Career Paths: How to Get Started in Academia or Industry

Cristina Cifuentes
Sun Labs

Overview

- Background
- Getting started in industrial research
- Case study – research at Sun Labs
- Lessons learned

Background

Getting Started in Industry Research

- Applied research
  - **can become a product**
  - needs to be justified in the context of the company
  - not just about writing papers and half-baked prototypes
  - a lot of extra effort is required to get a prototype to the level of a product
  - a lot of interaction is needed to get product division interested in outcomes of the research

Getting Started in Industry Research

- Sun Labs career path
  - Member of technical staff
    - recent PhD graduate
  - Staff engineer
    - individual contributor, own a piece of a project
  - Senior staff engineer
    - owns project, talks to the rest of the company
  - Distinguished engineer
    - owns project, recognized externally as an expert in a domain
  - Fellow
    - high level of contributions to the company and industry
    - very few people in the whole company become fellows

Getting Started in Industry Research

- Sun Labs career path
  - Member of technical staff
    - recent PhD graduate
  - Staff engineer <– joined
    - individual contributor, own a piece of a project
  - Senior staff engineer <– current
    - owns project, talks to the rest of the company
  - Distinguished engineer
    - owns project, recognized externally as an expert in a domain
  - Fellow
    - high level of contributions to the company and industry
    - very few people in the whole company become fellows

Getting Started in Industry Research

- My experience
  - > Visiting Professor on sabbatical leave
  - > Best of both worlds
  - > Had own project (binary translation), wanted to know what was needed to apply it in industry
    - – academia limited to research outcomes, no tech transfer unless create startup company (was offered VC funding)
    - – industry provides opportunity for tech transfer
    - – had to learn to get support for the project, not just from engineers but also from their senior management and my own senior management
    - – the more different it is, the harder it is to transfer

Getting Started in Industry Research

- Determine your role in the project
  - > individual contributor
    - normally when you're junior at the Labs
    - also needed in product groups – junior and senior engineers
  - > lead a project
    - normally when you're senior and above at Labs
    - in product groups, normally manager leads a project and senior engineers lead parts of the project

Getting Started in Industry Research

Facts to Take into Account

- No “freedom of research” as per universities
- No basic research or theory-only projects
- Timeframe of projects is short-scale in general
- Less job security
  - “tenure” doesn't mean anything
- Restrictions in terms of tools used
  - productivity tools, sometimes for implementation projects
- May be difficult to go back to academia
  - different criteria

Case Study – Research at Sun Labs

Research Strategy

- Applied research aligned with Sun's Business
- Innovate, Demonstrate, Transfer
  - > Create innovative technologies, (i.e. Java), but not the only source of innovation at Sun
  - > Use small teams to develop innovative technologies
  - > Transfer our Knowledge, Prototypes, People and Projects to Sun engineering
- Contribute to open-source and standards initiatives

Center for Innovation

We're About Surprises ...

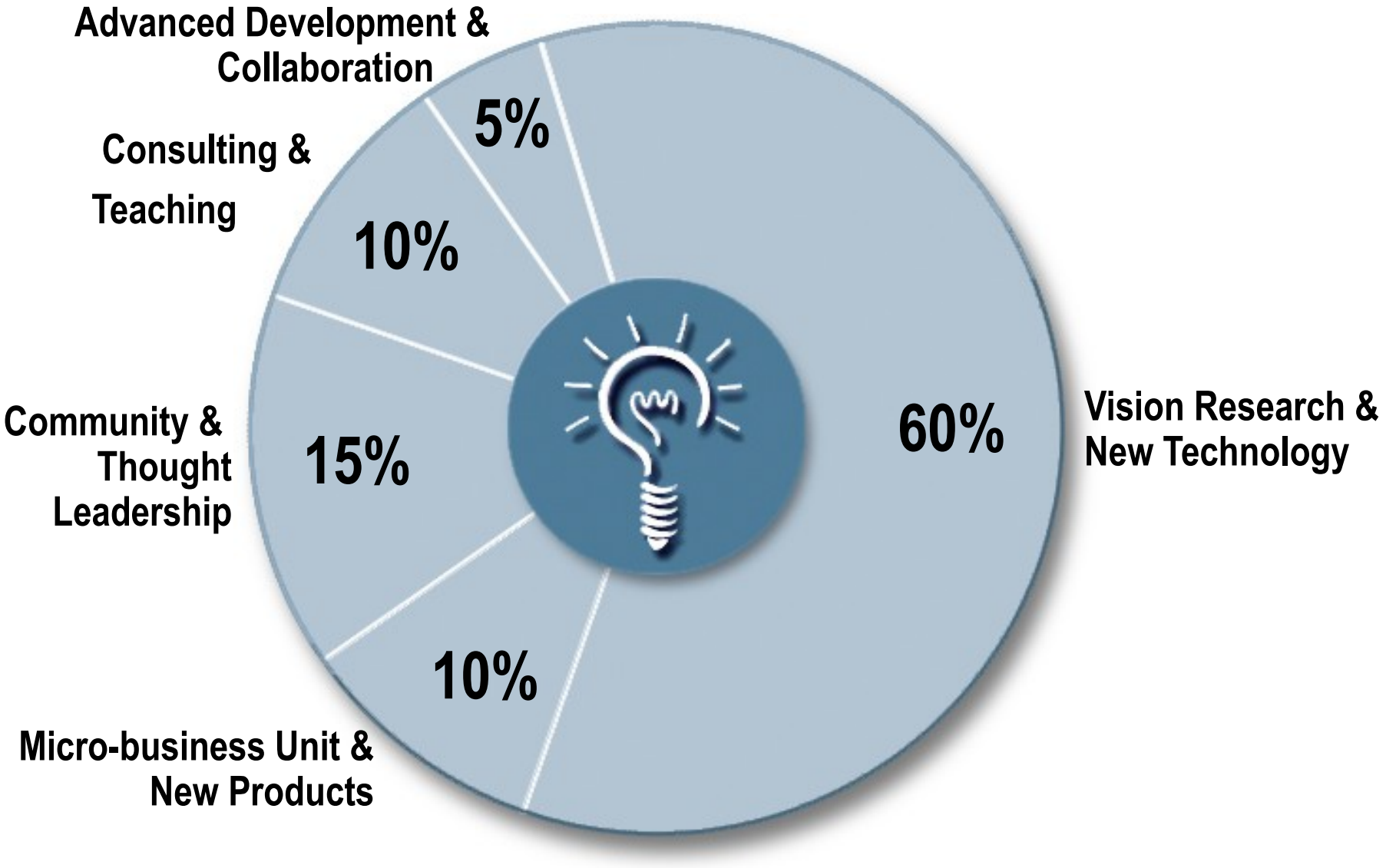
Engineering (Business Units)

- No surprises
- Execution on-budget, on-schedule is key
- Eliminate ambiguity
- Incremental product evolution
- Stability

Research (Labs)

- All about surprises
- Execution is important but innovation is key
- Ambiguity is your friend
- Two Innovation options:
  - > Substitute products
  - > New Markets
- Change

What We Do


Advanced Development & Collaboration
5%
Consulting & Teaching
10%
Community & Thought Leadership
15%
Micro-business Unit & New Products
10%
60%
Vision Research & New Technology

Lessons Learned

- Choice of project
  - > May improve existing technologies and practices
    - – product division needs to agree on taking it on board
    - – sometimes transfer people to product group
  - > May replace existing technology
    - – hard to transfer
  - > May create a new market
    - – difficult to transfer as no product division at the other end
  - > May contribute externally to the company
    - – contributions to open source code
    - – projects not within the scope of the company

Lessons Learned

"Technology transfer is a contact sport."

Bert Sutherland
Former Sun Labs Director

Lessons Learned

- Division of your time
  - individual contributor
    - mostly research and implementation in the project
  - lead a project
    - research, implementation, service (to the company and the community)
    - learn how to balance
    - and when to say no
  - no formal teaching
    - teach interns new theory, technologies, and skills

Lessons Learned

- When starting a new project
  - > feasibility analysis
    - – discuss with researchers and product folks
  - > propose project
    - – have 2-3 year plan
    - – proposal based on number of people likely to join project
  - > design
    - – determine areas of research to tackle
    - – determine infrastructure and implications of using such infrastructure
      - – software licenses, implications of using open source
    - – setup testing infrastructure prior to implementation

Lessons Learned

- Publish or patent or open source?
  - No “publish or perish” rule
  - Patents are important to protect company's IP
  - Papers are useful to communicate one's research and be in touch with the community
  - Contributing to open source is another way to be in touch with the community
    - need to be aware of one's time availability
  - Collaborative research agreements are good to explore new ideas in related areas of knowledge
    - university owns IP

Lessons Learned

Work and life balance

- Life events (e.g., baby is born)
  - can change project
  - can work part-time
  - can work from home
  - no clock is ticking for tenure
- Working remotely (e.g., from Australia)
  - home office or hosted at university
  - more flexibility in life
  - less commute time, less stress (no traffic!)
  - need to be dedicated, like to work independently, have tools to be available (IM, video chat, email, phone)
  - need to create presence on the host site

Career Paths: How to Get Started in Academia or Industry

Cristina Cifuentes
cristina.cifuentes@sun.com