What do you need to know about IP and Innovation?

Learning Objectives

- Be able to list the four forms of intellectual property
    - > describe key attributes and differences
    - > identify typical use case or give an example of how each might be used
- Be able to describe the two main types of patents
- Be able to navigate the USPTO web site
    - > Find basic information about patents and patent application process
    - > Find patents relevant to an invention
    - > Download a patent
- Be able to explain the pros and cons of having engineers read patents
- Be able to describe the ways that patents might be used in the design process
- Be able to define terms related to innovation and give an example of each
    - > sustaining innovation
    - > radical innovation
    - > disruptive innovation
- Be able to define the role of marketing in technology development
    - > market research
    - > minimum viable product
- Be able to define the strategy known as "fail fast"

What do you need to know about intellectual property?

You should be able to explain these aspects of IP

- Four types: Patents, copyright, trademarks, trade secrets
- Duration and type of protection afforded by each type of IP
- Criteria for awarding patents: novelty, non-obviousness, utility
- Basic knowledge of USPTO web site: how to do a basic patent search

Legal reality

- Intellectual property rights give you a legal claim on your invention or creative work. Intellectual property is not a magical shield.
- Patents are a tool of competition. Companies build up intellectual property portfolios not just because they want to commercialize their inventions or creative work. Intellectual property is used as leverage making business deals.
- Patents are also a way to make money, especially for patent trolls.

What do you need to know about patents?

Basic facts

- A patent gives you legal claim to prevent someone from using your invention
- Three types: utility, design, plant
- Granted by countries: rules vary, protection applies within boundaries of the company
- Patent is issued in the name of the inventor
- As of March 2013, USPTO gives priority to the *first to file*, not the *first to invent*.

What do you need to know about innovation?

Definitions – there are many. See Griffin

McDermott and O'Conner (2001) define innovation as "a new technology or combination of technologies that offer worthwhile benefits" [1]. Griffin [2] defines innovation as "The managed effort of an organization to develop new products or services or new uses for existing products or services" [2].

- Invention is not the same as innovation. Again, disagreement over terms exists.
  + Invention is the creation of a new process, material, device for the first time.
  + Innovation is the application of an improvement for a purpose.
- Innovation can be described by its social context (business versus technological) and by the type of influence it has (incremental, radical, disruptive).
- Understanding the impact of innovation is more important than semantics. However, clear language and testable models are also very important. Thus, it makes sense to learn the terminology and use it with as much precision as reasonably possible.

- Understanding the dynamics and patterns helps in making business decisions

Innovation Policy

- Policy: motivation for government regulation, establishing patents, existence of USPTO and international counterparts
- Taxation: depreciation of equipment, support of university research

Innovation in business strategy

- Need to understand innovation to survive and succeed in a competitive business environment
  + Is your company in a competitive business environment?
  + If not now, will it be? (See disruptive innovation)
- Incremental innovation is the standard approach. We can't do with out it.
- Engineering managers and technical (non-managerial) engineers should survey competition and be aware of their technical and business innovations

Incremental Innovation (a.k.a. Sustaining Innovation)

- Definitions
  + (Griffin): "A new gradual improvement of existing product or process
  + (Davila et al): Continuous or gradual improvements
- Important (!) though not as sexy as radical or disruptive innovation
- Likely to be the kind of innovation of your first job

Radical Innovation

- Definitions
  + (Griffin): "A new product, service or technology that completely replaces an existing one"
  + (Davila et al): Changes (technological or business) that alter the competitive environment such that earlier technologies or businesses are severely disadvantaged
- Dimensions
  + Davila: combination of business innovation and technology innovation
  + Architecture
- Design: user experience; applicable

Disruptive Innovation

- A kind of radical innovation
- An initially inferior product or process that is ignored by incumbents, and which allows competitors to gain foothold, and then surpass incumbent with rapid technological innovation

Open and collaborative innovation

- The open source software movement has created huge benefits for society [3]. It has introduced viable free alternatives, which is especially important for non-profits, governments, and start-up companies. The open source movement is a mechanism for software innovation.

- In the past few years, and open source hardware movement has emerged (http://www.oshwa.org).

References

1. McDermott, Christopher M. and O'Connor, Gina C., *Managing radical innovation: an overview of emergent strategy issues*, Journal of Product Innovation Management, 19: 424-438, 2002.

2. Griffin, Ricky M., **Management**, 11th edition, 2012, Cengate Learning.

3. David Douglas, Greg Papadopulus and John Boutelle, **Citizen Engineer**, 2010, Prentice-Hall.