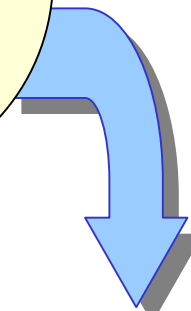
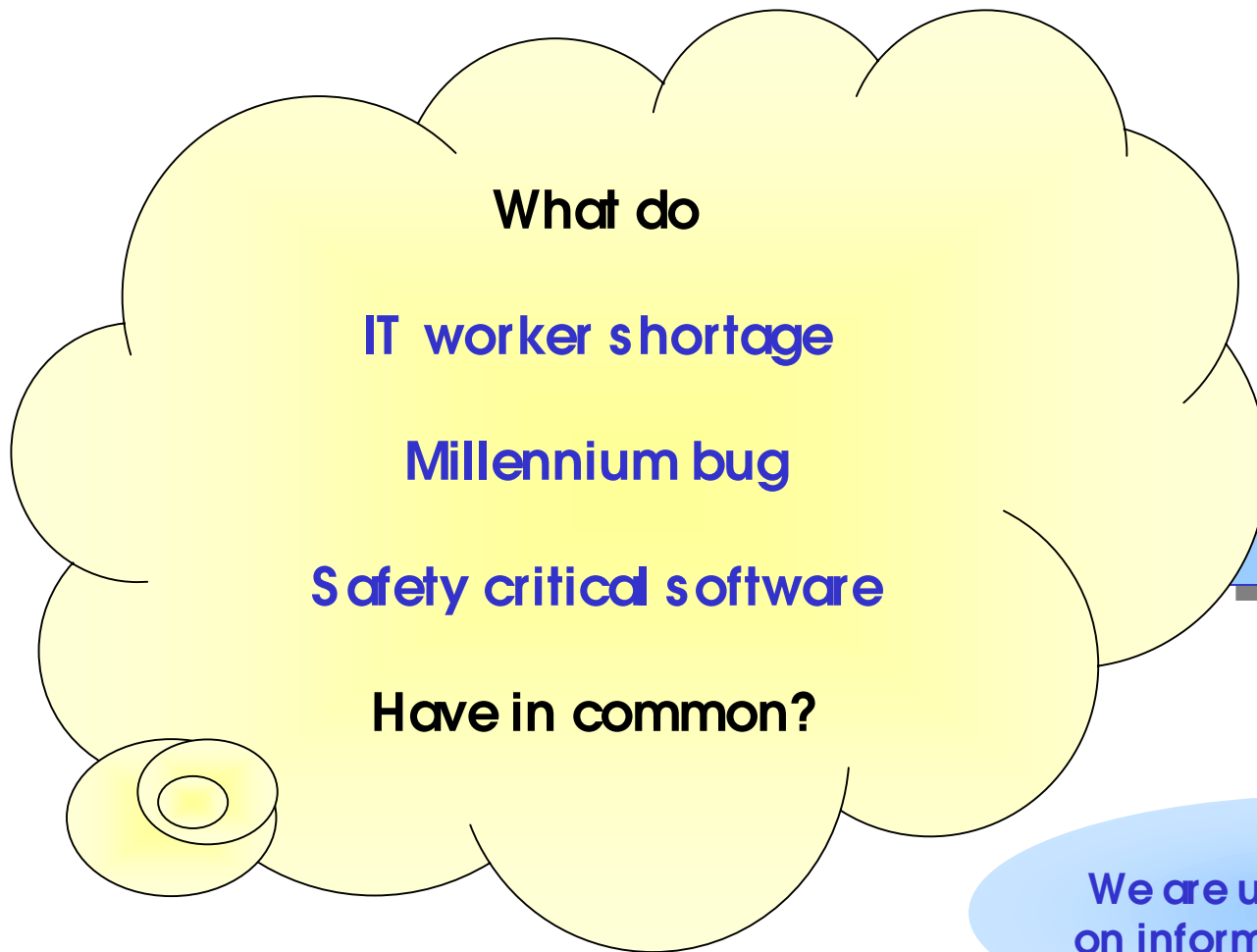


ACM's IT Profession Initiative

What it means for you

Peter J. Denning

11 July 2000



**We are utterly dependent
on information technology**

AND

**On the PEOPLE who design,
build, manage, operate, teach,
and repair it**

Who are the professionals?

Who is educating them?

Are they keeping up to date?

Who certifies them?

Are there enough of them?

Are they trustworthy?

Does IT qualify to be a profession?

Domain of permanent concerns	Yes!
Standards of responsibility (ethics)	Yes!
Body of knowledge	Emerging
Standards of practice	Emerging

Who gets to be considered as an IT professional?

IT FIELDS

Professional specialties whose primary concern is advancing information technology

(Most were or are branches of computer science and engineering)

IT-INTENSIVE FIELDS

Professional specialties whose primary concern is advancing another field, making heavy use of information technology

(May make contributions to information technology)

SERVICE FIELDS

Professional specialties who take care of IT systems and infrastructure

Who gets to be considered as an IT professional?

IT FIELDS

Artificial intelligence
Computer science
Computer engineering
Computational science
Database engineering
Graphics
Human computer interaction
Network engineering
Operating systems designer
Performance engineering
Scientific computing
Software architecture
Software engineering
System security

IT-INTENSIVE FIELDS

Bioinformatics
Cognitive science
Digital library science
E-commerce
Genetic engineering
Information science
Information systems
InfoSec and Privacy
Instructional design
Knowledge engineering
Mgt information systems
Multimedia design
Telecommunications

SERVICE FIELDS

Computer technician
Help desk technician
Network technician
Professional IT trainer
System administrator
Web services designer
Web identity designer

Who gets to be considered as an IT professional?

Core IT

IT FIELDS

Artificial intelligence
Computer science
Computer engineering
Computational science
Database engineering
Graphics
Human computer interaction
Network engineering
Operating systems designer
Performance engineering
Scientific computing
Software architecture
Software engineering
System security

IT-INTENSIVE FIELDS

Bioinformatics
Cognitive science
Digital library science
E-commerce
Genetic engineering
Information science
Information systems
InfoSec and Privacy
Instructional design
Knowledge engineering
Mgt information systems
Multimedia design
Telecommunications

SERVICE FIELDS

Computer technician
Help desk technician
Network technician
Professional IT trainer
System administrator
Web services designer
Web identity designer

Who gets to be considered as an IT professional?

IT practitioners

IT FIELDS

Artificial intelligence
Computer science
Computer engineering
Computational science
Database engineering
Graphics
Human computer interaction
Network engineering
Operating systems designer
Performance engineering
Scientific computing
Software architecture
Software engineering
System security

IT-INTENSIVE FIELDS

Bioinformatics
Cognitive science
Digital library science
E-commerce
Genetic engineering
Information science
Information systems
InfoSec and Privacy
Instructional design
Knowledge engineering
Mgt information systems
Multimedia design
Telecommunications

SERVICE FIELDS

Computer technician
Help desk technician
Network technician
Professional IT trainer
System administrator
Web services designer
Web identity designer


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graph TD; A([Breakdowns Facing IT Field]) --- B([Business & Industry breakdowns]); A --- C([Education breakdowns]); A --- D([Professional Group breakdowns]);
```

Breakdowns
Facing IT Field

**Business & Industry
breakdowns**

**E ducation
breakdowns**

**Professional Group
breakdowns**

Breakdowns Facing IT Field

**Business & Industry
breakdowns**

**E d u c a t i o n
b r e a k d o w n s**

**Professional Group
breakdowns**

IT worker shortages

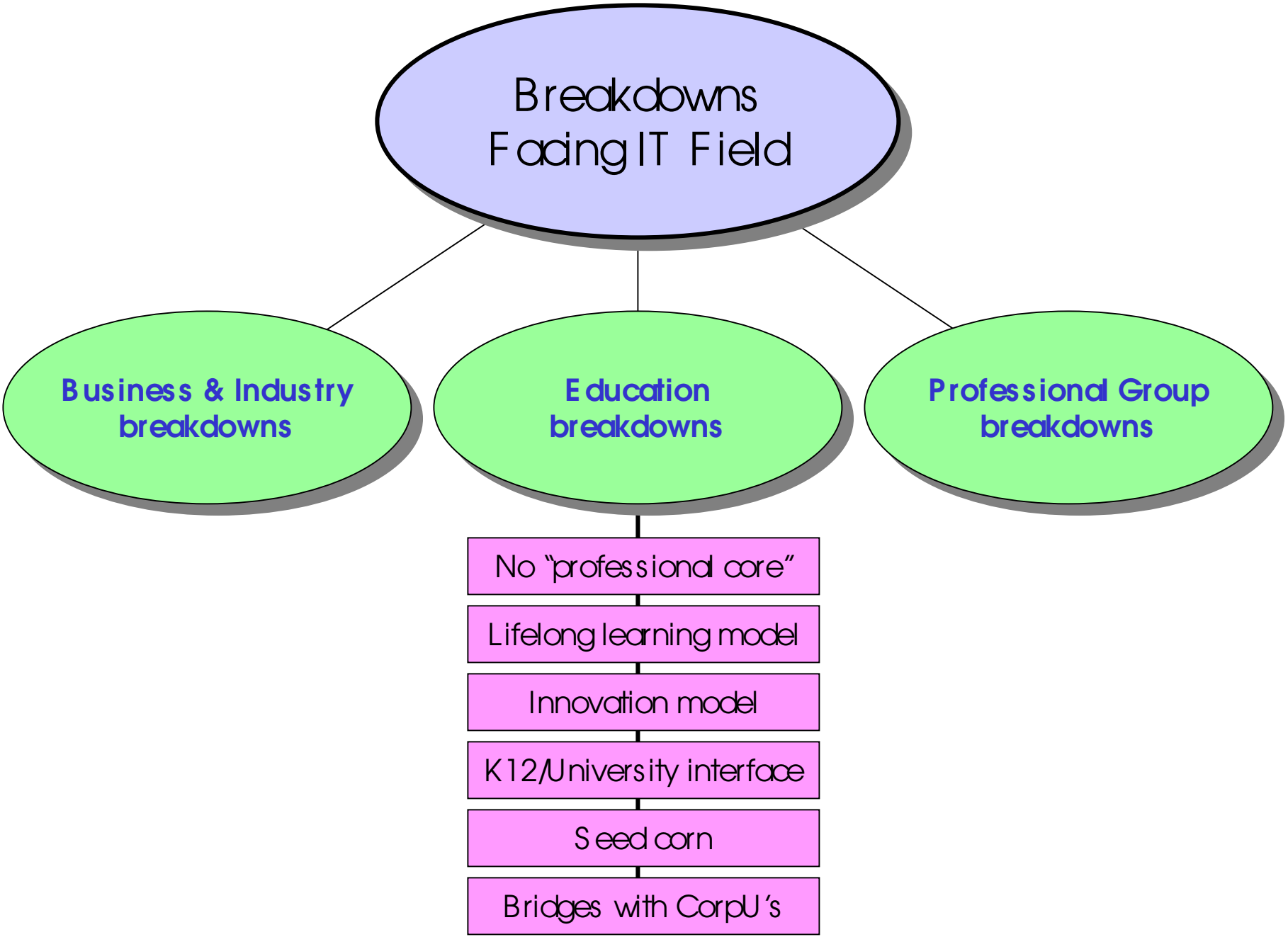
Churn, salary ratchet

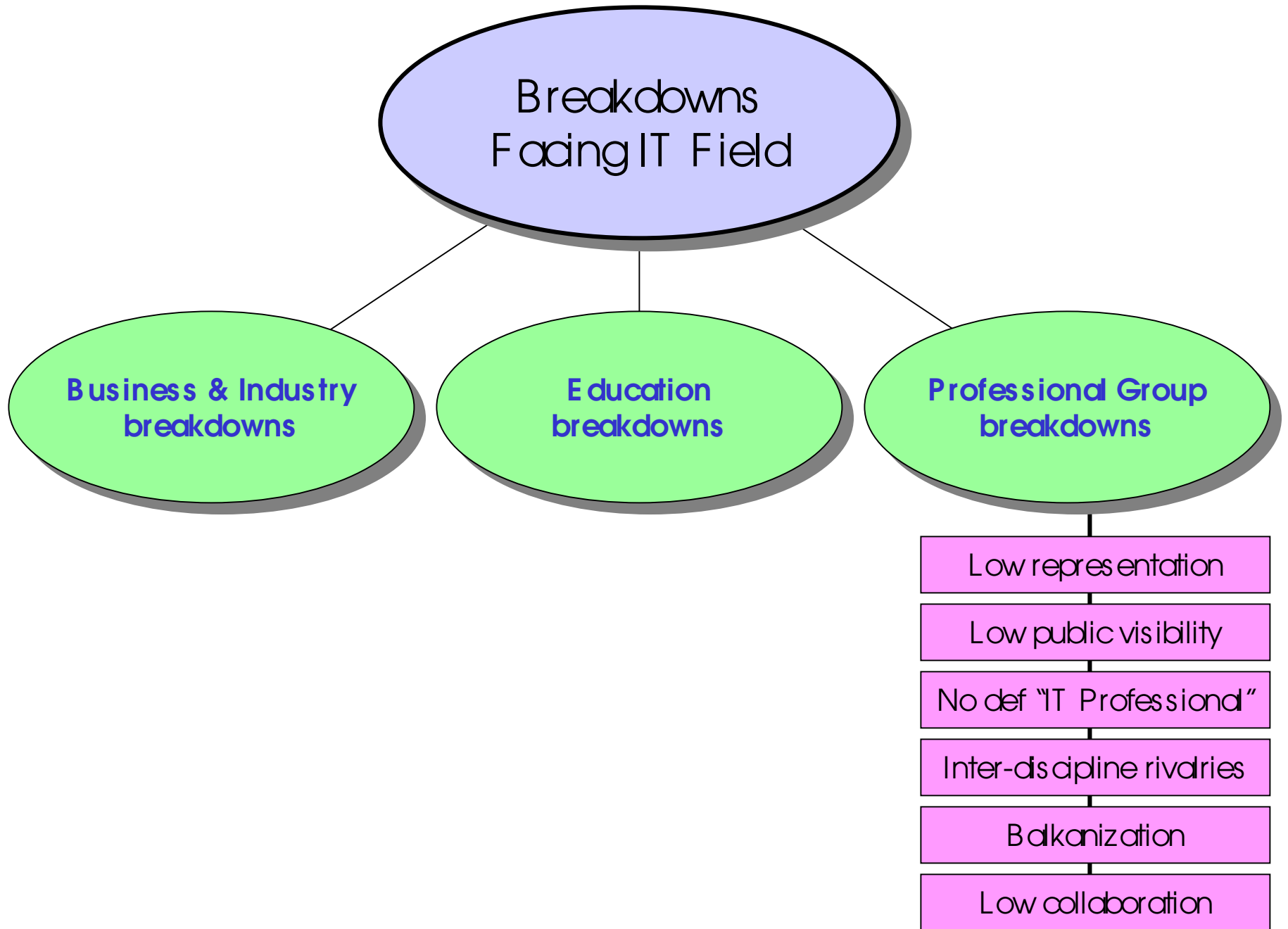
Entry retraining

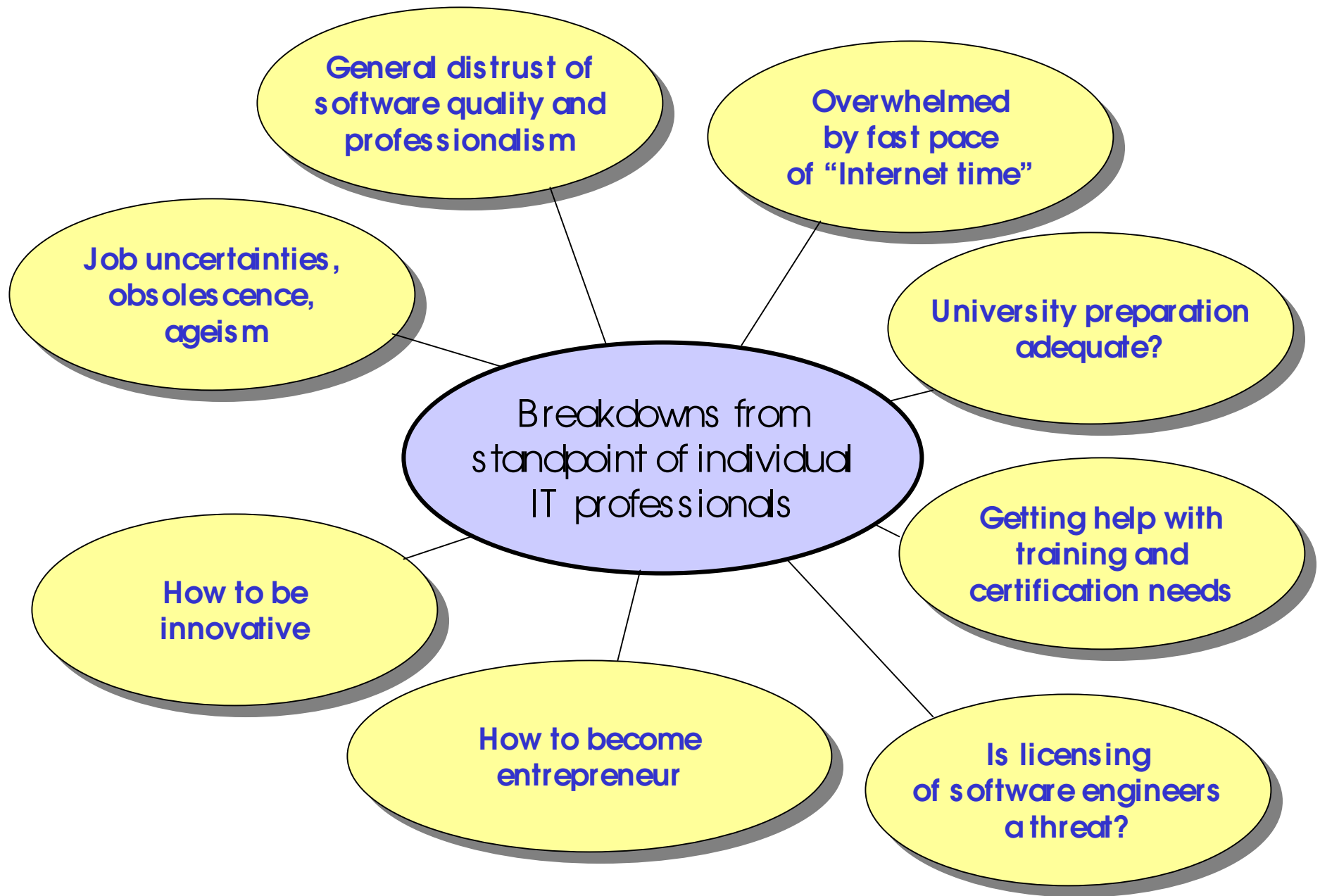
Professional education

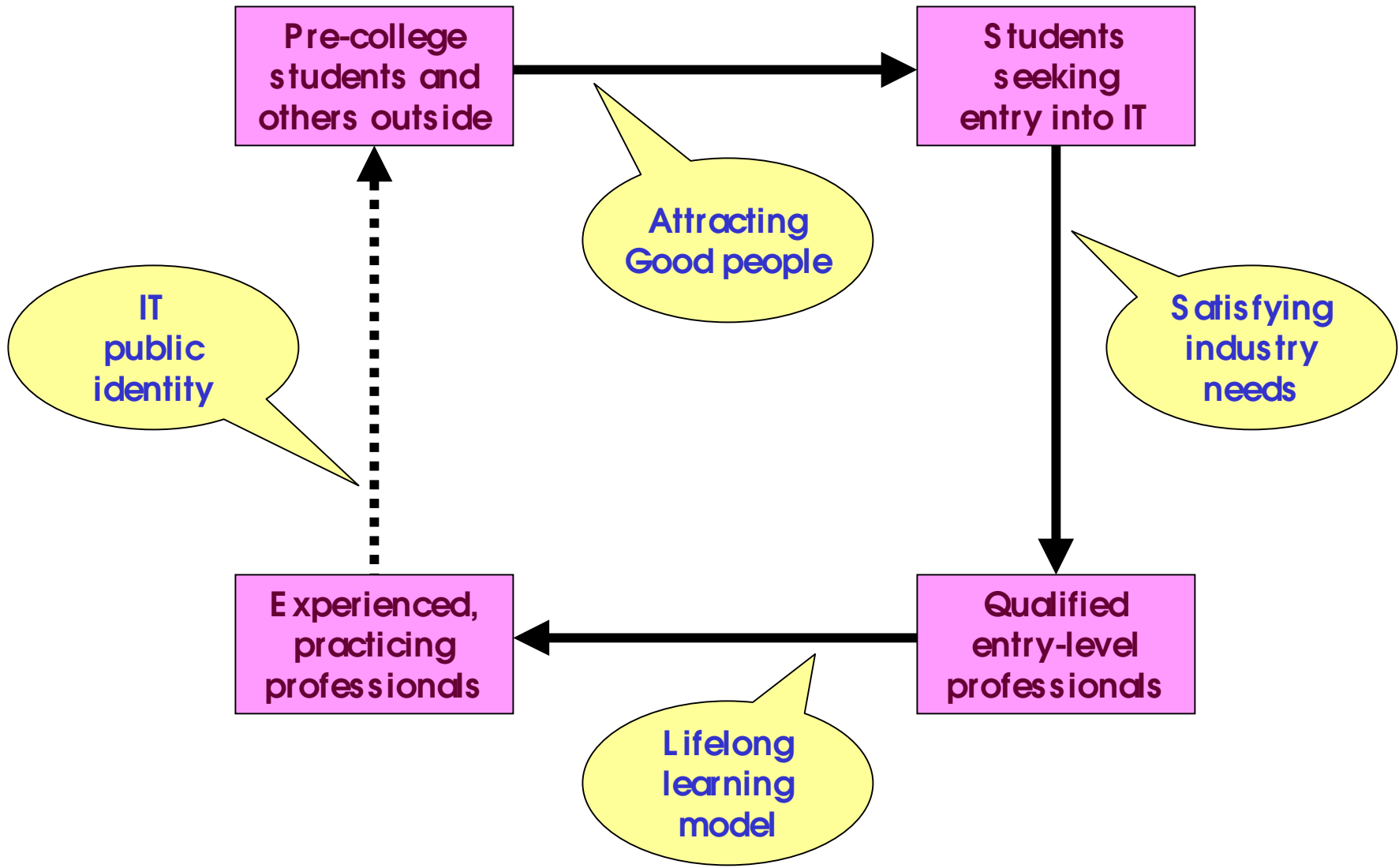
Certification & Licensing

Ageism







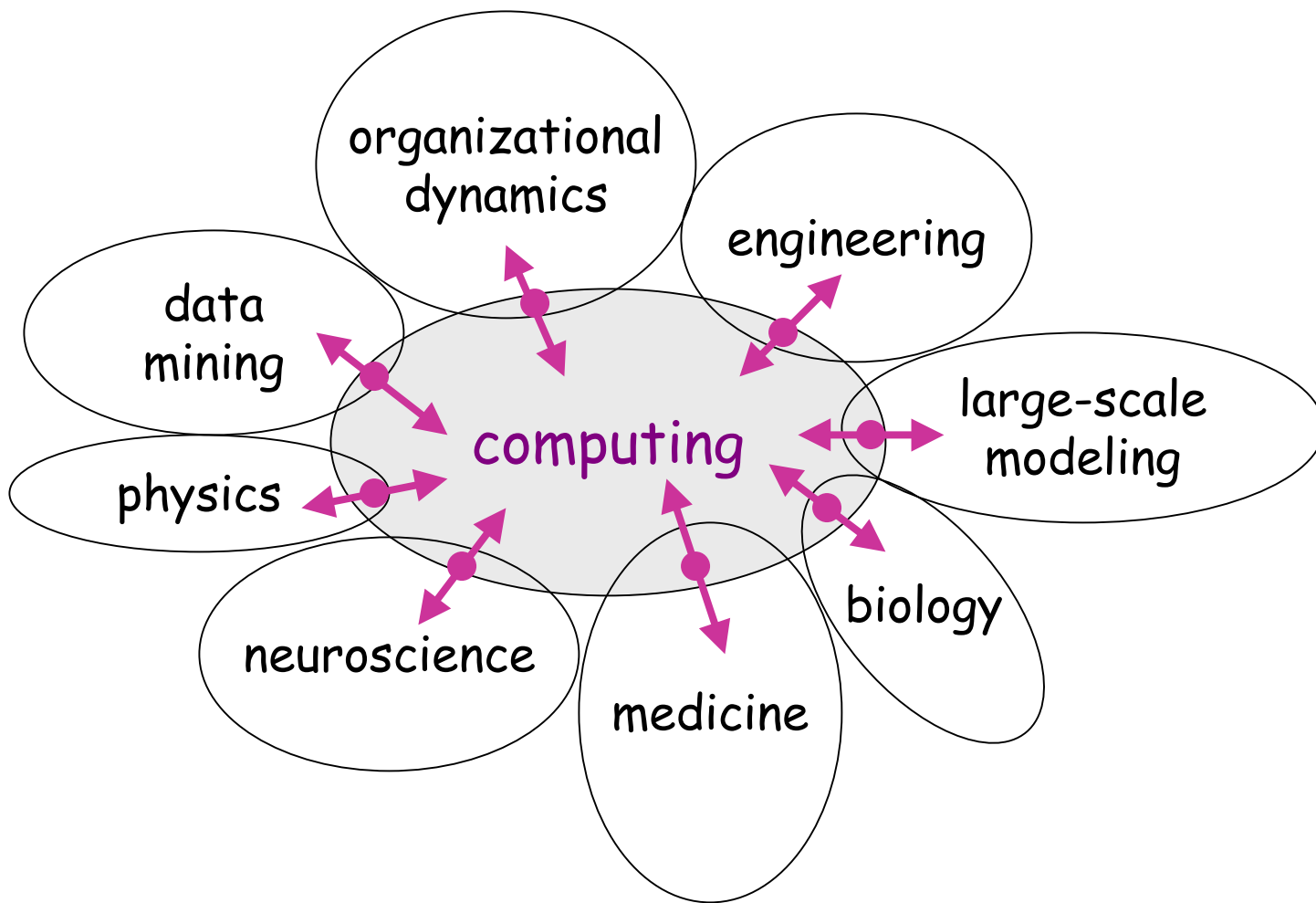


ACM's IT P Initiative

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graph TD; A[ACM's IT P Initiative] --> B[Establish IT as a Profession]; B --> C[Position computing as custodian of the core of our science and engineering];
```

Establish IT as a Profession

Position computing as
custodian of the core of
our science and engineering



We have experience doing this within computing

	theory	abstraction	design
algorithms	yellow	blue	pink
programming languages	yellow	blue	pink
architecture	yellow	blue	pink
databases	yellow	blue	pink
...	yellow	blue	pink

SIGACT
SIGMETRICS
SIGSOFT

examples

ACM's IT P Initiative



Ubiquity

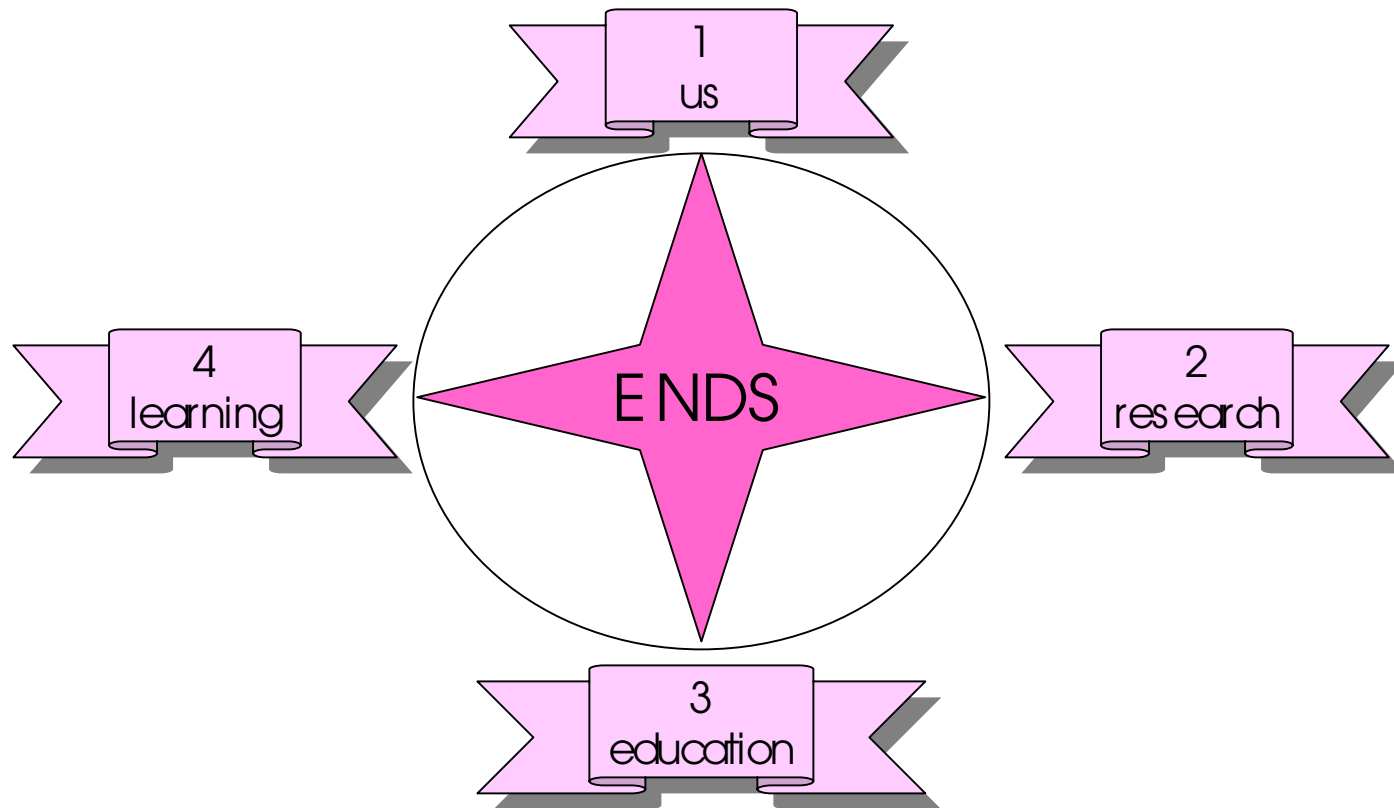
Int'l Computer Drivers License

IT P identity and unification

K12 IT teacher training

Curriculum 2001

Four Big Questions for Us



esti

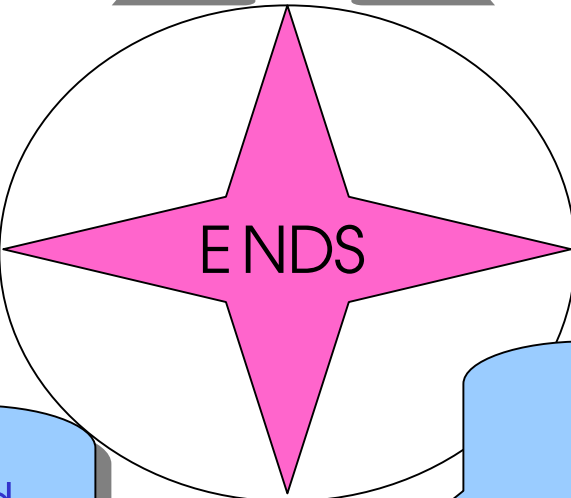
How to maintain our value for the communities we serve?

How to sustain a research program that produces IT innovations?

1 us

4 learning

2 research



How to attain embodied professional knowledge?

How to retain a human side to IT?

3 education

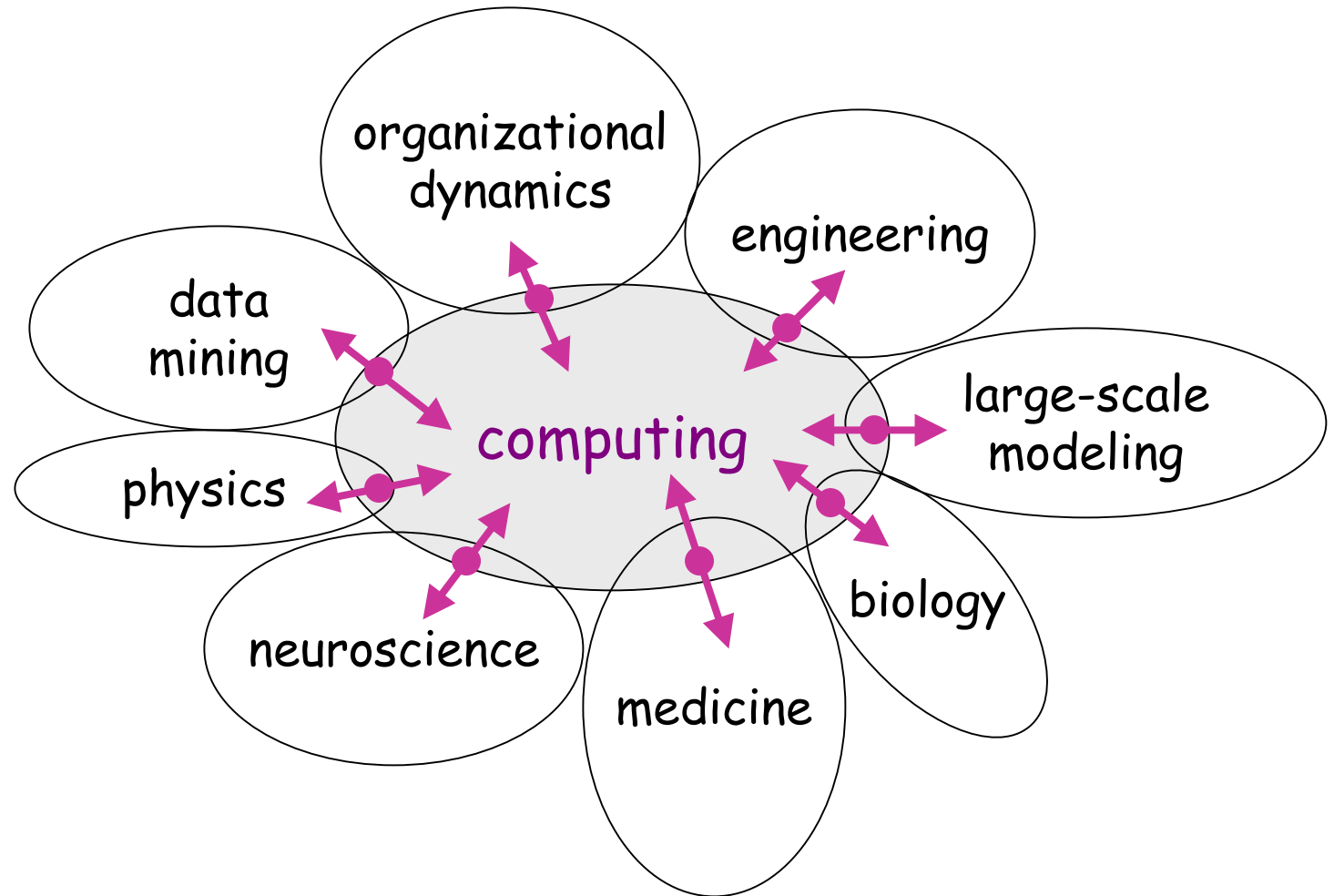
#1 -- The End of Us

IT useless if it does not
produce value for others

Need for adaptability

Must constantly look at
"application domains"

Finding or generating marginal practices at boundaries



#2 --The End of Research

A new model of innovation has emerged in the IT marketplace.

It values speed above all else.

It attracts 5 times more funding (from VC) than the Federal Government spends on university research.

Is it a threat or an opportunity?

Processes of Innovation

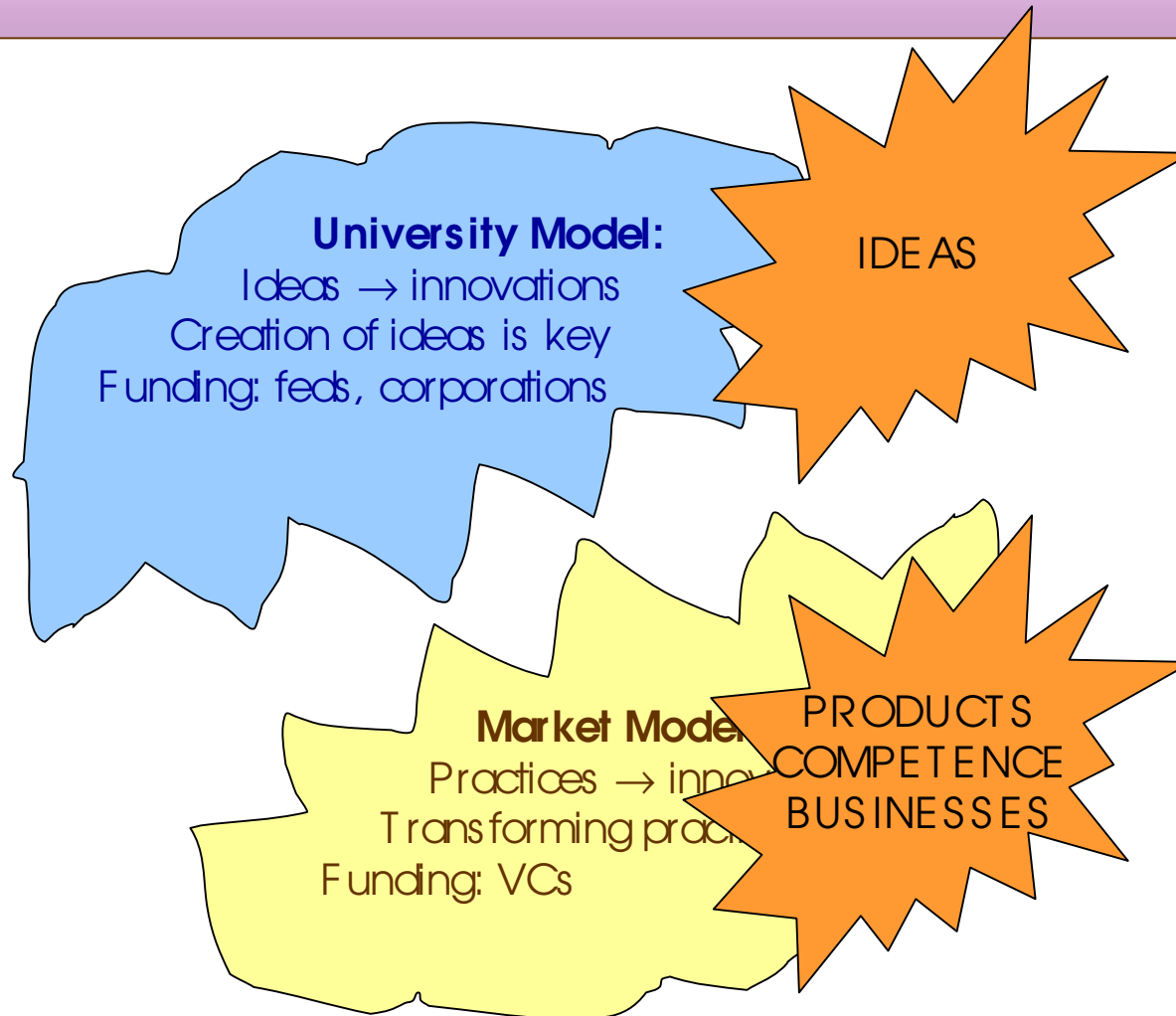
Generate Ideas

Generate Products

Generate Competence

Generate Businesses

Balkanization of innovation



Blended Model within IT Profession?

University Model:

Ideas → innovations
Creation of ideas is key
Funding: feds, corporations

Market Model:

Practices → innovations
Transforming practices is key
Funding: VCs

#3 -- The End of Education

Strong pressure for curriculum to prepare people for jobs

Will we wind up with all-technical curriculum?

Or a liberal education?

Do we promise our students we will teach them to make a living?

Or to have a life?

Bill Murray's plea

www.cs.jmu.edu/users/reynolcw/InfoSec/Murray.htm

#4 -- The End of Learning

Is this a trend? -- Graduating seniors

- who are burnt out from work
- self-centered
- relationships a mess
- few friends or confidants
- health problems
- spiritual emptiness

All this at age 22!



Dot com
(wannabe)
millionaires
too!

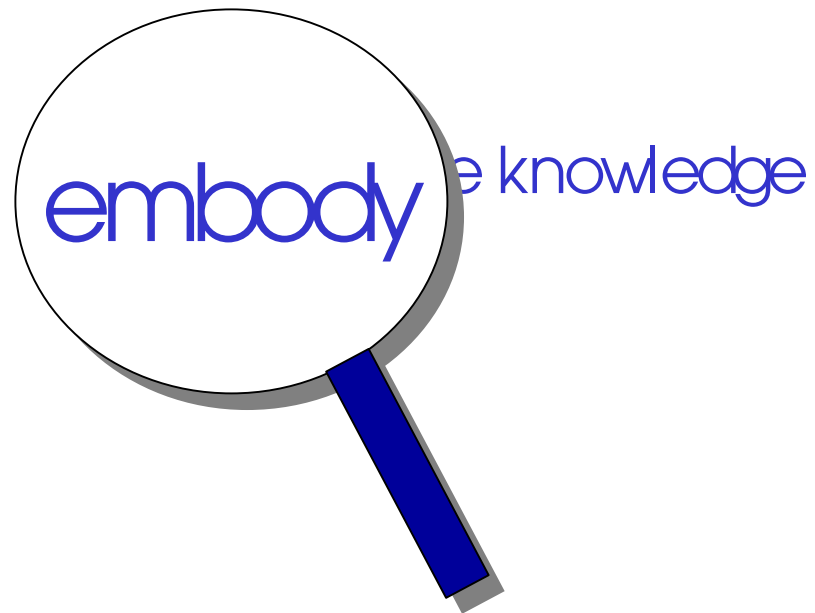
They are being set up for failure

Why?

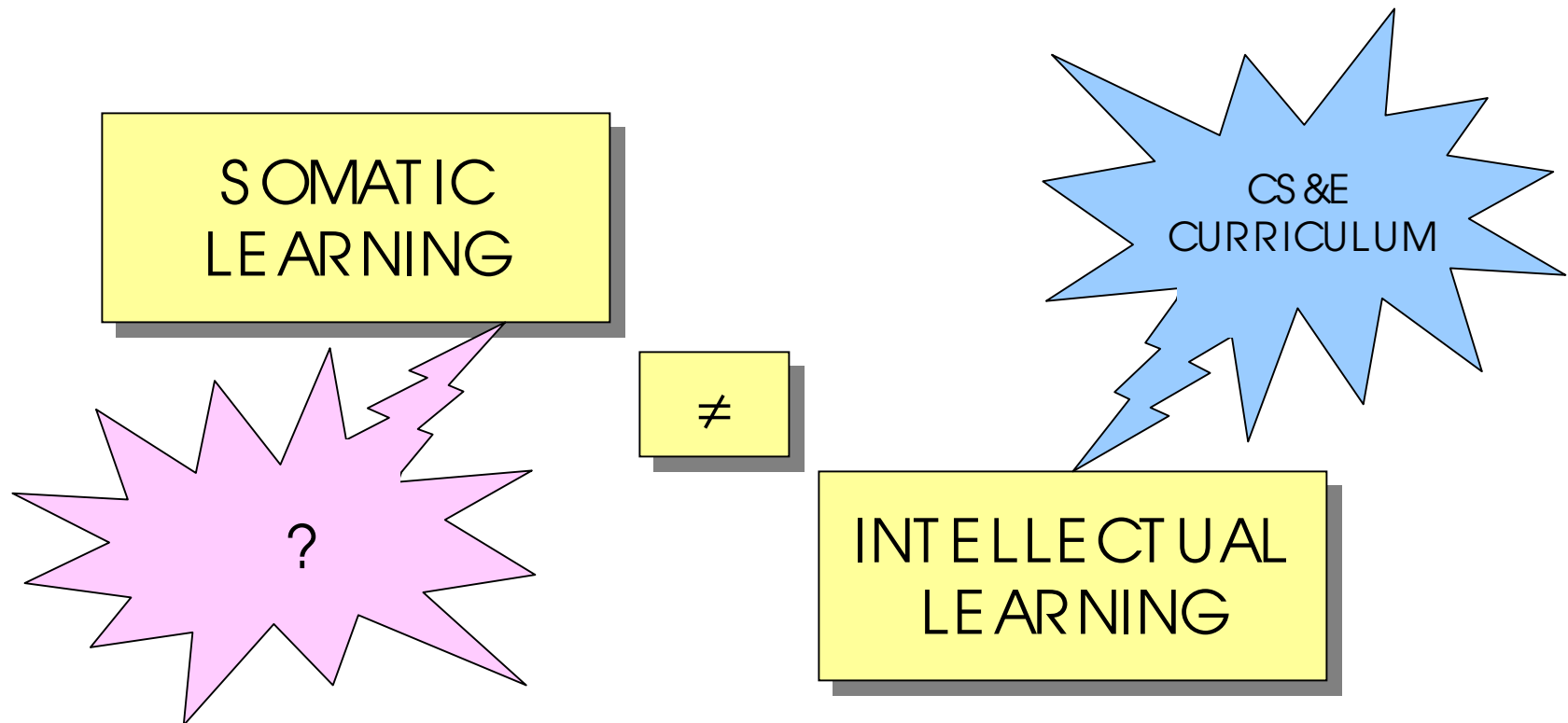
Is the problem a failure of counseling?

Or a failure of our curriculum?

To know is to be able to act effectively



Nothing is learned that is not embodied through practice.



Examples of somatic practices:

listening to
concerns

making a
declaration

inspiring
action

projecting
intention

forming a
team

generating
trust

managing
promises

connecting
with others

having a
presence

grabbing
attention

testing
programs

documenting
systems

confirming req's
with client

grounding
claims

One of the most important
somatic practices for CS &E
in the “new economy”:



entrepreneurship

Entrepreneurship is not an intellectual subject.
Is it a set of skills for observing the world and
transforming marginal practices to central ones.

It gives people the capacity to mobilize others to
attain their new future.

It gives people the capacity to move effectively in
the face of uncertainty.

It can be learned by practice, even through
simulated situations. It's like dance: you learn by
doing it and by hours of practice.

Fernando Flores :

If computer science cannot learn to teach
entrepreneurship, it will die.

What are we going to do to...

- #1 -- Maintain value by integrating into our curricula strong interactions with application domains?
- #2 -- Sustain innovation through new research elements following market model?
- #3 -- Retain a strong liberal education?
- #4 -- Attain embodied professional knowledge by adding a strong somatic and entrepreneurial dimension to our curricula?

Summary

- Nature of emerging IT profession
- ACM's initiative -- your help needed
- Four challenging questions about
 - Us
 - Research
 - Education
 - Learning

