What I've Learned on the Dark Side

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My Background

- Ph.D. In Computer Science, UC Davis, 1990
- Faculty, University of Idaho 1990-1993
- Faculty, Brigham Young University, 1993-
- CTO and Founder, iMALL, Inc. an early e-commerce company
- VP, Product Development and Operations, Excite@Home, a broadband internet provider
- CIO, State of Utah

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IT in Utah State Government

- 22,000 employees = 22,000 desktops
- 20+ agencies
- 950 IT professionals
- $250 million/year
- State-wide private network
- Two 20,000 sq ft. data centers
- Numerous multi-million dollar applications in use and under development.
- Goal of putting all government services online by 2004

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Building www.utah.gov

- eGovernment has the power to transform government.
- Important steps:
  - utah.gov – an appropriate domain
  - Product management to the rescue
  - Building a web services ASP
  - Business process re-engineering

IT: Why CS Should Care

- Information Technology is much broader than folks in CS typically view it.
- IT is not just the application of CS to business.
- Many companies fail to use IT resources effectively.
- IT, as a discipline, has large numbers of customers who we consistently fail to please.
- CS and MIS, as academic pursuits, are failing to meet the needs of students and industry.

Driving Forces

- 33% of capital investment by all companies in the area of IT (Gartner Group).
- This will grow to 50% by the end of the decade.
- In 1999, the US spent $762 billion on IT (WITA).
- Worldwide spending was over $2 trillion.
- In 2000, the Federal government funded IT research at $10 billion;
- In 2000, venture capital funded entrepreneurs at approximately $50 billion.

Are We Becoming Irrelevant?

- Computer Science, which gave birth to the information technology revolution, is no longer the driving force in the field.
- Will CS find itself increasingly marginalized as IT takes a larger and larger chunk of the world or find a happy home?
- Are we meeting the needs of
  - Industry
  - Students
  - Alumni
  - Users
- As IT innovation soars, most comes from non-academic sources and most academics find themselves surprised at their lack of fore-knowledge

Life Will Find a Way

- Market forces don't care about our egos.
- As CS has ignored or been unable to meet needs, others have filled in the gaps:
  - Technical schools
  - Businesses
  - On the job training
- CS no longer creates the majority of the innovations that drive IT.
- While CS offers very little specialized training, businesses demand it and IT professionals categorize into themselves very clearly.

IT Professions

IT Specific

- AI
- Computer Sci
- Computer Engr
- Computational Sci
- Database Engr.
- Comp. Graphics
- HCI
- Network Engr.
- OS
- Perf. Engr.
- Robotics
- Scientific Comp.
- Software Arch.
- Software Engr.
- Info. Security

IT Supportive

- Computer Tech.
- Help Desk Tech.
- Network Tech.
- IT Trainer
- Security specialist
- System admin.
- Web designer
- Database admin.

IT Intensive

- Aerospace Engr.
- Financial Srvc.
- Bioinformatics
- Cognitive Sci.
- Digital Library
- e-Commerce
- Genetic Enrg.
- Information Sci.
- Information Sys.
- Instructional Sci.
- Knowledge Engr.
- Multimedia
- Transportation Sys.
- Telecommunications
- MIS

Source: Peter Denning

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IT Professions

- Every profession listed on the previous page has a professional organization associated with it: these people identify themselves.
- Can we realistically insist that these people all come from “computer science” or that they remain “true” to “computer science?”

What is CS?

- Discipline that studies the “phenomena surrounding computers.”
- Science, engineering, or mathematics?
- All three?
- Technology centric (e.g. the latest “cool” thing)
- Schizophrenic about issues like
  - theory vs. empirical knowledge
  - concepts vs. practice
  - programming vs. systems

Why CS Rocks

- CS gives grounding in important theory
  - XML: reality vs. Hype
  - Programming language/system independent
- CS prepares students to be life-long learners
- CS can innovate at the basic level
- CS is well respected

Facing Customers

- “Customer” is a dirty word in academics.
- Many feel that dealing effectively with the needs of students and industry will lead us to become a vocational school.
- Specialized training is done at the expense of general education – engineering has been struggling with this for years.
- How do we balance what our customers “want” with out failing to teach what they “need?”

Some Obvious (to me) Holes

Basic

- Dynamic Visualization
- Software architectures

Specialized

- Software engineering
- Systems
- MIS
- Networks

What We Don't Need

- Turf wars
- Soul searching over the proper role of discrete mathematics (for example)
- A few new courses at the 400 level
- Moronic discussions of “where” engineering belongs

Model A: CS as Umbrella

- Specialized degree programs within CS that mirror professional roles
- Requires a more “unitarian” view of technologists and related IT disciplines.
- Requires a great deal of discipline on the part of faculty and administration.

Model B: CS as Physics

- CS looks at itself from a primarily technical viewpoint, much as Physics does.
- Physics cares little about the *practices* or *standards of performance* related to the technology, that's what engineering is all about.
- If CS is Physics, where and what are the engineering disciplines?
- The “IT Schools” movement is an example of this model.

Conclusions

- There's more to IT than CS.
- CS is loosing its prominence as the foundation for IT.
- CS is not the source of most IT innovations.
- The driving forces behind these changes are powerful and unlikely to go away.
- If we don't serve industry and students they will find a way to get what they need somewhere else.
- Even so, CS is important
- We can sit back and wait for things to happen to us or we can decide what is going to happen.

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My Weblog

- See http://www.windley.com for daily ramblings on this and other subjects related to large scale, enterprise computing.