

Software Summit 11 May 04
Do We Have a "Creeping Crisis"
And
Are We Losing our [Edge]?

Wm. A. Wulf, President, National Academy of Engineering

Thanks for the kind introduction.

First, let me say a few words about the National Academy of Engineering. I have learned that not everyone understands us ...

- Academies as honorific organizations
- 1863 charter of the NAS
- fast forward: NAS, NAE, IOM, NRC
- dual hatted: honorific and advisor
- sizing info: mbrs, studies, volunteers, money

Ok, now let me turn to the main part of my talk.

So, I am now a "policy wonk", and I approached this talk with some trepidation.

A danger of being NAE President is that you get asked to talk to experts about something that you know nothing about. But this is worse since I used to know something about the topic!

What to say?

- a) the "Outsider/insider" approach. Provost search.
Danger is that you think you know what you're talking about.
- b) So ... reflecting on the '95 summit
 - a. WOW. We didn't crash and burn or hit a brick wall!
 - b. Many incidents, including recent NE blackout, but NO catastrophies!
 - c. We even survived Y2K!
- c) In fact, I found cautious optimism among my curmudgeonly academic friends!

Only a masochist would want some of our more dire warnings to have come true, BUT

- 1) I sense a complacency
 - a. Witness the public NON-reaction to security and e-voting issues
- 2) I also sense a sort of complacency in the technical community — not about SW in particular — but it's this that I want to talk about.

The worst kind of crisis is a "creeping crisis"

You all know the storied procedure for boiling a frog

"They say" that if you put a frog in boiling water, it will jump out

But if you put a frog in cool water and heat it very slowly, it won't ... and you'll get a boiled frog

I fear our country is about to get boiled.

I believe the technical community, this community, is best positioned to see the issues and raise the alarm.

But, they are not yet engaged. My goal today is to engage you!

Two recent NYT stories

Mar 23: Thomas Friedman ... "under-current of concern in Silicon Valley".

May 3: Front page, above the fold, Wm. Broad — US losing our domination in science

Before proceeding — I want to use these stories, but I am also offended by them. They both use the journalistic trick of setting up the presumption of a zero-sum game — making the US situation sound BAD because countries X, Y, and Z are doing whatever.

The truth is we want other countries to contribute to the global understanding of nature. For our own selfish benefit, we want other countries developing technologies that make our lives better and decreasing the disparity between the rich and poor!

What we don't want, is a diminution of the US capacity to innovate ... to make our own destiny if that is needed. Alas, I think I see evidence of precisely that. That is the creeping crisis that I want to talk about.

This is not going to be easy because there isn't one BIG THING wrong. Instead I see a mosaic of problems ... but I see a pattern in the mosaic, and I am unsettled.

Let me briefly sketch a set of issues/problems - focus on engineering because:

- a) I know it best, and
- b) The contributions of engineering

OK, the problem mosaic --

- 1) the number of graduates from US engineering schools
- 2) the percentage of US undergraduates in engineering
- 3) visas
- 4) diversity - the flat/reversing trend
- 5) perception of HE as a private good rather than a public one
- 6) technological illiteracy in the public
- 7) the demise of much corporate R&D (Bell, GE, ...)
- 8) engineering and PS research funding vs life sciences
- 9) GUIRR story about corp. funding of university research
- 10) major research infrastructure going elsewhere (eg ITER)
- 11) outsourcing of technical jobs because of gov attitude

The pattern that I see in this mosaic is complacency, short term, lack of investment ...

Issues like the visa situation, or protectionist approaches to the outsourcing of jobs are trading near-term "security" for long term weakness!

So, what to do?

My dream is that the two NYT articles have opened a "moment in time".

Wouldn't it be wonderful to get these issues into this year's political debate?

Let's get both sides trying to outdo each other on "fixing" these issues

- how to get more Americans into engineering & science
- how to reap the potential of R&D (note social RoI is 15030%/yr!!!!!!)
- how to attract the best and brightest globally to our HE system
- etc

You could make that happen!

Note small # letters to congress people/issue. One has a big impact!

Note US response to Japan "threat" (mfg. quality); we
CAN DO IT!

I have great faith in the US. If list of problems sounded like
gloom and doom, it was, but I have faith in the capacity of
the US

BUT, we need to get the conversation going!

The NYT articles have created an opening

Individually -- 10 minutes writing a letter could have an
enormous impact!!

Collectively, should you choose to do that, could be the
tipping point.

Thanks.

We in the US have a good life ... but it is not guaranteed.