Changing the way the Enterprise works:

Operational Transformations

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Tom (Thomas J. Greene)

- Boston College (B.Sc.’66), Univ. of Toledo (Ph.D.’73), Harvard (Ed.M. ‘90)
- Built a Computer Aided Instruction Lab (‘78)
- Began a Computer Science Department (‘80)
- UN consulting (‘88)
- Visiting Scientist at Stanford (‘81), IBM (‘85), MSC (‘70)
- W3C (‘94-‘98)
- NSF (2000-’03)
- MIT-CSAIL (1986-present)
Outline

- A (short) History of people and technology (From Whence?)
- Some Abstractions for Enterprise Managers
- The Forces causing Faster Change
- Your Models now need Monitors and open design to be NIMBLE with Updates.
Population & Time - The Growth rate

- 35 BCE-Julius Caesar -- 150 Million people
- 1 Billion
- 2 Billion
- 3 Billion
- 2000 A.D. -- 6 Billion people

60 Billion
BILLIONS OF PEOPLE

World population distribution

US & CANADA = 310M (5%)
EUROPE = 729M (12%)
ASIA = 3.68B (61%)
AFRICA = 784M (13%)
LATIN AMERICA = 519M (9%)
OCEANIA = 30M (0.1%)

SOURCE - HTTP://WWW.UN.ORG/DEPTS/UNSD
Serving the World's Poor, Profitably

---by C.K. Prahalad and Allen Hammond

By stimulating commerce and development at the bottom of the economic pyramid, multinationals could radically improve the lives of billions of people and help create a more stable, less dangerous world. Achieving this goal does not require MNCs to spearhead global social-development initiatives for charitable purposes. They need only act in their own self-interest. How? The authors lay out the business case for entering the world's poorest markets.

Fully 65% of the world's population earns less than $2,000 per year—that's 4 billion people. But despite the vastness of this market, it remains largely untapped. The reluctance to invest is easy to understand, but it is, by and large, based on outdated assumptions of the developing world.

While individual incomes may be low, the aggregate buying power of poor communities is actually quite large, representing a substantial market in many countries for what some might consider luxury goods like satellite television and phone services. Prices, and margins, are often much higher in poor neighborhoods than in their middle-class counterparts. And new technologies are already steadily reducing the effects of corruption, illiteracy, inadequate infrastructure, and other such barriers.

Continues---
Technology & Time - The Growth rate

- 3000 BCE -- ABACUS
- 1450 -- GUTTENBERG PRESS
- 1837 -- TELEGRAPH
- 1876 -- TELEPHONE
- 1948 -- TRANSISTOR
- 1994 -- WWW GOES GRAPHIC
- 2000 -- DRAFT OF HUMAN GENOME
1900-2000

- **1910**: J.L. Baird gives the first demonstration of true television.
- **1920**: First high-speed electronic computer, ENIAC, runs a thousand times faster than previous computing machines.
- **1930**: Mathematical theory of communications established by Claude Shannon, providing the basic theory for all modern digital communications.
- **1940**: First computer introduced: the Electronic Numerical Integrator and Computer (ENIAC). It was the first fully electronic computer.
- **1950**: First transistor invented at Bell Telephone Laboratories.
- **1960**: First recombinant DNA technology constructed by Paul Berg.
- **1970**: First transgenic plants introduced into commercial use.
- **1980**: World Health Organization dedicates smallpox eradicated.
- **1990**: First biotechnology drug released for use.
- **2000**: First computer made from a single silicon chip.

**Key Events**

- **1900**: Alexander Fleming discovers penicillin.
- **1910**: First radio broadcast.
- **1920**: First color photograph.
- **1930**: First przezonal letter eliminated.
- **1940**: First nuclear reactor.
- **1950**: First artificial heart.
- **1960**: First personal computer.
- **1970**: First compact disc.
- **1980**: First personal computer.
- **1990**: First portable computer.
- **2000**: First wireless computer.

**Technological Milestones**

- **1910**: Radio.
- **1920**: Television.
- **1930**: Transistor.
- **1940**: Computer.
- **1950**: Transistor.
- **1960**: Microprocessor.
- **1970**: Computer network (ARPANET).
- **1980**: Computer network (Internet).
- **1990**: Mobile phone network.
- **2000**: Wireless computer network.
Outline

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INFORMATION SPACE -A PHASE CHANGE?

- A water molecule can exist in different phases, as it changes phases its world is very different, but only in hind-site

- Solid ---->
- Liquid ---->
- Gas ----->
Technology Change Rates

- Moore’s law - 2 year doubling
- Network - 18 month doubling

Information speed of travel--
By spoken words, by letter, by horse, by phone
Sound speed? (~600mph)
Network
Light speed (~186,000mps)
Abstracting the global Transformation

Perhaps think of the TRANSFORMATION being caused by Transforms

Abstract State (color, weight, letters, people…)

A= (blue,50, xy, 10 men …)
B= (red, 25, ab , 15 women)

A process has occurred that changed A to B , the process may involve ideas, people, Machines, paint brushes call it T(W,X,Y,Z ---)
That is B = T op A

Hilbert Space ? Linear Algebra ?

Just a powerful picture!
Business Roots of the Process-Managed Real-Time Enterprise: the Enterprise is its Business Processes

BUY
- Sourcing & Procurement
  - Sourcing, Supply Planning, Materials Procurement
- Inbound Logistics
  - Receiving, Incoming Material Storage
- Operations
  - Assembly, Component Fabrication, Branch Operations

ADD VALUE
- Research & Development
- Facilities Management
  - Physical Plant, Office Equip., IT Services, Supplies, MRO Procurement
- Human Resource Management
  - Recruiting, Training, Compensation

SELL
- Outbound Logistics
  - Warehousing, Fulfillment, Shipping
- Sales & Customer Service
  - Sales, Order Processing, Customer Support
- Marketing & Advertising
  - Market Research, Promotion, Advertising, Trade Shows

Support Activities
- Financial Management
  - Financing, Planning, Investor Relations
- Human Resource Management
  - Recruiting, Training, Compensation
- Marketing & Advertising
  - Market Research, Promotion, Advertising, Trade Shows

Primary Activities
- BUY
- ADD VALUE
- SELL

Under the Hood of the Enterprise (Porter’s Value Chain Analysis)

Source: Peter FINGAR, personal correspondence
Business Process Management (BPM)
Process-Oriented Architecture

From Systems-of-Record to Systems-of-Process
Scalable  Real Time  Agile

Source: AMR Research
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GLOBALIZATION

- Innovate without emigrate
  - Distance is not an issue
  - Language is not an issue
  - Design can occur anywhere

AND --- An economic incident, Legislation or a strike or a medical breakthrough or a discovery, or ANYWHERE on the Globe can directly, immediately effect your Enterprise.
Columbus was wrong (for information space)

- … WE are all INTER-connected by the NET for information across all boundaries of geography and language.

- THE WORLD IS NOT ROUND
- “THE WORLD IS FLAT” - T. Friedman
- …and becoming flatter
Asia-1
Increasing technology/Changes
Change in global landscape
Maximum value---
(Cheaper, better, ...)

6/13/2005

InformationWeek

BusinessWeek

IBM Beyond Blue

Never mind computers and tech services. Now IBM wants to run your business.

By Steve Hamm (P.88)

www.businessweek.com
Examples from the Flat Earth

- Language barriers are down (2)
- University education is free and instantly accessible (no certification) (2)--OCW OCW+
- Information is excessive - 10,000 books, 35 languages
- The BLOG
- Our Lady of Guadalupe statues in Mexico --mostly from China
- Cell phone calls from the Amazon River
- My energy bill has doubled in 12 months.
Language Barrier

INFORMATION FLOWS FREELY AND INSTANTLY AROUND THE GLOBE

Recent examples

- Death of the pope
- 9-11
- Berlin wall
- Elections - Britain, Iraq, Palestine, etc.
This text has been automatically translated from English:

ABSTRACT: The communication and information revolution has a fast changing sets of technologies that have already caused changes in the enterprise. However expectations of the "customers" of the enterprise have also changed by their personal use of the internet and web.
The communication and information revolution has a fast changing sets of technologies that have already caused changes in the enterprise. However expectations of the “customers” of the enterprise have also changed by their personal use of the internet and web. They expect a Time of response for any transaction to be instantaneous. Managing the pace of change is the problem. The technologies that enable very fast response are complex and themselves fast changing. To use them requires learning new skills and changing current procedures. Operational Transformation is the next frontier of business advantage. Because of global competition in uncertain times, The enterprise of all sizes must be configured to change the way they conduct business and reinvent their operations or face losing to competitors who do change. These issues will be examined and a possible solution to the problem offered.
摘要：通信和信息革命已经导致变化在企业上的快速改变的套技术。然而“顾客的”期
望企业由对这个网际网络的和网的创业者的个人用途并且改变。他们期待反应时间为任
一种交易之间。支持步骤变化是这个问题。使它非常快速变化的技术是复杂并他们自
己快速改变。使用他们要求学习新技能和改变的当前步骤。可用变化是企业好坏下
个边境。由于全球性竞争在不定的时期。所有大企业必须被配置改变他们举办事务
和重创他们的操作或因丢失对竞争者改变的方式。这些问题将被审查并且对这个问
题的一种可能的解答将被提供。

ABSTRACT: The communication and information revolution has a fast changing
sets of technologies that have already caused changes in the enterprise. However
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personal use of the internet and web. They expect a Time of response for any
transaction to be instantaneous. Managing the pace of change is the problem.
The technologies that enable very fast response are complex and themselves fast
changing. To use them requires learning new skills and changing current
procedures. Operational Transformation is the next frontier of business advantage.
Because of global competition in uncertain times, The enterprise of all sizes must
be configured to change the way they conduct business and reinvent their
operations or face losing to competitors who do change. These issues will be
examined and a possible solution to the problem offered.
MIT-3
Topics of Info openness

1. Open source -- Emacs -25 years ago,(copyleft)

2. Open Course Ware -- 5 years ago

3. Science Commons -- This year

(OOPS--W3C)
Welcome to MIT’s OpenCourseWare:

a free and open educational resource for faculty, students, and self-learners around the world. OCW supports MIT’s mission to advance knowledge and education, and serve the world in the 21st century. It is true to MIT’s values of excellence, innovation, and leadership.

MIT OCW:

- Is a publication of MIT course materials
- Does not require any registration
- Is not a degree-granting or certificate-granting activity
- Does not provide access to MIT faculty

Learn more about MIT OCW...

Investing in Open Sharing

Demonstrating his belief in MIT and the ideal of open sharing of educational materials, MIT alumnus Jon Gruber has donated $1 million to the OpenCourseWare project.

Johns Hopkins OpenCourseware

Johns Hopkins University’s School of Public Health has launched its pilot OCW project with eight courses now available.

Reflections from MIT President Susan Hockfield

“OpenCourseWare expresses in an immediate and far-reaching way MIT’s goal of advancing education around the world. Through MIT OCW, educators and students everywhere can benefit from the academic activities of our faculty and join a global learning community in which knowledge and ideas are shared openly and freely for the benefit of all.”

- Susan Hockfield, President of MIT
Traffic by Geographic Region (in Web hits, since 10/1/03)

<table>
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<th>Region</th>
<th>Hits Since 10/1/03</th>
<th>Hit %</th>
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<td>North America</td>
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<tr>
<td>Asia</td>
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<tr>
<td>Western Europe</td>
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<td>South Asia</td>
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<td>Latin America</td>
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</table>

4 new OCW universities
The Academy should keep Copyright -- Public domain science- paid for by the public, not IP gatekeepers.

• CREATIVE COMMONS

• SCIENCE COMMONS

*Double cost of Journals in 10 years*

- Serial Expenditures (+250%)
- Serial Unit Cost (+215%)
- Monograph Unit Cost (+82%)
- CPI (+68%)
- Monograph Expenditures (+66%)
- Serials Purchased (+14%)
- Monographs Purchased (0%)

The DSpace Federation

The DSpace Federation coordinates the planning, research, development, and distribution of DSpace, an open source digital repository system. The DSpace Federation also advocates for digital archiving initiatives open access to research literature.

At this time, there is no formal membership structure, just the collective participation of institutions using DSpace, who often face the same set of challenges. Currently participating in the DSpace Federation are research institutions, libraries, archives, cultural heritage institutions, government agencies, and corporations.

We actively encourage other institutions to use DSpace. If your organization is running a production DSpace system, please add your URL to the DSpace Wiki.

DSpace Federation Goals

Members of the Federation share the following goals:

- Sharing in the development and maintenance of the DSpace source code.
- Developing a critical corpus of content that represents the intellectual output of the world’s leading research institutions.
- Promoting the continued development of the DSpace service through the open source community.
- Promoting the interoperability of archival repositories.
- Ensuring the long-term preservation of scholarly work by complying with published standards and supporting national and international initiatives to develop standards in this domain.

Supporting the DSpace Community
Concordance to Turn of the Screw - Henry James

This page can be accessed directly from your browser as "http://www.concordance.com/ttur.htm"

Search the book:

Search Input Words: evil

In the box above, you can type any of the following choices, then click the Go! button;
(a) Put in one word to find all occurrences of that word in the book;
(b) Put in two words to find all occurrences where those words are within 70 characters of each other;
(c) Put in three or more to find all occurrences of the phrase consisting of the entered words;
(d) Put in a word preceded by a = sign, e.g. =GOOD to find synonyms and related words;
(e) Put in a number to go to that location in the text, e.g. 10000 will go to the 10000th character in the text; or 1 will go to the beginning of the book;
(f) Enter, for instance, L^ to get all words that begin with L
Click here to return to book search page

Concordance to Turn of the Screw - Henry James

Choose a text phrase from the list and click the 'Get Surrounding Text' button below:

(Word searched is: EVIL, 7 occurrences)

1 stretch. ~ The limit of this < evil > time had arrived only when, on the
2 te as unmistakable horror and < evil > : ~ a woman in black, pale and drea
3 " ~ "For the love of all the < evil > that, in those dreadful days, ~ th
4 m. And to ply them with that < evil > still, ~ to keep up the work of de
5 ght ~ and just so bowed with < evil > things, I had seen the specter of t
6 knew, the imagination of all < evil > HAD ~ been opened up to him: all
7 her desire, ~ an inch of her < evil > that fell short. This first vividn
morrow's sun
was high I had restless read into the fact before us almost all the
meaning they were to receive from subsequent and more cruel occurrences.
What they gave me above all was just the sinister figure of the living man--
the dead one would keep awhile!--and of the months he had continuously
passed at Bly, which, added up, made a formidable stretch.
The limit of this evil time had arrived only when, on the dawn of a
winter's morning, Peter Quint was found, by a laborer going to early work,
stone dead on the road from the village: a catastrophe explained--
superficially at least--by a visible wound to his head, such a wound
as might have been produced--and as, on the final evidence, HAD been--
by a fatal slip, in the dark and after leaving the public house,
on the steepish icy slope, a wrong path altogether, at the bottom of
DSpace@Erasmus

Welcome to the repository of research documents of the Erasmus University of Rotterdam!

Feel free to search, browse, and retrieve all documents from DSpace@EUR

Search

Enter some text in the box below to search DSpace.

[Box for text input] [Go button]

Advanced Search

Communities in DSpace

Select a community to browse its collections.

Annual Reports
Arts (FHKW)
Erasmus University for Sustainability and Management (FSW)
Erasmus MC (University Medical Center Rotterdam)
Erasmus Research Institute of Management (ERIM)
Erasmus School of Law
History (FHKW)
Institute of Health Policy and Management (IBM)
Proceedings of Conferences
Psychology (FSW)
Public Administration (FSW)
Research School of Safety and Security in Society
Rotterdam School of Economics (Erasmus School of Economics (BSE))
Sociology (FSW)

5 new Dspace Universities
The Challenges to the Enterprise

- Extreme competition
- Globalization
- Rapidly changing technologies
- Forces beyond your control (world events are now directly coupled to your activity)

The **Response** must be-
A Flexible, Nimble, continuous self-educating, continuous world monitoring, new Enterprise
Extreme competition

- **Established companies should brace themselves for a future of extreme competition,** which will make the pressures of the 1980s and 1990s look tame by comparison. Incumbents must understand how powerful forces are aggregating once-distinct product and geographic markets, enhancing market-clearing efficiency, and increasing specialization in the supply chain. They should respond by adopting a new approach to strategy—one that combines speed, openness, flexibility, and forward-focused thinking.

- Mature companies must learn to be young at heart. Boundless new opportunities await executives who recognize that the **days of slow change are over**

**SOURCE:** Mckinsey Quarterly, 23 May 2005

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The Future of the Enterprise

The IT revolution is just beginning. The Technology life cycle is
- First INVENT
- Second build infrastructures
- Third-- experience the benefit

The Enterprise MUST Create Almost Real-time Operational Change
Or Die! (Companies, governments, Churches-- the Enterprise)

Extreme competition

Add Value  Satisfy Customers
A 21st Century Value Network

The Network is the Value-Delivery System

GLORIAD = 1st OPTICAL FIBER CIRCLING THE GLOBE
Maybe?--The world pyramid

The World Pyramid

Most companies target consumers at the upper tiers of the economic pyramid, completely overlooking the business potential at its base. But though they may each be earning the equivalent of less than $2,000 a year, the people at the bottom of the pyramid make up a colossal market—4 billion strong—the vast majority of the world’s population.

purchasing power parity (in U.S. dollars)

>20,000 100

2,000–20,000 2,000

<2,000 4,000

population (in millions)
Global thinking-1

Counterpoint

Where to Next?

A Woman's Place
7

Life After Graduation
22

Global Thinking

Continuing...
"The Generation Gap at Work," studied co-existence of four different generations of workers within the U.S. workforce and frequently, within small offices. To find a framework for understanding the gaps across generations and offered tips to manage these sometimes baffling and tense relationships smoothly. They divided the workforce into

"Matures," born between 1909 and 1945;---Matures are the silent generation. They value sacrifice, commitment, and financial and social conservatism. They remember the Depression. They're the 'Establishment.'"

"Boomers," born between 1946 and 1964;---"Boomers value themselves. They're competitive, anti-authority. They grew up with Vietnam, Watergate, Woodstock. They have high expectations. They're diplomatic, loyal and want validation. And they value privacy.

"Gen Xers," born between 1965 and 1978;---"Gen Xers were the first latchkey kids. They're entrepreneurial, pragmatic, straightforward. They grew up with AIDS, MTV, PCs, divorce.

"Millenials," born from 1979 onward.---The Millenials are neotraditionalists, optimistic and very community-centered. They're technologically adept and busy, busy. They grew up with the O.J. Simpson trial, Columbine and 9/11. They're versatile. They write blogs about their lives," said Jones.

What this means to us is that co-workers may have fundamentally different approaches to work, teamwork, privacy, respect and authority.

- SOURCE=February 2, 2005 issue of MIT Tech Talk (Volume 49, Number 16).
Human Change?

50% of finding strategic advantage for the Enterprise is how to use our technologies--The other 50% is how fast the human component of the Enterprise can absorb change -- Not solving both issues can be a problem.
In Conclusion…

The World is Flat in information space and The Enterprise must Change to live with it!

Thank you!
On the shoulders of giants---

- HAL ABELOCITY --the academe
- PETER FINGAR -business perspective
- THOMAS FRIEDMAN -globalization

I SAY --- THANK YOU!