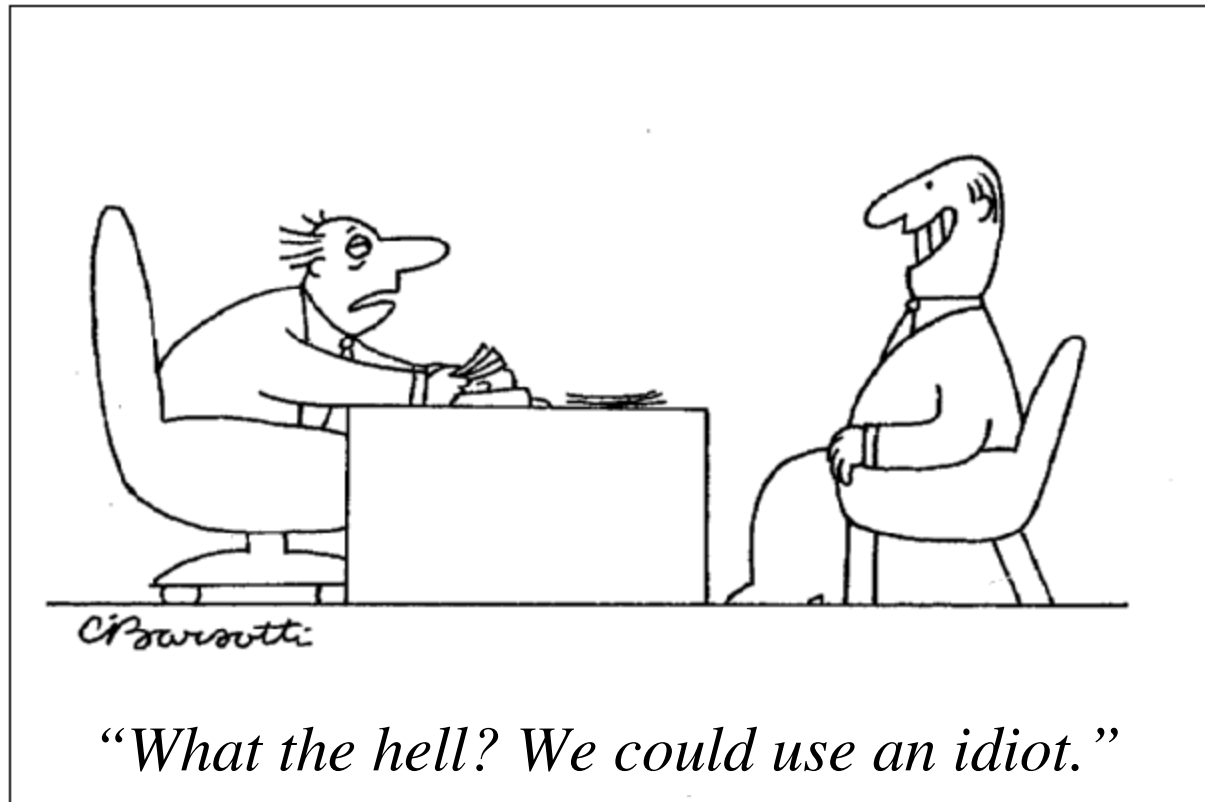


# Capacity Planning & Performance for Web-based Services



by Bill Greenbaum, CSM  
for NYCSPIN, May 11, 2010

# 2010 Greenbaum Survey of Capacity Planning

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Google "computer capacity planning"  [Advanced Search](#)

Web [+ Show options...](#) Results 1 - 10 of about **283,000** for "computer capacity planning".

Google "computer performance"  [Advanced Search](#)

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# 4 Questions of Capacity Planning

1. What it is?
2. Why is it important to me?
3. Who does it?
4. How to do it?

# What is Capacity?

- **Capacity:** how much traffic can your system handle before crashing?
  - *Throughput:* count of requests per period (TPM)
  - *Concurrency:* how many simultaneous requests

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Contrasts with:

- **Performance** = average response time (sec/req)
- **Redundancy** = capacity reserved for business continuity

# What is Capacity Planning?

- **Capacity Planning is good management.**
  - Proactive
  - A form of risk management
  - Ensures competitiveness & profitability

*...contrasts with*

- **Firefighting** = fixing issues that already have customer impact

# Capacity contrast with Performance

- **Capacity** = throughput (TPM)
- **Performance** = average response time (sec/req)

	<b>Searches in Billions</b>		
<b><u>Market</u></b>	<b><u>Dec 2008</u></b>	<b><u>Dec 2009</u></b>	<b><u>% Change</u></b>
<b>Worldwide</b>	<b>89.7</b>	<b>131.4</b>	<b>46%</b>
Google sites	55.6	<b>87.8</b>	58%
Yahoo! sites	8.4	<b>9.4</b>	13%
Baidu.com Inc	8.0	<b>8.5</b>	7%
Microsoft sites	2.4	<b>4.1</b>	70%
eBay	1.3	<b>2.1</b>	58%
NHN Corp	1.9	<b>2.1</b>	9%
Yandex	1.0	<b>1.9</b>	91%
Facebook	1.1	<b>1.6</b>	54%
Ask Network	1.0	<b>1.5</b>	43%
Alibaba.com Corp	1.1	<b>1.1</b>	-1%

*Source: comScore*

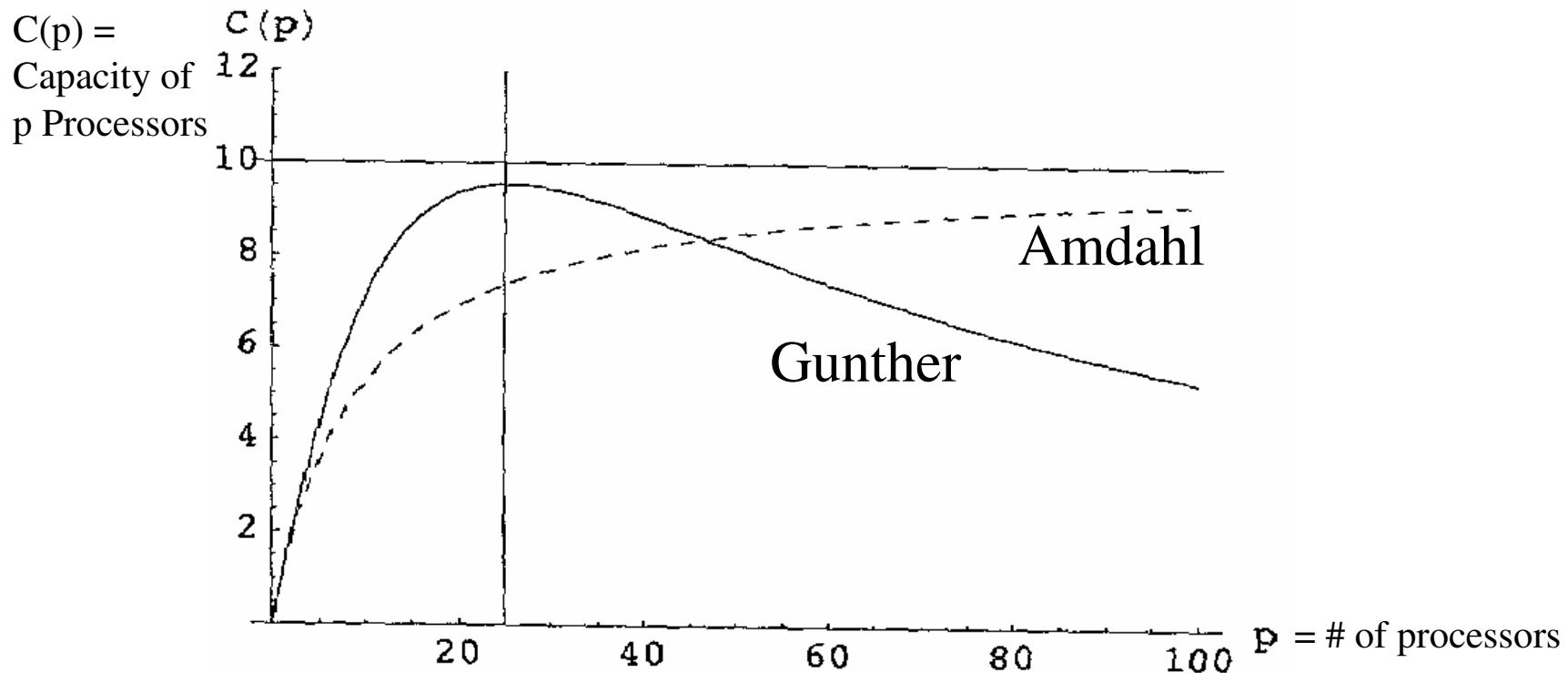


# Who Does Capacity Planning?

- **Capacity Planner** guides others thru the process, does toughest analysis, crafts proposal.
- **Technical Project Managers** are the glue
- **Business Owners** provide critical projections
- **Application Developers**
- **System Developers**
- **Architecture/Hardware Resource** team
- **Database Admins**
- **Disk Storage Admins**
- **Network Admins**
- **QA** validates & does load tests

# How (a): Capacity Planning Theory

- Amdahl Scalability Model, 1967
- Gunther Universal Scalability Model, 2000



# How (b): Practice

- Obtain Business projections (VoC)
- Model business projections into peak throughput and concurrency
- Load test / Stress test.
- Follow the data to find bottlenecks
- Monitor traffic and look for trends
- Work with lead-time for procurement

## How (c ): “Follow the data”

- Weak: “+11% YOY, -2% MOM”
- Moderate: Regression lines
- Strong: Control charts include variation in data

# Capacity Planning: Example

# Further reading

- *The Art of Capacity Planning*, by John Allspaw, 2008, (O'Reilly Media)
- *Performance by Design*, 2006, Daniel Menasce & Virgilio Almeida, 2004, (Prentice Hall)
- *Building Scalable Web Sites*, by Cal Henderson, 2006 (O'Reilly Media)
- *Guerrilla Capacity Planning*, by Neil J. Gunther, 2007 (Springer)

Back to  
you,  
Olly!