

## Dangerous Curves

Hockey Sticks, Swine Flu, and More

April, 1975  
Los Gatos, California

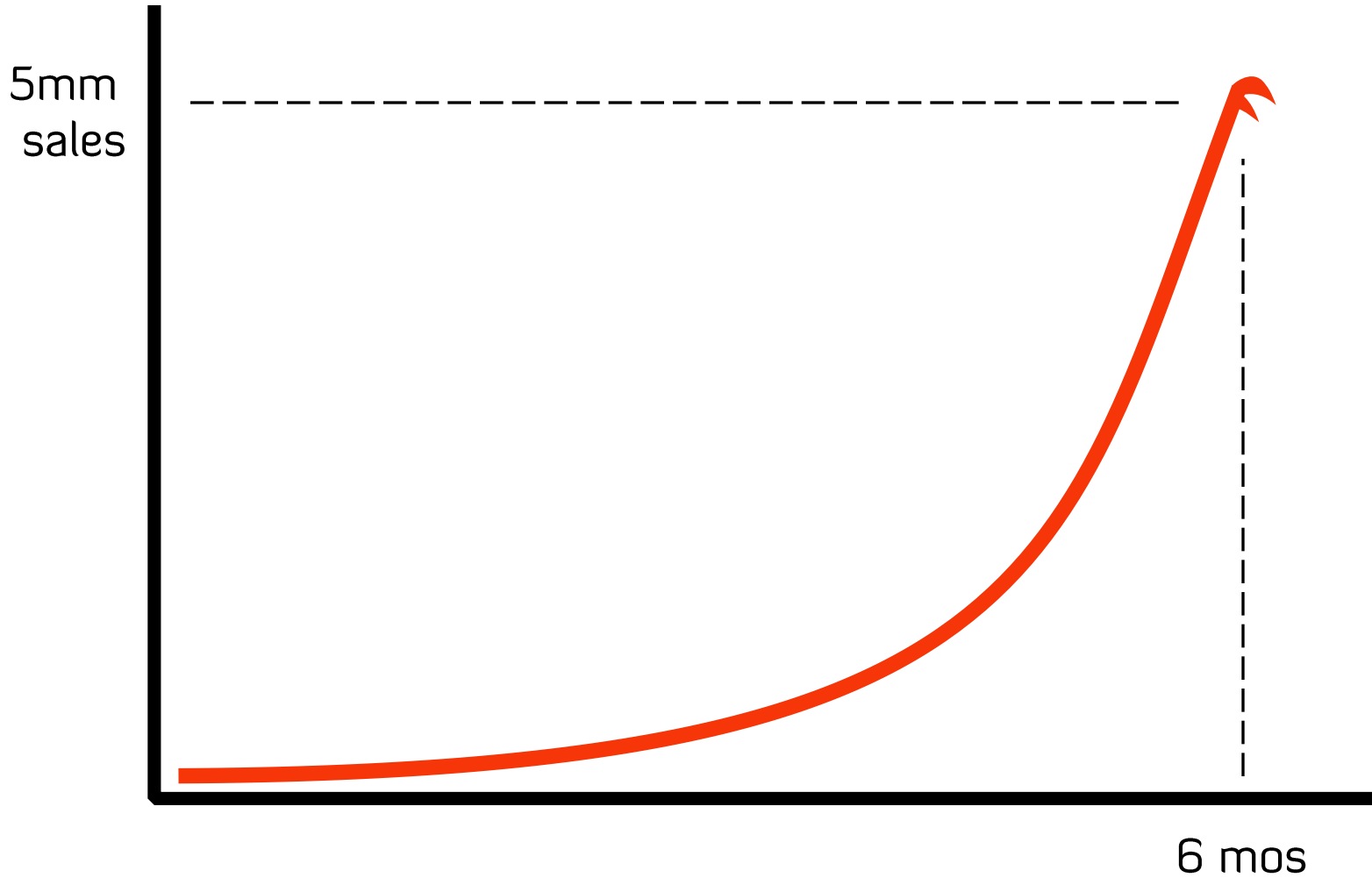
\$0.01 in raw materials

\$3.95 sale price

sold 500 in August

was shipping 10K/day by October '75

**sales took off exponentially**



**Gary Dahl's \$13 million business**

The care  
and training of your

# PET ROCK



**Wikipedia: “70’s fad”**

**sales promptly tanked**

**but that was *obviously a fad***

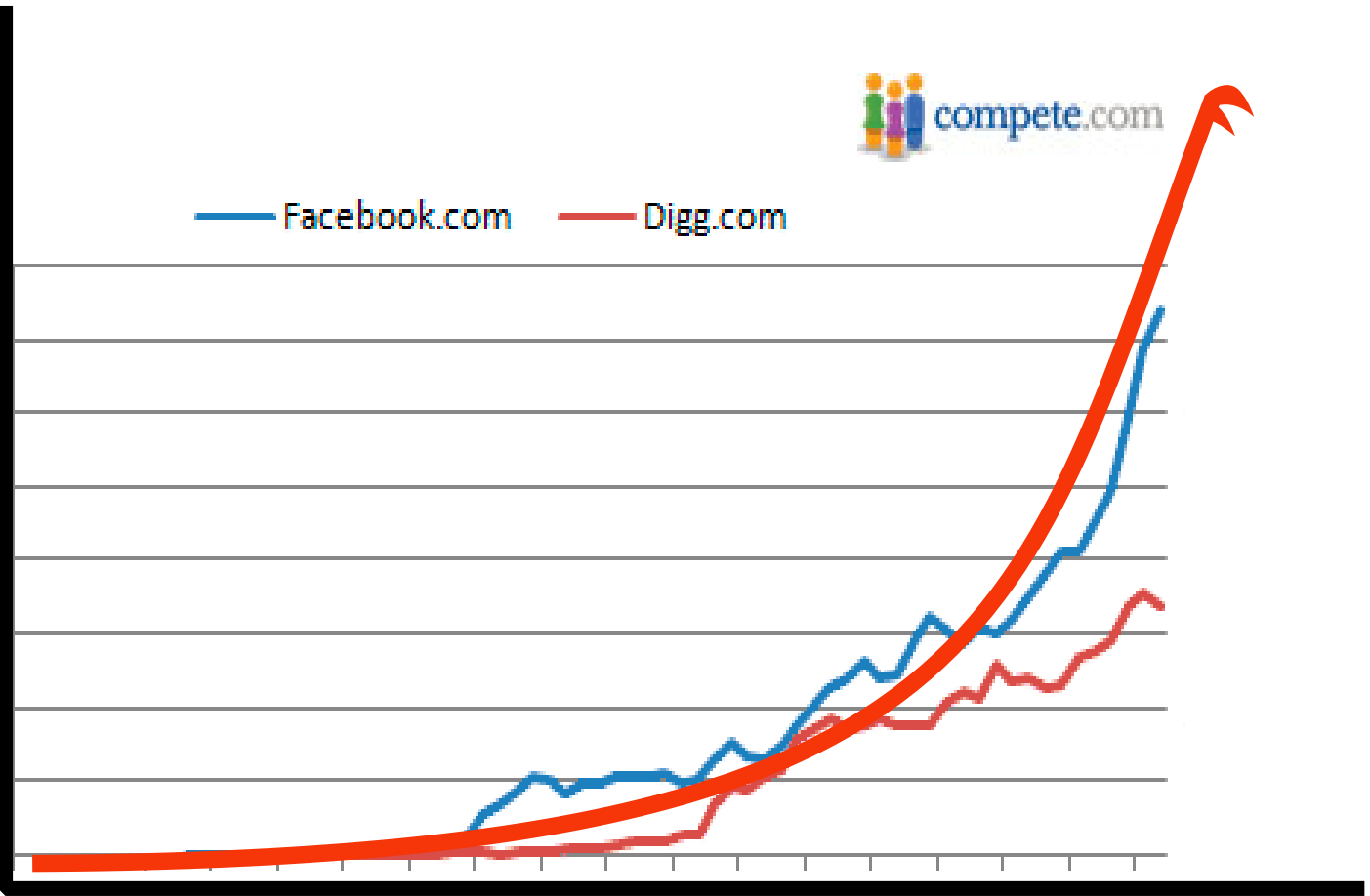
*or was it?*



Facebook.com      Digg.com

80,000,000  
70,000,000  
60,000,000  
50,000,000  
40,000,000  
30,000,000  
20,000,000  
10,000,000  
0

May-03    Sep-03    Jan-04    May-04    Sep-04    Jan-05    May-05    Sep-05    Jan-06    May-06    Sep-06    Jan-07    May-07    Sep-07    Jan-08    May-08    Sep-08    Jan-09



# **Dangerous Curves:**

## **Hockey Sticks, Swine Flu and more**

**Who am I?**

**Who:** Rolf Skyberg

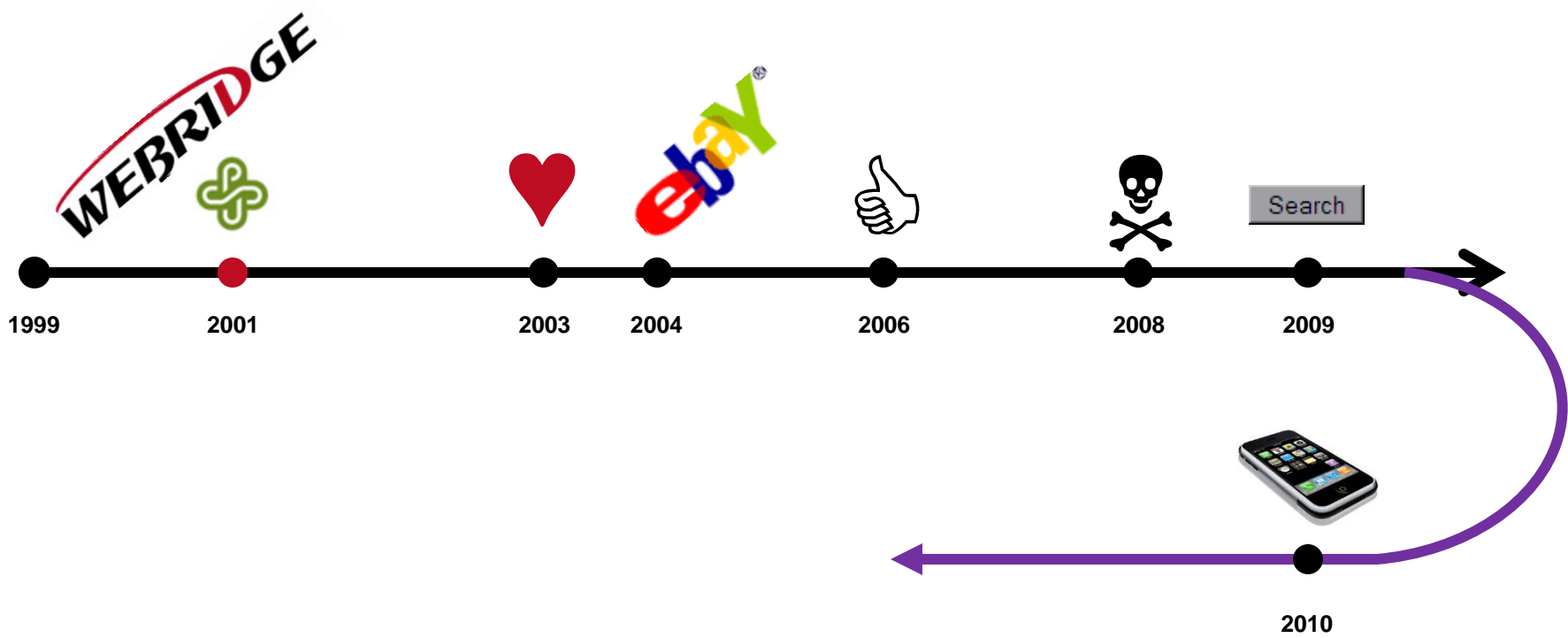
**What:** Senior Mobile Product Manager, for eBay Inc.

**Why:** I want to know *why*.

**Who:** business school grad with a scientist's heart

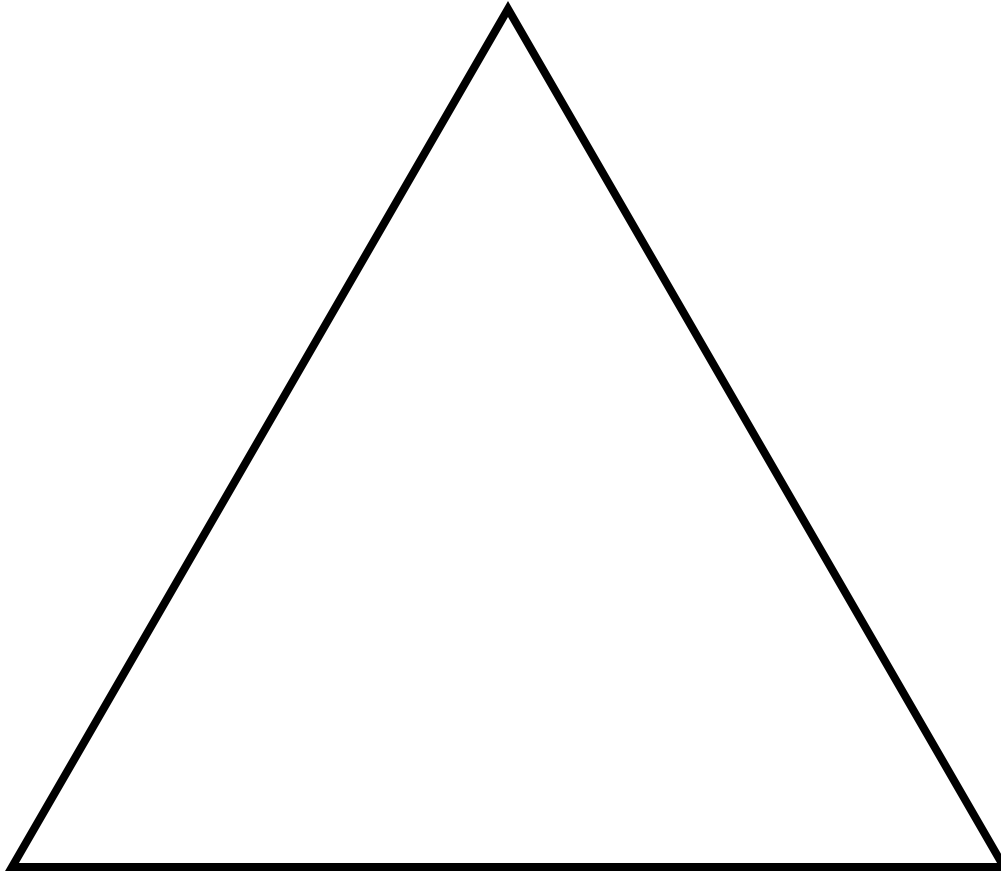
**What:** restless investigator

**Why:** because, seriously, I want to know *why*.

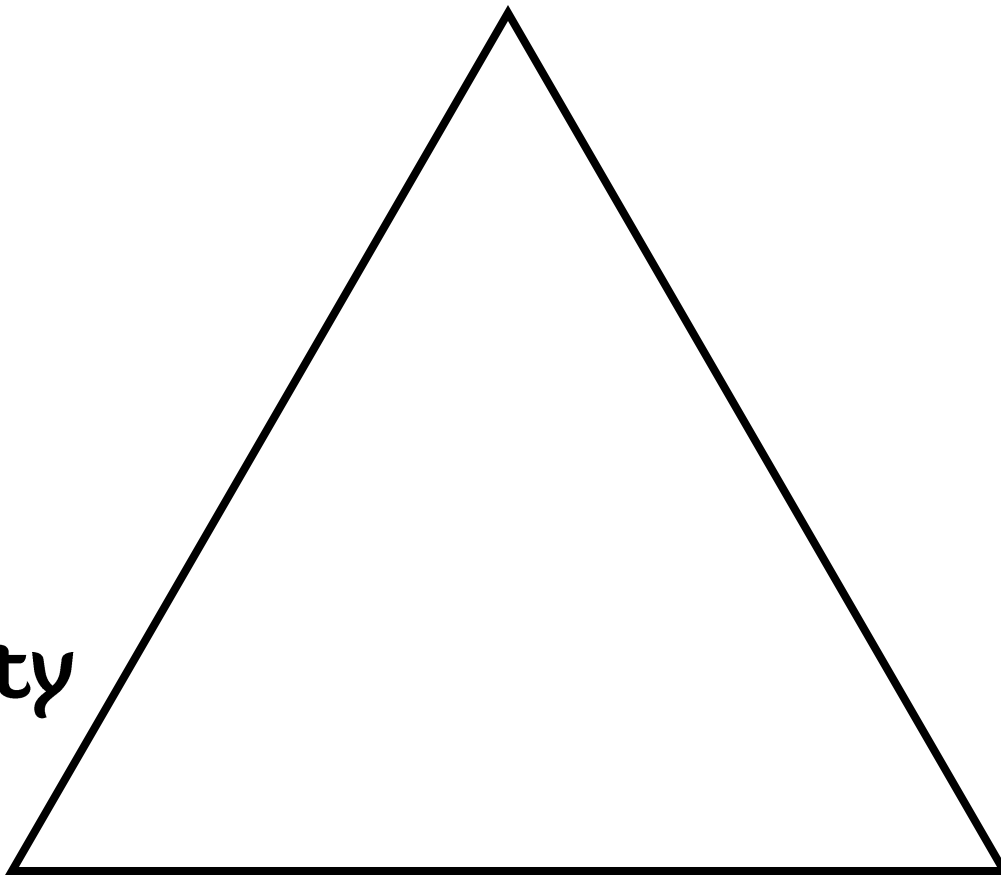


**this all started one day in 2007...**  
with “Maslow’s Hierarchy of Needs”

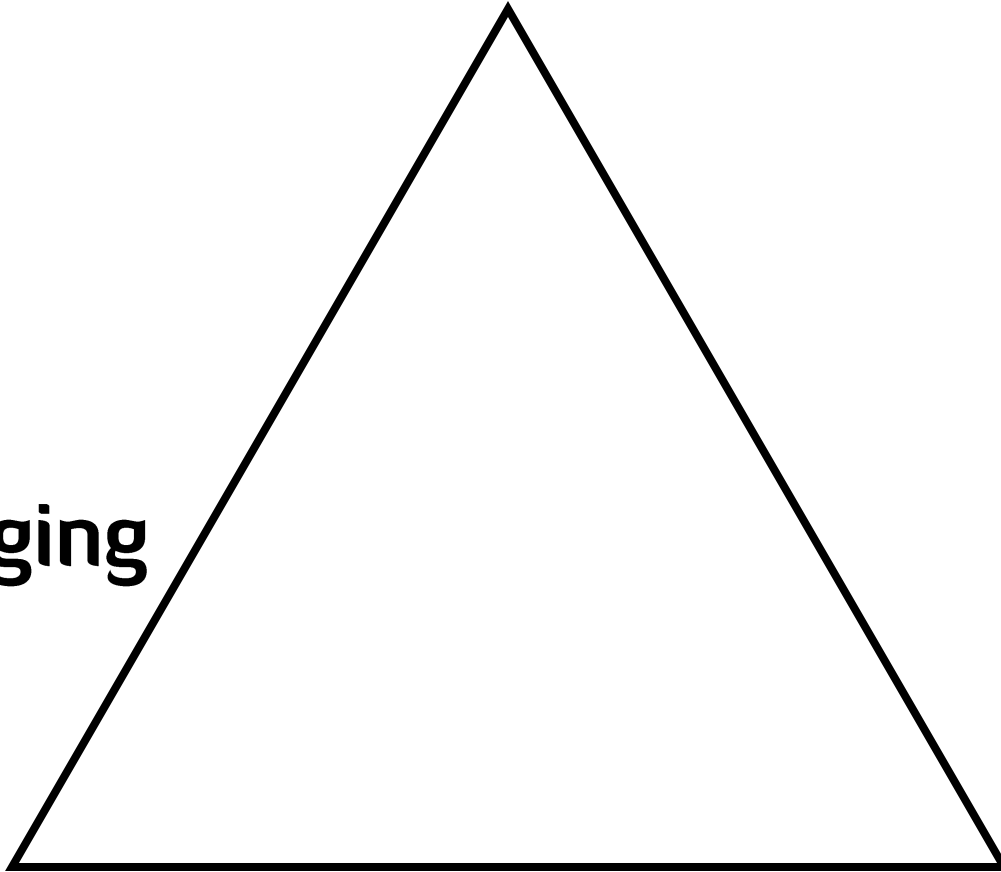
**survival**



**security**



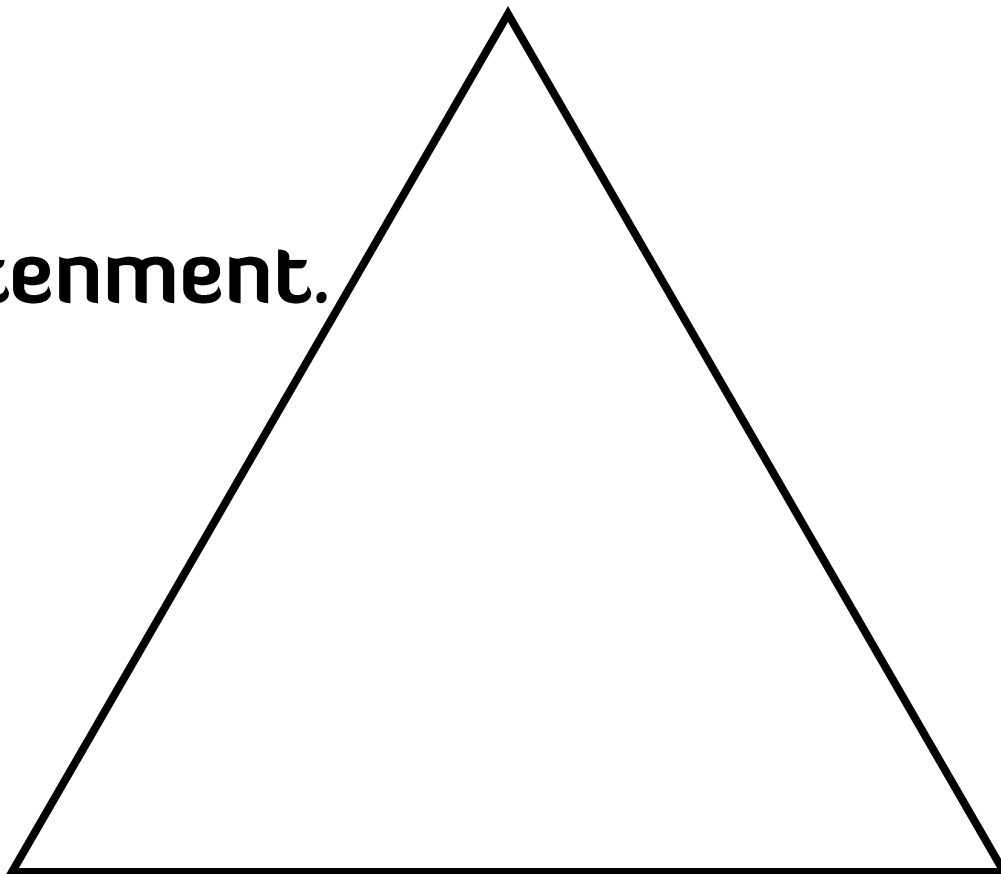
**belonging**

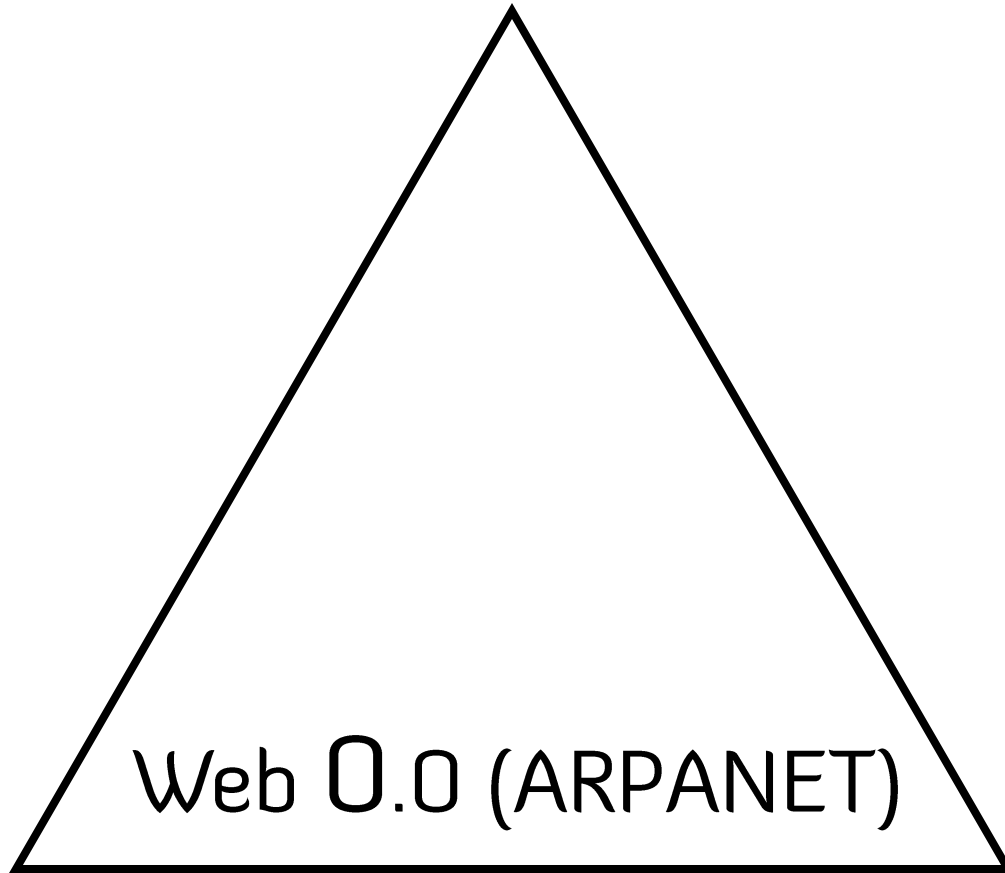


**esteem**

A large, simple black outline of a triangle is centered on the page. To the left of the triangle, the word "esteem" is written in a bold, black, sans-serif font.

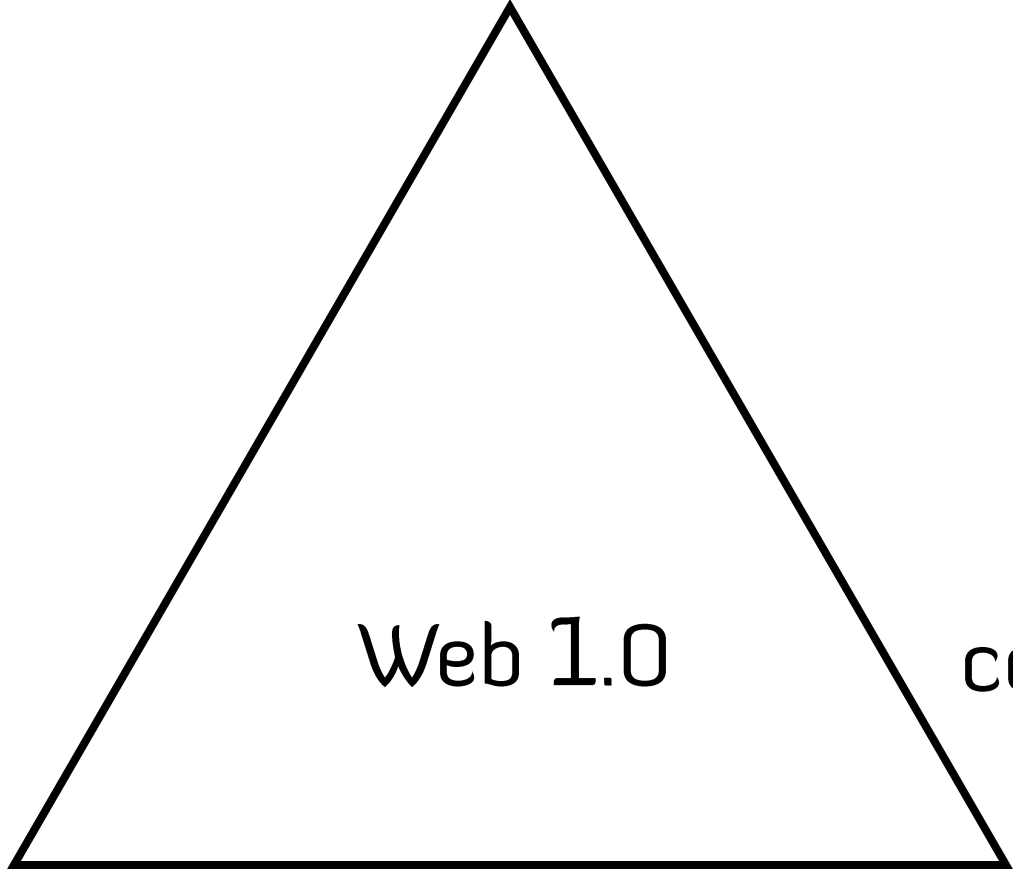
**enlightenment.**





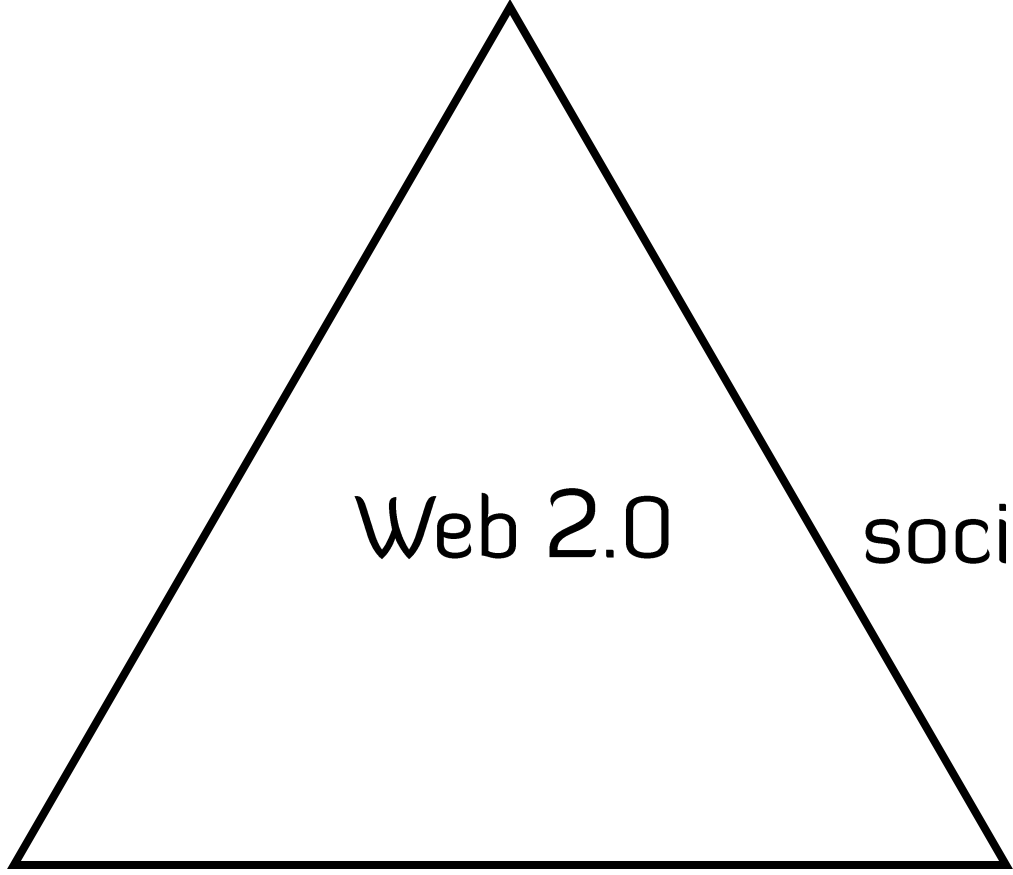
Web 0.0 (ARPANET)

defence



Web 1.0

commerce



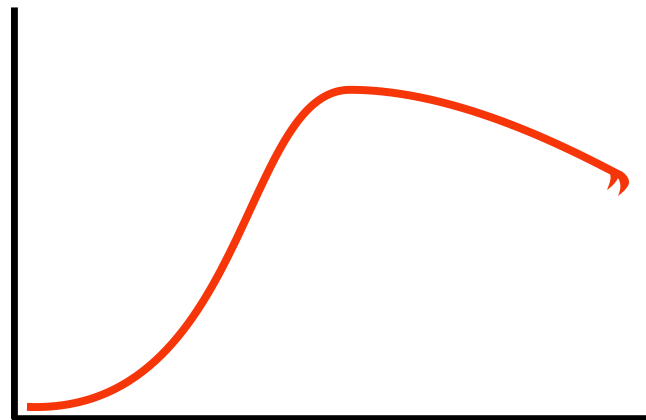
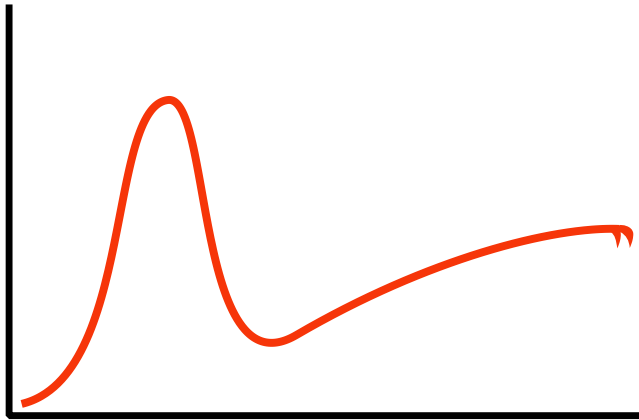
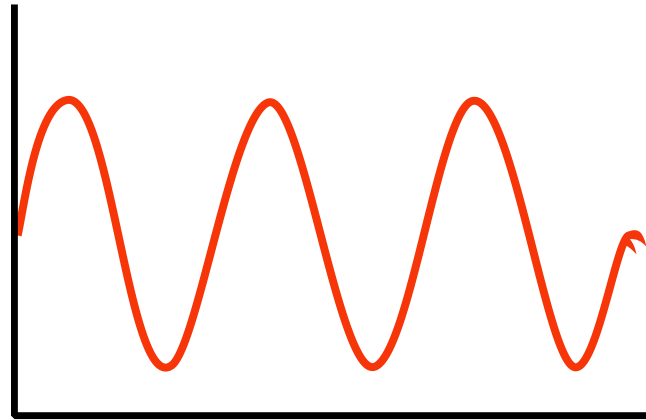
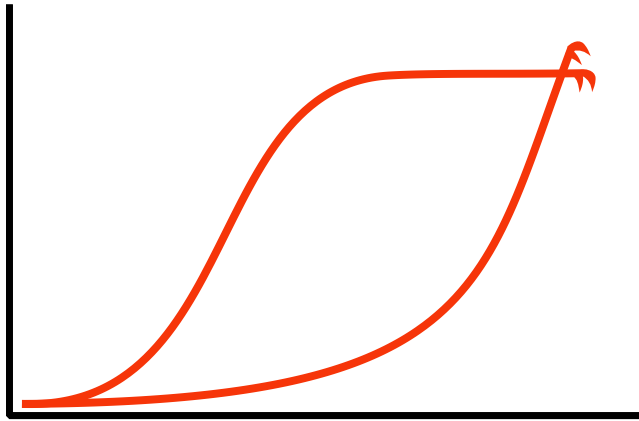
Web 2.0

social beings

**So I thought...**

*“Are there other patterns we see over and over again?”*

it wasn't hard to find a few commonly-flawed examples.



five curves with bite

**you can own them,  
or you can be owned by them.**



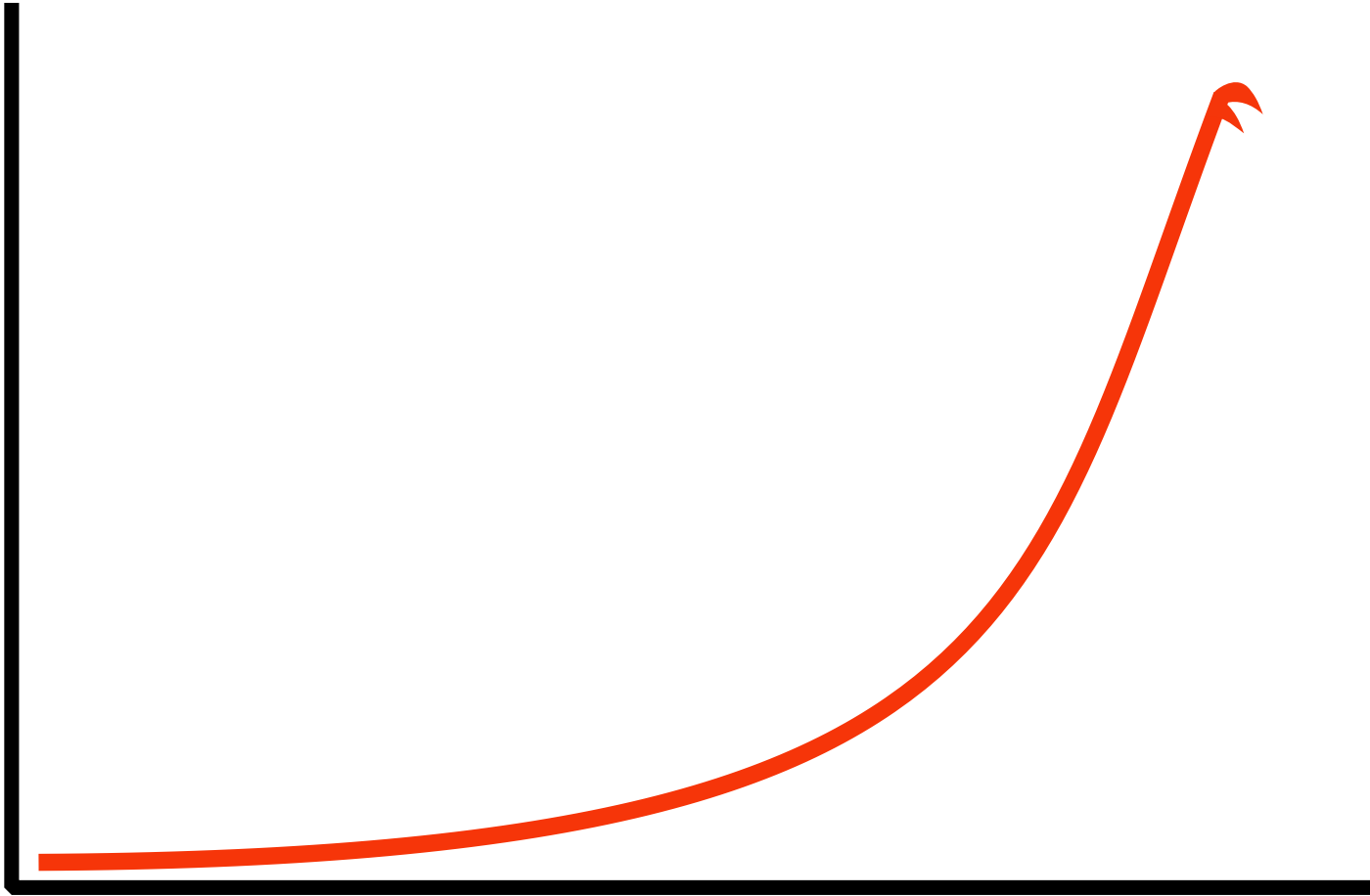
## Warning Math Geeks:

I am not a math geek.

I am more of a  
business guy.

I'll leave the math, for  
you, and your geeking.

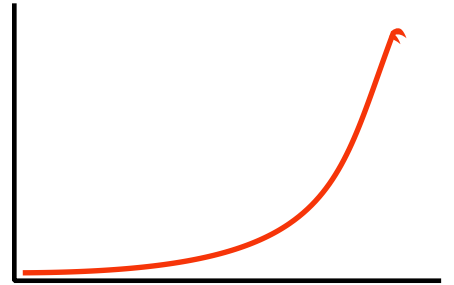
**on to the talk:**



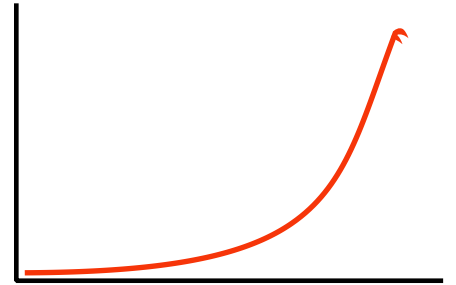
**The “Hockey Stick”**

## Where do we see it?

- unique visitors
- sales
- profits
- traffic
- subscriptions
- you name it

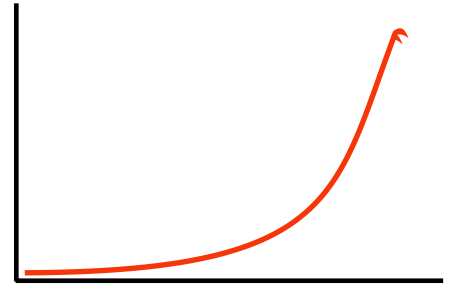


## What's the problem?



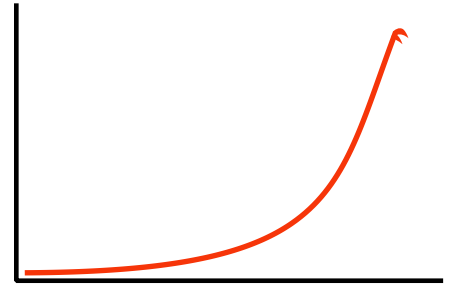
- this graph does not represent the future
- implication of “limitlessness”
- exponential growth is *unsustainable* over time

## What causes it?



- usually, not actually  $F(x) = x^2$
- it could be each member referring 1 other member, or maybe some other equation
- for short periods, many things look exponential
- sometimes Oprah causes it

## BEWARE:



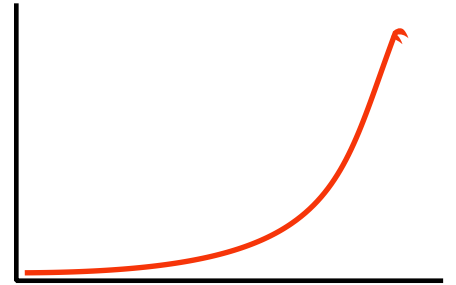
There are three kinds of people who think growth is exponential:

- a) people who are stupid
- b) people who think *you* are stupid
- c) people who are both A and B

\* It is always bad to do business with A and B, but not necessarily C.

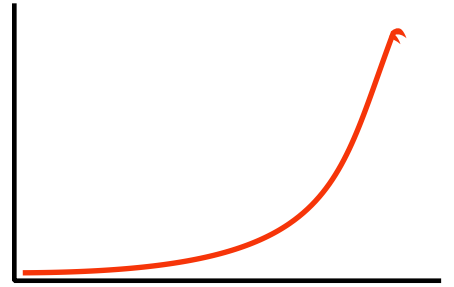
## Why do we get bitten?

- it's so pretty
- “look, but there's numbers!”
- that #\* @%\$ Excel trend line lies to us

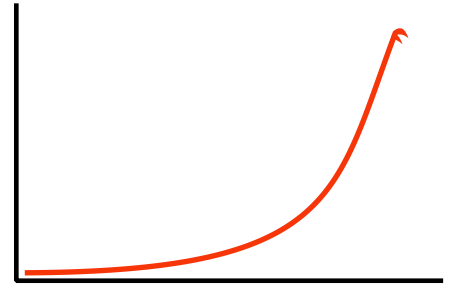


## Who got bitten?

- The Pet Rock
- the Hula Hoop
- snap bracelets
- Krispy Kreme
- Kim Kardashian
- The Backstreet Boyz

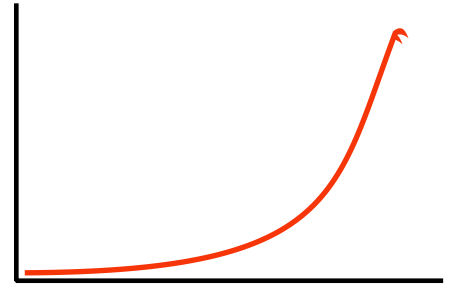


## Fad vs. true growth?



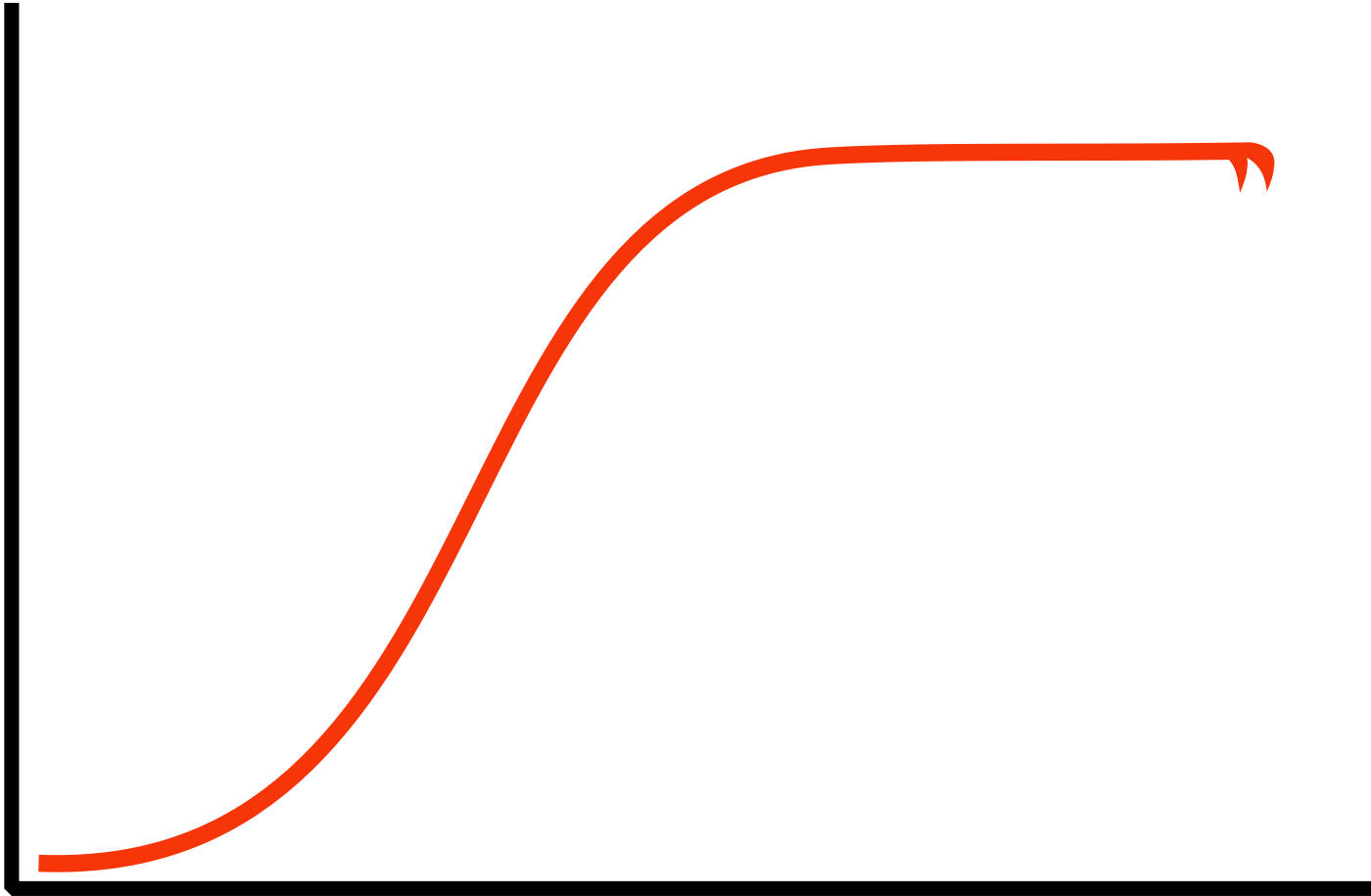
- the faster the spike, the faster the fall
- slow and steady growth is OK, it takes *time* to allocate resources towards useful things
- “does this provide lasting value?”
- would a rich person want this?

## How can I protect myself?

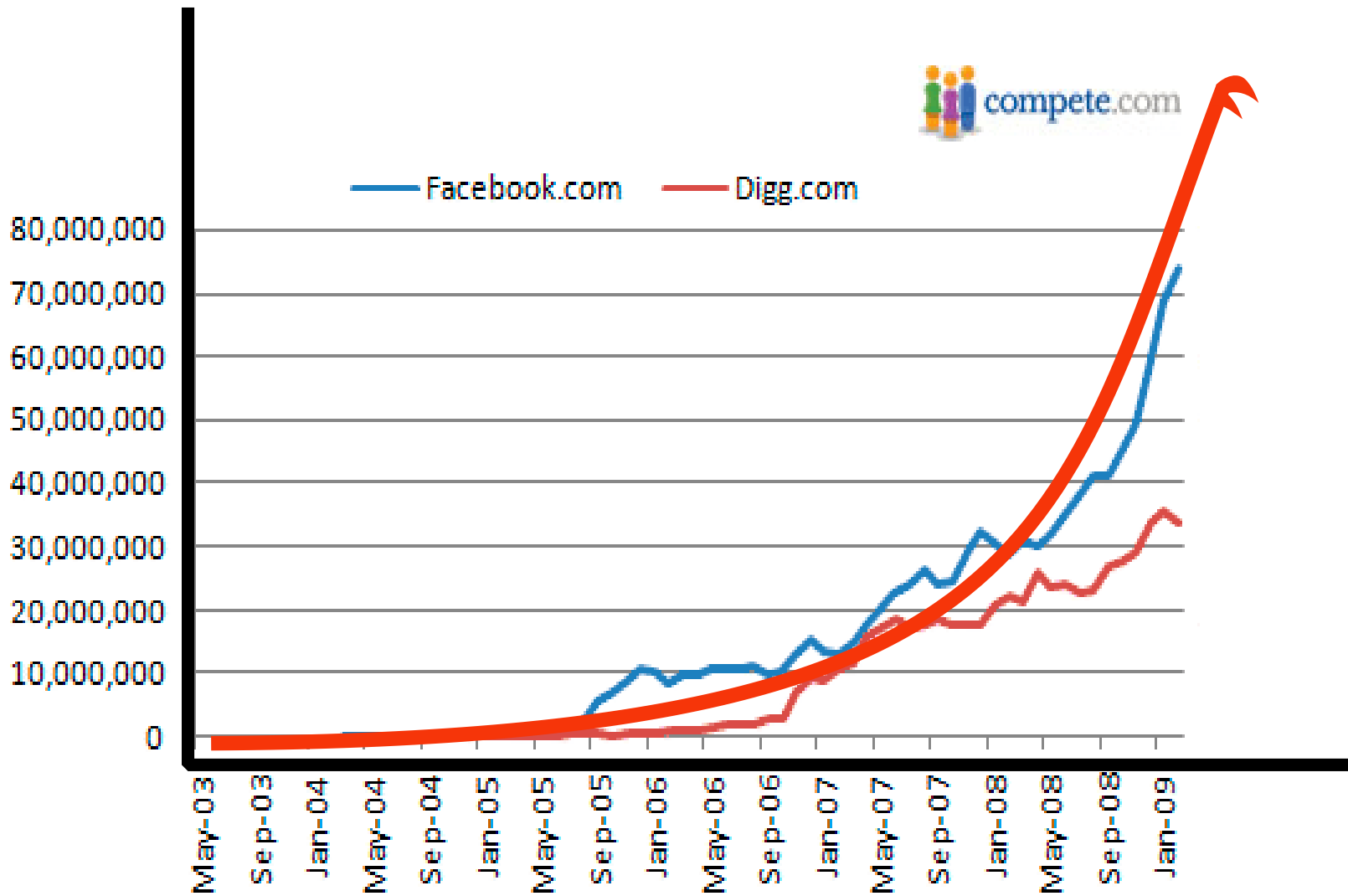


- always question claims of exponential growth
- do not invest at the top
- don't overinvest, in the middle
- know the question is not *if* growth will slow down, but *when will growth slow down*

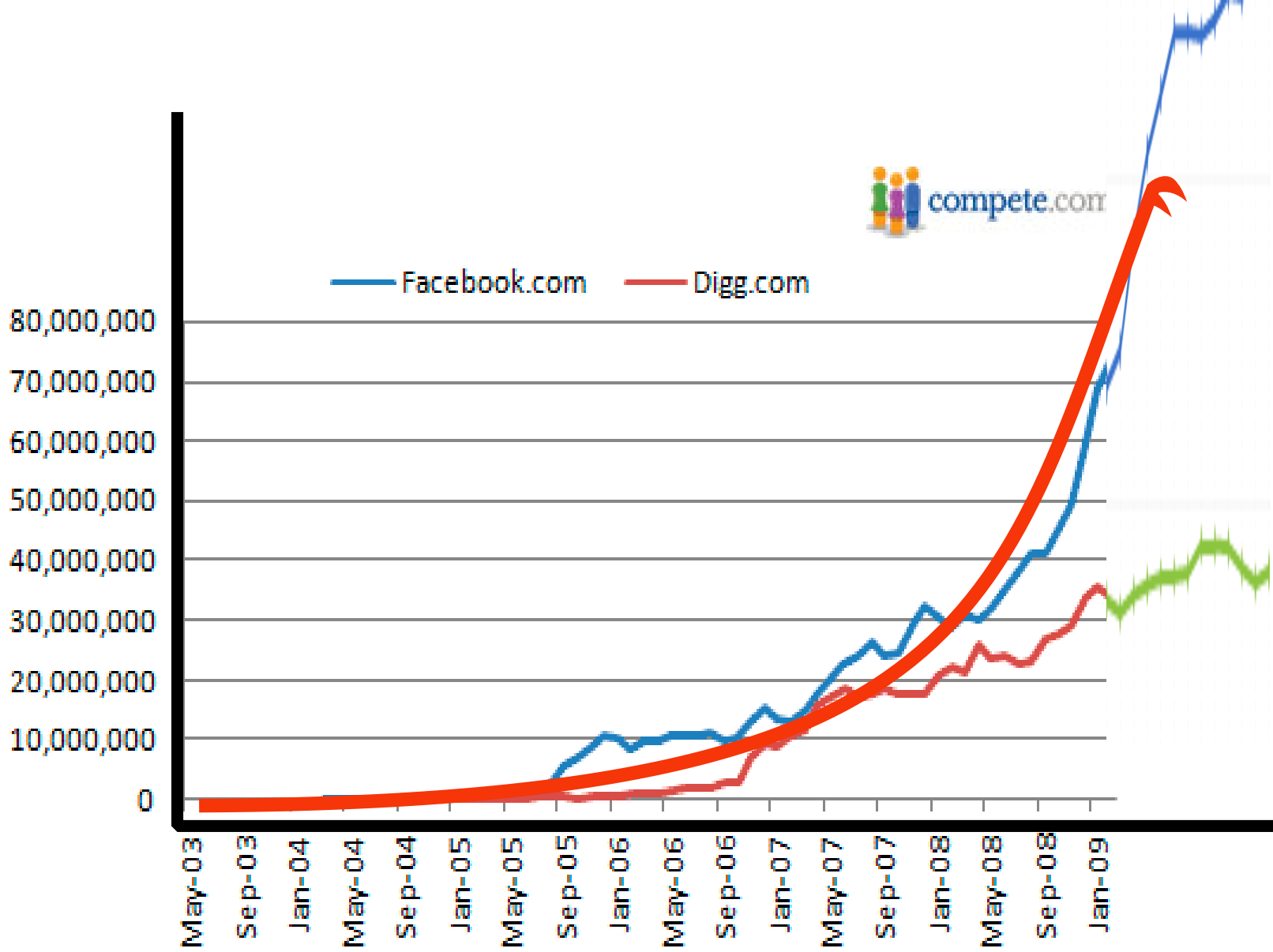
**and that brings us to...**



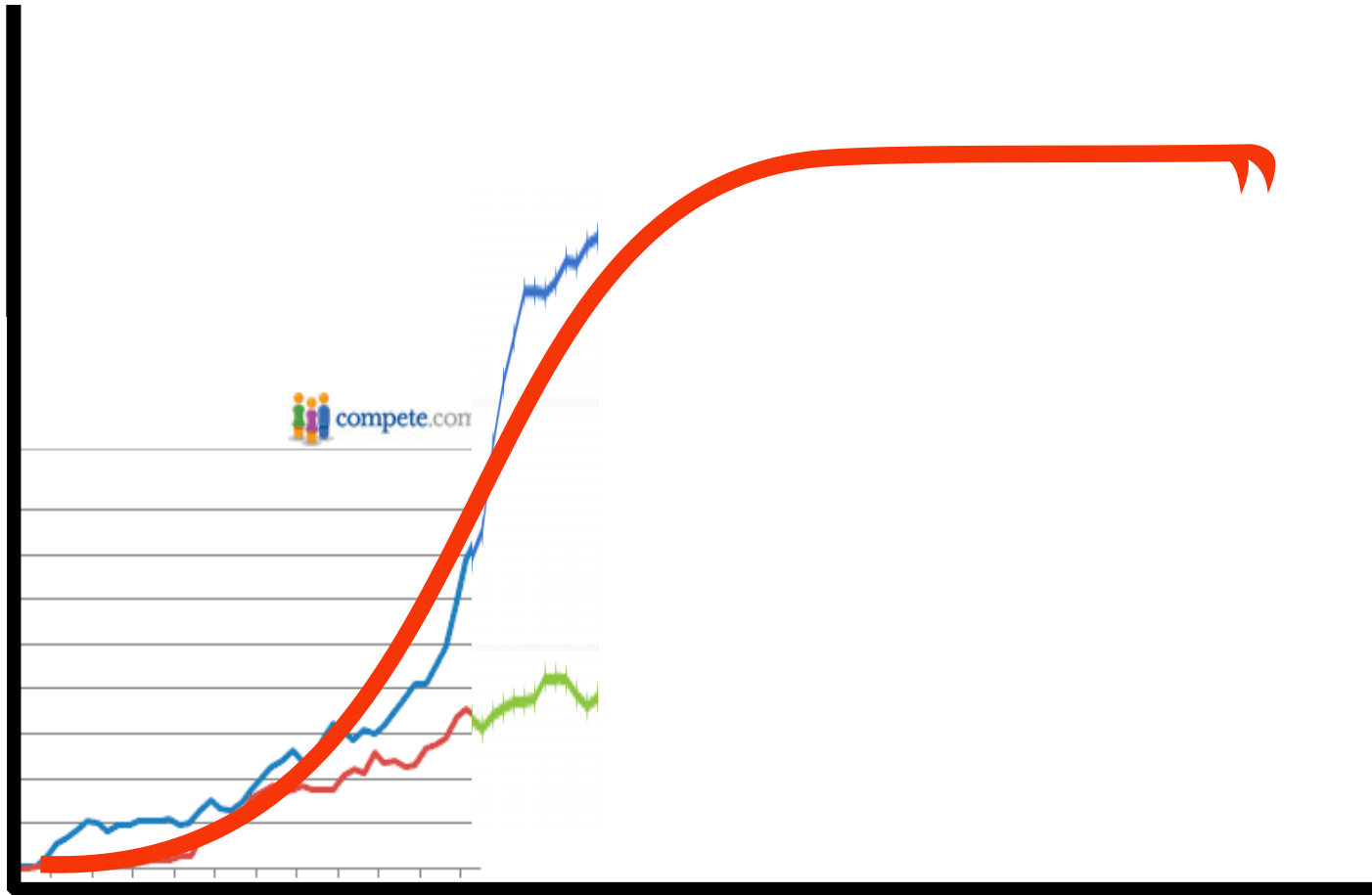
**The Infection Curve**



was our growth really exponential?



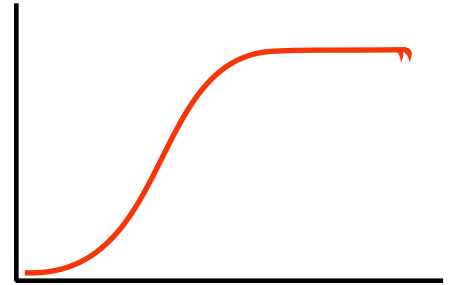
do we still think so?



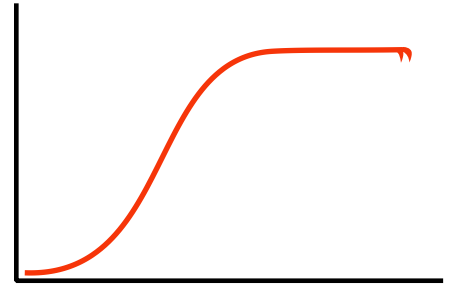
**The Infection Curve**

## Where do we see it?

- viral infections
- bacterial populations
- population prediction
- tumor size prediction
- completion of trends
- sophisticated business projections  
(not Excel)



# Why is this important?



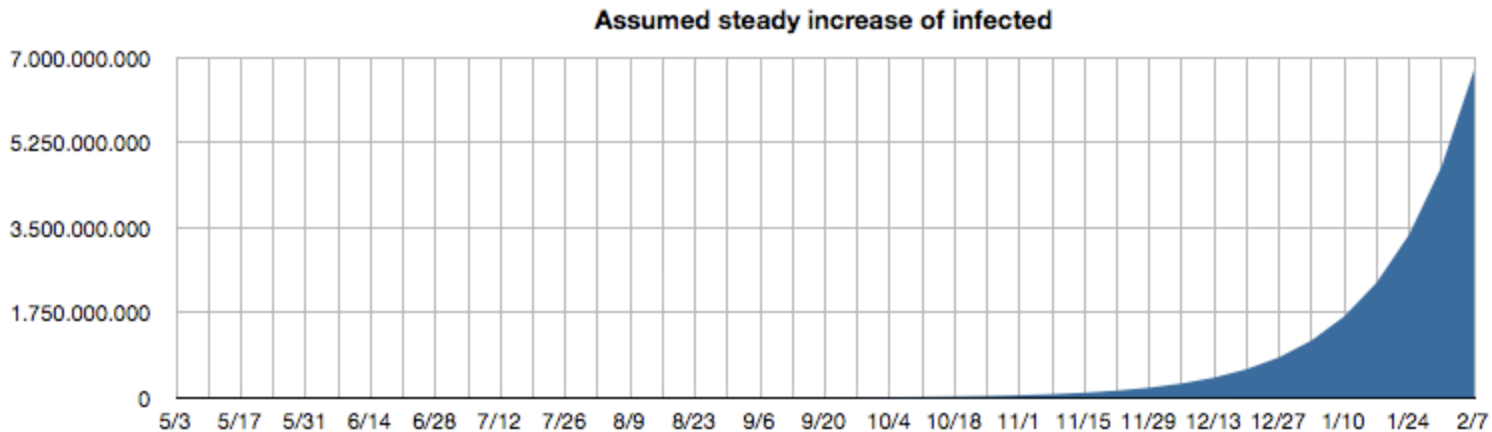
[60000000 Swine Flu deaths by year's end? « The great escape](#)

Jun 15, 2009 ... 60000000 Swine Flu deaths by year's end? Spanish\_deathper1000. In our matrix monitoring center here in Belgium, data from WHO enters our ...

[matrixgreescape.wordpress.com/.../60000000-swine-flu-deaths-by-years-end/](#) -

[Cached](#) - [Similar](#)

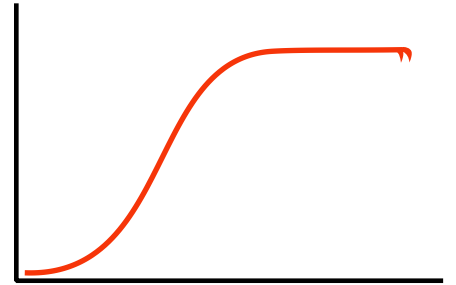
OMG!



WTF?

DOOM!

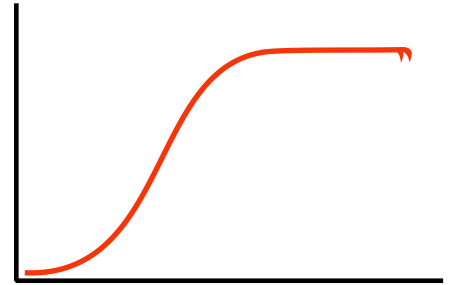
**Why is this important?**



**Alarmist Prediction: 60 million**

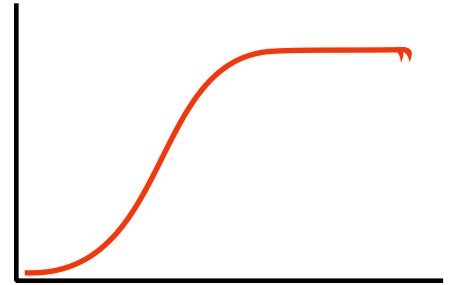
**Actual deaths by Dec. 2009? 10 thousand**

## What's with the plateau?



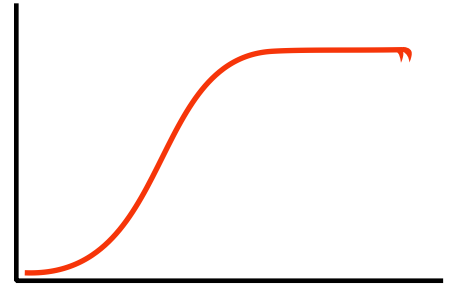
- this graph does not assume limitless resources
- the plateau is full “saturation”, or “conversion”
- the graph flatlines at the sustainable capacity of the environment (carrying capacity)

# What is Carrying Capacity?



- the point at which growth or expansion can no longer continue
- living ecosystems only replace damaged or dead individuals
- static systems don't gain new members (unless existing members are forced out)

## Is Carrying Capacity important?



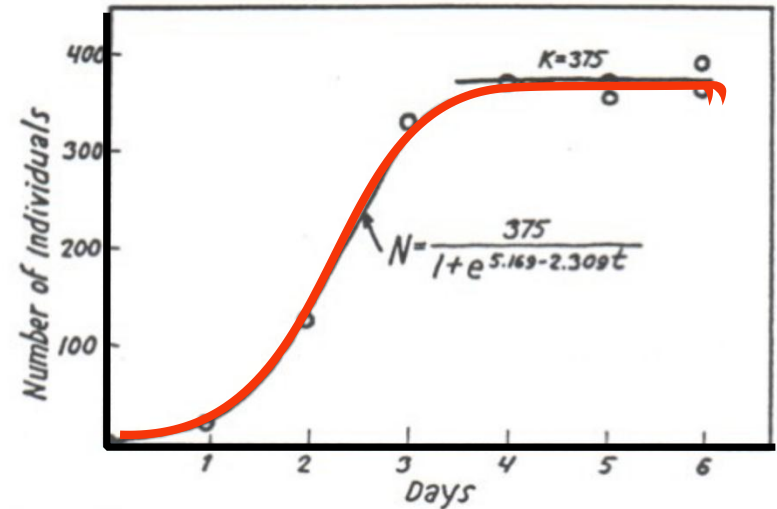
- what it takes to “use” your product, is finite:
  - spare time
  - money
  - clicks
  - victims
  
- oh, and you’re sharing all those resources with everything else in their lives

# It's SCIENCE!

(no, seriously)

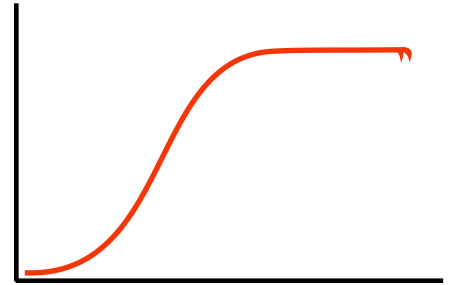
Check out on Wikipedia:

- Thomas Malthus
- Gompertz growth curve
- Logistic Curve
- Weibull
- Janoschek
- Morgan-Mercer-Floden
- von Bertalanffy growth equation



The growth of population of *Paramecium caudatum*

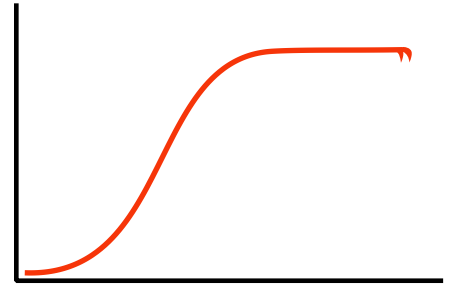
## Why do we get bitten?



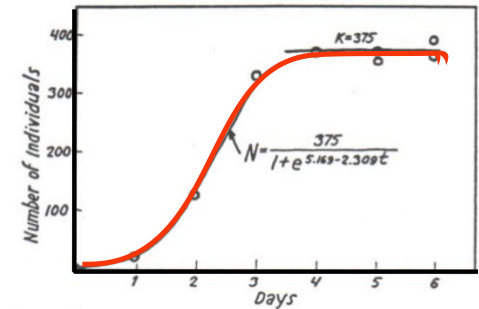
- the pie is finite, *competitors included*
- “wah! exponential is better!”
- to predict accurately, you need to know the “carrying capacity” of the environment
- unfortunately, the market is non-scientific

## Who got bitten?

- MySpace
- Yahoo
- music CD industry
- television vs. internet
- landline telephones
- Hootie and the Blowfish



# What does SCIENCE tell me?



The growth of population of *Paramecium caudatum*

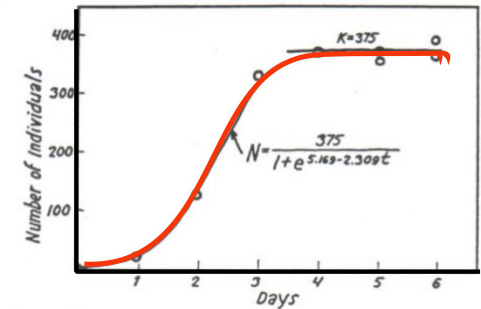
Scientists have a theory regarding two strategies:

- “R-selected”
- “K-selected”

Unstable environments, tend to support highly adaptable R-selected animals like bacteria, rats, and weeds; that grow fast, mate fast and spread fast.

More stable environments, can foster K-selected animals like humans, bears, and whales that grow slowly, mature slow and are highly specialized.

Make it work for you?



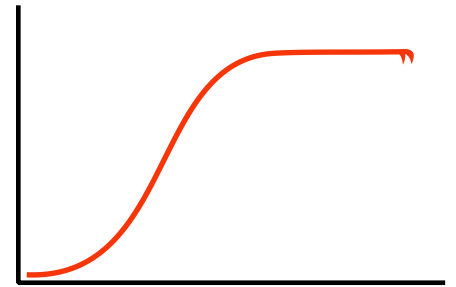
The growth of population of *Paramecium caudatum*

Are you more like a dandelion, or an oak?

*Would it help if you were a little of both?*

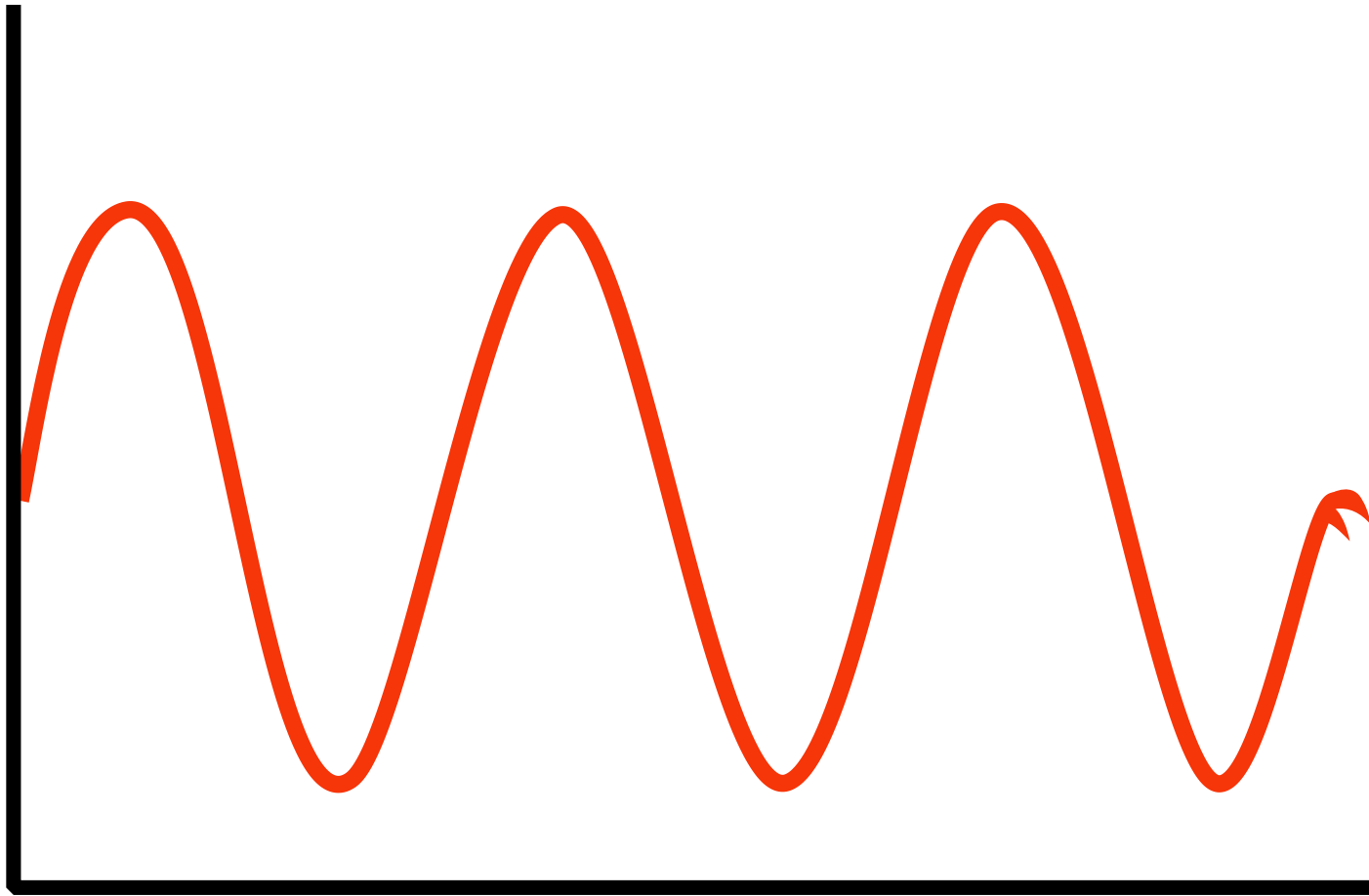
Would you know *when* to pick each strategy?

## How can I protect myself?



- plan for the plateau
- for unstable markets, maximize flexibility
- when the market is stable, dig in on optimization
- calculate the Carrying Capacity!

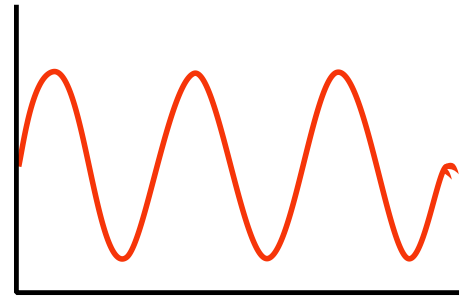
**what goes up, must come down...**



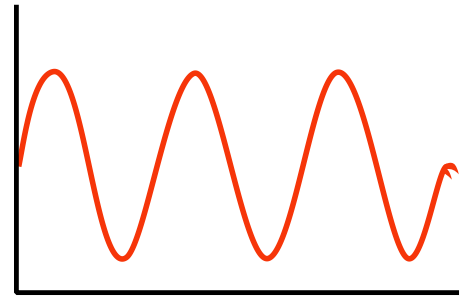
**The “Sinusoidal” Curve**

## Where do we see it?

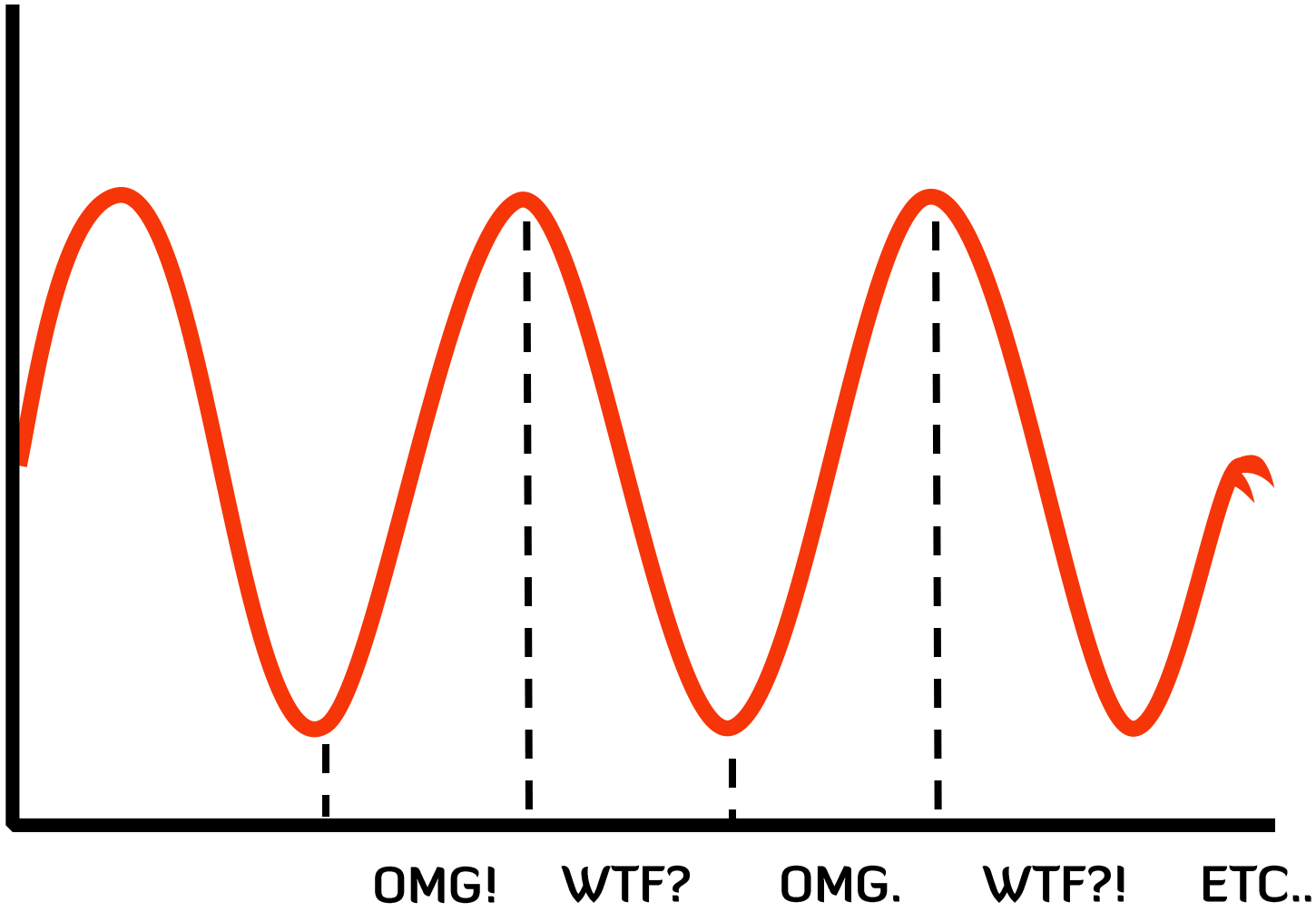
- fashion
- human sleep patterns
- the tide
- the seasons
- new product releases
- church on Sunday
- pretty much, anything cyclical



## Why is it dangerous?

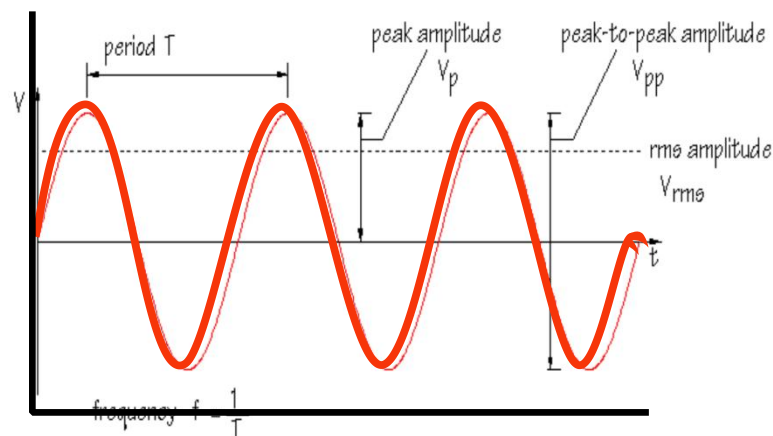


- by itself, it's not, unless misinterpreted
- when taken in small chunks, it looks exponential, or horrific!
- you need YoY comparisons, or your weeklies can be deceiving



**Also, it's SCIENCE!**

(though not all would agree)



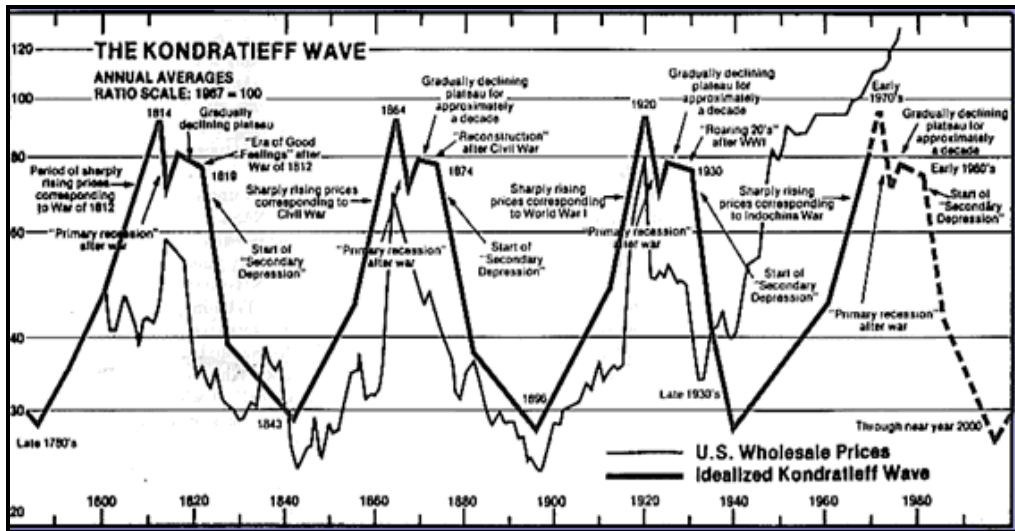
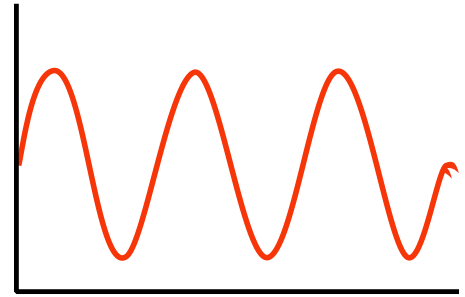
Many math guys and science guys have made theories about “meta” economic waves.

Some people believe them, some don't.

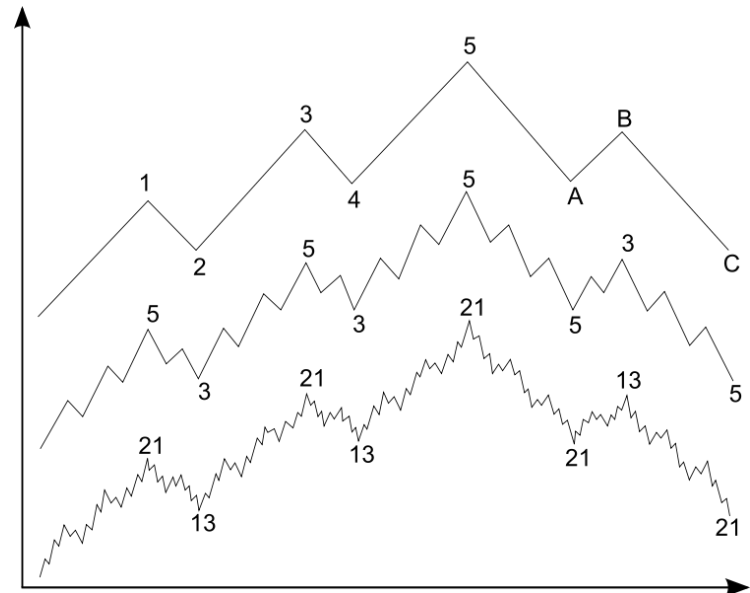
Check them out on Wikipedia:

- Kondratiev wave
- Simon Kuznets
- Elliott wave

# It's SCIENCE!



OMG!



WTF?

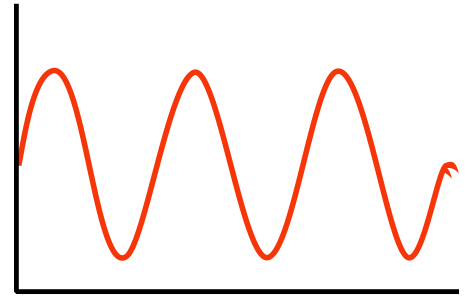
## Why do we get bitten?

- it comes, and it goes

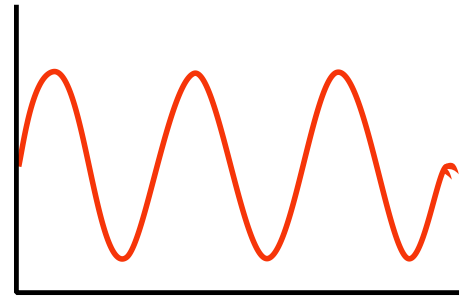
- we have short memories

- we are overly reactionary

*("Oh yes; Oh no! Oh yes! Oh, no.")*



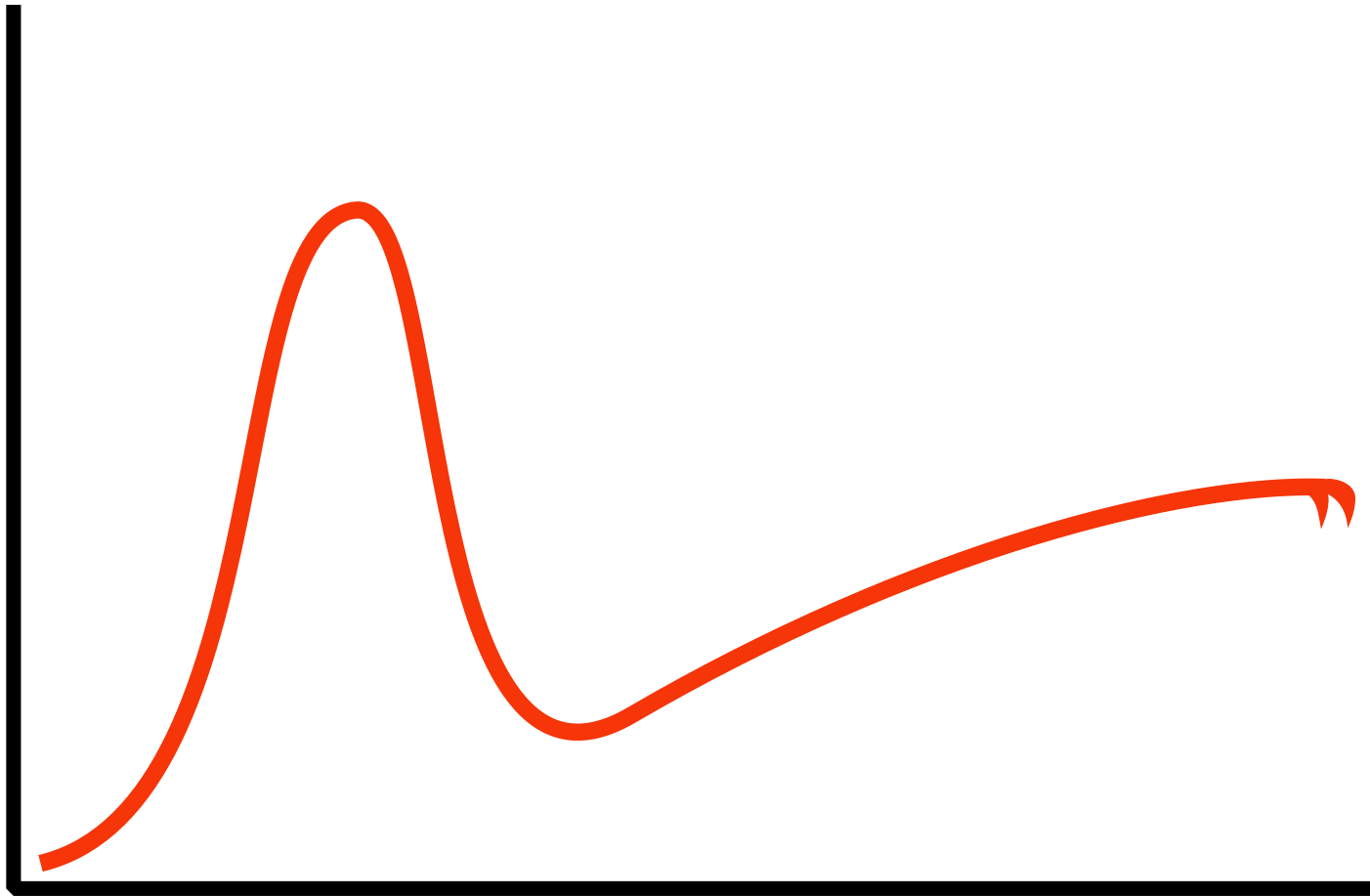
## How can I 'work it'?



- a steady hand on the wheel
- resist the urge to do anything drastic
- don't try to correct for seasonal changes
- buy low, sell high!

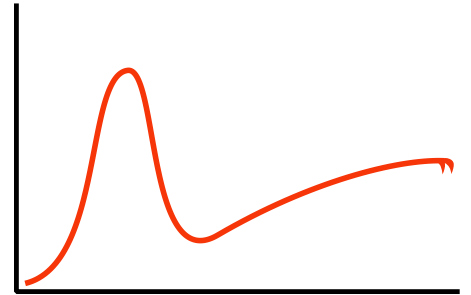
**and what about a mashup?**

a sinusoidal bacterial infection?



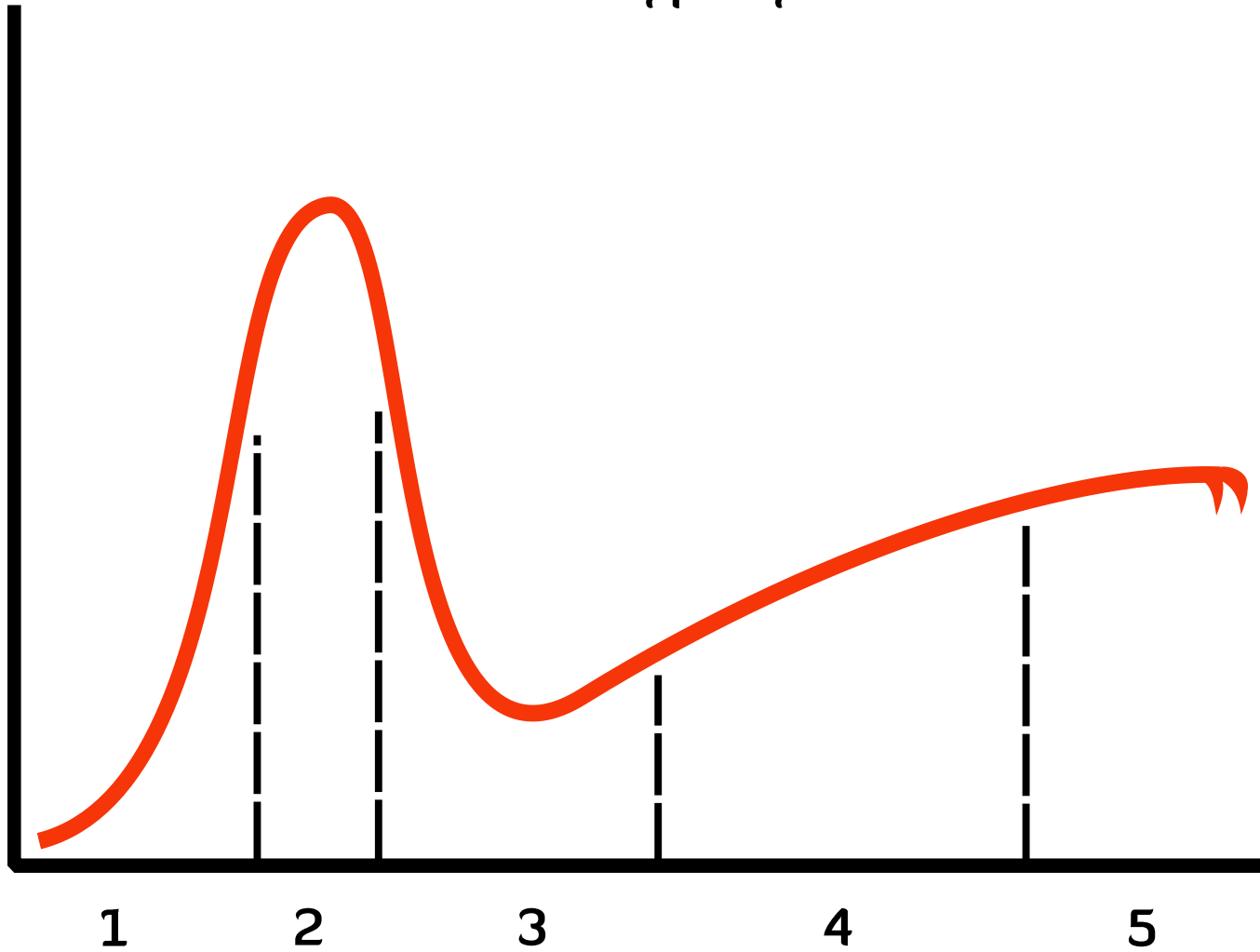
**The Gartner Hype Cycle**

## Where did it come from?



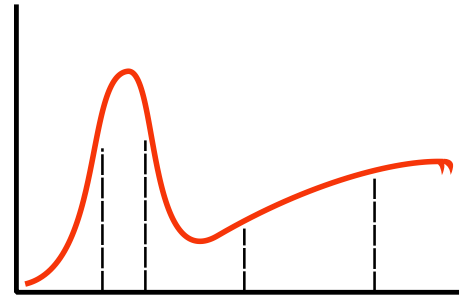
“Since 1995, [Gartner](#) has used hype cycles to characterize the over-enthusiasm or “hype” and subsequent disappointment that typically happens with the introduction of new technologies”

# Generic Hype Cycle

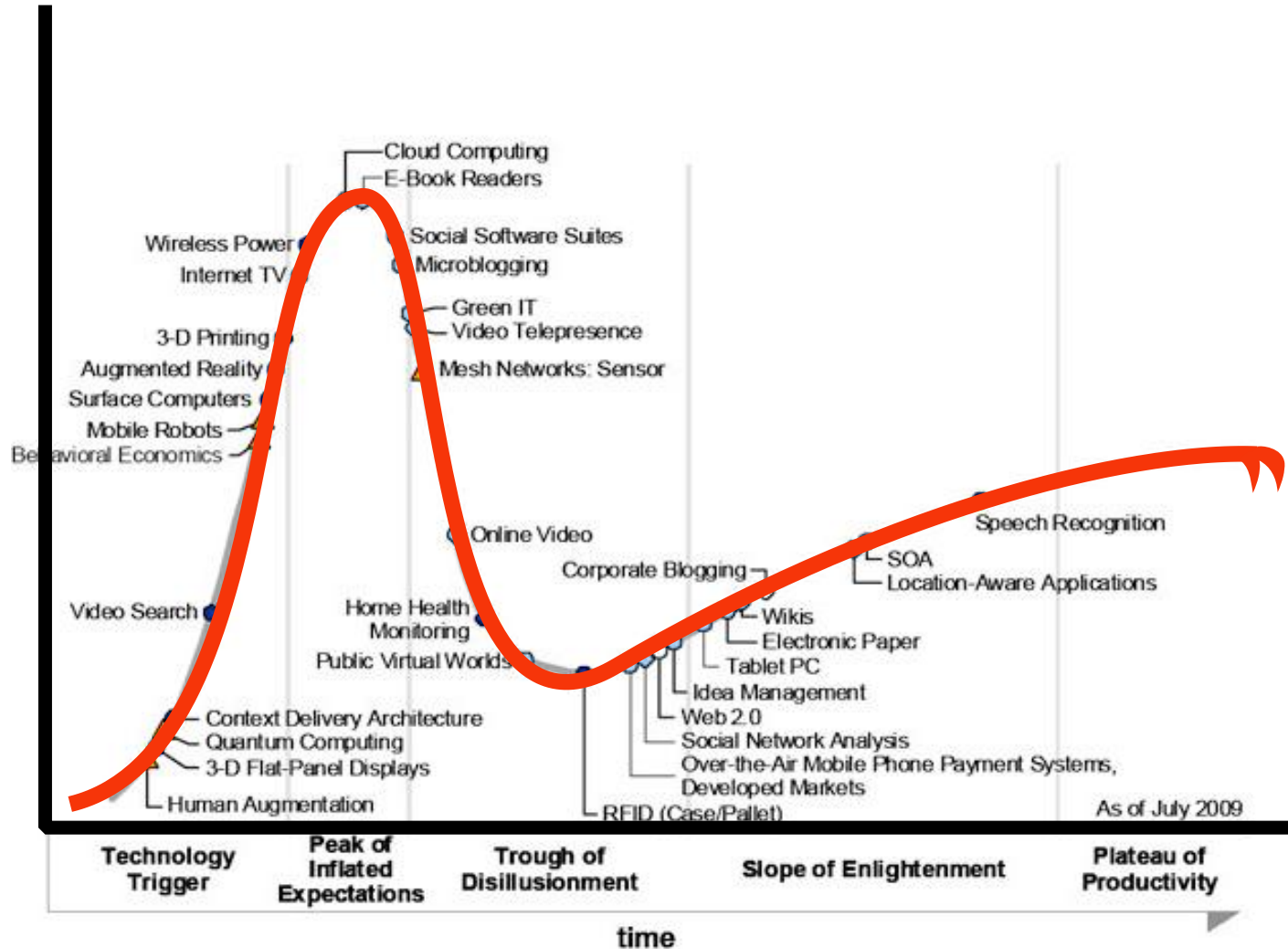


## 5 distinct cycles:

- 1) Technology Trigger
- 2) Peak of Inflated Expectations
- 3) Trough of Disillusionment
- 4) Slope of Enlightenment
- 5) Plateau of Productivity



# Gartner 2009 Hype Cycle

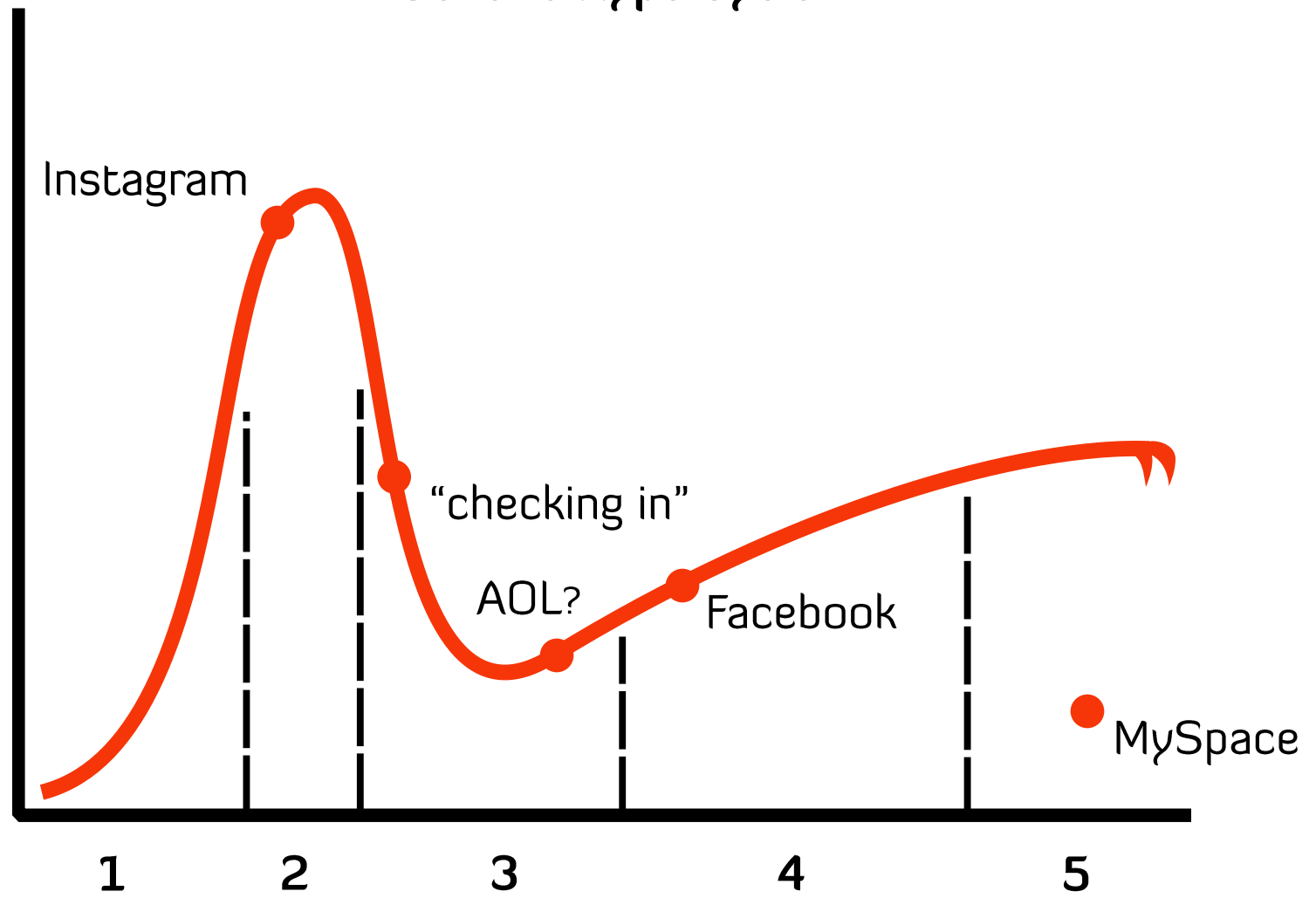


Years to mainstream adoption:

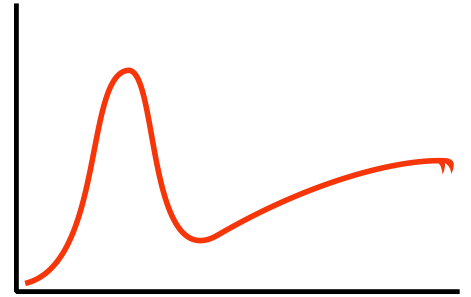
- less than 2 years
- 2 to 5 years
- 5 to 10 years
- ▲ more than 10 years
- ⊗ obsolete before plateau

Source: Gartner (July 2009)

# Generic Hype Cycle

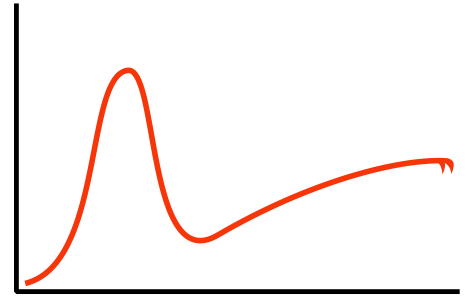


## Why is it dangerous?



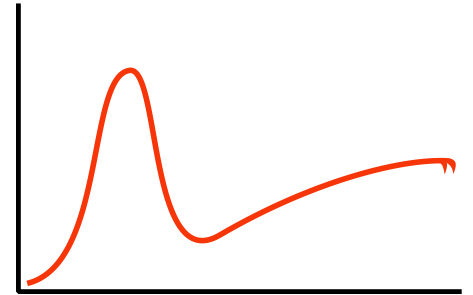
- when we are in puppy love, we do weird things
- when we're betrayed, we do weirder things
- it looks a lot like a fad, but it's not
- CEO's normally don't "get it"

## What causes it?



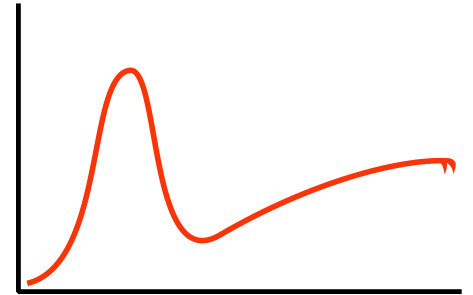
- the echo chamber: if something is worth talking about, it must be worth talking about, *more*
- by the time the majority arrives, there's no way the expectations can be fulfilled
- the early minority usually doesn't want to hang with the later majority

# Why do we get bitten?



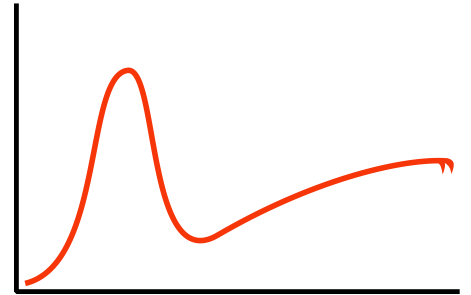
- the young are more susceptible
  - oh, and technology bloggers
- when we are young, we are programmed to assume new is better (no really, it's neuroscience)
- the tech industry is still very young

## Why is it dangerous?



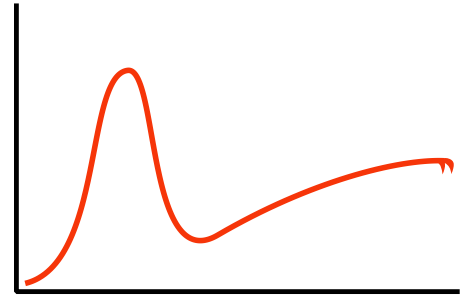
- tendency to feel the *need to act*
- overinvest in “fad” technology
- failure to build in long-lasting value

## How can I protect myself?

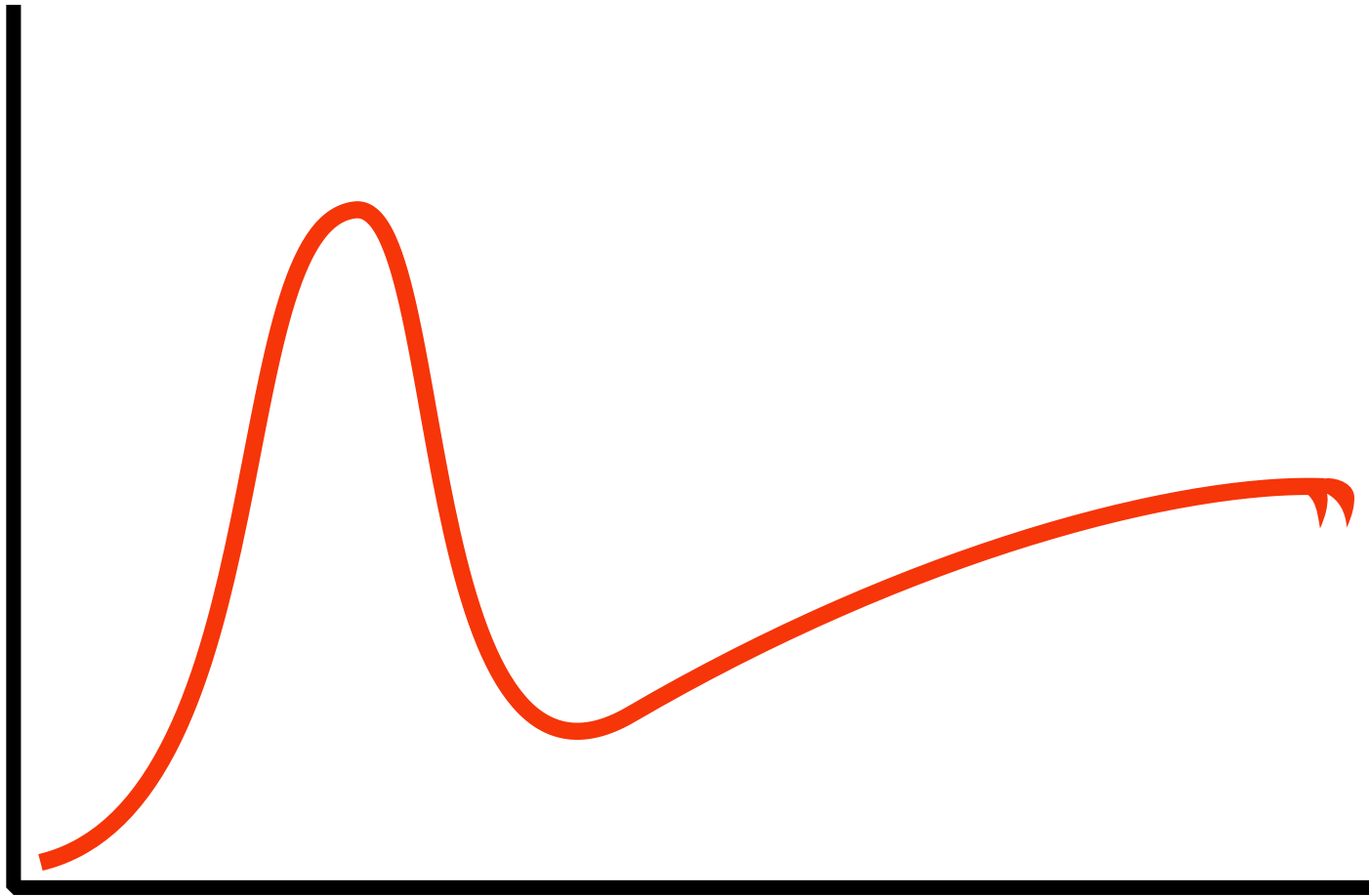


- know the pattern, talk about the pattern
- resist the urge to do anything drastic
- know that if you **continue** to drive value, you will succeed, if you survive.

**Who *owned* this curve recently?**

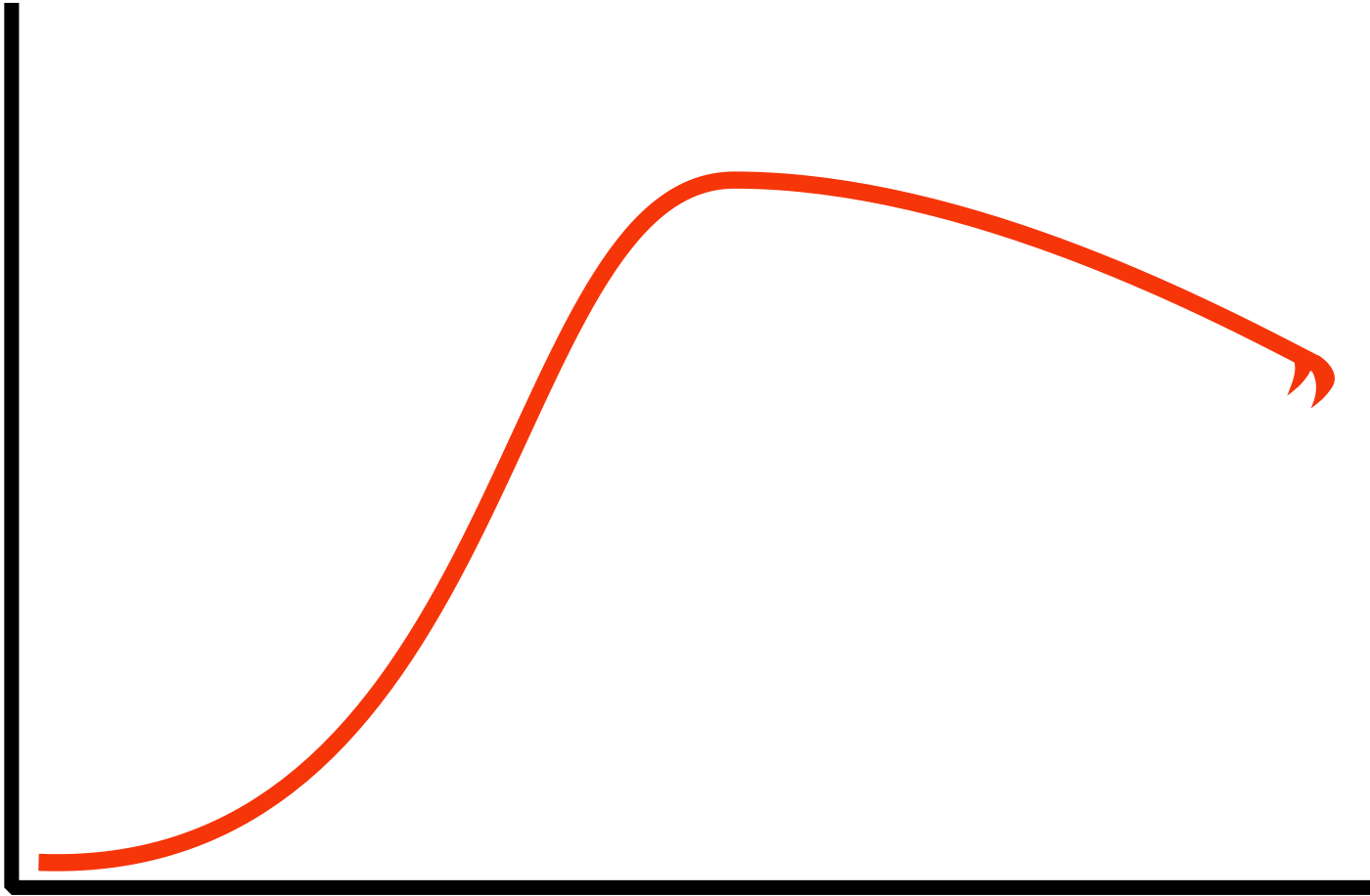


- Doogie Houser
- Justin Timberlake
- Starbucks
- the Beatles
- Michael Jackson



**alternately... graph of how cute a child is**

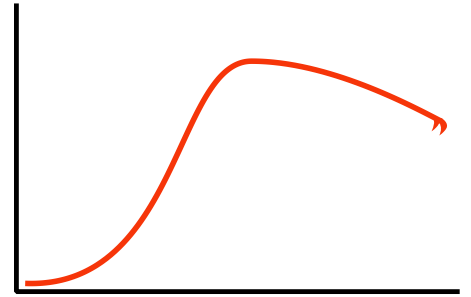
**now on to the most powerful tool:**



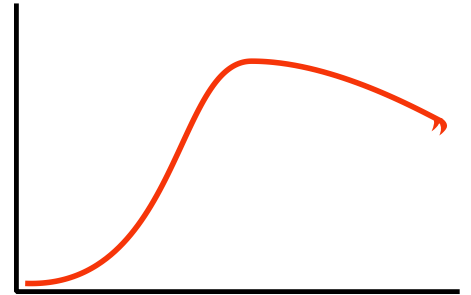
**a normal growth cycle**

## Product life cycles contain:

- 1) Introduction
- 2) Success
- 3) Growth
- 4) Saturation
- 5) Decline



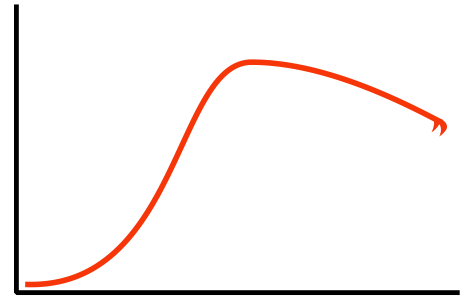
**This is pretty close to a business:**



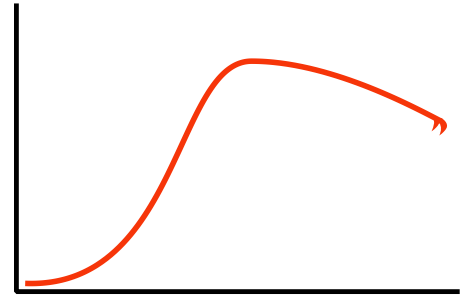
- 1) Concept + Inception
- 2) Survival
- 3) Growth
- 4) Maturity
- 5) Decline

**We've seen this before:**

- 1) Conception + Gestation
- 2) Survival
- 3) Growth
- 4) Maturity
- 5) Decline

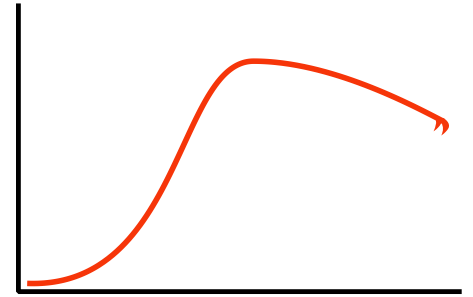


## What causes it?



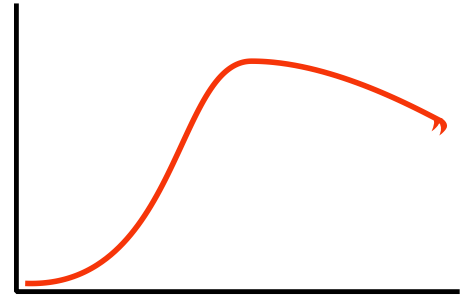
- we all start from zero
- it takes a bit of time to get up to speed
- we all end at zero
- what you do in the middle is what counts

## Why do we get bitten?



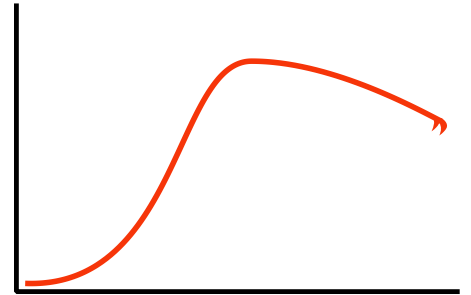
- we can't possibly believe there is an end
- we live in the moment
- the change is usually gradual

# How can I protect my company?



- know the pattern, talk about the pattern
- plan your boost strategy
- age gracefully

**Why is this the most powerful?**

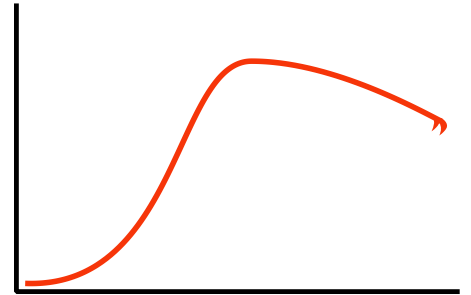


It tells you where you are.

**For startups, I break this into 5 phases:**

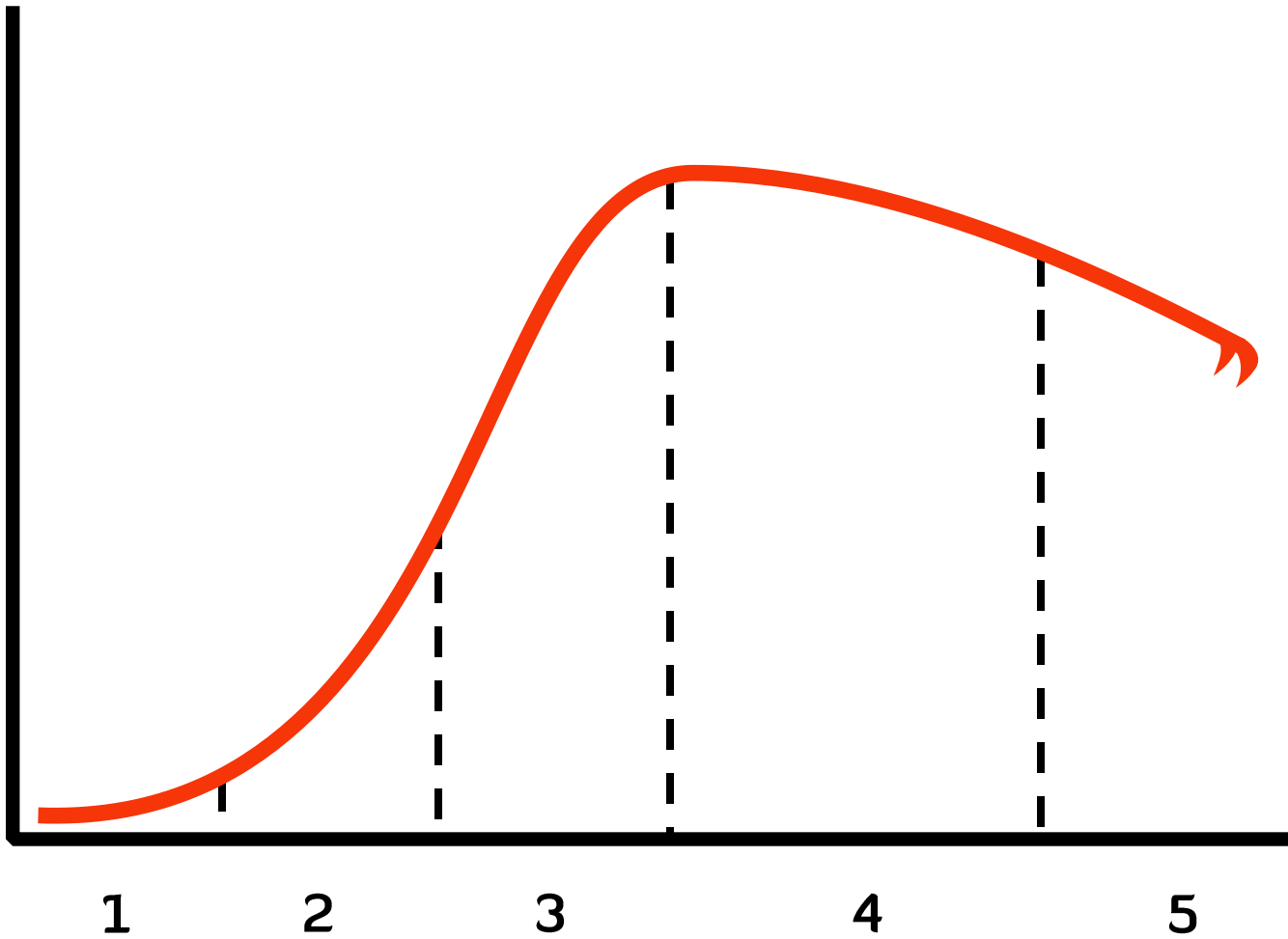
- 1) crazy innovator
- 2) rockstars
- 3) proceduralists
- 4) optimizers
- 5) vultures

**This mirrors project management:**

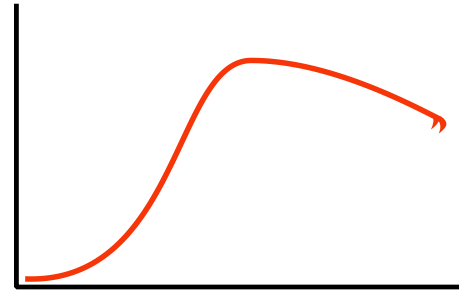


- 1) Starting
- 2) Planning
- 3) Implementation
- 4) Controlling
- 5) Ending

# Generic Growth Cycle



## Providing a common language:



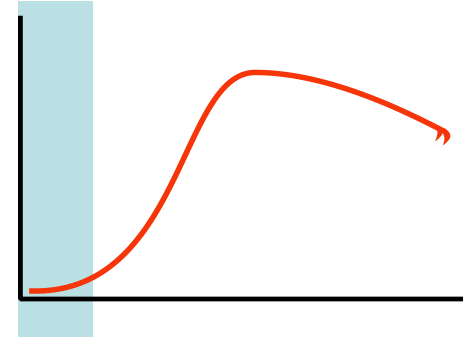
These stages represent a common language that can be used independent of other measures.

*“Oh yeah, they’re still around a 2.2, great products coming out, yet no real business model...”*

*“The last company I worked at was around 4.7, and they had no room for restructuring the process...”*

# Stage 1: Crazy Innovator

Forming

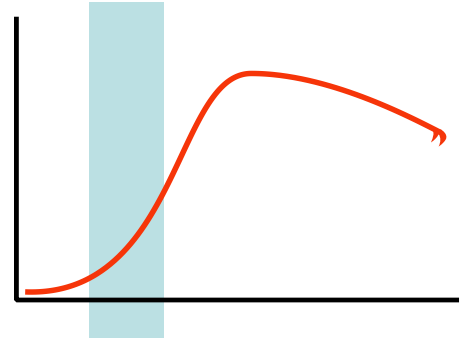


## **1** borderline crazy innovator has an idea

- insane energy
- passionate about the idea
- potentially, scatter brained
- occasionally manic
- focus on the idea

## Stage 2: Rockstars

### Storming

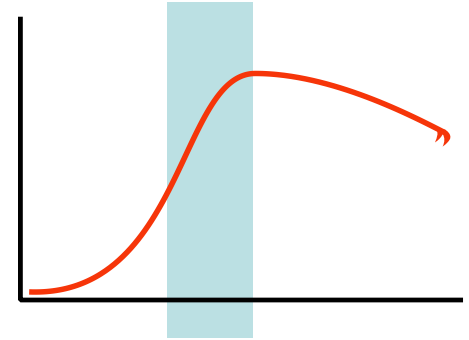


**a small group of high-performance generalists**

- high energy
- passionate about delivery
- focused, but can be distracted
- binge drink caffeine
- focus on doing cool shit

## Stage 3: Proceduralists

Norming

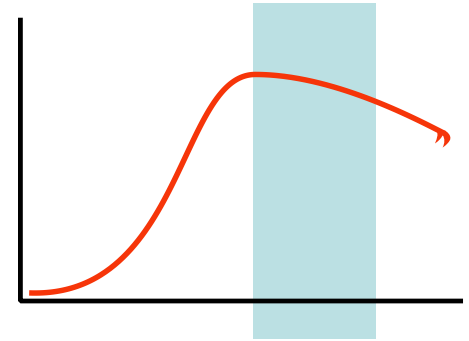


**larger group of high-performance specialists**

- focused energy
- passionate about the opportunity
- driven to refine this into something real
- want this thing to work
- focus on the process

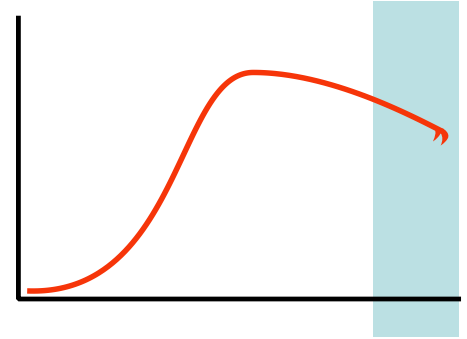
## Stage 4: Optimizers

Performing



### The bulk of a company's full workforce

- steady energy
- passionate about tweaking
- driven for a 1% improvement
- want this thing to work, better
- focus the "the numbers"



## Stage 5: Vultures

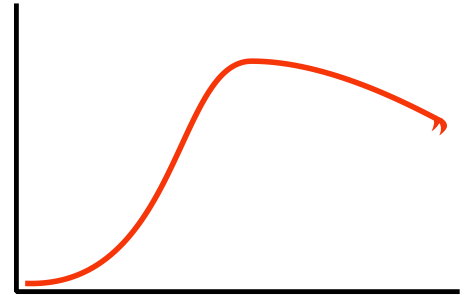
Shut It Down

### Arrive after the decline

- draconic energy
- passionate about bleeding out the last \$
- driven to dismember
- want this thing's pieces
- focus the recovery of investment

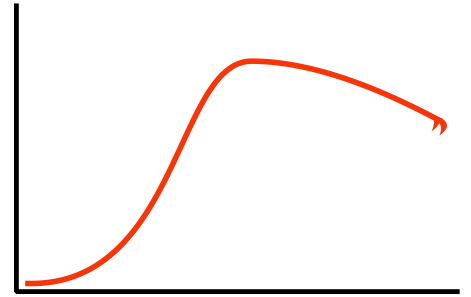
**let's talk about not getting  
bitten as an entrepreneur.**

# How do I protect myself?



- as your company progresses, the staff will change, the needs of the company will change
- most people are not good at all roles, this is why founders leave
- individuals may span multiple phases, usually adjacent

# How do I protect myself?

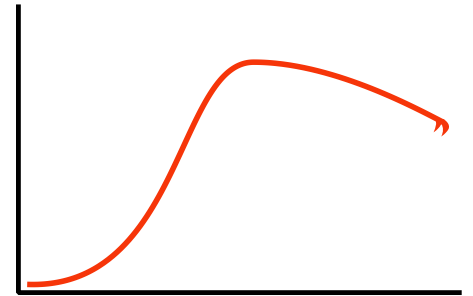


- a “4” to do the job of a “2” won’t be happy
- a “2” to do the job of a “4” will go crazy
- a “1” will want to strangle a “4” in a meeting

## Know your business:

- example: don’t expect a warm reception for “2” ideas within a “4” business cycle

# How do I protect my biz?



Stay away from stuff you don't want to do, don't like doing it? *you won't do it well.*

Know yourself, and your business:

- jumping from 2 to 3 is hard, but bearable
- maneuvering from 3 to 4 is really hard
- plan on when you're going to hire the change, sell out, or reboot

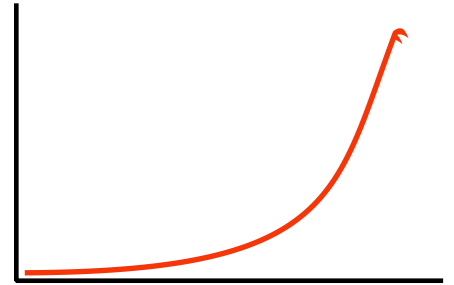
**applying what we've learned:**

**3 “oh crap” emails you will receive  
on a Tuesday night:**

***“hey, our signups just spiked,  
what should we do?”***

**You're looking at a graph like this:**

- is it exponential?
- is the start of a growth curve?
- is it cyclical?
- OMG, are we awesome?

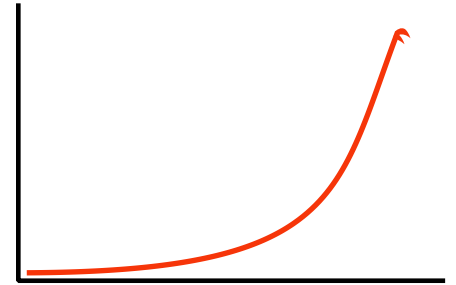


**How do you respond?**

- A) throw a party
- B) flail
- C) cower
- D) keep calm, carry on

# Keep Calm and Carry On

investigate the cause, and report



## Eliminate the obvious:

*Cyclical? check last year*

*Start of a growth curve? check your stats*

## Ignore the inconsequential:

*Exponential? lots of things look exponential*

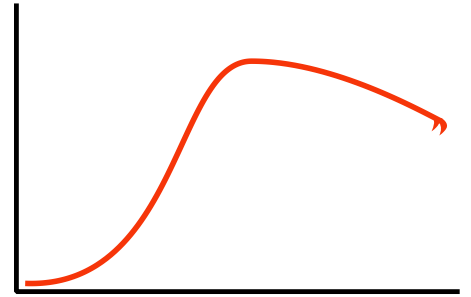
*Hype Cycle? if it was, what would you change?*

*“It’s only a difference, if it makes a difference.”*

***“for the third quarter in a row, this section of the business has had declining revenue...”***

**You're looking at a graph like this:**

- it doesn't look good.

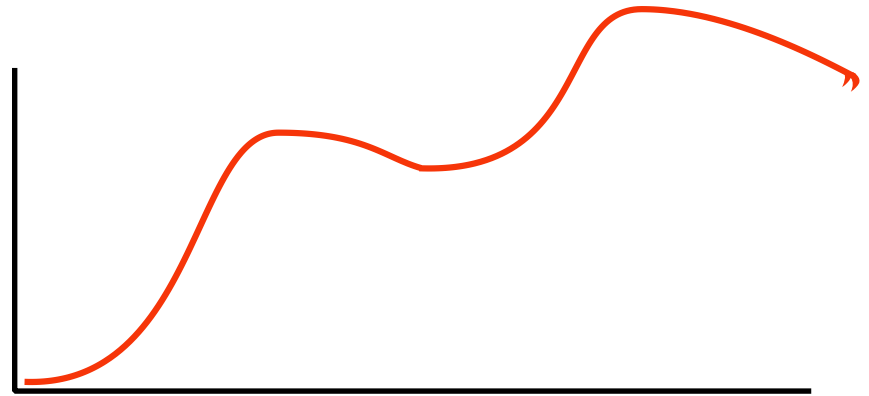


**How do you respond?**

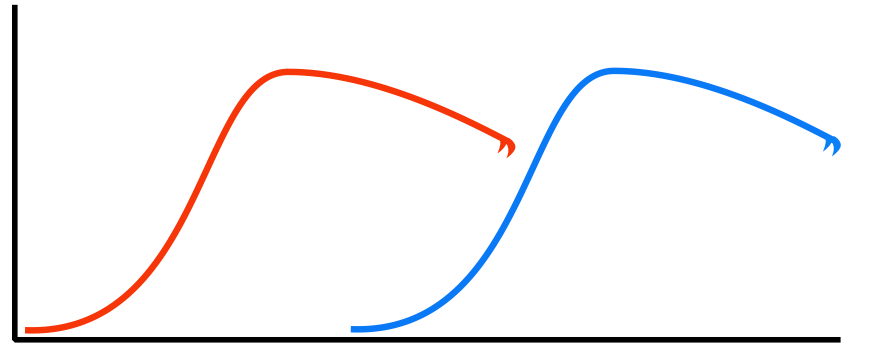
- A) add features
- B) start planning a new product
- C) cower
- D) keep calm, carry on

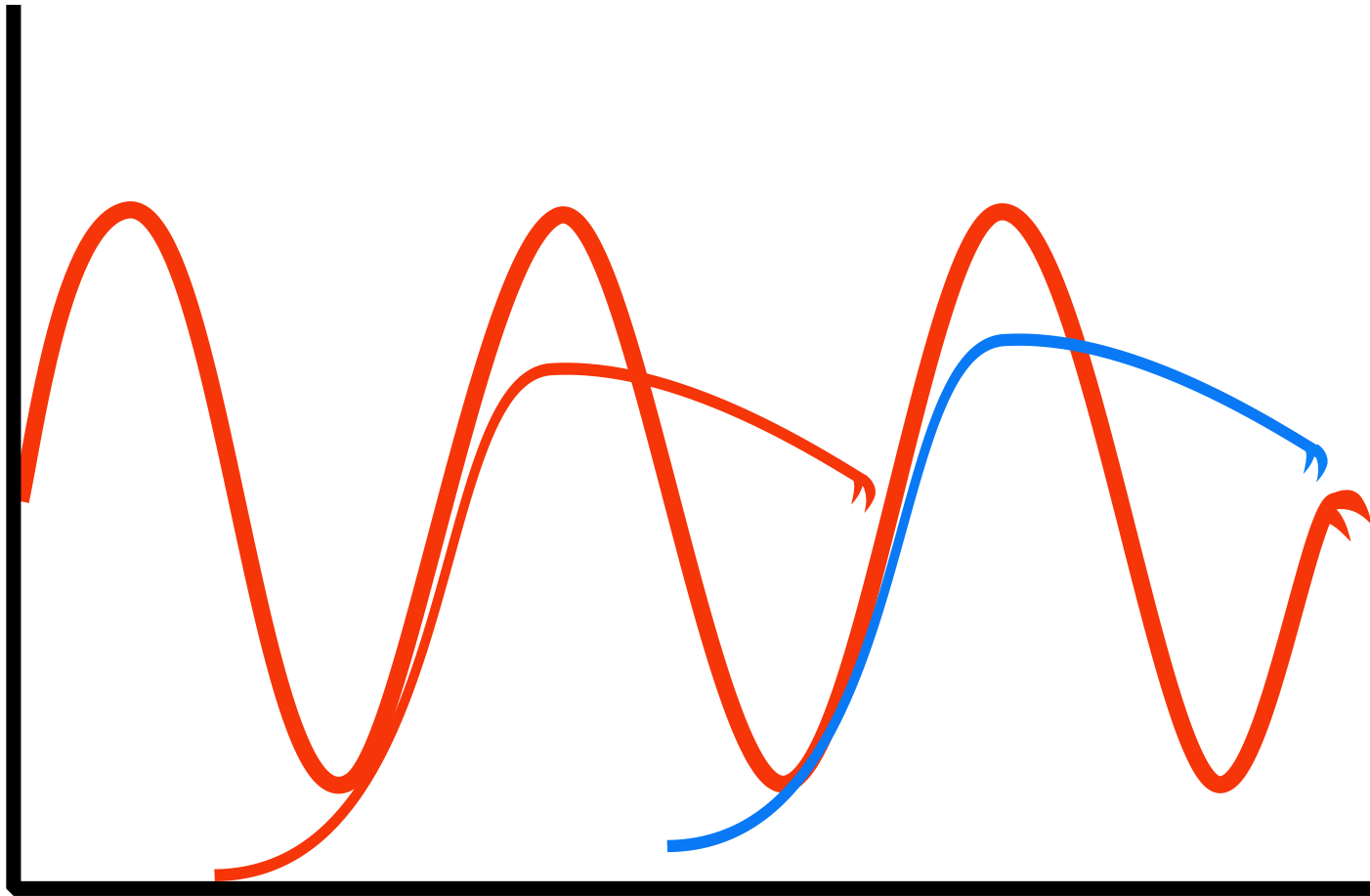
# Two main strategies:

new features



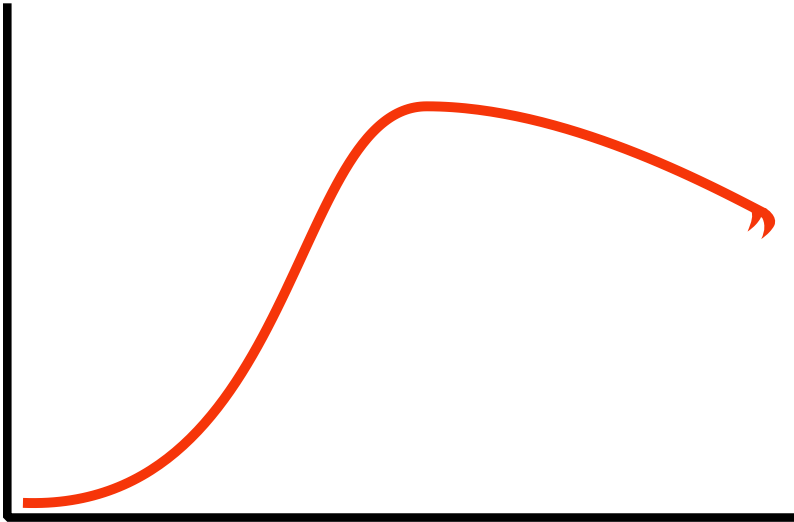
new product





**btw, are you seeing what I'm seeing?**

## Hidden Option #3: Keep Calm and Carry On \*



\* for ninjas only



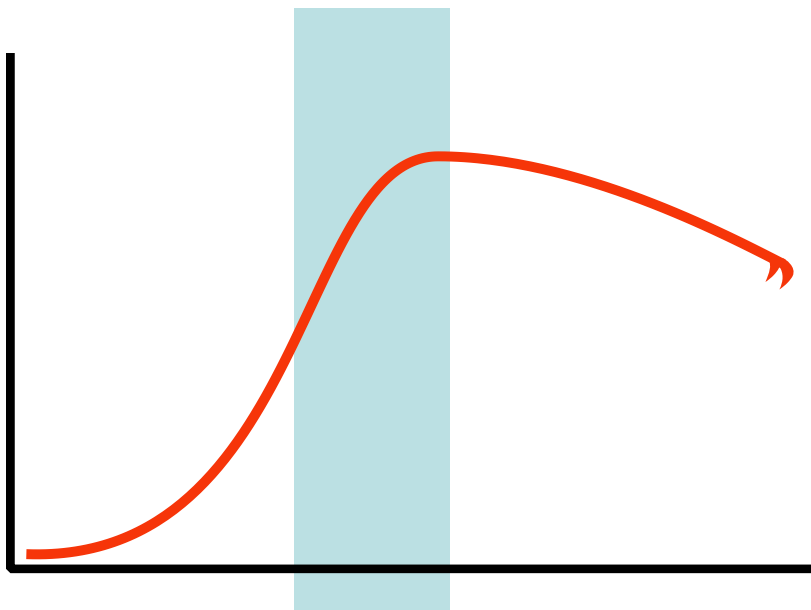
26 years, and still going



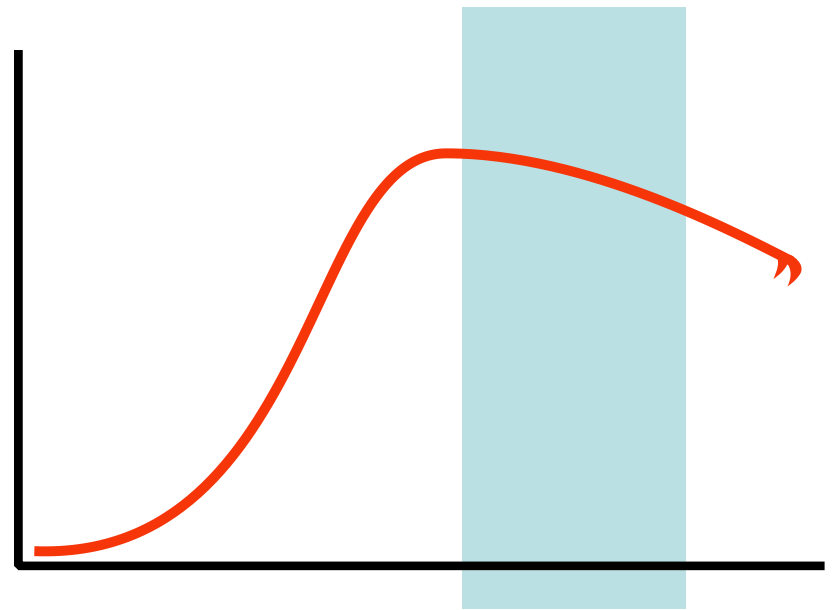
65 years of glory

***“Please welcome our new CFO  
who starts work next Monday.”***

This should make you think of two graphs:

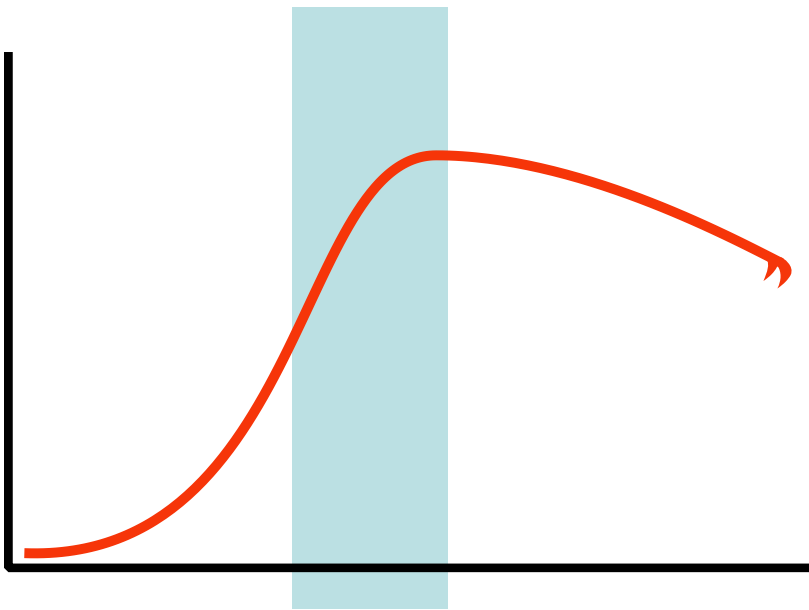


stage 3 growth

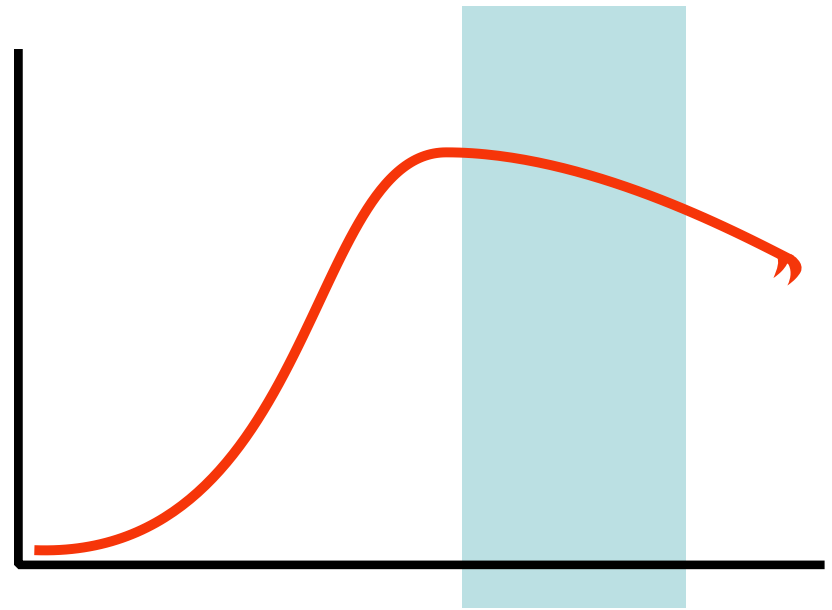


stage 4 growth

**And ask two questions:**



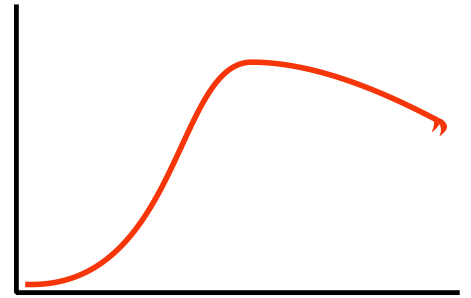
**where were they before?**



**what are they going to do here?**

## These questions are important!

- a new CFO is a non-trivial event
  - their arrival “signals” something
  - they wield a lot of power
- if you think you’re a “3” company, a new CFO might signal the transition to a “4” (you might be unhappy)
- or, it could signal the reverse
- what you do about the new CFO is entirely dependent on what they are expected to do



***and to recap:***

## Write these down:

- unbounded exponential growth is a myth
- markets saturate according to available resources
- it's perfectly normal for some things to be cyclical
- don't freak out when the hype dies down
- know your individual "number", to control your destiny

Thank you for your time.

Be safe out there,  
and remember: we're all in this together.

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presented at In2Lex, April 18<sup>th</sup>, 2011, Lexington, Kentucky

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