

The slide features a light blue header with three stylized human figures (two yellow, one blue) in the top right corner. The main content is centered in blue text. The title is 'Software Development Challenges for the 21<sup>st</sup> Century'. Below it is the author's name 'Steven Teleki' and his titles: 'Vice President, Software Engineering, Y&L Consulting, Inc.' and 'Chairman, IEEE Computer Society, Austin Chapter'. A small grey human figure icon is in the bottom right corner. A copyright notice '© 2004 Y&L Consulting, Inc. All Rights Reserved.' is at the bottom center.

**Software Development  
Challenges  
for the  
21<sup>st</sup> Century**

**Steven Teleki**  
Vice President, Software Engineering, Y&L Consulting, Inc.  
Chairman, IEEE Computer Society, Austin Chapter

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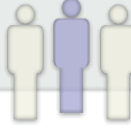
**THE GOAL TODAY!**

**To challenge your thinking!**

*“We cannot solve the problems  
that we have created at the level  
of thinking that we have created  
them.”*

Albert Einstein


**A Strategy for the 21<sup>st</sup> Century**



1. The Century of the Knowledge Workers
2. What is Performance?
3. “Honey, I shrunk the world!”

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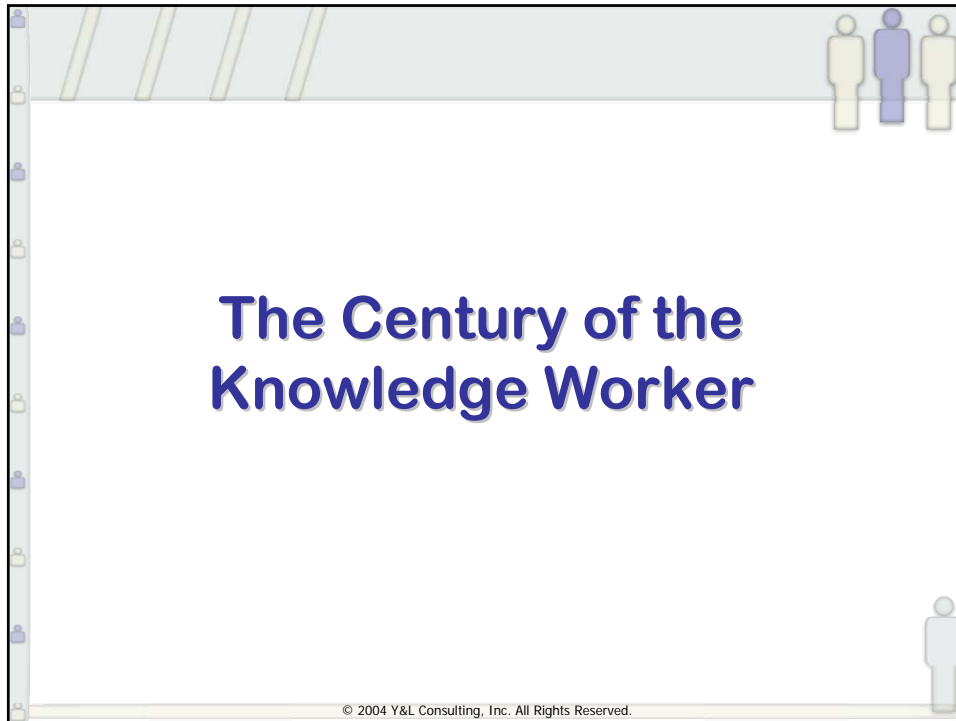


## **A Word From The Weary**

***“You can be sure our plan was perfect. It’s just our assumptions were wrong.”***

**Ken Olsen**

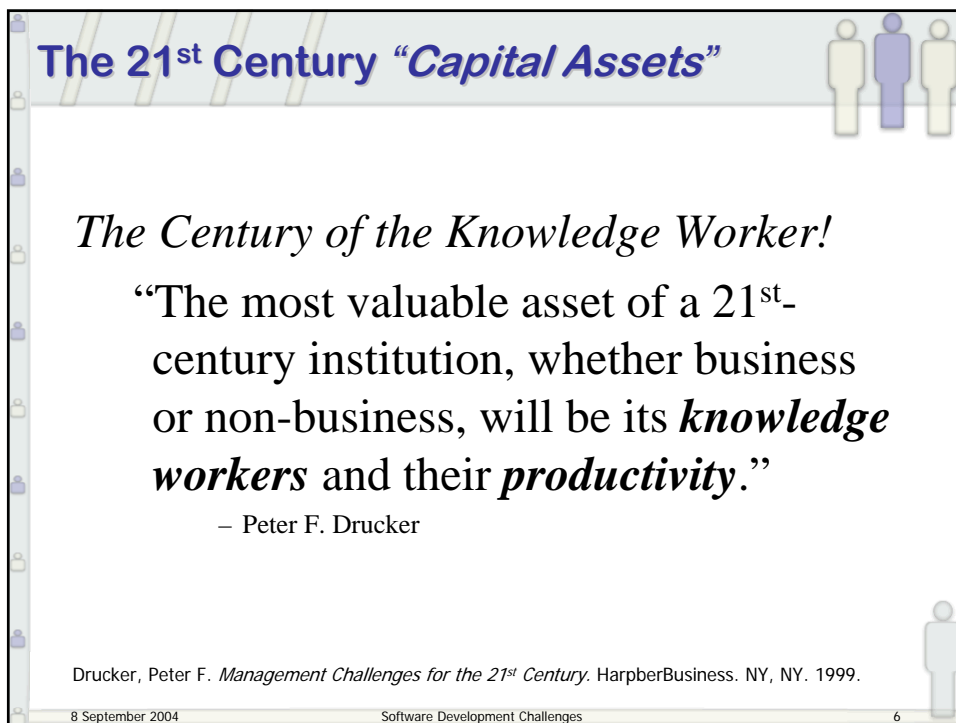
Founder & CEO  
DEC (for 35 years)  
1991



The Century of the Knowledge Worker

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This slide features a decorative header with a light blue background and diagonal lines, containing three stylized human figures (two yellow, one purple). The main content area is white with the title 'The Century of the Knowledge Worker' in a large, bold, blue font. The footer is a light blue bar with a small grey figure icon on the right and the copyright notice '© 2004 Y&L Consulting, Inc. All Rights Reserved.' in the center.



The 21<sup>st</sup> Century *“Capital Assets”*

*The Century of the Knowledge Worker!*

“The most valuable asset of a 21<sup>st</sup>-century institution, whether business or non-business, will be its *knowledge workers* and their *productivity*.”

– Peter F. Drucker

Drucker, Peter F. *Management Challenges for the 21<sup>st</sup> Century*. HarperBusiness. NY, NY. 1999.

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This slide features a decorative header with a light blue background and diagonal lines, containing three stylized human figures (two yellow, one purple). The main content area is white with the title 'The 21<sup>st</sup> Century “Capital Assets”' in a blue font. Below the title is a quote in italics: 'The Century of the Knowledge Worker!' followed by a larger quote: '“The most valuable asset of a 21<sup>st</sup>-century institution, whether business or non-business, will be its *knowledge workers* and their *productivity*.”'. The quote is attributed to '– Peter F. Drucker'. Below the quote is a reference: 'Drucker, Peter F. *Management Challenges for the 21<sup>st</sup> Century*. HarperBusiness. NY, NY. 1999.'. The footer is a light blue bar with the date '8 September 2004', the title 'Software Development Challenges', and the page number '6'. A small grey figure icon is on the right, and the copyright notice '© 2004 Y&L Consulting, Inc. All Rights Reserved.' is on the right side of the slide.

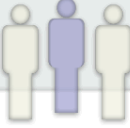
**“From the neck down...”**

“It wasn’t that long ago that we referred to the workers at my father’s factory as ‘hands’.”

“They hired me from the neck down.”

Senge, Peter. *The Fifth Discipline*. Currency Doubleday. New York, NY. 1990.

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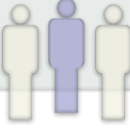
**Cost vs. Assets**

“Economic theory and most business practice sees manual workers as a *cost*. To be productive, knowledge workers must be considered a *capital asset*.”

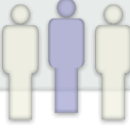
“*Costs* need to be controlled and reduced. *Assets* need to be made to **grow**.”

Drucker, Peter F. *Management Challenges for the 21<sup>st</sup> Century*. HarperBusiness. NY, NY. 1999.

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### “Orphans Preferred”



*“Wanted: Young, skinny, wiry fellows not over 18. Must be expert riders willing to risk death daily. Orphans preferred. Wages \$25 per week.”*

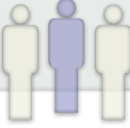
– Pony Express advertisement, 1860.

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McConnell, Steve. *After the Gold Rush*. Microsoft Press. 1999.

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### Anything changed in over 140 years?



*“We realize the skills, intellect and personality we seek are rare, and our compensation plan reflects that. In return we expect **TOTAL AND ABSOLUTE COMMITMENT** to project success—overcoming all obstacles to create applications on time and within budget.”*

– Software Developer Advertisement, Seattle Times, 1995.

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McConnell, Steve. *After the Gold Rush*. Microsoft Press. 1999.

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**Plant seeds, harvest when ready...**

“In every human activity, the *Law of the Farm* governs.”

“There is no cramming on the farm.”

Covey, Stephen R. *First Things First*. Free Press. 1996.

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**“The Law of the Farm governs...”**

performance

time

Learning Starts

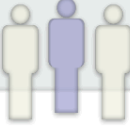
Learning is Complete

The “Silver Bullet” Syndrome

Don't Quit Here!

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**“I’m a fast learner...”**




**Crawl, walk, run!**  
*An accomplished walker doesn’t think about the mechanics of the steps anymore.*

**Learning Dilemma**  
*We learn best from experience but we never directly experience the consequences of many of our most important decisions.*

Senge, Peter. *The Fifth Discipline*. Pg. 23. Currency Doubleday. New York, NY. 1990.

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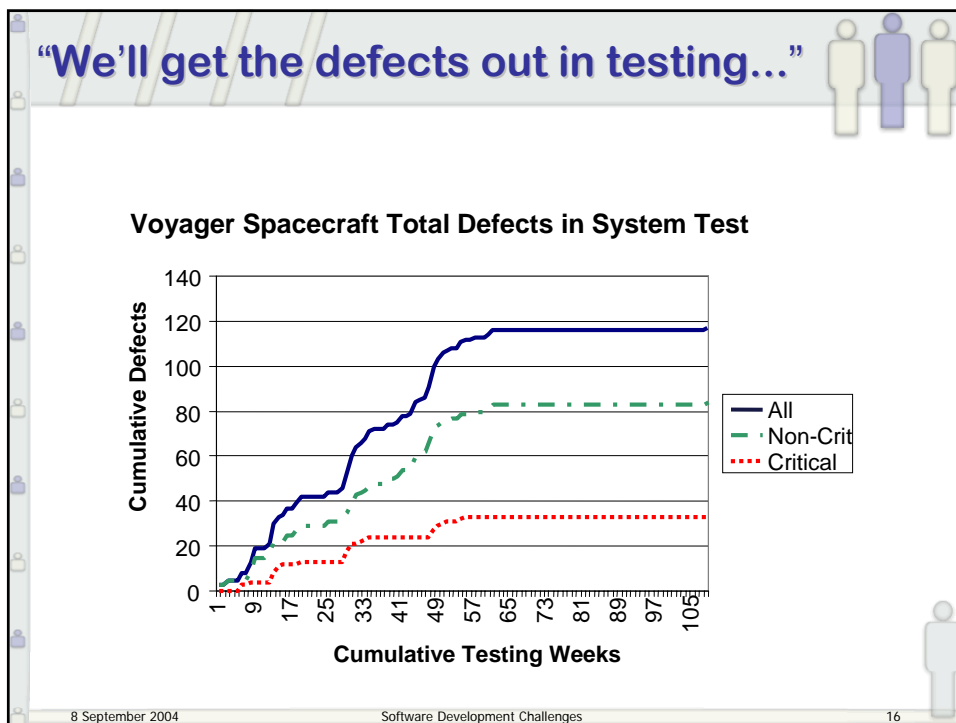
## What does it mean: “To Know?”

- **0<sup>th</sup> Order of Ignorance: Lack of Ignorance.** You know.
- **1<sup>st</sup> Order of Ignorance: Lack of knowledge.** You know the question. Uncertainty.
- **2<sup>nd</sup> Order of Ignorance: Lack of awareness.** This is a real problem: not only you don’t know the answer, you don’t even know what the question is. Ambiguity.
- **3<sup>rd</sup> Order of Ignorance: Lack of process.** You don’t have a process to find out what it is that you don’t know.
- **4<sup>th</sup> Order of Ignorance: Meta Ignorance.** You don’t know about the orders of ignorance. You are past this. 😊

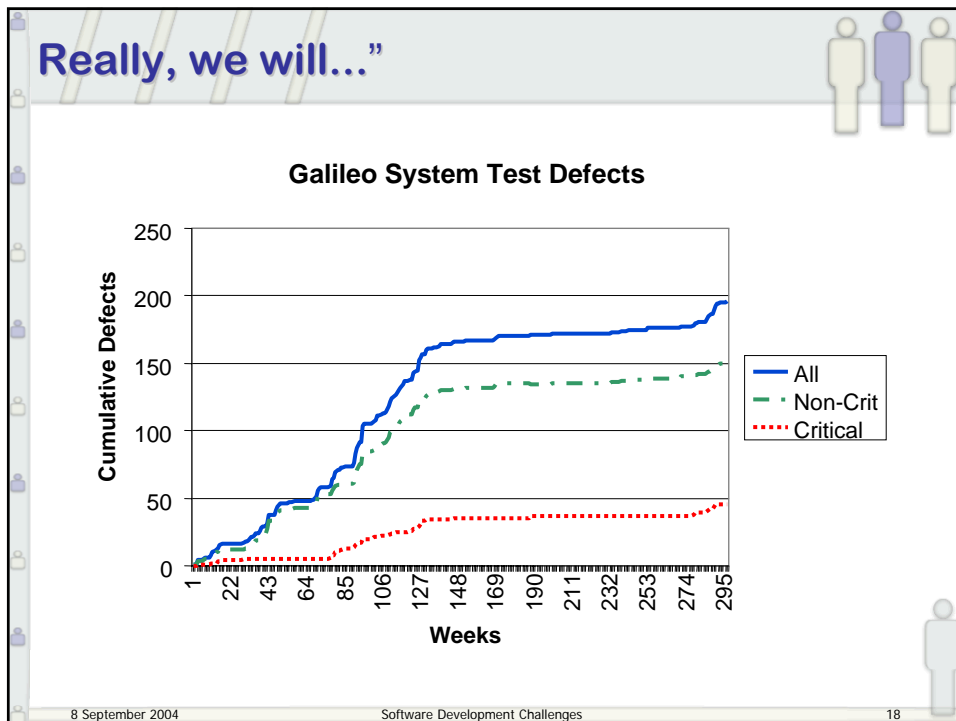
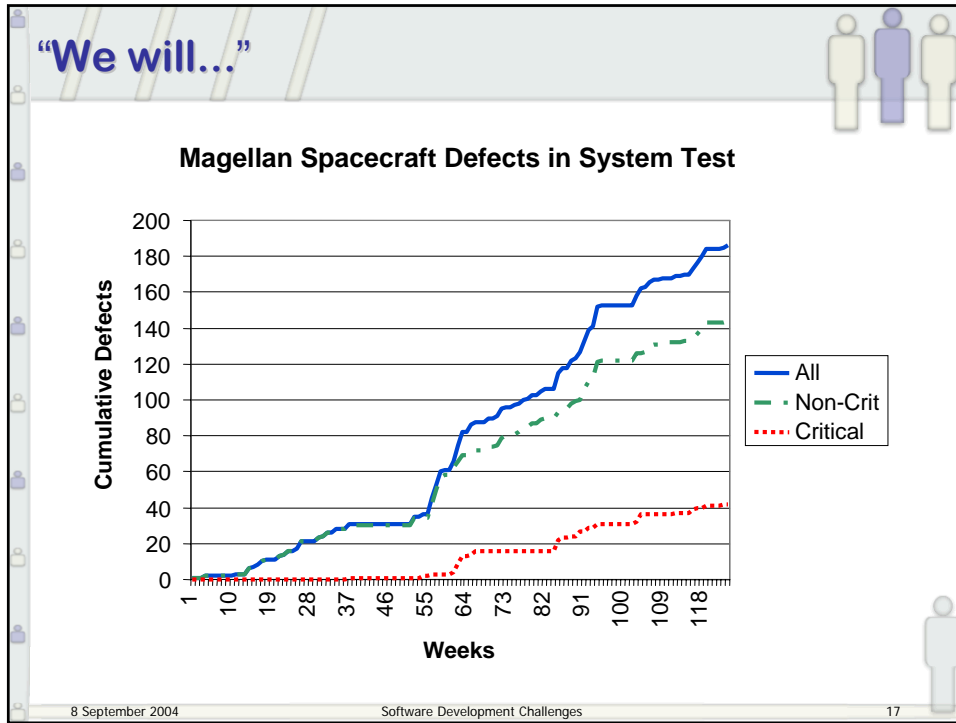
Armour, Phillip G. *The Five Orders of Ignorance*. Comm. of the ACM. Vol.43. No.10. Oct. 2000.

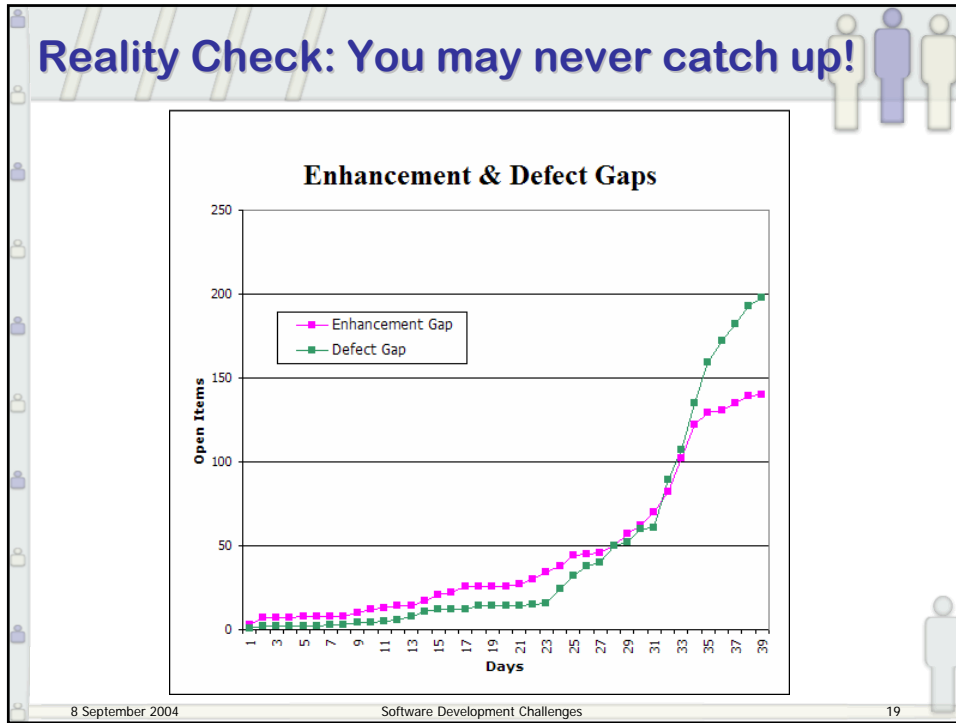
# What is Performance?

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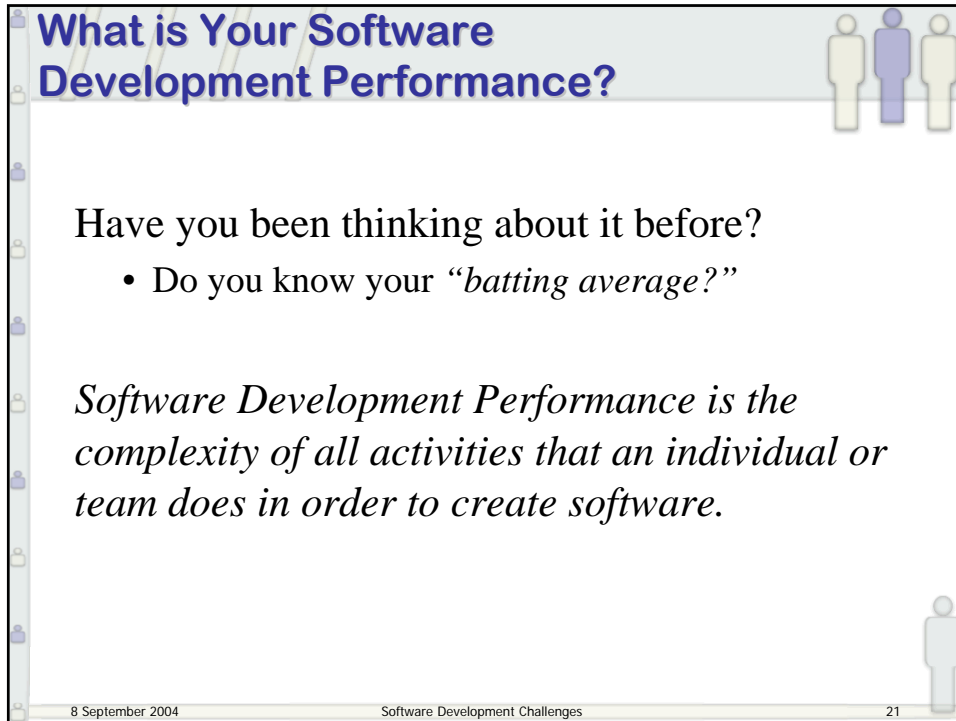
### The lessons of a long-ago disaster...

What do you know to be *important* but are *unable* to measure?

- Back in October of 1707 it was **longitude**
- Longitude: How far east or west you are?
  - ✓ Guessing average speed, or dropping a log over the side of the boat and measuring time of travel from bow to stern.
- Admiral Cloudisley Shovell misjudged longitude.
  - 4 warships and 2,000 lives were lost

Buckingham, Marcus, Curt Coffman. *First, Break All The Rules*. Simon & Schuster. NY, NY. 1999.

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**What is Your Software Development Performance?**

Have you been thinking about it before?

- Do you know your “*batting average?*”

*Software Development Performance is the complexity of all activities that an individual or team does in order to create software.*

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**Faster, Faster, Faster!**

**Knowledge and  
understanding are  
speed.**

### That's different! That's crazy!

*“We should do something when people say it is crazy. If people say something is ‘good,’ it means someone else is already doing it.”*

» Hajime Mitarai, president, Canon

Peters, Thomas J. *The Circle of Innovation, You Can't Shrink Your Way To Greatness.* Vintage Books. New York, NY, 1997.

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### Performance Indicators

#### Relative Effort on a Typical vs. an Advanced Project

Project Phase	Typical Project (Relative Effort)	Advanced Project (Relative Effort)
Requirements Analysis	Low	Low
Architecture	Low	Low
Detailed Design	Low	Low
Construction	High	Medium
Testing and Debugging	Very High	Low

Advanced software development approaches require more work during the early stages of the project to eliminate enormous amount of unnecessary work in the later stages of a project.

McConnell, Steve. *After the Gold Rush.* Microsoft Press. 1999.

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## Success Hinges On The Individual

**Capability Maturity Model (CMM):** Focuses on the organization's capability; management actions.

**Team Software Process (TSP):** Focuses on team performance; product development.

**Personal Software Process (PSP):** Focuses on individual skills and discipline; entirely personal.

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## Focus on Talents

**What is a **talent**?**

*“A talent is a recurring pattern of thought, feeling, or behavior that can be productively applied.”*

Every role performed **at excellence** requires talent.

*“Michelangelos of housekeeping.”*

Buckingham, Marcus, Curt Coffman. *First, Break All The Rules*. Simon & Schuster. NY, NY. 1999.  
 Peters, Thomas J. *The Circle of Innovation*. Random House. New York, NY. 1997.

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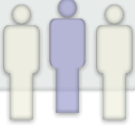
## Make Non-Talents Irrelevant

*“People don’t change that much. Don’t waste time trying to put in what was left out. Try to draw out what was left in. That is hard enough.”*  
– wisdom from great managers

Team up people with complimentary talents.

Buckingham, Marcus, Curt Coffman. *First, Break All The Rules*. Simon & Schuster. NY, NY. 1999.


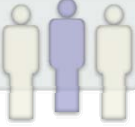
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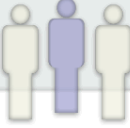
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## “Honey, I shrunk the World!”

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## The Death of Distance



“I’m no more than two tenths of a second away (measured by the speed of light) from anybody in the world.”

Peters, Thomas J. *The Circle of Innovation, You Can't Shrink Your Way To Greatness*. Vintage Books. New York, NY, 1997.

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## New Threats, New Opportunities



“*Been there, done that!*”

- The “Wild West” and Railroads
- Automobile manufacturing
- Textiles
- Steel
- Memory chips

– and on and on...

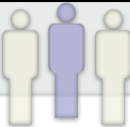
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## **LOW PRODUCTIVITY KILLS!**

***“However low its wages, a business [...] is unlikely to survive, let alone prosper, unless it measures up to the standards set by the leaders in its field, anyplace in the world.”***

Peter F. Drucker

**Focus on Yourself** 

**You are special!**


Think of yourself as:

**Me, Inc.**

– Even if you happen to be on somebody’s payroll at the moment!

Peters, Thomas, J. *Brand You 50: Fifty Ways to Transform Yourself from an “Employee” into a Brand that Shouts Distinction, Commitment, and Passion.* Knopf/Random House, 1999.

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## **DISTINCT ... OR EXTINCT!**

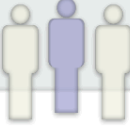
***“If there is nothing very special about your work, no matter how hard you apply yourself, you won’t get noticed and that increasingly means you won’t get paid much, either.”***

Michael Goldhaber, *Wired*

### Wrapping Up...

- If you want different results, you must change the way you think.
- Going from manual work to knowledge work changes the game.
- You should know your own performance.
- Like it or not: your competition is no longer the fellow next door...

## Knowledge Worker Productivity




*“The most important, and indeed the truly unique, contribution of management in the 20<sup>th</sup> century was the fifty-fold increase in the productivity of the MANUAL WORKER in manufacturing.*

*“The most important contribution management needs to make in the 21<sup>st</sup> century is similarly to increase the productivity of KNOWLEDGE WORK and the KNOWLEDGE WORKER.”*

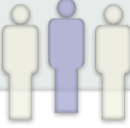
Drucker, Peter F. *Management Challenges for the 21<sup>st</sup> Century*. HarperBusiness. NY, NY. 1999.

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## Embrace The Stockdale Paradox



Retain faith that you will prevail in the end, regardless of the difficulties. **AND at the same time** Confront the most brutal facts of your current reality, whatever they might be.

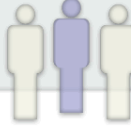
Collins, Jim. *Good to Great*. Harper Business. NY, NY. 2001.

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**Sage Advice...**



*“Expose yourself to the best things humans have done and then try to bring those things into what you are doing.”*

—Steve Jobs, President, Apple Computer



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***“If things seem under control, you are just not going fast enough!”***

**Mario Andretti**  
race car driver

**Thank You!**




**Contact Information**

**Steven Teleki**  
**Y&L Consulting, Inc.**  
1431 Greenway Drive Suite 830  
Irving TX 75038

**teleki@computer.org or teleki@ylconsulting.com**

For a software development reading list please visit:  
**<http://pseng.net/reading/>**



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