

Power Laws, Longtails, & Software

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Why should you **believe**
anything I say?

iMALL!



iMALL!

- \$20 million in funding in 1998



iMALL!

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- 3 to 125 employees in 18 months



iMALL!

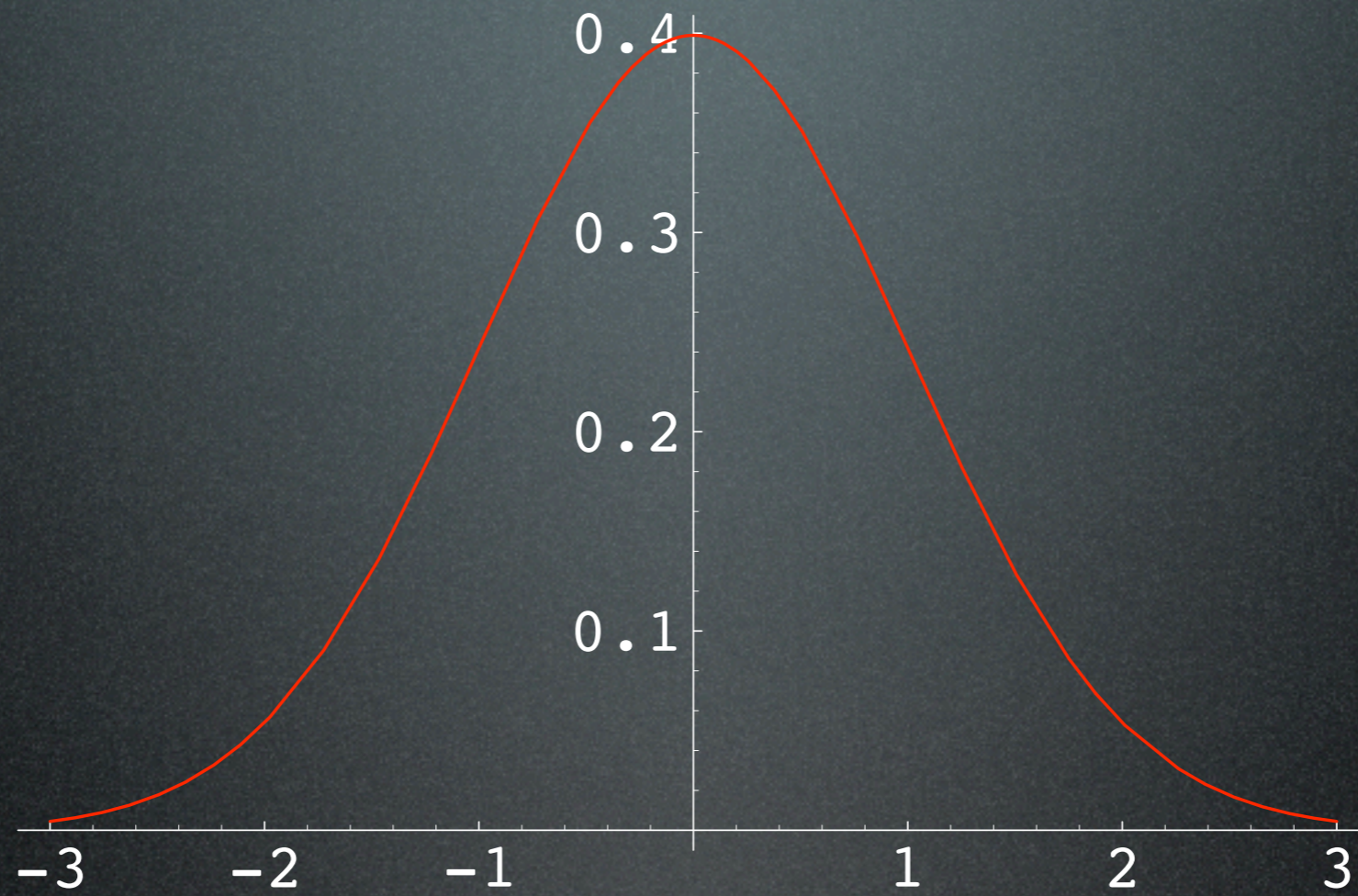
- \$20 million in funding in 1998
- 3 to 125 employees in 18 months
- Built four complete versions of our eCommerce tools

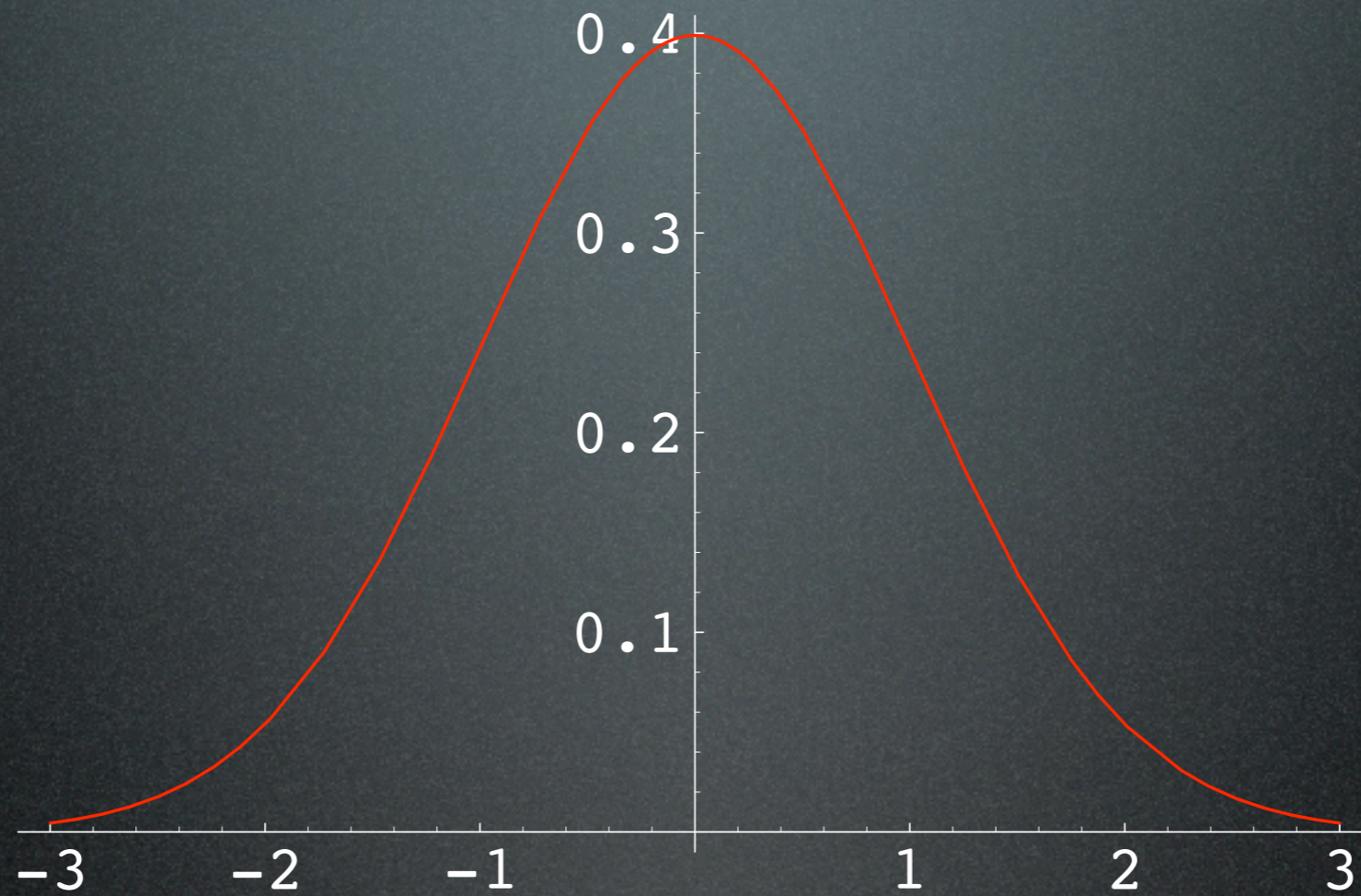


iMALL!

- \$20 million in funding in 1998
- 3 to 125 employees in 18 months
- Built four complete versions of our eCommerce tools
- Sold for \$500 million in 1999







Normal Distribution

Pretend Networks

What if we **simulate** networks by adding links at random nodes according to a **normal** distribution?

Pretend Networks

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if (avg[links/node] < 1)
then disconnected islands
else fully connected

Real Networks

Real network connection distributions follow this equation:

$$y = px^{-k}$$

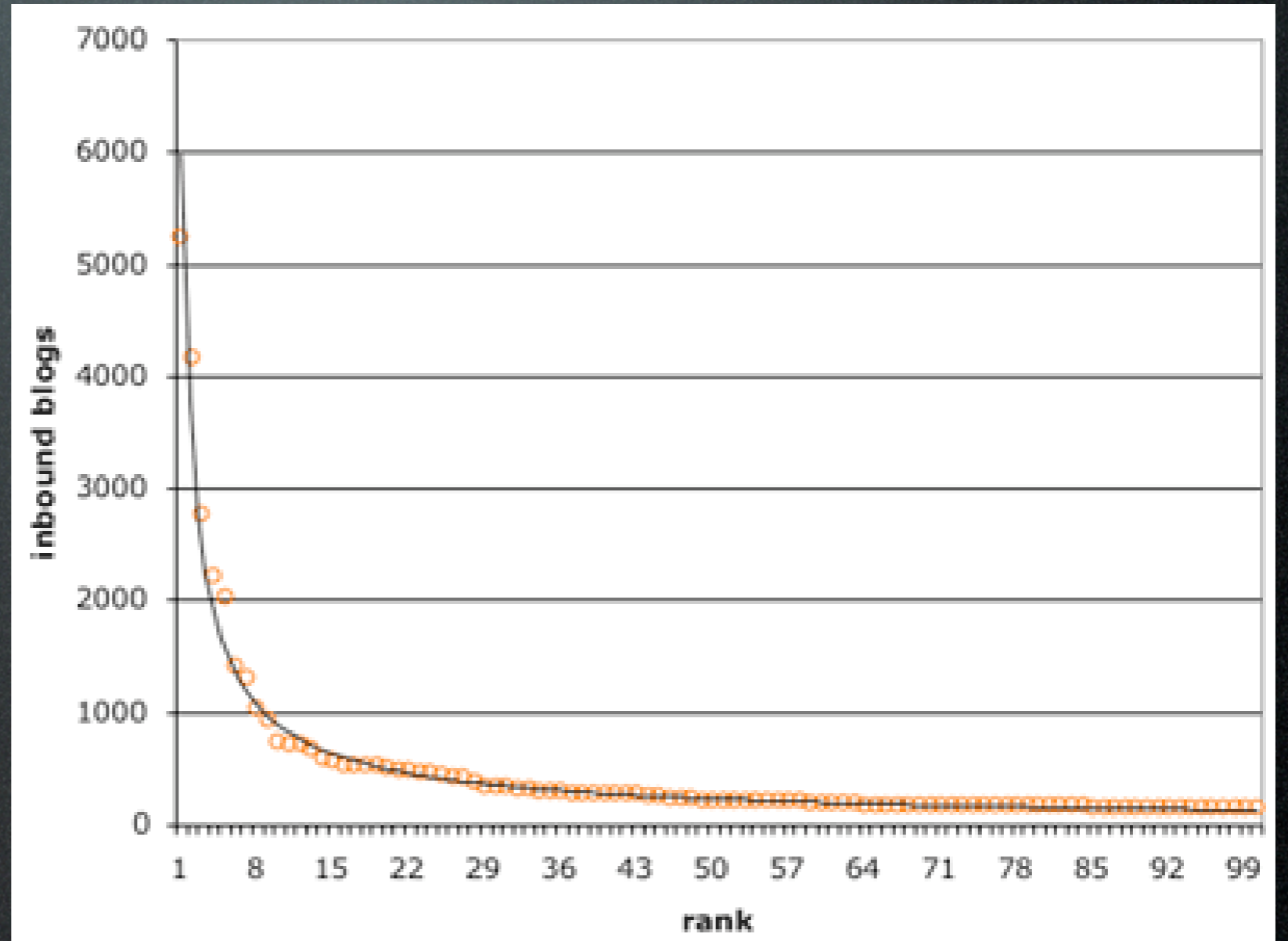
Surprise!

So do the distributions of:

- **Earthquakes** vs Richter magnitude
- **Actors** who've starred in the same films
- Journal **citations**
- **Links** between Web sites
- **Visits** to Web sites by AOL users



Clay
Shirky



Blogs



Peter Denning

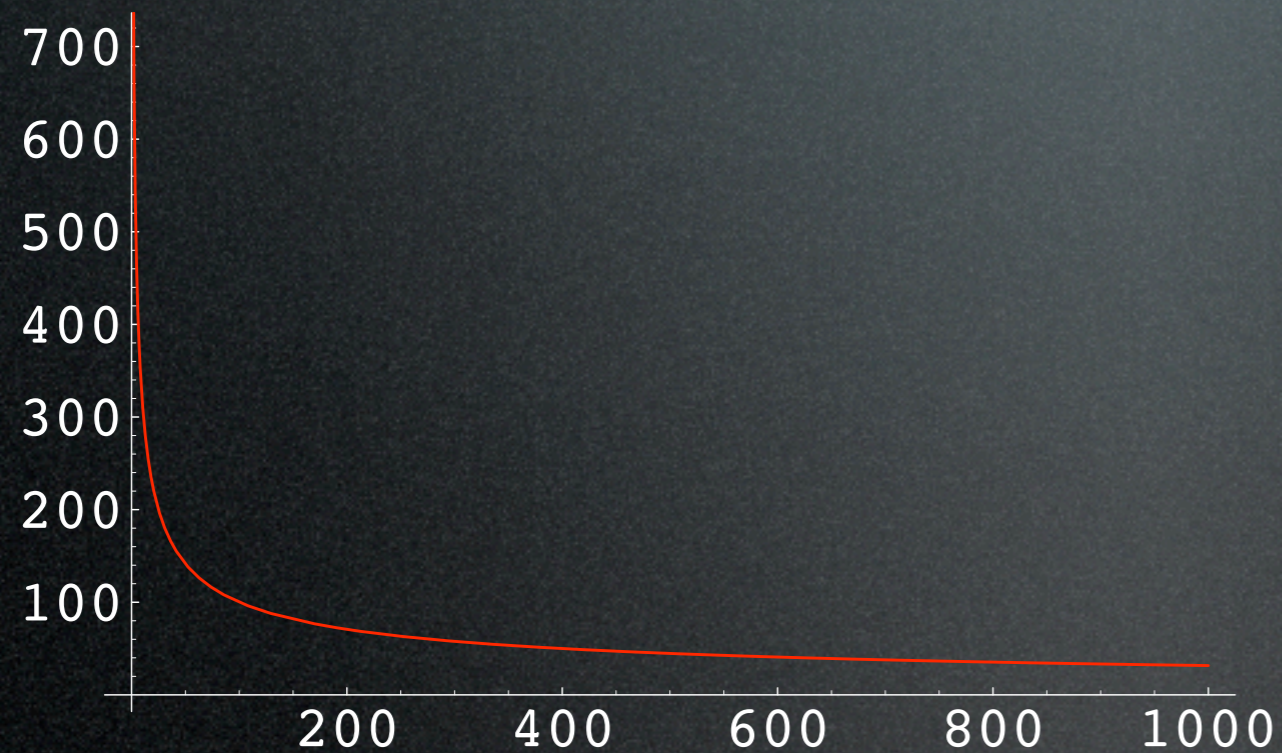
Power-law Distributions



Peter Denning

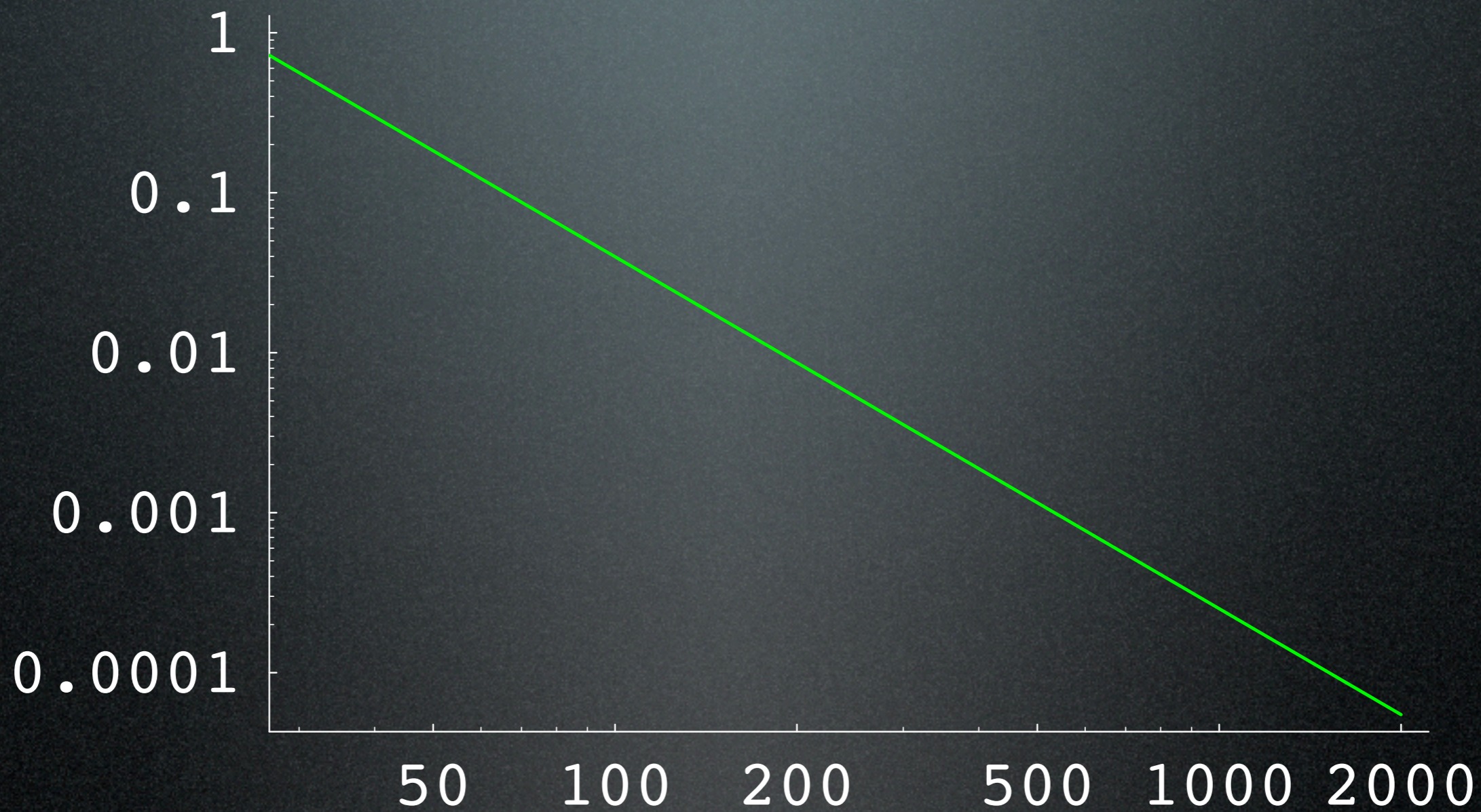
Power-law Distributions

$$k = -0.5, \alpha = 1000$$



Peter Denning

{ $k=2.2$ }



Growing Scale-Free

Two conditions:

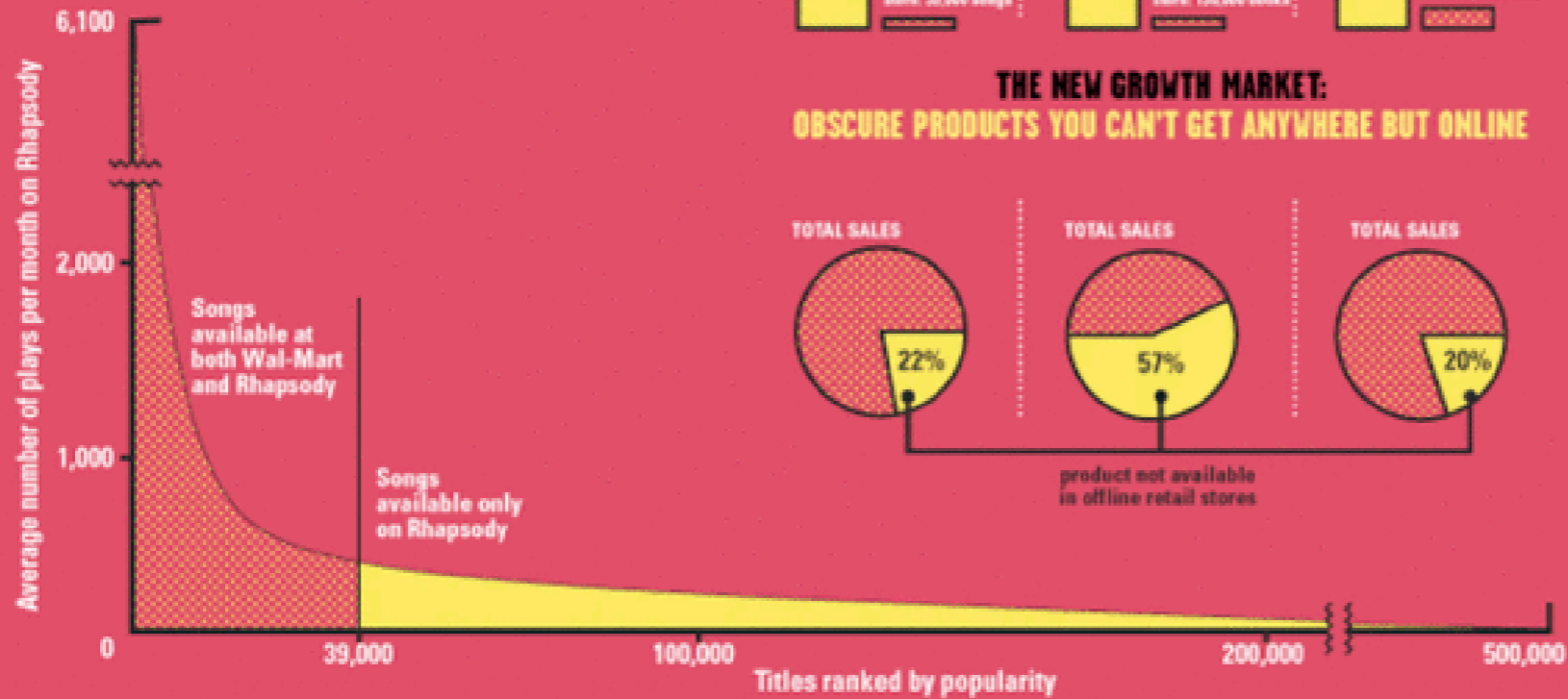
- **Growth:** New nodes appear at random times
- **Preferential connection:** probability a new node will connect with an existing node is proportional to the connectivity of that node

The Longtail



ANATOMY OF THE LONG TAIL

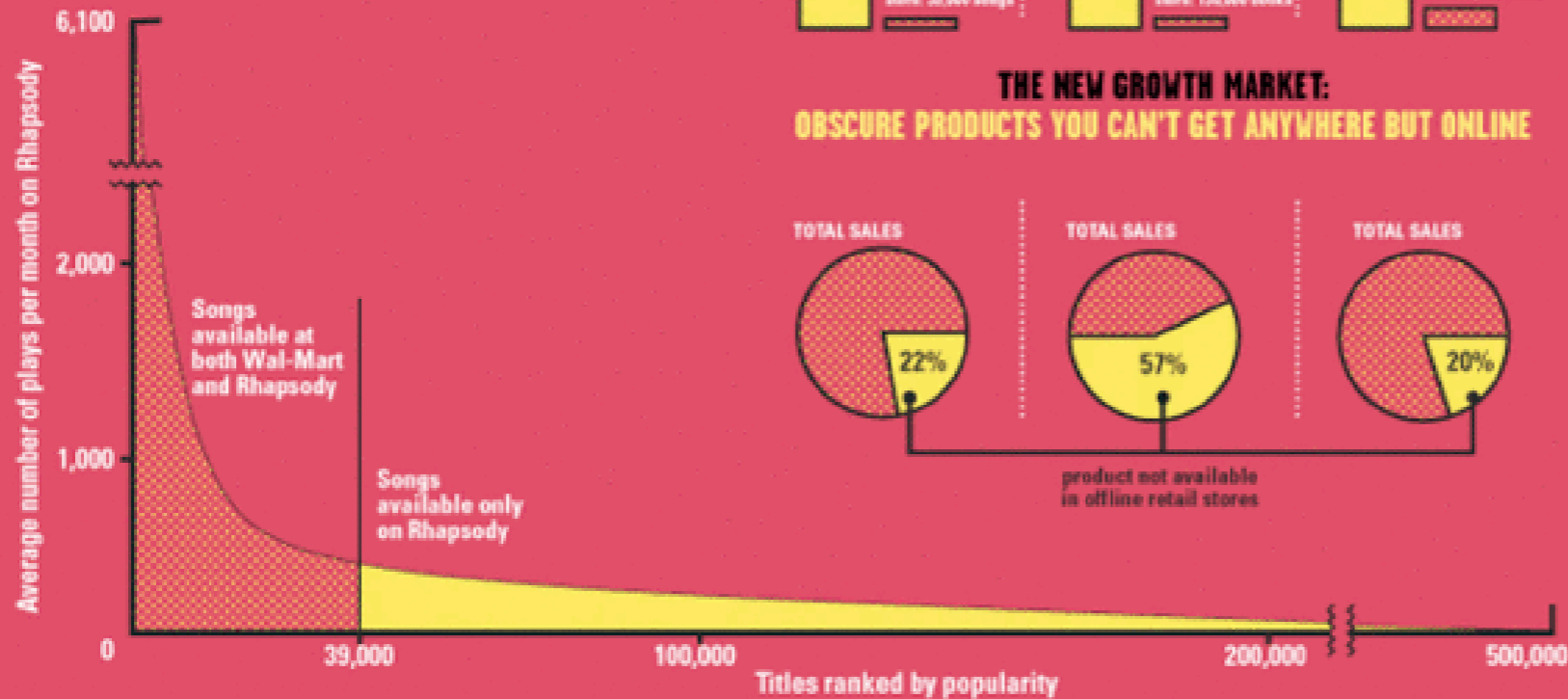
Online services carry far more inventory than traditional retailers. Rhapsody, for example, offers 19 times as many songs as Wal-Mart's stock of 39,000 tunes. The appetite for Rhapsody's more obscure tunes (charted below in yellow) makes up the so-called Long Tail. Meanwhile, even as consumers flock to mainstream books, music, and films (right), there is real demand for niche fare found only online.



Sources: Erik Brynjolfsson and Jeffrey Ho, MIT, and Michael Smith, Carnegie Mellon; Barnes & Noble; Netflix; RealNetworks

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Virtually **Free** Distribution
+ **Infinite** Shelf Space
=
New Business Models based on
Customer **Streams**

Not Just Media

- Google: advertising
- eBay: hard goods
- CapitalOne: customers
- Offshoring: services

Source: Chris Anderson

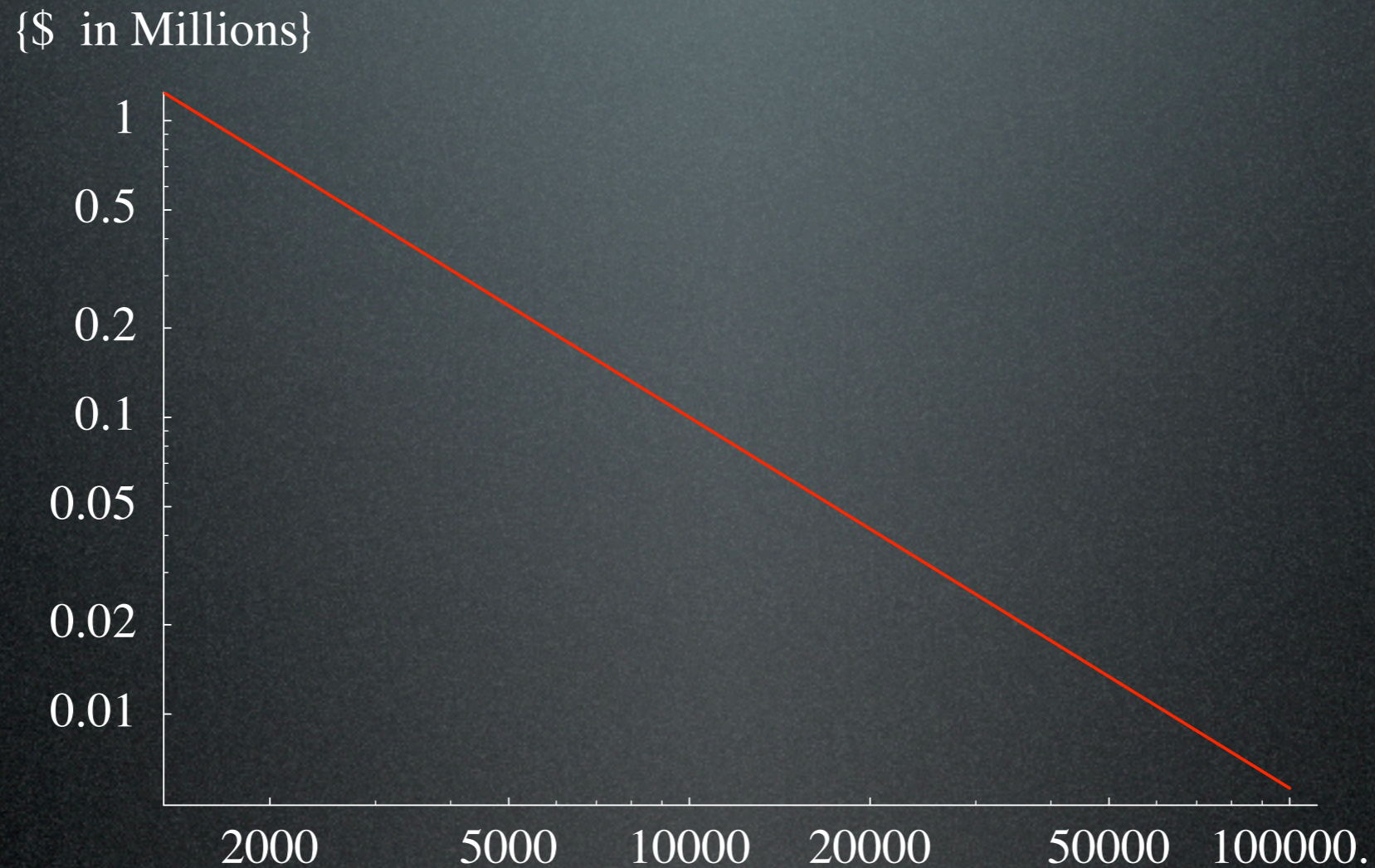
Database Licensing

Database Licensing

{ \$ in Millions }



Database Licensing



An Alternate View

Exploiting the Longtail

Exploiting the Longtail

1. **Hire** 1000 Consultants

Exploiting the Longtail

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2. **Build tools** and sell them to 1000 consultants

Exploiting the Longtail

1. **Hire** 1000 Consultants
2. **Build tools** and sell them to 1000 consultants
3. Create a **self-service** system

Exploiting the Longtail

	Email	Web Design
Consultants	Lotus, Groupwise	US Web
Build Tools	Eudora, Microsoft	LAMP
Self-service	Hotmail, GMail	Wikis, Blogs

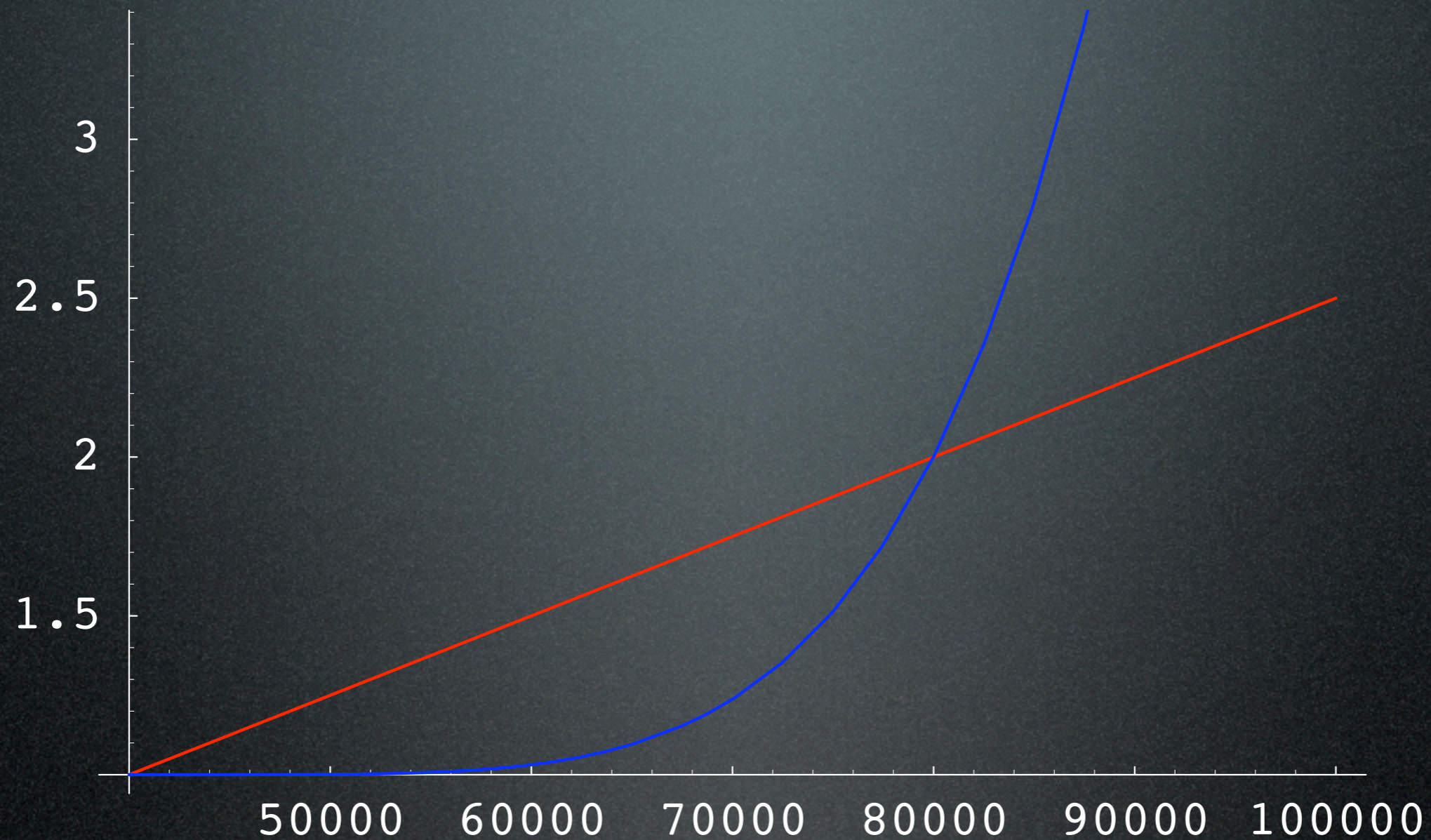
JotSpot

The screenshot shows the JotSpot Recruiting application interface. At the top, there is a header with the title "Recruiting" and a navigation menu with links for "Home", "All Prospects", "All Companies", "TalentSearch", "Show all Searches", and "Recruiters". Below the navigation menu, there is a form to "Add new prospect" with a text input field and a "Create" button. The main content area is titled "Open Searches" and contains a table with the following data:

ID #	Position	Status	Age	Search Start Date	Location	Recruiting Firm	
Search0	Manager Marketing HP	Open	20 day(s)	9/16/2004 12:00AM	Palo Alto, CA	KornFerry	G/c
Search1	Manager Marketing Red Hat	Open	9 day(s)	9/27/2004 12:00AM	Raleigh NC	HeidrickStrovetz	Jar
Search2	CEO Coca-Cola	Open	138 day(s)	5/21/2004 12:00AM	Atlanta, GA	SpencerStuartInc	Da

Below the table, there is a section titled "Recently Updated Prospects".

Exploiting the Longtail of Web Applications

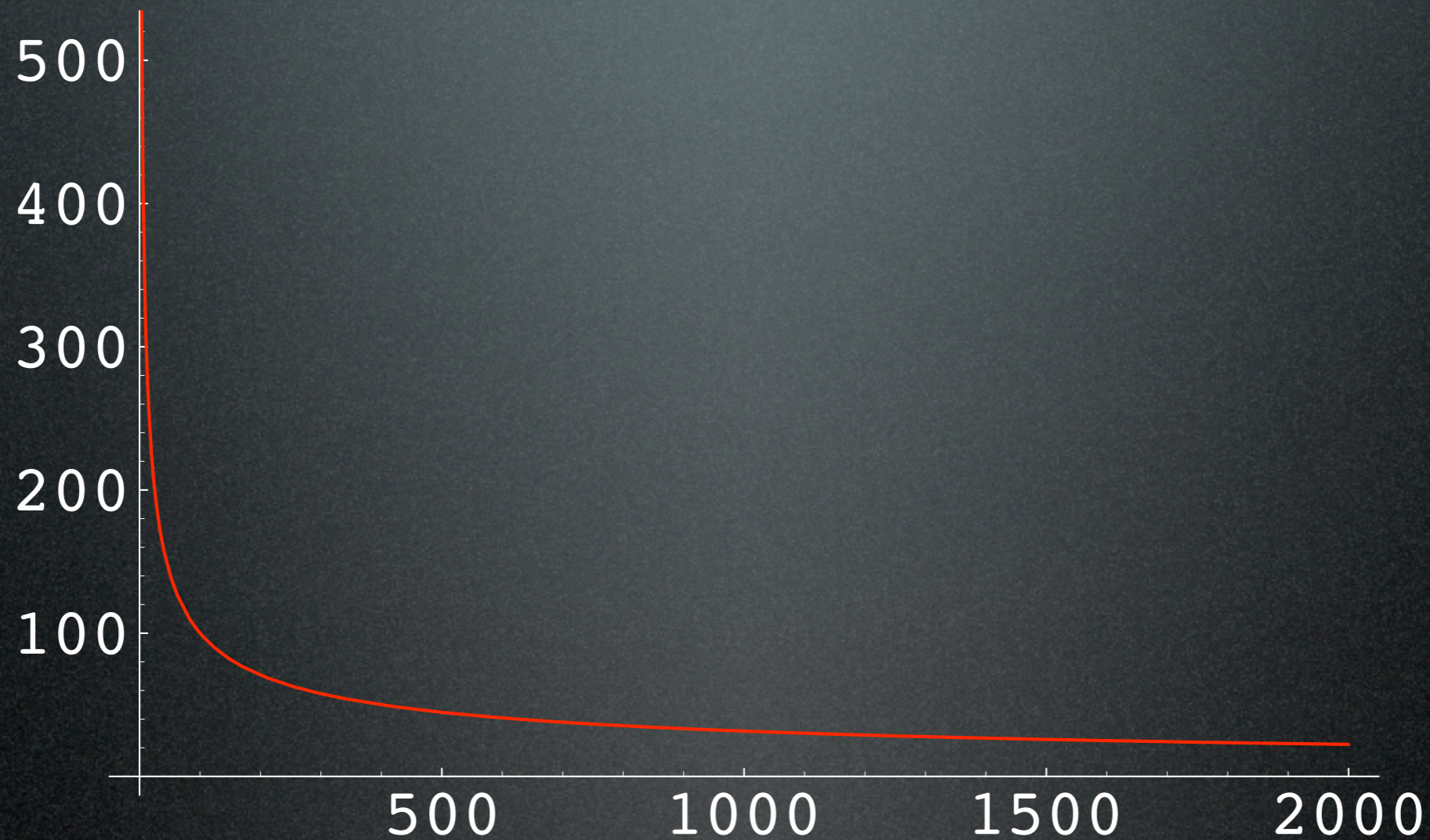


Your best programmer is **40 times** as effective as your worst

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An Alternate View

$\{k = -0.5, p = 1000\}$

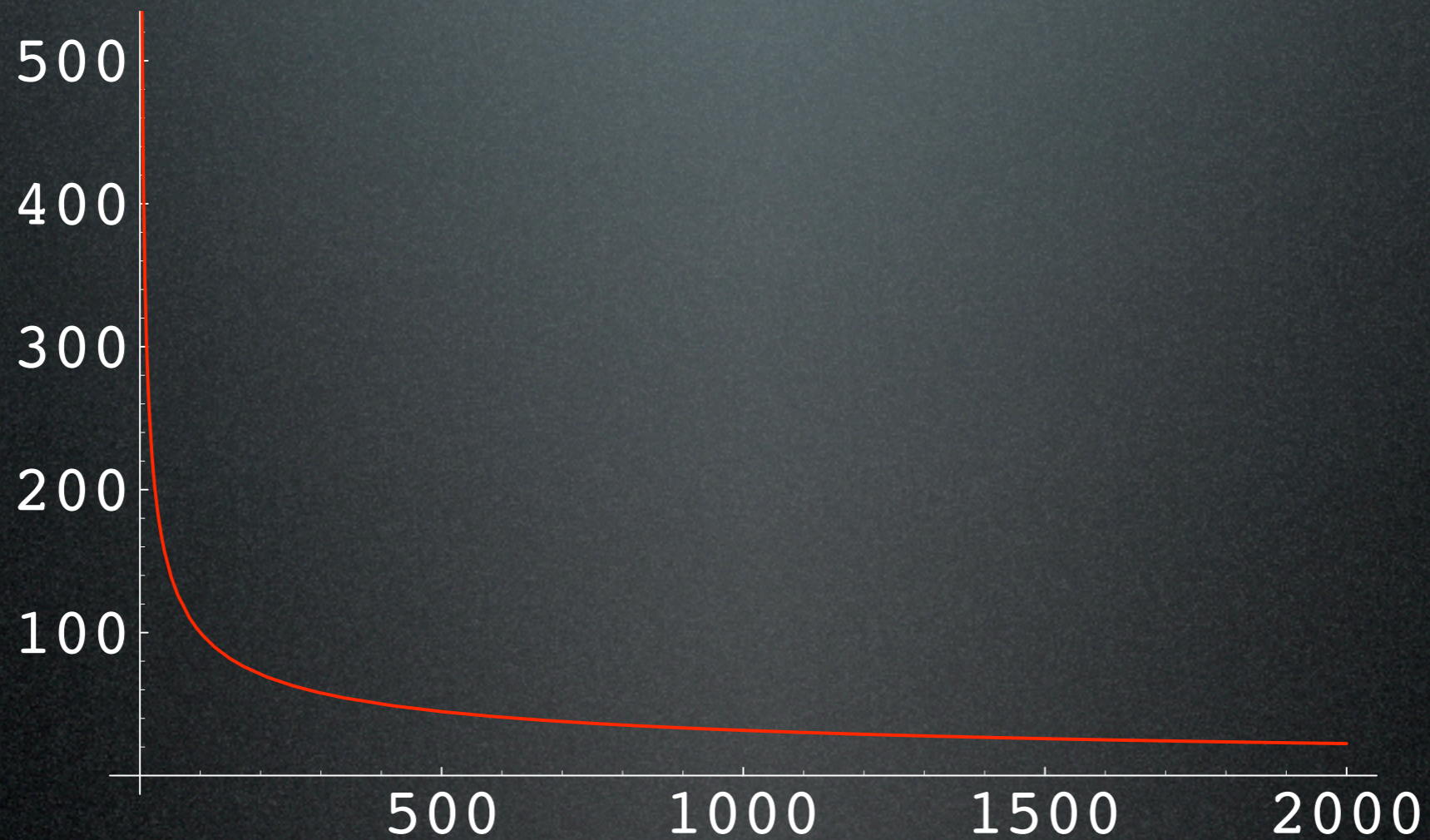


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Programming Projects

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$\{k = -0.5, p = 1000\}$

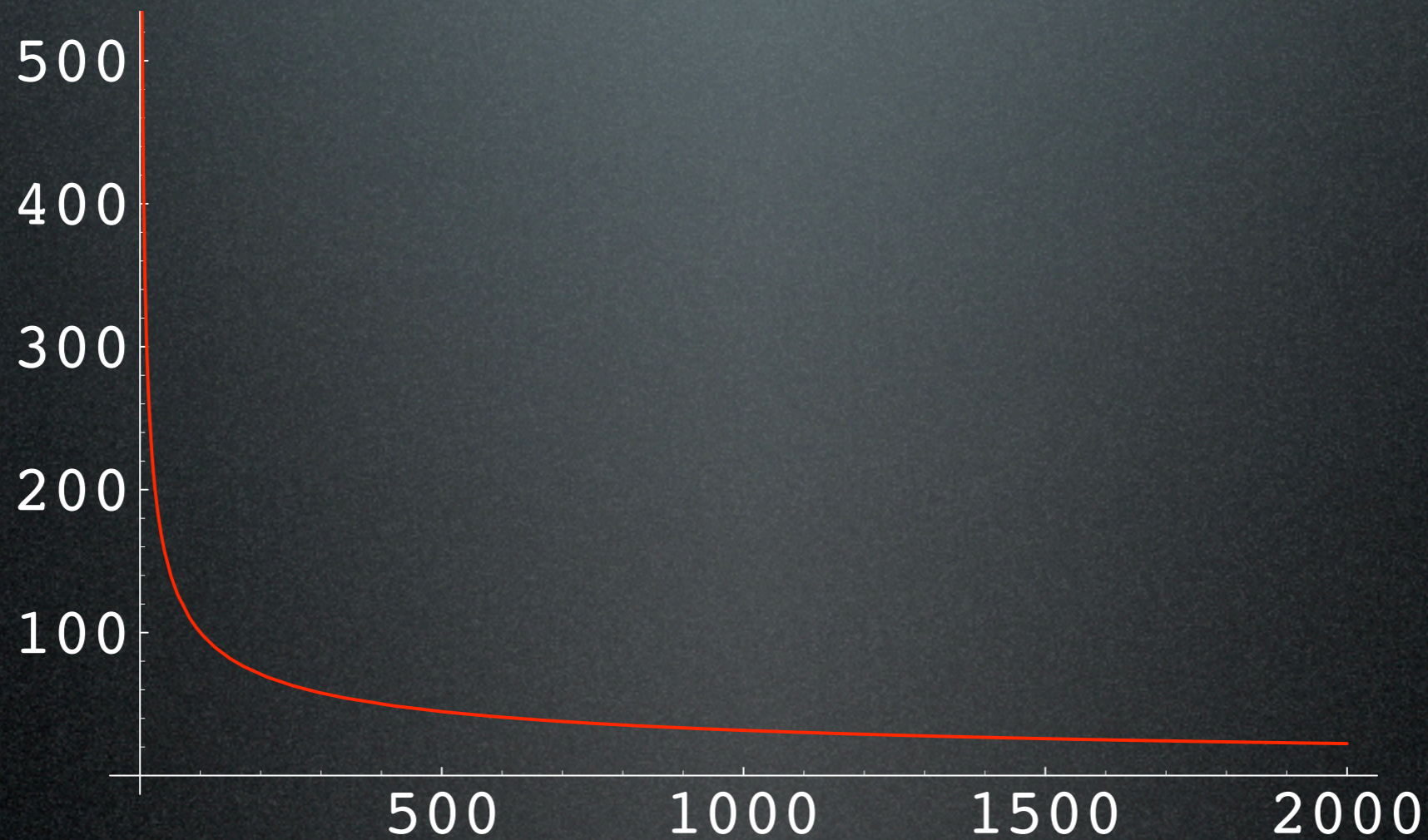


Utah High Tech Employees

2500 High Tech Firms in Utah

Utah High Tech Employees

$$\{k = -0.5, p = 1000\}$$



2500 High Tech Firms in Utah

Big Programming



SUN CERTIFICATION

Mihal Badjonski

HAS FULFILLED ALL REQUIREMENTS AS A
SUN CERTIFIED PROGRAMMER
FOR THE JAVA™ 2 PLATFORM

On May 17, 2001

A handwritten signature in black ink, appearing to be "SM", positioned above a horizontal line.

Scott McNealy, President, Chairman, and CEO of Sun Microsystems, Inc.

A handwritten signature in black ink, appearing to be "Bill Richardson", positioned above a horizontal line.

Bill Richardson, Vice President and General Manager of Sun Educational Services



Big Programming

Java is a language for accreting
programs as a series of patches
-Paul Graham

Think of your favorite language...

Think of your favorite language...

Is your language better than machine language?

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Is it better than Cobol?

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Why?

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Why?

Abstractions yield power!

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Follow this argument to its logical conclusion...

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Is your language better than machine language?

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Why?

Abstractions yield power!

Follow this argument to its logical conclusion...

One language must be more powerful than the rest.

Lisp

Lisp

(or Ruby, Python, Perl, PHP)

You don't have to believe me...

You don't have to believe me...

In fact, I hope you don't.

Some advice...

Don't be **afraid** to work
for small companies

Don't confuse your job
with your career

Exploit
longtail
opportunities

Build a
self-service,
hosted
product

Two pizza teams

Manage programming debt

Release *early* and *often*

Don't give up your
advantages easily

Choose the most **powerful**
language you can

The End

Questions?

Contact me:

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phil@windley.org

www.windley.com

