National Depression Screening Day is Oct. 9

“No one needs to suffer in silence”

Source: Email message, “Annie’s Mailbag” September 18, 2003
“Over 500,000 US tech jobs lost in 2 years”

American Electronics Industry,
March 2003
Payroll Job Growth during Recoveries

Sources: Has Structural Change Contributed to a Jobless Recovery?
Federal Reserve Bank of New York, August 2003
Note: The shaded area indicates the length of the 2001 recession.
Is this a cyclical phenomenon or.....?

What about higher value-added jobs?
Worldwide Marketshare

Steel: 50% to 10%
Semiconductors: 90% to 50%

Is software & services next?
Software & Service Employees

* Cross over in 2010?
Factors

- Capacity → Educational Output
- Cost → Labor Rates
- Design Productivity → Virtual Proximity
Capacity: Educational Output

US Science and Eng Graduate enrollment down 5% over the last 10 years

>50% of all graduate students are foreign nationals

Source: National Science Foundation
Source: Engineering Workforce Commission
### Cost

<table>
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<tr>
<th>Intel Labor Rates</th>
<th>Billing Rates/Hour *</th>
</tr>
</thead>
<tbody>
<tr>
<td>India: $30k/year</td>
<td>India: $20 – $40</td>
</tr>
<tr>
<td>US: $100k/year</td>
<td>US: $60 – $120</td>
</tr>
</tbody>
</table>

Giga 6/30/03. "Global Sourcing Options Increasing but India Still Leading the Way" Moore, Martorelli
Design Productivity: Virtual Proximity

Telecom bubble to the rescue

Engineers in India got “on the LAN”
India to US Telecom Capacity

<table>
<thead>
<tr>
<th>Year</th>
<th>Capacity (Gb/S)</th>
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<tbody>
<tr>
<td>1999</td>
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<td>2000</td>
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<td>2001</td>
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</tbody>
</table>
“The bottom 20% of [ SW workers ] will disappear”

Ed Yourdon, Director iGate Corp, an Indian software firm

—WSJ, October 6, 2003
“Good enough” for some market segment: gets better and moves up
Defacto public policy

Science & Engineering Education
- K-12 math & science poor
- Graduate students: \( \frac{1}{2} \) foreign nationals

Academic R&D funding
- Down

Infrastructure
- Ho hum

Friction
- Growing
Academic R&D Funding

Federal Research Funding as a % of GDP

- Engineering - Down 22%
- Physical Sciences - Down 30%

Source: Stanford University
Infrastructure
Broadband Access % of Households

Source: Business Week, Sept 8, 2003
“...Train or bring into the country technical and managerial professionals...

...introduce bonus and share options to remuneration...”
People’s Republic of China

5 year government plan for the information industry,

10th edition June 2001
Friction: Software Patents Issued

The line graph shows the number of software patents issued from 1990 to 2002. The number of patents issued increased significantly in 1998, with a steady rise until 2002.
What Could and Should Be Done?

- Fight protectionism....abroad and at home
- Double US productivity
How?

**Universities**
Research on SW/SV technologies

**Industry**
Collaboration on pre-competitive techniques

**Human Resources**
Attract the best around the world with incentives & Immigration policy

**Friction**
Raise the hurdle for IP litigation; strengthen the patent office
Can We Afford It?

Farm: $30B subsidies

Airline: $15B loan guarantees

Oil: $11B subsidies

Steel: $12B tariffs

$1B/year could help us achieve the goal
Do we dare take purposeful action?

Before it is obvious....

and

too late