Brief Overview of Research Intellectual Property (IP) and Entrepreneurship
Outline

• What is research Intellectual Property (IP)?
  – Patents
  – Copyrights
  – Trademarks
  – Trade Secrets / Confidential Information
  – You are likely to see
    • Confidential Disclosure Agreement (CDA)
      – Also called Non-Disclosure Agreement (NDA)
    • Employee assignment agreements
    • Employee non-compete agreements

• Entrepreneurship and start-ups
  – What’s the ONLY thing you MUST have for a company?
  – People, People, People --- the management team
  – Business plan
    • The “hockey stick”
  – Funding
    • Friends & Family; Angel Investors; Venture Capitalists; Investment banks
    • The “Golden Rule” --- who has the gold, makes the rules
  – Stock (equity) and vesting --- “Incentive”
  – Exit strategies
    • Initial Public Offering (IPO); Buy-out/merger/acquisition; Sustained profitable business
Patents

- In return for disclosing your invention publicly, you are given a limited monopoly (typically 20 years) to practice your invention
  - “A license to sue infringers.”
  - A patent’s Claims state the limit of the invention
  - Royalties, license fees, etc.
- A patent must be three things: Novel; useful; non-obvious
- Inventorship is a matter of law, determined by the patent attorneys
  - Inventors = those who contributed a (conceptual) inventive step to the Claims
  - Not an inventor: A “hired pair of hands;” one who pointed out the problem
  - An incorrect inventor list may invalidate the patent
- Typically takes 3-5 years and $5-100K from filing to issuing (US only)
  - First reply from Patent Office curtly dismisses all your claims
  - Thereafter, a negotiation ensues about what they will allow
  - US patent applications and issued patents are online at //www.uspto.gov/
- Provisional patent vs. full patent: provisional established priority date for full
- Must file a separate patent in each country desired
  - International translation and prosecution costs can mount rapidly
- US patent law differs substantially from most other countries
  - US priority = first conception, followed by diligence in reducing to practice
    - Keep good laboratory notebooks!
  - Harmonization efforts in progress, expect major changes in US patent law in coming years
Copyrights

• Gives the creator of an original work the exclusive rights to that work (typically for 50-100 years, maybe renewable)
  – Generally, gives control of copying; maybe other rights, e.g., attribution, translation, derivative works, other controls

• Creator has an implicit copyright on any created work
  – Stronger to mark it with © 2011, Richard Lathrop
  – Even stronger to register the copyright with the government ®

• Applies to source/binary code, firmware, schematics, VLSI masks, digital icons, other “works of art,” etc.
  – Images may be digitally “watermarked” as proof

• Text and images from the web are implicitly copyrighted
  – Be very careful about unauthorized public or commercial use
  – Safer to post the URL than to download and post text/images

• Many innovative copyright extensions for “open source/open access”
  – How to make it “public” without someone else just copyrighting it and keeping it themselves
  – Can control almost all aspects of derivative use
    • Require others to replicate copyright; make source code enhancements available; etc.
  – GNU public license; Creative Commons Attribution License; other “Open access” licenses
Trademarks

• Sign, logo, or indicator used to indicate or brand a unique source of goods or services
  – TM = unregistered trade-mark (goods)
  – SM = unregistered service mark (services)
  – ® = trade-mark registered with government
  – Trade-mark owner can prevent infringement by others

• Intent: Prevent confusion among consumers
  – Generally cannot be “too close” to existing trade-mark or word(s)
    • “Too close” may depend on industrial sector
    • Common words generally not allowed
    • Distinctive phrases may be allowed
  – Can be lost/unenforceable if it passes into common speech
    • Aspirin, cellophane, dry ice, escalator, heroin, laudromat, zipper

• Start-ups usually trade-mark their name, logo, product names, etc.
Trade Secrets / Confidential Info

• Information, not generally known, that confers economic advantage because it is secret
  – Process, formula, method, design, procedure, etc.
  – E.g., the formula for Coca-Cola® is a trade secret

• Three requirements for legal protection
  – Not generally known to the public
  – Confers benefit because it is a secret
  – Owner takes reasonable steps to preserve secrecy

• Enforced by non-disclosure/non-compete agreements, special handling procedures, technical measures
  – Reverse engineering or employee poaching is legal
  – Industrial espionage is illegal

• Legal remedies include injunctions and award of damages
You are likely to see

• Confidential Disclosure Agreement (CDA)
  – Also called Non-Disclosure Agreement (NDA)
  – You agree not to disclose confidential info for N years
    • Heavy legal/financial penalties
  – Standard exclusions:
    • Already known; public info; known from other channels

• Employee assignment agreements (often mandatory)
  – Commonly you assign all IP to your employer
  – Sometimes retain rights outside scope of employment

• Employee non-compete agreements (often mandatory)
  – You agree not to compete for N years
  – Avoids/reduces “employee poaching” for IP by competitors
  – Be careful! May greatly reduce your ability to get a new job
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• A customer
People, People, People ---
The management team

• A common failure mode for high-tech start-ups
  – Techie founder believes that, because they’re a smart techie, they’re also a smart businessperson
  – You truly do need smart people who know business

• Typical business management team members
  – CEO/President
  – Chief Financial Officer (CFO)/accounting
  – Chief Business Officer (CBO)/sales & marketing
  – Chief Operations Officer (COO)/procedures, logistics
  – Chief Legal Officer (CLO)/IP, contract writing & review

• Often hired at a lower title (VP, Director, Manager)
  – Promoted later based on performance
  – Avoid filling your high-level slots too early

• Management team usually in place before major fund-raising
  – Will be scrutinized closely by funders
Business plan (outline)

• Executive summary: One page of highlights; concise; interesting
• Company description
  – History, industry focus, current status, future plans
• Product or service: How will you make money?
• Market Analysis
  – Market, customers & how to reach them, competitors
• Implementation strategy
  – Budgets, target dates, management tasks, milestones
  – Be sure you can track progress and results
• Web plan summary (for e-commerce)
• Management team --- people, people, people
• Financial analysis
  – Future projected profit-and-loss (P&L), cash-flow analysis
  – “Hockey stick” --- revenues initially flat, then increase dramatically
Funding

• Funding source varies with development stage
  – Friends & Family in “garage” stage
  – Angel Investors in “seed” stage
  – Venture Capitalists in “growth” stage
  – Investment banks in “mature” stage

• The “Golden Rule” --- who has the gold, makes the rules
  – You give up both ownership & control with growth

• Each successive funding round dilutes the previous rounds
  – Your fractional ownership will be reduced
  – Hopefully, though, your net worth will increase

• “Valuation” = (number of shares) x (price/share)
  – Determines your “cost” for next funding stage
  – Funders often value your company at less than you do

• What’s the ONLY reason companies fail?
  – They run out of money
  – In early stages, CEO/President spends almost all the time just raising money
Stock (equity) and vesting --- “Incentive”

• Two kinds of stock
  – Preferred
    • Issued to funders at full “cost” of valuation
    • Paid back first if company fails or is liquidated
  – Common
    • Issued to employees, usually at very low cost
    • Usually incentive-based and tied to specific milestones
    • May be a grant or an option
    • Note: a grant is usually taxed as income, EVEN IF NEVER REALIZED

• Vesting: when do you actually own your shares?
  – Typically “vests” in monthly increments over 2-3 years
  – What if you quit or are fired while only partly vested?
    • Do you get to keep your partly vested shares?
    • Does the company get to repurchase them?
  – Typically all shares vest 100% upon an “exit event” (next)
Exit Strategies

• How to get your money out of the company?
• Initial Public Offering (IPO)
  – Become a publicly traded company
  – Typically you can’t sell your shares for 6 months
• Buy-out/merger/acquisition
  – Merge with a competitor or bought by a customer
• Sustained profitable business
  – Investors usually prefer to exit with the cash
• Investor’s exit goals
  – 5X return in 3 years or 10X return in 5 years
  – Need high returns because most start-ups fail
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