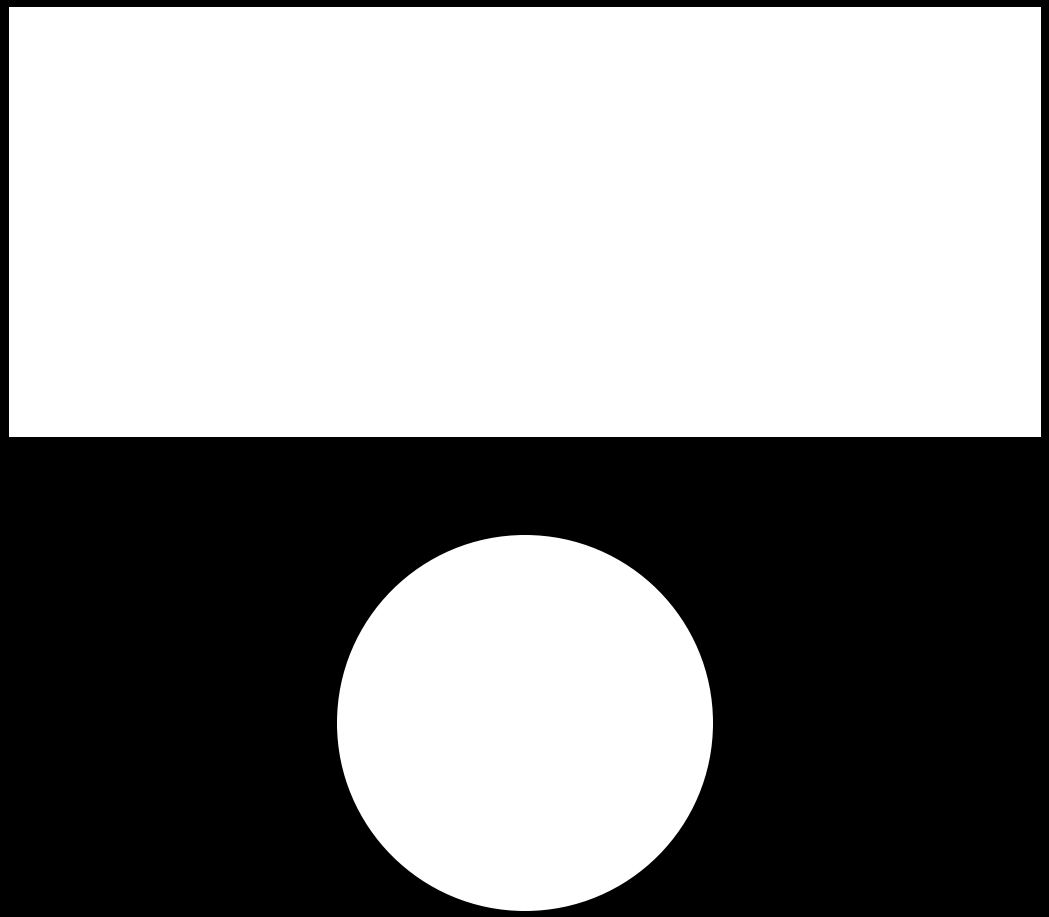
IT CAN BE UNCOMFORTABLE

“WHY ARE YOU MAKING THINGS SO DIFFICULT?”

COMMUNICATION IS SCARY

COMMUNICATION ABOUT
HARD THINGS THAT PEOPLE
DON'T WANT TO HEAR
IS EVEN SCARIER

RELUCTANCE TO TALK



AMBIGUITY

THE DESK FORCE

THE LAND OF
UNKNOWN TRUST

OUR MUTUAL TRUST DETERMINES THE INFORMATION CONTENT

THEY TOO MIGHT BE
RELUCTANT TO TALK

ARTICULATE
THE PROBLEM

JUSTIFICATION
OF OPINIONS

DISCUSSIONS & NEGOTIATIONS

POSSIBILITY OF CONFLICT

WHY IS THERE AN AMBIGUITY?

MAYBE SOMEONE'S BAD AT
EXPRESSING THEMSELVES

MAYBE THERE'S
INDECISION AND CONFLICT
HIDDEN THERE

DO I WANT TO TRIGGER THAT?

SELF-DEFENSE MECHANISMS

THEY'RE PROBABLY
VERY BUSY

I CAN'T BOTHER THEM
WITH THIS

NO-ONE ELSE ASKS
THESE QUESTIONS

WHAT ABOUT THE ESTIMATES?

(WON'T SOMEONE PLEASE
THINK OF THE ESTIMATES?!)

CAN I SOLVE IT BY MAKING AN ASSUMPTION?

ASSUMPTION

GUESS

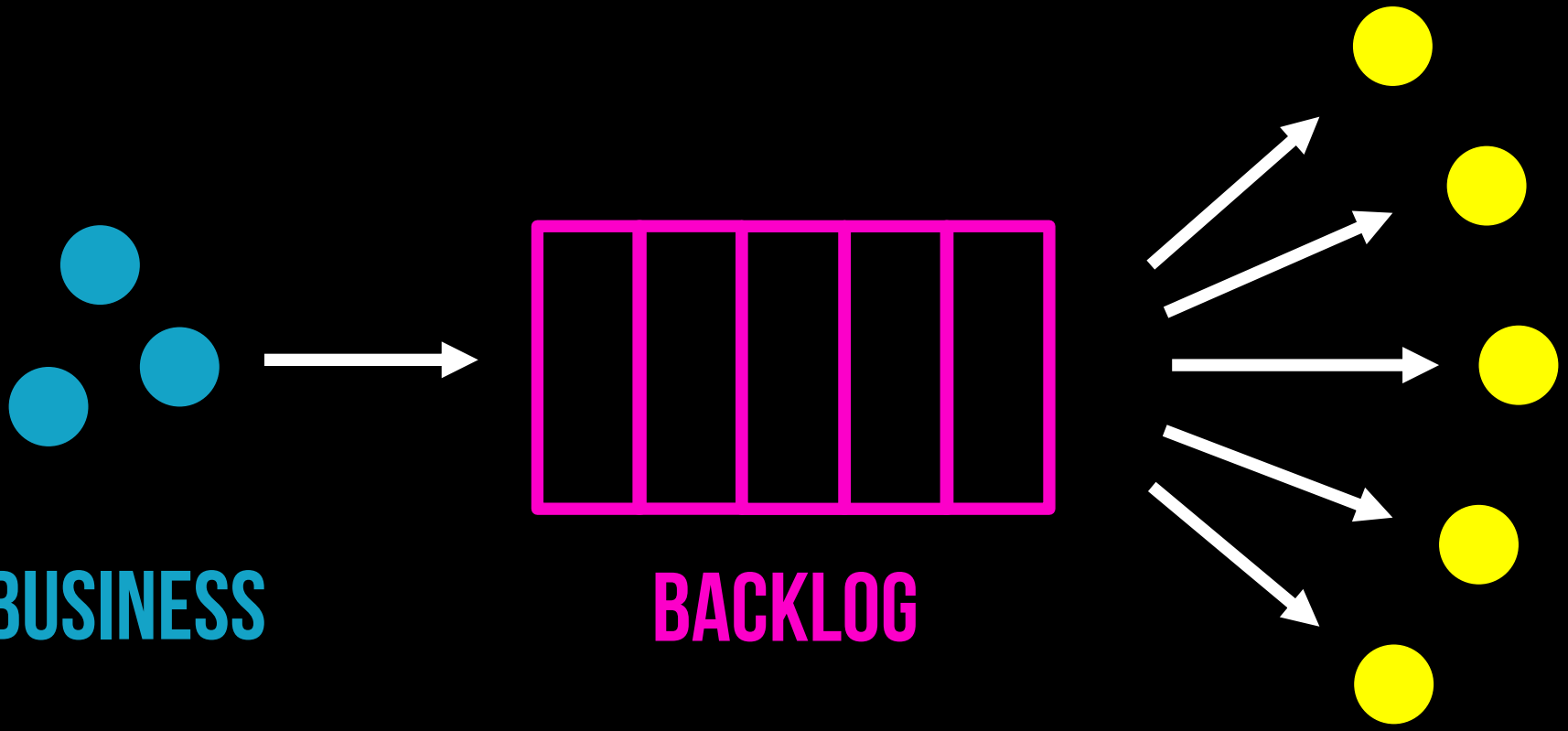
MAKING STUFF UP

BETS AGAINST THE FUTURE

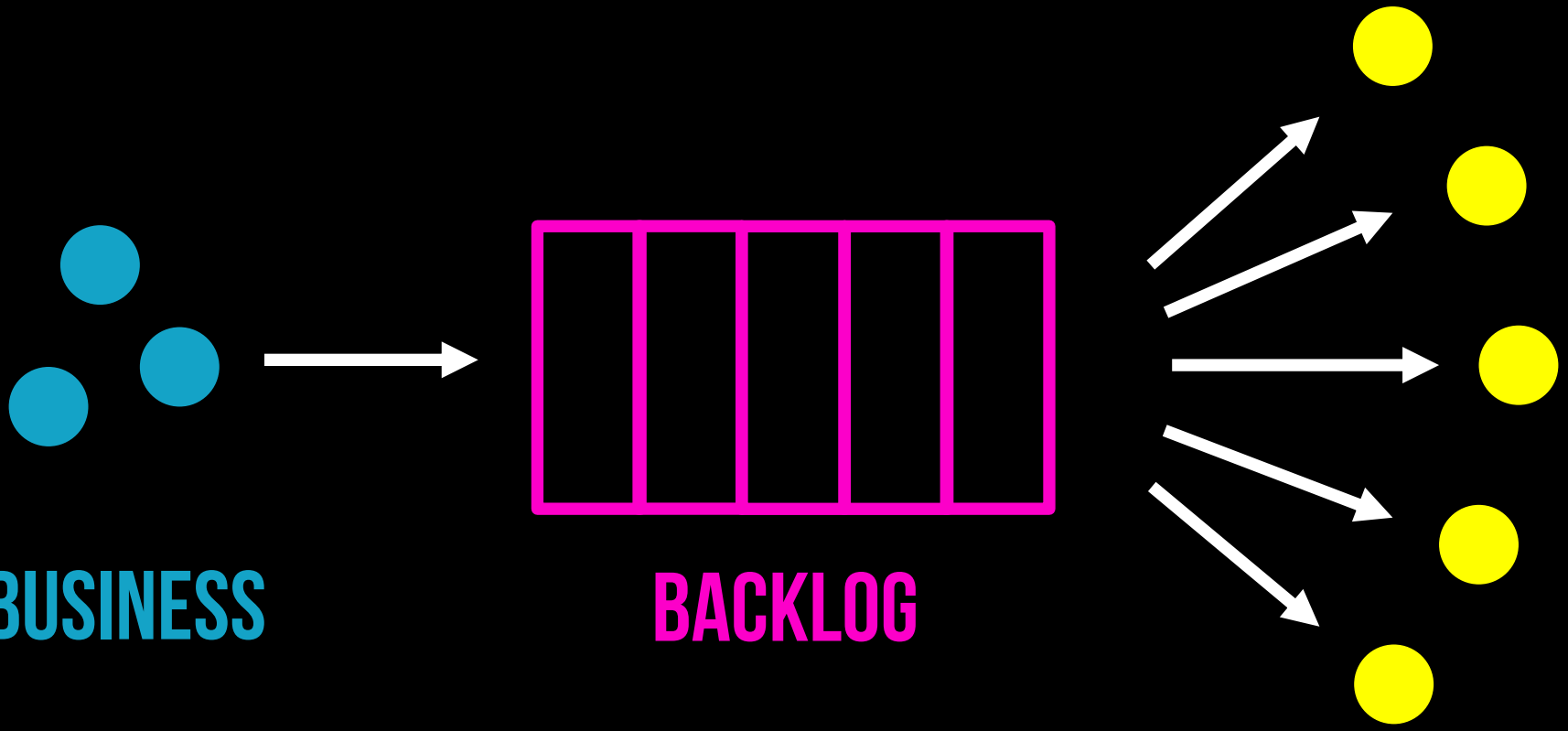
THE BACKLOG AS DECOUPLING MECHANISM BETWEEN BUSINESS AND IT

ANTIPATTERN

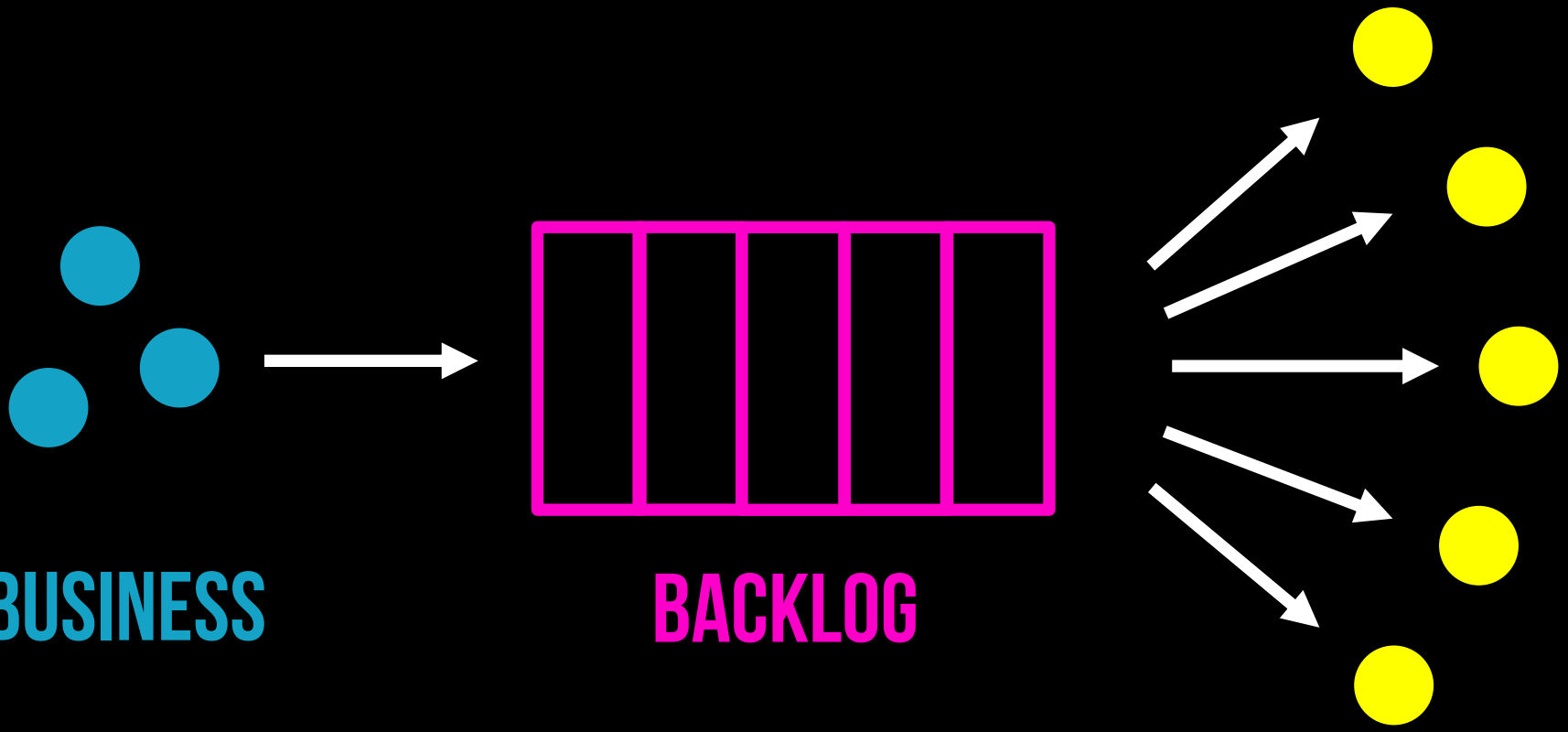
THE BACKLOG AS
DECOUPLING MECHANISM
BETWEEN BUSINESS AND IT


BUSINESS
BACKLOG
DEVELOPERS

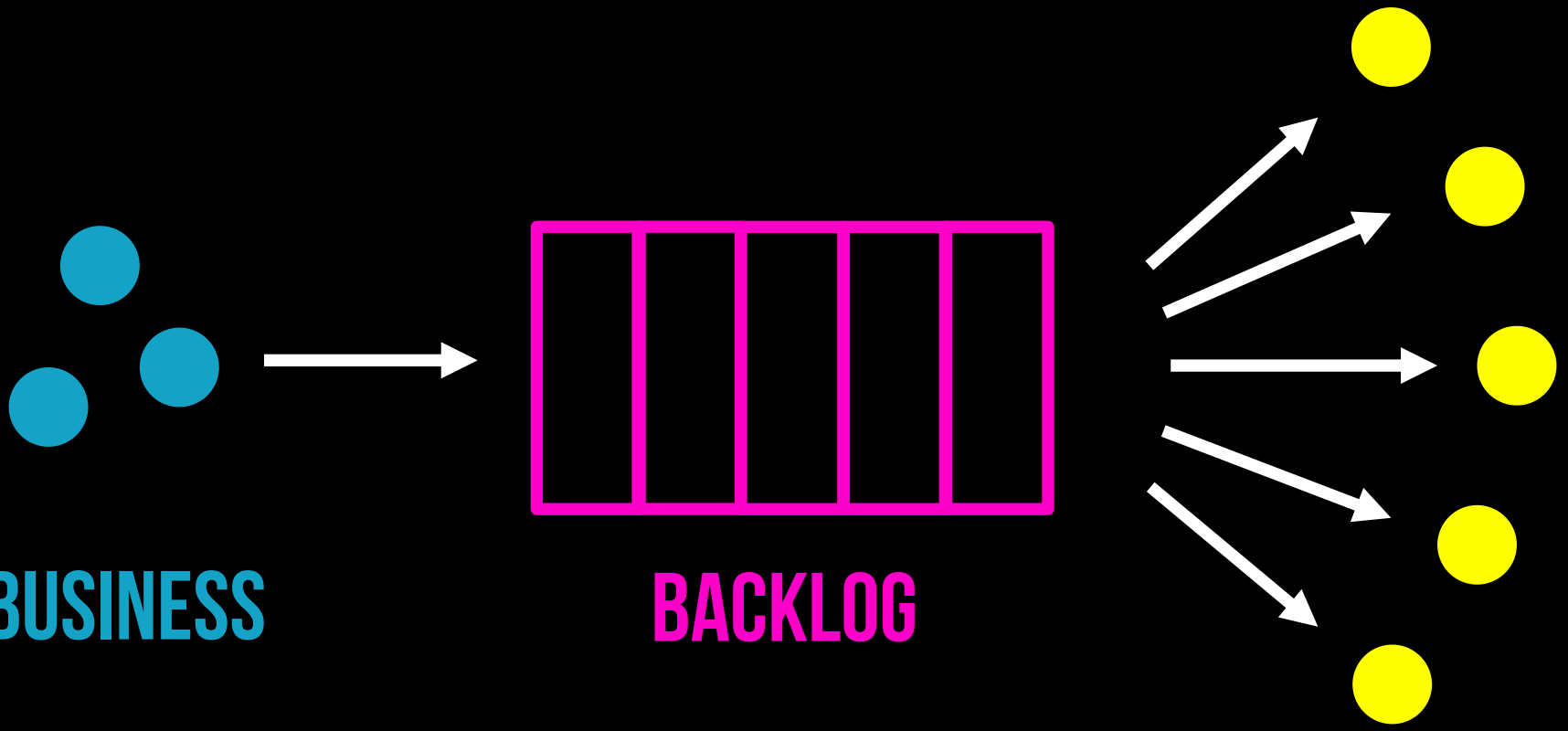
NO FEEDBACK



NO CONVERSATION



ASSUMPTIONS



THE BY-PRODUCT OF
THE FEATURE FACTORY IS
SOCIO-TECHNICAL DEBT

CONVERSATIONS
THAT DIDN'T HAPPEN

MENTAL MODELS
THAT ARE WEAK AND OUTDATED

CODE
THAT ISN'T WHAT IT SHOULD BE

IF YOU REMAKE AWFUL SOFTWARE FROM SCRATCH WITHOUT CHANGING THE CULTURE THAT CREATED IT YOU'LL REMAKE AWFUL SOFTWARE.

— @MALK_ZAMETH

WE HAVE COME A LONG WAY FROM UGLY CODE!

WHY DO WE STILL TALK ABOUT TECHNICAL DEBT?

THE CONSEQUENCES ARE MADE MANIFEST AND VISIBLE AT THE TECHNICAL LEVEL

DEVELOPERS LOOK FOR TECHNICAL SOLUTIONS TO SOFT PROBLEMS

TECHNICAL TASKS ARE TEMPTING!

THEY FIT OUR TRAINING AND EXPERTISE

THEY INVOLVE LITTLE IN TERMS OF PSYCHOLOGY AND POLITICS

THEY RARELY LEAD
TO CONFLICT

TECHNICAL WORK IS
PUZZLE SOLVING

MODELLING WORK REVEALS TENSIONS

WE MAY NEED TO
INVOLVE BUSINESS PEOPLE

WHO OWNS TECHNICAL DEBT?

THE REST OF THE ORGANIZATION WOULD LOVE FOR TECHNICAL DEBT TO BE THE PROBLEM OF THE IT DEPARTMENT

THE IT DEPARTMENT
WOULD ALSO
LOVE FOR TECHNICAL DEBT
TO BE THE PROBLEM OF
THE IT DEPARTMENT

BUT IT'S NOT GOING TO WORK

WE'LL LOSE THE GAME

WHAT MAKES A MEME SUCCESSFUL?

GREATEST
EXPLANATION
POWER?

MOST EFFECTIVE AT REDUCING COGNITIVE DISSONANCE?

WE HAVE TO WORK TOGETHER
TO REDUCE THE AMOUNT OF
TECHNICAL DEBT
PRODUCED OVER TIME

THERE ARE
NO TECHNICAL SOLUTIONS
TO TECHNICAL DEBT

TECHNICAL DEBT
ISN'T TECHNICAL