

## life after grad school - heaven or hell?

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i n v e n t

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## abstract

- There is life after grad school! Two alumni offer advice from the world beyond the ivory tower. What useful things did we learn in grad school? What wasn't so useful? What did we not learn that we wish we had? What to look for in a job and a company. How to succeed once you get there. This talk will look at those questions from two different viewpoints - for a job in an industrial research lab, and at an Internet startup. Information for making a decision if you're close, and things to think about if you're not.



## disclaimers

- your mileage will vary
- our opinions, our experience
- our opinions, *not* our employers
- no universal truths



## industrial lab vs. startup

### *labs*

- Research and development for a large company
- long(er) time scales
- long-term impact
- (often) hard to see impact
- avoid the details
- steady cash
- some risk of boredom

### *startup*

- research and Development for a small company
- short time scales
- immediate impact
- noticeable impact
- sweat the details
- large (potential) \$ upside
- high risk of failure



## what I can use from grad school

*labs*

- process of research
- critical thinking
- hard work
- healthy skepticism
- how to defend your ideas
- writing and speaking
- thesis research (maybe)
- connections



*startup*

- process of research
- critical thinking
- hard work
- healthy cynicism
- how to defend your ideas
- coding
- (probably not)
- connections



## what I can't use from grad school

*labs*

- excessive broadness
- focus on a particular "great idea"



*startup*

- specialized knowledge in distant fields
- thesis research



## things I should have learned

### *labs*

- funding and proposals
  - sell ideas internally
    - > rsch community, divisions
  - how innovation happens
  - trade-offs
    - > Turing awards vs. SKUs
- teamwork
- real world innovation
  - what corners to cut
  - when it's "done"



### *startup*

- "selling" proposals
  - sell ideas internally
    - > technical, business case
  - how marketplace works
  - trade-offs
    - > "faster is better"\*
- teamwork
- real world engineering
  - (practical) fault tolerance
  - maintainable code
  - users are a diverse bunch



## what to watch for (finding a job)

### *labs*

- freedom
- funding models
  - central vs. per-project
- division partners
  - to get ideas used
- protection for innovation
  - for wild & crazy ideas
- MTBR
  - mean time btwn reorgs
- company culture
  - flexibility (hours, locations)
  - focus on development
  - people, people, people



### *startup*

- can the company succeed
  - me-too idea?
  - unrealistic assumptions
- funding
  - burn rate
- who's running the show
  - engineering, marketing, VCs
- does management seem realistic
  - challenges, trade-offs/risks
- company culture
  - innovation, autonomy
- people, people, people



## what to do (to succeed)

### *labs*

- take ownership
  - initiative
  - follow-through
- take risks
  - technically novel
  - in “transfer” activities
- politics
- play nicely with others
  - listen
  - talk
- don't over-engineer
  - there's always competition



### *startup*

- take ownership
  - initiative
    - > matters to the company
    - > just-do-it
  - follow-through
- take risks
  - push ideas out on the limb
  - tackle difficult problems
    - > general-purpose soln
- play nicely with others
  - listen
- build code/systems to last



## career evolution

### *labs*

- researcher
- technical track
  - senior researcher
  - lab scientist
  - company fellow
- management track
  - manager
  - 2nd line manager
  - 3rd line manager

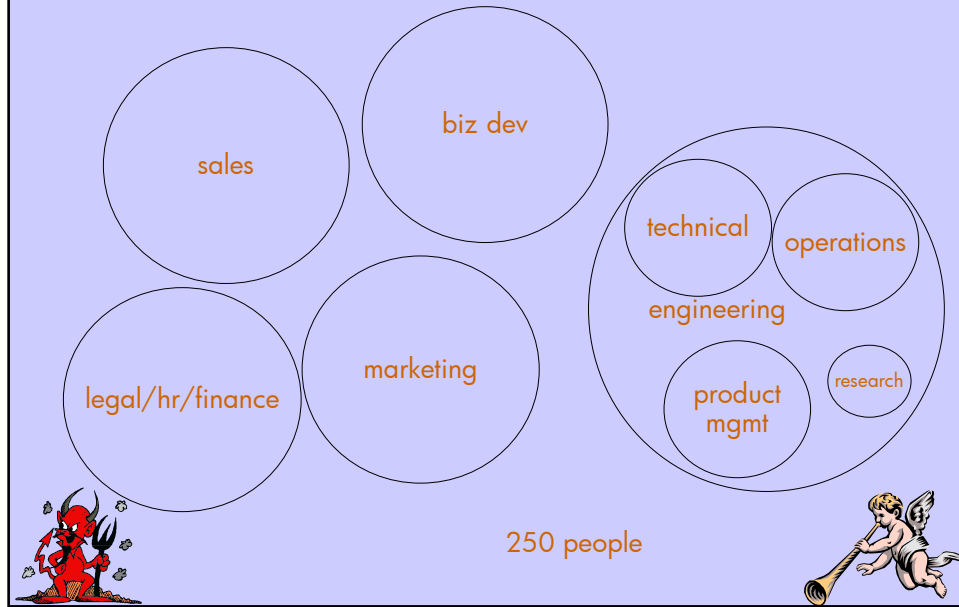


### *startup*

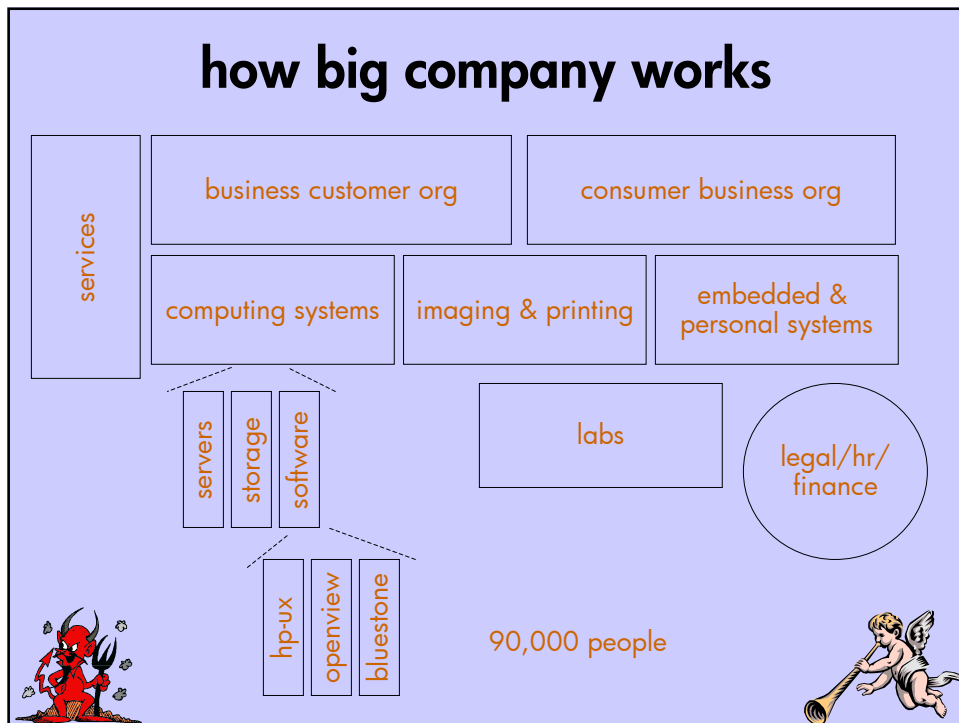
- engineer
- project lead
- product manager
- group manager
- fellow
- more fluid movement



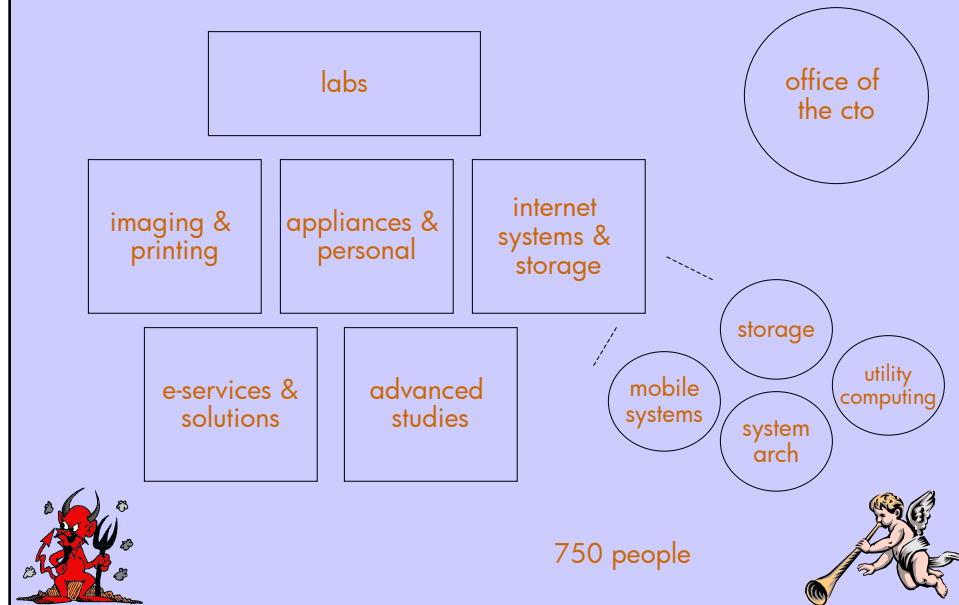
# how startup works



# how big company works



## how big research works



## industry vs. academia (why we didn't stay in academia)

- ability to have a direct impact
- publish or perish
  - tenure pressure gets in the way
- too much work
  - get funding, get students, run university, write papers
- too much politics
- money
- teamwork vs. working (often) for oneself



## why go to

### *labs*

- sense of the future
- contribute to innovation
- impact
  - smaller, indirect
- support for “bigger” things
- work w/ lots of smart people
- people w/ a broad range of interests



### *startup*

- sense of adventure
- do something new
- impact
  - big, direct
- financial reward
- work w/ smart and motivated people
- learn about business
  - broader experience
- do it yourself some day



## why not go to

### *labs*

- not enough direct impact
  - long-term
  - hard to see
- not risky enough
  - small innovations
- too big, get lost
- more corporate bs
  - cost-cutting
  - hierarchies, salary scales



### *startup*

- risky
- lots of work
- lots of things outside your control
- more direct reliance on others
  - one missed sale...
  - one technical snafu...
- chaotic
- lower salaries





## hiring process

### *labs*

- resume gets you in the door
  - who you know speeds the process
- give talk
- talk to entire group
- recommendations matter
- thorough interviews
  - technical competence
  - vision thing
  - teamwork



### *startup*

- who you know gets you in the door
- phone screens
- rigorous interviews
  - programming
  - problem solving
  - system design



## a day in the life

### *labs*

- get on train
- read email
  - corporate memos
  - cost-cutting measures
- think big thoughts
- visitor talks
- research presentations
- review papers
- visits to/from business units
- occasionally customers



### *startup*

- get on motorcycle
- read email, overnight fires
- code reviews
- informal discussion w/ peers on open problems
- design meetings
- fire fight production systems
- write code, write code
- field questions from business/support staff, other engineers



## have a life

- work to live *not* live to work
  - work to learn *not* work to earn
- have boundaries/limits
  - burn-out helps nobody
- watch for signs of stress
  - and then *pay attention* to them
- work isn't everything
- socialize with people other than just co-workers
- enjoy the world around you
  - always remember, this *is* life!



## things to remember

- take time off
  - don't start a job right away
  - see the world (or at least your family)
- finish writing before you leave Pittsburgh
  - otherwise it'll be another year, or two, or ...
- don't take the first job that appears
  - shop around, compare options
  - watch benefits (flextime, vacation, mortgage assist)
- you can always change jobs if it doesn't work out
- keep in touch with people
  - contacts, contacts, contacts



## companies in the marketplace

### *labs*

- wide range of businesses
  - sometimes some do better than others
- new business takes time
  - has to be “big”
  - overcome inertia
- divisions aren't sitting still
  - not sitting around their offices waiting for cool new ideas from research



### *startup*

- narrow set of businesses
- one smart competitor ruins your whole day
- big industry players can make you sweat
- always another hungry startup on your heels
- ability to redefine yourself
  - move into new businesses quickly



## value-added - what makes a good idea?

- expands the market
  - raises all boats, vs. fighting for market share
- creates a new market
- better “enough” to motivate customers to switch
- benefits can be understood by customers
- creates barriers to switching away (lock-in)
- cost-effective for the company
  - high enough margins
  - large enough (potential) customer base
- patentable or publishable
  - contributes to patent/technology portfolio



## the verdict

*labs*



*startup*



life is hell, enjoy grad school while it lasts!

## conclusions

- your mileage will vary
  - evaluate options
  - trust your instincts
- the PhD is worth it
  - stay in school
- remember critical thinking
  - not arrogance
- have a life
- contacts, contacts, contacts



## recent PhD alums, where (why)

- Erik Riedel, HP Labs (the people)
- Howard Gobioff, Google (adventure)
- Fay Chang, Compaq SRC (freedom, the people)
- Andrew Tomkins, IBM Almaden (the people)
- Hugo Patterson, NetApp (interesting new products)
- Sean Slattery, Applied Psychology Research (research, location)
- Peter Dinda, Northwestern University (adventure, growth)
  - Khalil Amiri, IBM Watson (cool work, impact)
  - Darrell Kindred, NAI Labs (friendly folks)
  - Arup Mukherjee, Yahoo! (product affects millions)



## bibliography

### *labs*

- *you and your research*, by richard hamming (talk)
- *first break all the rules: great managers*, by marcus buckingham and curt coffman
- *the innovator's dilemma*, by clayton christensen
- *six thinking hats*, by edward de bono

### *startup*

- *startup*, by jerry kaplan
- *crossing the chasm*, by geoffrey moore
- *what they don't teach you in graduate school*, by bruce nelson (1997 emigration course)
- *is work hell? life in industrial research*, by john wilkes (1997 emigration course)

