

End-of-Chapter Answer Keys (Selected Exercises in Red)
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Technology Ventures: From Idea to Enterprise
McGraw-Hill Higher Education

1.8 Exercises

1.1 What is the difference between an idea and an opportunity? Why is this difference important to entrepreneurs?

The primary purpose of this question is to ensure the student understands the distinction between having an idea for a company and the process of assessing if the idea is a viable opportunity. Many of the chapters and frameworks in this book address a number of the key questions an entrepreneur must answer about their idea to determine if it is worth pursuing and investing time and money to make happen. An opportunity can be considered a fully vetted idea where the customer need is clear, the market potential is assessed, the competitive landscape is understood, the market context is addressed, and the next steps that must be taken to start the new venture are clear. The business plan and business presentations are common methods of communicating and refining an idea to a specific, targetable opportunity. Figure 1.1 provides some of the key characteristics of an attractive opportunity.

1.2 Consider opportunities that have occurred to you over the past month and list them in a column. Then, describe your strong interests and passions, and list them in a second column. Finally, create a list of your capabilities in a third column. Is there a natural match of opportunity, interests, and capabilities? If so, does this opportunity appear to offer a good chance to build an enterprise? What would you need to do to make this opportunity an attractive chance to build an enterprise business?

1.3 Name an entrepreneur that you personally admire. Why do you consider this person to be an entrepreneur? What sets him or her apart from other business leaders? What path did this person take to entrepreneurship? What personal sacrifices or investments did this person make in the journey? What people were important to this person's success?

There is no right or wrong answer to this question. But hopefully the student takes the characteristics of an entrepreneur outlined in this chapter and apply these characteristics to a role model. Some of the founders of companies in Table 1.1 would be appropriate. Table 1.3, Table 1.5, Table 1.6 and Table 1.7 outline many of the key personality characteristics associated with being an entrepreneur. It would be helpful for students to think about founders that have emerged from different parts of the organization. Many founders come from engineering background. However there are also many successful entrepreneurs from sales and other parts of an organization. The opportunities entrepreneurs identify are in many cases heavily weighted to past experiences and what levels of customer interaction are experienced. Repeat successful entrepreneurs are also a unique breed given the repeatability of delivering on their visions. Personal sacrifices hints at the potentially all-consuming nature of starting a new business. Being

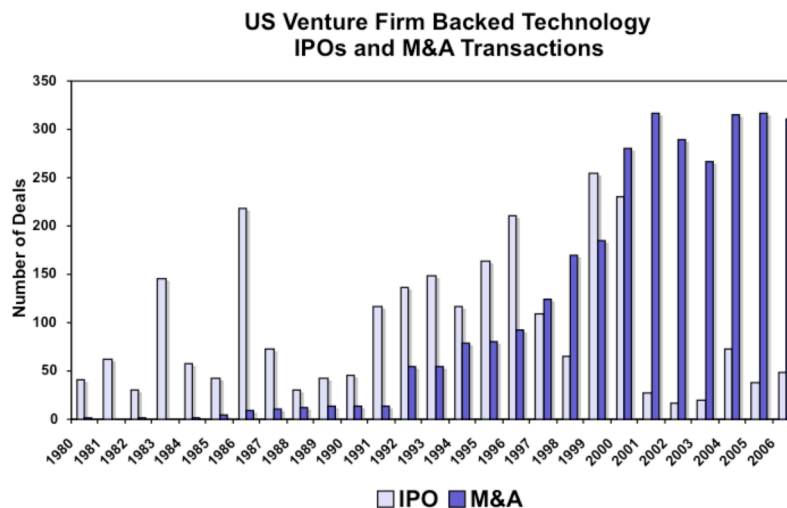
an entrepreneur in many cases requires a significant investment of time and effort, at the expense of other life activities. It is important to recognize this tradeoff and address it honestly. Many successful entrepreneurs also point to key mentors they have had throughout their careers. Mentors can provide guidance and much needed sounding boards for ideas.

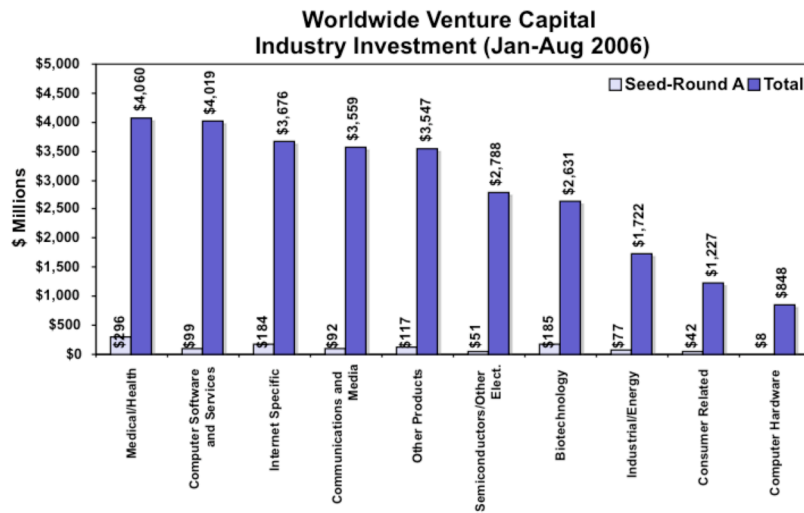
1.4 Name a successful entrepreneurial team you personally admire. How would you classify it in the context of the entrepreneur types defined in Table 1.4? Do the elements of entrepreneurship apply to it?

1.5 Research the number of companies that either had an IPO (initial public offering) or have been acquired in the last five years. What industries were these companies in? Where is the number of IPOs vs. M&As (mergers and acquisitions) trend leading? What implications does this have on the number of new ventures being started?

Since the dot com explosion and a tougher overall economic environment, it can be seen that acquisition is a more likely exit than IPO. The total number of exits has increased, however this should be weighed against the total exit valuations. IPOs have traditionally led to higher exit valuations than M&A. It is always dangerous for entrepreneurs to think too much or target specific types of exits. But it is relevant to consider the specific market dynamics the new venture is operating in and how value is being rewarded. For example, in the drug discovery space, it is unnecessary for the vast majority startups to create a go to market strategy, relying on a larger partner to take successful drugs to market (either in partnership or via acquisition).

Example charts:





- 1.6** Given an understanding of the waves of innovation throughout history (Figure 1.5), explore opportunities that are created in a wave after the peak. For example, how can an entrepreneur take advantage of a mature or declining market?

2.7 Exercises

2.1 One approach to classifying market entry is by (a) creating a new market, (b) attacking an existing market, or (c) resegmenting an existing market. Using Table 2.1, indicate how each of these categories of opportunities would be applicable to these market-entry approaches.

Use Table 2.1 to analyze each of the above scenarios.

Creating a new market is challenging since there is no precedence (by definition) and users must be educated about the product or service. This can be expensive and require large marketing expenditures. It is also challenging if any type of consumer behavior change is expected or necessary for the company to be successful.

Attacking an existing market has the benefit that customers and price points are well understood. However, there are usually large competitors and challenges in stealing market share or differentiating from existing market options.

Resegmenting an existing market is usually focused on meeting an underserved need or segmenting the most attractive customers in a market. There are benefits since the market is established and the market size can be estimated. However similar to existing markets, there will be competitors to some degree.

Very different product and market entry strategies are recommended given these 3 different market types. Table 2.1 provides a list of suggested opportunities these market approaches would fall under.

2.2 What were some of the key customer, technology, and market trends that drove entrepreneurship during the last decade? What factors do you predict will drive entrepreneurial challenges in the next decade?

The Internet (dot com and dot bomb), semiconductors, bio-tech, wireless, medical devices are some of the frequently mentioned areas of change. Many of these markets have exhibited exponential growth rates and orders of magnitude performance improvements or cost declines. In defining these types of markets, characterizing each market opportunity as either a new market, a re-segmented market or an existing market is helpful in understanding the motivation for the trend. New markets are most often associated with entrepreneurs, creating a product where one did not exist before and bringing it to market. Many entrepreneurs have also looked at existing markets and either re-segmented the customers or improved upon what is currently done (process related, operational costs, distribution channels, etc.).

Convergence is a key theme in many forward looking markets. Old media navigating a new medium in the Internet is creating a number of new opportunities for both established and new companies. The Internet and the proliferation of mobile devices has created new channels and usage patterns of media. Social networking is in the middle of many media and communication trends. Bio-tech investment continues to attract a significant amount of investment. With rising

energy costs, investments in renewable energy or processes that are more efficient is expected to be a significant growth area into the future.

2.3 The next big wave of innovation may be the convergence of bio-, info-, and nano-technologies. Each holds promise in its own right, but together, they could give rise to many important products. Describe one opportunity motivated by the convergence of these new areas, and write a story about the opportunity.

Example: BACKGROUND: Ovarian cancer is the fifth leading cause of cancer deaths among U.S. women. It accounted for an estimated 25,400 new cases and 14,300 deaths in 2003. The 5-year survival rate is approximately 95% if it is detected early. However, symptoms usually do not become apparent until the cancer has reached an advanced stage (III/IV) at which point the survivability falls to 35%. CHALLENGE: Current protocol recommends screening only for women deemed to be at high risk because of personal or family history (up to 10 million in the U.S.). For this population it is recommended that Cancer Antigen (CA)-125 protein blood tests be performed on a regular basis. If CA-125 levels in the blood become elevated, the next step is a transvaginal ultrasound (TVUS). If the results of the ultrasound are abnormal, surgery is performed. This strategy is so poor that it is estimated that it takes four “needless” surgeries to find one case of ovarian cancer in asymptomatic women. This protocol does nothing for normal-risk women or those who develop ovarian cancer without elevated CA-125 levels. Still, an estimated \$80 million is spent on CA-125 tests annually in the US. RESOLUTION: Glycans (polymers of sugar) are fundamental to many biological processes including fertilization, immune defense, viral replication, parasitic infection, cell growth, cell-cell adhesion and inflammation. Dr Carlito Lebrilla of UC Davis, a leading expert in glycan analysis using mass spectrometry, has developed patent-pending techniques for identifying glycan biomarkers. In particular, he has discovered glycan biomarkers exclusively linked to ovarian cancer cells. Using only a chemical test of blood serum, his process accurately identifies not only the presence of ovarian cancer, but also the sub-type of and stage of cancer. The ovarian cancer test is currently in small-scale clinical trials. Dr. Lebrilla is confident that within the next year tests will also be developed for other adenocarcinoma (in the lining or inner surface of an organ) such as breast, prostate, lung, and pancreatic cancers. Glycometrix plans to become a leading cancer screening and monitoring company providing highly accurate, non-invasive, and cost-effective products for early stage cancer detection using novel proprietary glycan-based blood-serum testing technologies. If their ovarian cancer screening test were offered at \$100/test/year, the potential in this market would be 10 million (high risk population) times \$100/person, or \$1B/year. For more information, visit www.glycometrix.com.

2.4 Some imagine that within a few years it will be possible, through the use of stem cells, to create new cells and eventually new organs to replace those that fail. Summarize the potential opportunity for stem cell businesses. How would you begin to estimate the size of this opportunity? Write a story depicting the opportunity.

2.5 The convergence of biology with computers and nanotechnology may lead to safer and more effective medicines. Visit www.research.cornell.edu/anmt and examine the potential for nanomedical technologies. Write a brief concept summary for a nanotechnology start-up.

Use Table 2.8 and the concept of convergence summarized on p. 32.

- 2.6** As energy costs rise and the impact on the environment becomes clearer, clean tech has become an area of significant new investment. Quantify the trends driving this renewed investment interest. How would you evaluate and market size the clean tech opportunity?
- 2.7** **Great companies often create tools that solve people's everyday problems. People like to chat and say hello often. What innovations were motivated by this simple desire? What new opportunities in this space are being created by technology innovation?**

The telecommunications space, and more recently mobile has focused on voice and a variety of mobile communication options. VOIP, IM, SMS, & email are clear examples of technologies that have been created and thrived due to the social nature of people. Many of these services are being enabled by the Internet or data connectivity.

- 2.8** Consider a software application you use regularly. What task(s) does it improve or enable? Suggest three ways the application could be improved. Would any of these improvements be considered an opportunity for a new venture? Why or why not?
- 2.9** **Global sales of radio frequency identification tags (RFID) and related equipment have been forecasted to explode multiple times in the last decade. Describe the problems solved by RFID and the opportunities presented. What have been the barriers to commercialization of this technology? What types of opportunities will be created when RFID tags are widely adopted in products?**

The RFID market received a huge endorsement and boost when Walmart mandated many suppliers in their supply chain move to RFID in the tagging of inventory. Walmart in a strong push towards inventory management improvement regards RFID as a key distribution network differentiator they can leverage to provide lower cost goods to their stores. The majority of the tagging is focused on warehouse level inventory tracking. There are a number of opportunities to expand RFID into the retail stores and into the vehicle distribution networks.

Walmart mandating a large number of their suppliers implement RFID has addressed one of the largest hurdles with RFID adoption. RFID tagging becomes valuable only when the flow of goods through the supplier network are enabled. Since it is an added cost to suppliers, they must have a strong financial incentive to make changes at such a drastic scale.

One of the key drivers of RFID will continue to be the cost of the RFID tags and readers and the accuracy of RFID detection. Passive and active RFID tags imply different costs (depending on if battery power is required or not in the tag). As RFID tags become cheaper, it becomes easier to embed in items. Currently, the majority of RFID tagging is targeted at pallets and larger collections of items. Many futurists believe RFID will eventually be cheap enough to embed in all sold items (including clothes and smaller items). Security becomes a larger concern when this occurs. Embedding passports with RFID tags has been at the center of much of the RFID

security debate. If individuals only need to be within a certain distance of readers, large risks to personal privacy are created (especially if sensitive individual identification information is included in the tag).

Another area where RFID is expected to motivate change is in near field communications (NFC) which is enabled contactless commerce, connectivity, and content. This market is just emerging. The majority of NFC focus has been focused on the integration of NFC and cell phones, allowing easy payment to goods, transportation and other daily purchases. There are also examples of RFID tags that are used at gas stations for purchasing gas and items. NFC is focused on taking advantage of the simplicity of not requiring contact for a payment mechanism (i.e. requiring a credit card reader). It is still unclear where this market will go but strong wireless markets like Japan are exhibiting strong adoption of these NFC technologies.

2.10 The trend of performance of two electronic technologies is given in Figure 2.8. Determine the performance trend of another technology, and prepare a chart of its performance over time.

Recognize both examples are on log scales, indicating both are improving at exponential rates.

A few additional examples might include: watts produced per meter squared for solar panels, accuracy of mammogram measurements, etc.

3.10 Exercises

3.1 How would you define Google's Vision? Construct a Mission Statement for Google. After completing both of these tasks, go to Google's web site and compare their corporate Mission Statement to your impression.

(September 2006)

Google's mission is to organize the world's information and make it universally accessible and useful.

Our Philosophy

Never settle for the best

"The perfect search engine," says Google co-founder Larry Page, "would understand exactly what you mean and give back exactly what you want." Given the state of search technology today, that's a far-reaching vision requiring research, development and innovation to realize. Google is committed to blazing that trail. Though acknowledged as the world's leading search technology company, Google's goal is to provide a much higher level of service to all those who seek information, whether they're at a desk in Boston, driving through Bonn, or strolling in Bangkok.

To that end, Google has persistently pursued innovation and pushed the limits of existing technology to provide a fast, accurate and easy-to-use search service that can be accessed from anywhere. To fully understand Google, it's helpful to understand all the ways in which the company has helped to redefine how individuals, businesses and technologists view the Internet.

Ten Things Google has found to be true:

- 1. Focus on the user and all else will follow.*
- 2. It's best to do one thing really, really well.*
- 3. Fast is better than slow.*
- 4. Democracy on the web works.*
- 5. You don't need to be at your desk to need an answer.*
- 6. You can make money without doing evil.*
- 7. There's always more information out there.*
- 8. The need for information crosses all borders.*
- 9. You can be serious without a suit.*
- 10. Great just isn't good enough.*

3.2 Social networking takes advantage of a compelling trend toward leveraging social connections to link people for viral marketing and affinity marketing. Compare and contrast the value propositions offered by these leading social networking sites: MySpace, Facebook, LinkedIn, and Friendster.

3.3 Compare the business models for Yahoo and Google using Table 3.8? Make sure to identify how they are different. How do you see their business models evolving over the next five years?

Customer Selection: Both Google and Yahoo are targeting online users interested in portal type services. Yahoo began as a manual search engine of the Internet and has emerged into one of the strongest Internet destination portals. Google began primarily as a search engine and has continued to add new features and software to compell end users to think Google more often. Google continues to consider search as the key driver for customer selection. Yahoo views the Internet portal and associated services as the key customer selector.

Value Proposition: Google provides superior search results. Yahoo provides a broad set of content from their portal.

Differentiation and Control: Google is targeting to organize the world's informartion. To date, Google has not aggressively invested in generating new content. On the other hand, Yahoo has invested in generating new content (i.e. local search reviews and content).

Scope of Product and Activities: Both Google and Yahoo play in the majority of the same areas: search, search advertising, instant messaging, email, Internet portals, investments in mobile apps (mobile search, mobile advertising, directions),

Organization Design: Google has prided itself on its relatively flat organization structure, focusing on high performing, small teams to focus on new and innovative market opportunities (large R&D house with a lot of teams focused on different areas). Yahoo has evolved to more of a "traditional" hierarchical organization structure as early financial pressure forced Yahoo to re-organize.

Value capture for Profit: Google generates the majority of their revenue from search advertising (primarily text ads). Google continues to invest in a large number of areas to find the next core revenue stream. Yahoo's revenues come from a wider set of services, but brand advertising and sponsored search continue to make up the majority of revenues and profits. Yahoo is investing in destination content to assist grow brand advertising revenues. Yahoo continues to invest in permium service areas such as Yahoo Personals which are helping Yahoo grow revenues.

Value for talent: Google has aggressively hired the best engineers and is regarded as a strong engineering culture, looking for the next revenue generator. Yahoo ...

3.4 Purchasing a used car is one of the least desirable experiences for most people. eBay Motors offers fraud protection, a warranty, and a title history (www.ebaymotors.com). What is the value proposition for eBay Motors? Would you buy a car using eBay?

Use Table 3.6 and the concept of value proposition found on page 56.

3.5 Twitter.com continues to see explosive user growth. However, a business model has yet to materialize. Describe three business models Twitter could pursue to become a profitable business.

- (1) The real time search deals executed with Microsoft and Google resulted in Twitter becoming profitable during the end of 2009.
- (2) Paid accounts or listings has been mentioned by Twitter executives multiple times.
- (3) Advertising, given the interest of brands and advertisers in Twitter to distribute and manage brand awareness and issues
- (4) This is not an exhaustive list ...

3.6 The branded and generic pharmaceutical industries have continued to grow rapidly over the past decade. Describe how branded pharmaceutical companies have innovated their business models to address the generic drug market. Generic drug companies have also experienced challenges as the sector has grown globally. How have these companies responded?

3.7 Apple has been successful in expanding its product and service portfolio from computers to MP3 players to mobile phones. What are Apple's business models? Describe the core competencies that have allowed Apple to make the moves from Mac to iPod, and from iPod to the iPhone.

Business Models:

- Selling hardware continues to be the underlying driver of Apple revenues
- Apple has a solid software business (OS, professional apps, consumer apps)
- iTunes Music Store which has been leveraged to monetize the sale of music, video and mobile applications
- Apple acquired Quattro Wireless (and mobile ad network), will be interesting to observe how Apple impacts the ad network ecosystem

Discussion of the iPod specifically is below:

Apple has been successful with the iPod for a number of reasons. They have continued to innovate with well thought-out features, they have recognized the PC as the best method of organizing and managing music, the iTunes Music Store provides a seamless shopping experience for new music, and the devices have continued to get smaller, longer battery life, more refined, etc. The number of incremental improvements for each iPod model is relatively small, however when taken as a whole, there is a very coherent story of when, why and with what features are introduced.

Product: Original iPod

Price: \$400. Originally thought to be extremely expensive for a new MP3 player, but sold well to Mac users.

Access: Provided first high-capacity MP3 player in a smaller form factor and easy to understand user interface. Firewire was also used for connectivity providing simple power and fast transfer speeds of music.

Service: Integration into iTunes (Apple branded mp3 player) allowed for the easy transferring and management of songs on the device.

Experience: Apple brand name continues to invoke thoughts of a “cool” company with cool gadgets and computers (design is important). The useability of the iPod benefited from tight integration with PC software and a simple user interface.

Other iPod areas of innovation:

- Addition of video to iTunes store, making it an add-on to an existing device vs. creating a new device
- Continued improvement of iTunes Music Store and iTunes software
- Flash based devices with iPod nano and iPod shuffle allowed for a significant reduction in size and improvement in battery life, at the expense of capacity
- Pricing and product differentiation between iPods is always clear (customer segmentation).
- Continued price leadership with forward purchases and investments in flash memory capacity to ensure availability during Holiday seasons
- Integration of iPod with car manufacturers, creating strong lock-in factor
- Addition of iPod + Nike running accessory to leverage iPod brand into new space

Many of the above characteristics can be extended to Apple’s success with the iPhone. They defined a completely new category of smart phones by leveraging previous expertise and betting on where the market could go given prompting. Apple has also been able to leverage the iPod Touch as a multimedia consumption device (similar to iPhone).

- 3.8 Woot.com is an online seller of mainly closeout products at a cheap price. This site provides low-priced sales and an online community to talk about the product of the day. Visit Woot.com and determine the business model of the firm. How does Woot generate a profit for this service?

4.11 Exercises

4.1 Zipcar offers a sophisticated form of car sharing (see www.zipcar.com). The firm opened for business in Boston in late 2000. Describe the strategy of Zipcar using the six questions of Figure 4.2. Is the Zipcar strategy sustainable, and will it lead to profitability

Example opinion:

http://money.cnn.com/2009/08/26/news/companies/zipcar_car_rentals.fortune/

4.2 Podcasting, blogging, online photo sharing, online video, and twittering are five technologies that are enabling a much broader set of content publishers and content consumers. Describe the nature of these industries and analyze the competitive situation using all six forces in Figure 4.3.

Firm Rivalry: Podcasting and blogging does not see a significant amount of inter-firm rivalry given the distributed nature of the content producers and a small number of larger players. The traditional media houses (namely magazines and TV) are beginning to experiment with podcasting. The technologies behind podcasting and blogging is more interesting from an inter-firm perspective. There are a growing number of blogging infrastructure providers and aggregators selling their software and services to bloggers. Apple is a leader in the listing and delivery of podcasts (given the tight integration with iTunes and the iPod). TypePad, Blogger and LiveJournal are three of the more popular hosted blog services. Moveable Type, WordPress and TextPattern are three of the more popular self-hosted blog service providers. There is also competition in the aggregation space with NewsGater being one of the premier software and software providers. There continues to be competition amongst firms, but given the rapidly expanding market place, grabbing new subscribers has been most critical. At some point, retention and gaining market share will become more of a competitive priority. Many of the social networking sites (MySpace, facebook.com, friendster) offer blogging functionality.

There has also been an explosion in media social sharing sites, like YouTube, Twitter, and Flickr. The challenges for content publishers very much mirror the challenges of the examples discussed above.

Threat of entry by new competitors: Both podcasting and blogging has a extremely low barrier to entry. Having something interesting to say, however, is a lot harder to come by.

Threat of substitute products: Podcasting is competing somewhat with radio and television. However most podcasting content has been customer segment driven or complementary to traditional news feeds. Traditional web sites has been the most impacted by blogging. Blogging will expand to additional mediums (i.e. mobile blogs and photo blogs).

Bargaining power of customers: No barriers to switch for customers. Web has made any one link as close as any other. There is some value from marketing but most blogs exist by the power of the author, not the service provider.

Bargaining power of complementors: Some ecosystems have evolved to provide plug-ins and meta data on top of existing blog services. The majority of these companies have not significantly changed the ecosystem to have strong bargaining power.

Bargaining power of suppliers: There has been some consolidation of vendors in the podcasting and blogging spheres. However, new technologies continue to evolve to make podcasting and blogging easier for the masses.

4.3 Cypress Semiconductor is an integrated circuit chip company in a very competitive industry. Identify the firm's core industry and key customers. Complete a SWOT analysis for the firm following Table 4.4.

Example data:

http://en.wikipedia.org/wiki/Cypress_Semiconductor

Also the following article focuses on the advantages Cypress Semiconductors has in touch screens, which is a market that is exploding due to the iPhone and followon devices.

<http://semiconductorgeek.wordpress.com/2009/12/17/next-generation-touchscreens/>

4.4 Nektar is an innovative drug delivery company creating differentiated products to allow for the inhalation of a number of medicines. Examine Nektar's web site and publicly available information. Describe Nektar's strategy using Tables 4.6 and 4.8.

4.5 During the 1990s, DVD players became widely available and the rental DVD market took off. NetFlix (www.netflix.com) initiated an online DVD rental service creating a new market. Examine the Netflix website and determine the firm's basic strategy. What are the challenges to its strategy? Consider the timing of the initiation of NetFlix: was it too early or right on time? How have Blockbuster and Walmart attempted to differentiate their online services from NetFlix?

Seeing as Netflix has survived and managed to go public since its launch, it is difficult to criticize its timing. Netflix wisely entered the market as DVDs started to become widely available. The firm's strategy is to eliminate hassle for customers by saving them the time of travel to and from the video store as well as the time associated with picking out and renting movies. It also proposes to eliminate the economic pain of late fees. It accomplishes this by using an on-line ordering system and the USPS for mail delivery of movies in DVD format to and from customers. Building brand awareness and a significant customer base is the largest challenge facing Netflix. They do have great potential in terms of economies of scale and fairly predictable levels of revenue. Competitors have already presented a challenge by attempting to imitate the Netflix Business model (Walmart and Blockbuster have launched similar services). Future challenges will likely come from the on-line downloading of movies. The timing of Netflix matched well with the proliferation of DVDs and DVD players, without which their business plan would not have been possible.

- 4.6 eBay has modeled worldofgood.com after early green marketplaces, positioning its activities in an environmentally friendly niche. Visit the website, describe its social mission, and describe how this fits into eBay's broader corporate mission.
- 4.7 With the release of the iPhone 3G and OS V2.0 in 2008, Apple created a new ecosystem or market for mobile software developers to compete and succeed in. Many iPhone developers made loud proclamations of early success. By 2009, over 30,000 separate iPhone Apps became available for iPhone users, presenting unique challenges to new iPhone developers. Using the competitive concepts and frameworks in this chapter, describe (a) the industry and context for a new firm entering into the iPhone App market, (b) how a sustainable competitive advantage could be built given this market's very low entry costs, and (c) competitive tactics that could match well to the unique nature of this market.**

There are many ways to answer this question. Answers should recognize the unique position Apple is in "choosing" market winners. It is extremely challenging to market to iPhone users without gaining placement within the Apple App Store. The vast majority of iPhone developers have not figured out profitable business models. It also should be noted many of the successes have either been well branded game titles and / or very small development shops iterating on a hit (or hits).

- 4.8 Identify a technology company that incorporated more than 100 years ago. Describe the industry and context for the firm today. Describe a significant industry and context shift for the firm in its history. Has the firm maintained a sustainable, competitive advantage in the markets it competes in? If so, how?
- 4.9 Many online search competitors are moving to compete in the mobile local search market. Providing location tailored information to mobile phones is expected to be a large opportunity for both wireless carriers and local advertisers. Select one of these mobile local search companies and create a value network for this company (e.g., Figure 4.6).**

Customers: Wireless carriers (wireless subscribers). Wireless carriers have traditionally been protective of their mobile data pipes, allowing only carrier-portal content. This is one reason why many carriers are partnering with smaller mobile search vendors since they can demand a larger percentage of the revenue share.

Complementors: Mobile portals (Google, Yahoo, MapQuest, weather.com, etc.), media houses (News, MTV, ampd, etc.) and others who are generating and providing mobile specific content. Mobile advertisers who are willing to pay for mobile search advertising (banner, key word search).

Competitors: Google, Yahoo, MSFT, traditional Internet search providers

Suppliers: Wireless carriers (with wireless subscriber usage behaviors), app sever vendors, database vendors

5.9 Exercises

5.1 **Name and describe the strategies of a company that was successful as a start-up being a first mover. Contrast that with a company that was successful being a fast follower.**

Section 5.1, and Table 5.2 specifically summarizes what should be discussed by students.

Answers should also take into consideration what type of market the company is in. Being a first mover is valuable especially in markets with increasing returns or market lock-in. In these markets, the first mover, if they get to scale, can lock in the market. However, in many cases, the nimble start up following the first mover is able to learn from the mistakes of those before and get to critical mass. (this is discussed on more detail in Section 6.3 in Chapter 6 if students begin to recognize this).

Social networking is an example where scale increases the value to participants exponentially.

Both Apple and Microsoft are examples of companies that have demonstrated success in being fast followers (and in many cases it has involved one other company leading).

5.2 Select an industry of interest to you and then try to find a good candidate for imitation. Describe the opportunity and tell how you will reap the benefits of imitation.

5.3 **Go to a university's web site and determine if a technology licensing office exists (e.g. otl.stanford.edu). Explore their web site and featured technologies. Would you consider any of the feature technologies new venture opportunities? Does the technology licensing office encourage innovation at this university? If so, how?**

See:

<http://otl.stanford.edu>

for ideas. Also determine what the licensing terms offered since this can impact what type of business makes sense. It is usually royalty based or a small % of sales.

5.4 An inventor brings you a new design for an electric toothbrush with an oscillating head and a tilted handle that appears to meet the American Dental Association criteria. The inventor has filed a preliminary application for a patent. Also, you have tried the brush and found it easy to use. Using the factors of Table 5.4, provide a brief review of this invention. Would you recommend proceeding with commercialization?

5.5 **Determine and describe the enabling technology used by Take-Two Interactive to develop its interactive software games (www.take2games.com). Describe Take-Two Interactive's value network as described in Section 4.6.**

In Section 5.5 and 5.6, new (enabling) technologies enable new applications. 2 examples are given in Table 5.6 as well.

5.6 Gentex Corporation designs and manufactures automatic-dimming automotive rearview mirrors. Its safety mirrors use sensors and electronics to detect glare from trailing approaching vehicles at night and darken accordingly (www.gentex.com). Describe the invention and technology that Gentex uses. Draw a value network as described in Section 4.6 for Gentex and name its partners.

5.7 Zebra Technologies Corporation provides bar-code labeling solutions for use in automatic identification and data collection systems (www.zebra.com). Describe the technology of Zebra in terms of the three dimensions of technological inventions: importance, radical-ness, and patent scope.

Zebra Technologies Corporation's technology's three dimensions as seen in Table 5.4:

Importance: RFID and on-demand bar codes new a variety of industries offers major efficiency gains in terms of logistics

Radicalness: RFID applications are disruptive in their ability to eliminate line-of-sight requirements that are necessary for managing existing barcode technology.

Patent Scope: Zebra has both trade secrets as well as patents on RFID and Barcode supporting technologies, in particular in the printing and encoding process.

5.8 The E-Stamp Corporation was first to market in 1997 with the ability to sell stamps over the Internet to consumers who print the stamps on their printer (www.estamp.com). By 2001, however, E-Stamps' 31 patents and other intellectual property were purchased by Stamps.com (www.stamps.com). Study this acquisition and determine why being first to market was not a winning strategy for E-Stamp.

6.8 Exercises

6.1 **Select a well known startup or one that personally interests you. Use the Sources of Uncertainty outlined in Table 6.2 to discuss three key risk areas for that company in the immediate future. Find a recent article about the company and list which risks are discussed in that article.**

Example where the eventual outcome is now clear, but YouTube was right on the edge of either being sued into oblivion or getting acquired when they were able to exit.

Youtube.com Sept 2006 stats:

- In a single month the number of videos on the site grew 20% to 6.1 million
- YouTube has some 45 terabytes of videos
- Video views reached 1.73 billion
- 70% of YouTube's registered users are American, roughly 50% are under 20
- The total time people spent watching YouTube since it started last year is 9,305 years!

Market Uncertainty – customer, market sales and growth, channels, competitors.

YouTube has generated a significant amount of content and viewers. YouTube invested early on to make it easy for other web sites to embed their video into other web sites. It also exhibits networking effects with the cross-posting of similar / like minded content.

There are a number of other video services out there (i.e. Google Video, Apple iTunes Store, Microsoft SoapBox) who continue to focus more on selling or renting video vs. providing an outlet for others to freely share videos and capturing revenues via purely advertising. Mobile video might also allow for new competitors to enter the market space and steal market share and mind share from youtube.

Youtube in Sept 2006 cut a deal with Warner allowing the distribution of music videos, with Warner Music Group getting a share of advertising revenues.

Organization and Management Uncertainties – Capabilities, Financial Strength, Talent, Learning Skills, Strategies

Product and Processes Uncertainties – Cost, Technology, Materials, Suppliers, Design

The largest challenge with youtube is monetizing it's viewers. The bandwidth costs for delivering (and storing) the amount of video pushed is significant. Youtube has done a strong job with the technical aspect of making it easy to embed youtube content in other web sites. The use of Flash also makes for a near ubiquitous video delivery mechanism.

Regulation and Legal Uncertainties – Government regulation, Federal and state laws and local ordinances, Standards and industry rules

There is a significant risk with copyright content and the distribution of video. Youtube does host a number of copyrighted video clips. Most of the studios and television networks have not gone after youtube to date (potentially due to the short length and lower video quality served).

Financial Uncertainty – Cost and availability of capital, Expected return on investment

Clearly Google felt there was enough value here. Would also be interesting to consider if the acquisition cost was worth the value gained by Google.

6.2 An investor is asked to invest \$10,000 in a new venture today. The expected return in three years is \$28,000 with a probability of occurrence of 70 percent. Would you recommend this investment? Describe your reasoning.

6.3 A new entrepreneur is relatively risk-averse with a risk-adjusted constant $\lambda = 2$. Her opportunity cost is \$100,000 before earning a regular salary from the venture in its second year. She also invests her savings of \$50,000. Calculate the minimum annual return that will be acceptable to her in the second or third year.

$U \geq R$

$= 2$

$R = \$50,000 + \$100,000$

where λ is the risk-adjusted constant, U is the Upside of the Venture and R is the Regret. Due to her risk averse nature, this entrepreneur requires the minimum upside of a \$300,000 return.

6.4 Verify the empirical validity of Figure 6.9. Research the following questions using your favorite finance web site or newspaper. What was the previous years risk-free T-bill rate? What rate of return has the S&P 500 generated over the last year? Select a startup that recently IPOed and determine their rate of return in the last year or since going public.

6.5 The timing of the first revenue or customer shipment is an important milestone for any start-up. Research the average time until first revenue for Internet, biotech, and clean tech companies. If you were an investor in these three types of businesses, how would this impact your view of these businesses? How could this time risk be managed?

The primary differentiator to recognize is the difference in development cycles for software vs. bio-tech. Software beta cycles have significantly compressed since the dot com days with 6-9 month x.0 +1 releases quite popular. From the perspective of an investor, software allows customer validation and revenues in a relatively short period of time. Software management is also more defined and can be tracked to identify and manage delivery risks. There are software companies that are more focused on the research (vs. development), however investors can quickly get new software companies focused on development.

Bio-Tech on the other hand is a very research driven field. The timelines are also compounded by the regulatory hurdles / gates that must be passed. The gates do provide an investor some visibility into mitigating risk along the way. However the approval process can be significant in adding time to market (3-5 years), especially when patient trials are required. Bio-Tech can be funded through regulatory approval phases, minimizing capital outlay somewhat.

6.6 Amazon.com and Borders are both in the book and music-selling business. Contrast the scalability of each business.

6.7 Describe how social networking sites such as Facebook, MySpace or friendster.com have leveraged network effects to expand.

Social networking began primarily in the recruitment / business world for networking, and quickly expanded into other customer segments. Early recruiting social networking sites created a web of connected “colleagues” which allowed the leveraging of business social networks for primarily employment purposes.

Facebook, MySpace and friendster.com focus on primarily youth segments. Both provide users the tools to create personalized web sites to blog about one’s life and to link to other interesting sites and friends. As more of your friends join the social network, you benefit from sharing links, web site updates and connectivity options.

6.8 Section 5.1 discussed the First Mover versus Follower Decision. How does the importance of this decision change in a market with network effects and increasing returns?

First Mover vs. Follower decision is more critical in these types of markets. The traditional thinking is in a market with network effects and increasing returns, it is more important and valuable to establish oneself as the First Mover. Since the value one offers in these types of markets is a function of how large your customer network is, gaining more subscribers at the early stages of the market can significantly influence the resulting “winners” of the marketplace.

Many technology standard battles exhibit this kind of behavior, especially when the standards are incompatible. Some examples would be the telephone, fax machine, BetaMax vs. VHS, BlueRay vs. HD-DVD, social networking sites, etc.

6.9 Choose a recent technology standards battle (e.g. BluRay vs. HD-DVD, Flash vs. AJAX, WiMAX vs. 3G Cellular, WiMedia vs. UWB Forum, 802.11 TGn vs. WWiSE, etc.). Succinctly outline the key differences between the two camps (technology or otherwise). Is there a startup driving one of these two camps with an innovative technology?

Section 6.3 on network effects and increasing returns is highly relevant for how these standards battles have turned out, and are turning out. Some quick thoughts:

BlueRay vs. HD-DVD – PlayStation 3 was a game changer, creating a huge base of installed BlueRay capable playback devices

Flash vs. AJAX – the battle continues, with Flash being more challenged as the mobile web becomes more relevant.

WiMAX vs. 3G Cellular – it appears as if LTE will win given the network technology migration path of the majority of major operators. WiMAX will remain on the fringes as a technology that is compelling under specific cases.

WiMedia vs. UWB – UWB won, but it is not clear if the market has cared.

802.11 – largely driven by early device adoption, given the importance of interoperability for devices.

7.7 EXERCISES

- 7.1 TerraPass sells an investment in energy projects or credits used to offset environmental impact. For example, drivers of gas-guzzler cars can exhibit a decal showing their environmental investment. Create a summary for this business (www.terrapass.com).**

What is TerraPass?

Ever wished you could do something about global warming? It might seem there's nothing you can do about global warming. The problem is just too big. Of course, we all contribute to global warming. We all have a "carbon footprint," the total carbon dioxide emissions we create when we drive or fly or use electricity.

Eliminate your carbon footprint with TerraPass

The first step you can take to fight global warming is to reduce your carbon footprint through conservation. Drive less. Turn down the thermostat. Buy locally produced goods. Then use TerraPass to reduce your carbon footprint all the way to zero. When you buy a TerraPass, your money funds renewable energy projects such as wind farms. These projects result in verified reductions in greenhouse gas pollution. And these reductions counterbalance your own emissions.

A new kind of environmental movement

Of course, global warming is too big a problem for a handful of people to solve on their own. It's a global problem that requires action on a global scale. But entrepreneurial groups are leading the way. City and state governments, forward-looking businesses, and enthusiastic citizens are banding together to show that a sustainable future is possible today. Every TerraPass member has taken a simple positive step to fight global warming. Every TerraPass purchase is a vote for innovation, efficiency, and clean energy. Together, we have eliminated over 150 million pounds of carbon dioxide emissions. Be part of a group that is driving change today.

The primary challenge with terrapass.com's business model is that it is attempting to internalize a social externality by asking concerned citizens to offset their personal production of carbon gas. Personal goodwill is generated by supporting such a program but "tangible" benefits are hard to identify. However, TerraPass is very much in line with broader government initiatives to create carbon trading markets where polluters and non-polluters can buy and sell emissions credits. This is a regulatory method of ensuring all production costs are taken into consideration by producers.

- 7.2** A new firm develops and distributes electronic games for mobile devices. These games teach children to read, recognize symbols, and perform mathematics. This new venture needs \$1 million to launch a nationwide campaign for its products. Prepare a short story that will persuade a venture capitalist to support the firm.

- 7.3 Evaluate either business plan from Appendix A using tables and figures from Section 7.3.**

Table 7.3 provides the key sections that should be included in a business plan. Table 7.4 lists a number of key mistakes that should be answered in the business plan. Section 7.4 provides a list of key questions for each major Business Plan section.

There is no right or wrong order of what sections or items come first within a business plan. However for the sake of telling a story, some structures work better than others.

7.4 For whom is a business plan written and why? Using Figure 7.3, explain how a business plan serves as an alignment tool for key stakeholders in the business.

7.5 What information on the competitive landscape should be included in a business plan? What frameworks would you use?

Some competitive landscape questions are listed in Section 7.4, sub-section VI Risks.

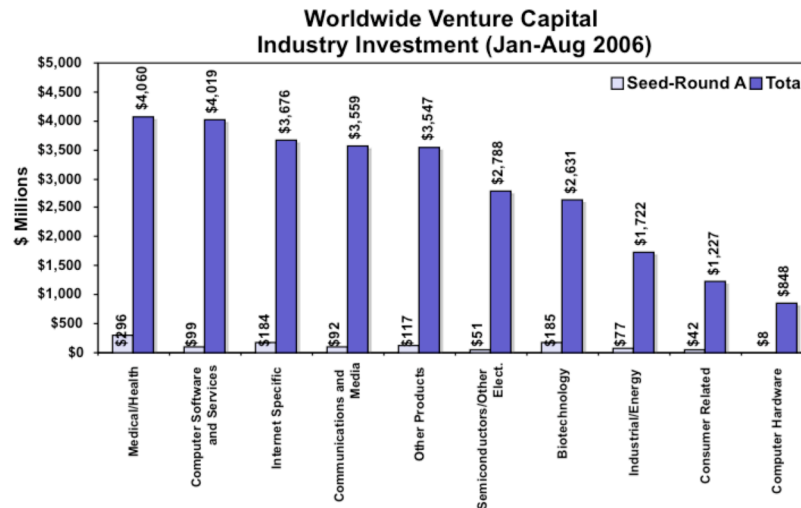
There are a number of frameworks available. One of the more popular is Porter's Five Forces. There are also Resource-Based approach and others. Any framework is fine. Example key questions that should be answered are:

- Who are my key competitive threats today? Tomorrow?
- Key customers and estimated revenues per.
- How fast would one of my competitors be able to duplicate or replicate my competitive advantage?
- What pricing do my competitors have? What sales and distribution channel advantages do they have?
- Product advantages?
- Can I use these competitors as a proxy to validate my business plan (financials, length of penetrating the market, cost of penetrating the market, etc.)

7.6 What information on the key venture risks should be included in a business plan? Is it important for the business plan to be pessimistic or optimistic in regards to these risks?

8.10 EXERCISES

- 8.1 Research the number of new ventures created in the last year. Try to segment the data you collect into the venture types outlined in Table 8.1. Compare the number of new ventures of each type. What growth rates have different venture types exhibited? Can this be explained by broader economic trends?



One example would be of venture capital backed companies. The above chart shows what types of companies were funded over a period of time. What industries are hot is cyclical over time, depending on the state of technology, market dynamics, and the attractiveness of IPO/M&A market conditions. Higher Seed or Round A investments indicates more new companies are being funded. At this point in time, later stage investments appear to dominate the amount of \$ being invested by VCs.

- 8.2 A partnership between a social entrepreneurship course at Stanford University and the nonprofit Light Up the World Foundation (www.lutw.org) worked to bring safe, affordable lighting to people in Mexico, China, and India. Students in engineering and business worked to design a lamp appropriate to the needs of villagers. Develop a brief plan for a social entrepreneurship project with an international nonprofit for your school.
- 8.3 **In 2000, three graduate students at Harvard University launched a nonprofit called New Leaders (NLNS). This venture recruits, trains, places, and supports principals in U.S. urban school districts (see www.nlns.org). The three founders met while enrolled in a class at Harvard on Entrepreneurship in the social sector. Determine the mission of NLNS and describe the accomplishments of the enterprise.**

Use Section 8.2.

- 8.4 Zimmer Holdings (www.zimmer.com) was incorporated in January 2001 as a wholly owned subsidiary and CNV of Bristol-Meyers Squibb Company. Zimmer designs and

markets orthopedic and surgical products. The subsidiary was created from its parent in August 2001, with shareholders receiving 1 share of Zimmer for each 10 of Bristol-Meyers they owned. Study the origins of Zimmer and determine if the spin-off was the right action for Bristol-Meyers.

8.5 The traditional newspaper industry is in a declining phase and much has been written on how newspapers should reinvent themselves. How are various newspaper organizations addressing this challenge? What is the best next step in the newspaper industry? See Figure 8.6 for potential options.

There are numerous articles that can be used as reference to answer this question. Generally, newspapers have not been successful in innovating their ways into new business models, clinging to existing revenues at the expense of future paths.

One example of “thinking different” is the proposed ban on Google indexing by the WSJ:

<http://blogs.wsj.com/digits/2009/11/09/news-corp-considers-a-google-ban/>

Google has demonstrated it is willing to pay for content if it is valued by it’s users (searchers). A different tact could have been more financially interesting to consider.

8.6 Many new clean tech ventures have relied on funding and partnership from established corporations. Select a recently funded clean tech venture with corporate venture involvement. Did the funding impact the structure of the new venture? What does the new venture expect to gain from the backing by the larger corporation? What does the larger corporation expect to gain from being involved in the new venture?

8.7 WiMAX is an emerging wireless broadband technology that promised to bring high-speed Internet to both developed and developing countries. Intel Capital has made significant marketing and corporate VC investments in this technology. List three of the startup companies Intel has invested in within the WiMAX space. How much money has Intel Capital invested in WiMAX more broadly? Why is Intel Capital placing these bets, how does Intel stand to gain from the success of WiMAX?

Examine the following links:

<http://www.intel.com/capital/>

https://www.intelportfolio.com/cps/portlist_alpha.asp

<http://www.intel.com/netcomms/technologies/wimax/index.htm>

Intel has invested in a number of companies that are complementary with Intel’s WiMAX chipsets. Intel has also invested heavily in technology trials with both small and large operators. It is rumored Intel and Motorola have committed over \$1 billion in vendor financing to Sprint-Nextel for their Mobile WiMAX network.

Intel is trying to change the existing dynamics of the cellular / mobile industry which is dominated by a small set of large players. Intel is aggressively investing in the client chipsets, hoping to be one of the dominant chipset providers for both the WiMAX base station and client chipset markets. It is a risky bet given the early stage of the WiMAX market and many of the cellular players are also aggressively entering into the WiMAX market. Intel has also not been strong in the mobile WiMAX market to date, primarily focusing on fixed wireless devices and laptop WiMAX enablement. This plays to Intel's strengths. But the "big" market is when / if mobile WiMAX successfully competes in the mobile handset market.

Intel's activity with WiMAX is similar to investments made with Centrino and WiFi. However, in that market, Intel was 2-3 years too late and entered a market with commoditized chipset prices already (limiting any profitability Intel could capture from integrating WiFi into laptops).

- 8.8 Describe the investment philosophy of a corporate venture capital firm such as Intel Capital, BlueRun Ventures (Nokia), Dow Corporate Venture Capital or General Electric (GE) Equity. How are these VC firms synergistic with their parent companies strategic direction?

9.9 Exercises

9.1 Examples of larger learning organizations are Microsoft, Hewlett-Packard, Medtronic, Pfizer, and Starbucks. Choose a company and describe its learning process. How would learning in an entrepreneurial venture be the same? Be different?

Apple's Entrepreneurial learning process follows closely to Table 9.2. iTunes is a great example:

- Apple *identified the problem or opportunity* in the digital music industry
- Apple *analyzed the problem or opportunity* that exists between the reality of digital music downloading and the music industries interests.
- Apple *generated potential solutions* in the form of iPod
- Apple *select a solution and create a plan* in the form of iTunes
- Apple *implement the selected plan* by securing cooperation of the music industry
- Apple then *evaluated the outcome and learn from the results* by expanding iTunes to work with Windows and developing a relationship with HP and key distributors

9.2 What role should the “end customer” in the Product Design and Development process? Do they always know what they want?

9.3 The magazine *Fast Company* produces an annual list called “The Fast Company 50, the World’s Most Innovative Companies.” Choose one of the younger companies on the list and use Figure 9.1 as a guide in describing the core competencies of the firm and how knowledge is created and shared within the firm to spur product or service innovation.

One can find the 2009 edition at:

http://www.fastcompany.com/fast50_09

9.4 Capstone Turbine is a developer, assembler, and supplier of microturbine technology. Its primary customers are in the on-site power production and hybrid-electric car markets (see www.capstoneturbine.com). Using the format of Figure 9.6, describe a scenario for the growth of Capstone over the next five years.

9.5 A new firm plans to design and sell fuel cells for vehicle use. The firm has received a \$1 million grant from the U.S. Department of Energy and is free to exploit the intellectual property developed during the research and development grant. Prepare a knowledge management plan that will enable the firm to file for patents.

Use Section 9.2.

9.6 The advantages of the Web as a distribution platform are many. Describe some of the impacts the Web has had for the delivery of services and content on product prototyping and product design and development.

9.7 A number of software development methodologies exist to encourage rapid design and implementation (e.g., agile software development, extreme programming, etc.). Select two of these methodologies and compare and contrast the specific product design and development processes each is attempting to address and improve.

See the following for guidance:

http://en.wikipedia.org/wiki/Agile_software_development#Comparison_with_other_methods

9.8 A IEEE Spectrum magazine article in Sept. 2005 (<http://www.spectrum.ieee.org/sep05/1685>) featured some of the most expensive software failures ever. Examine the “Software Hall of Shame” and select your favorite. Describe why failure of knowledge management and the lack of behaving as a learning organization led to this result.

(From Article)

Why do projects fail so often.

Among the most common factors:

- Unrealistic or unarticulated project goals
- Inaccurate estimates of needed resources
- Badly defined system requirements
- Poor reporting of the project's status
- Unmanaged risks
- Poor communication among customers, developers, and users
- Use of immature technology
- Inability to handle the project's complexity
- Sloppy development practices
- Poor project management
- Stakeholder politics
- Commercial pressures

10.11 Exercises

10.1 Three friends have decided to form a firm to design and manufacture nanotechnology devices for medical technologies. Michael Rogers has worked for Hewlett-Packard for 12 years and on his own has designed and submitted a patent claim for a nanotechnology manufacturing technology. Steve Allegro, a graduate student, has a software design program he has developed for the design of nanotechnology medical devices. Alicia Simmons, CFO of Alletech Software Inc., is a skilled and experienced manager. Shall they incorporate immediately? What is the problem, if any, of using Rogers's patent ideas? Should they incorporate in their home state of Alabama? Simmons has knowledge of several manufacturing trade secrets of Alletech. Can she use these secret methods at her new firm?

Incorporating right away may be a hasty decision. Steve should first make sure that HP does not have a claim on his patent application, as he may have developed the ideas using HP equipment or during time he was working for HP. Simmons' trade secret knowledge would also likely not be an asset that the new firm could use. Ethical and likely legal restrictions would prevent such activity. If they do incorporate, they should receive legal advice and consider the future ramifications of incorporating in Alabama as opposed to Delaware or other incorporation friendly locations.

10.2 Continuing exercise 10.1, if the three founders expect to be able to fully bootstrap fund the new venture, is there a preference for what legal form of the firm makes most sense? What if the three founders expect to require angel or venture capital investment in the future? How would medical device legal risks influence this decision?

10.3 The three founders of the new firm described in exercise 10.1 are looking for a name for their firm. One idea is Advanced Nanoscience & Technology. Another is Nanoscience Applications. What do you think of these names? Can you suggest a better name?

Naming a firm can be very subjective. Section 10.2 provides some high level guidance around what to consider in a name.

10.4 Apple Computer and Apple Corps have had trademark disputes over the use of the name Apple associated with the music business. Apple Computer has a thriving iPod and online music store. Briefly describe the arguments for both sides. Why is it important for a company to challenge and protect their trademarks?

See:

http://en.wikipedia.org/wiki/Apple_Corps_v._Apple_Computer

Apple Computer won the latest legal battle due to the Judge's interpretation of an agreement between Apple Computer and Apple Corp. The Judge found Apple Computer's use was allowed under the terms of the prior agreement.

10.5 Describe the advantages and disadvantages of a company name representing more than just a company name (e.g. Xerox, Kleenex, Google).

See Section 10.6.

It is clear there are strong branding benefits from having a company name represent more than just the company. However, the name can become generic (i.e. Xerox, Kleenex) and not necessarily have as strong an association with the company over time.

10.6 Mayo Clinic has filed an application for a broad method patent that gives it control over a new generation of treatments for chronic sinus inflammation, or sinusitis. The patent, in effect, blocks others from selling an antifungal agent to treat the condition without Mayo's approval. Mayo will soon try to license this patent to a pharmaceutical company. Are patents helpful in the process of developing a cure for diseases?

Patents have been critical in the development and evolution of the US pharmaceutical industry. Generic drugs are sold at prices 10-100x lower than non-generic drugs. Higher pricing for non-generic drugs is justified by the significant amounts of R&D that are spent to develop these new drugs and ensure the inventors are rewarded. There must be an economic incentive to ensure further drug exploration is worth pursuing.

Ethical concerns naturally arise. HIV and AIDS drugs is a hot topic since many people that are HIV infected are not able to afford treatment. There is a growing movement by non-profits and large drug companies to implement tiered pricing by region to assist in the income disparities (namely Africa) and ensure better medical care and drugs reach developing countries.

Walmart is attempting to shake up the market for generic drugs by offering many common treatments at significantly reduced rates. TBD how this impacts the broader industry.

10.7 Headwaters Inc. develops and licenses technologies for turning coal and other fossil fuels into a higher-value product. Is this an appropriate name for the firm? Revenue is generated through the licensing of the firm's patented chemical processes (see www.hdwtrs.com). Examine the patents of Headwaters and its intellectual property protection. How would you describe the growth potential of this firm?

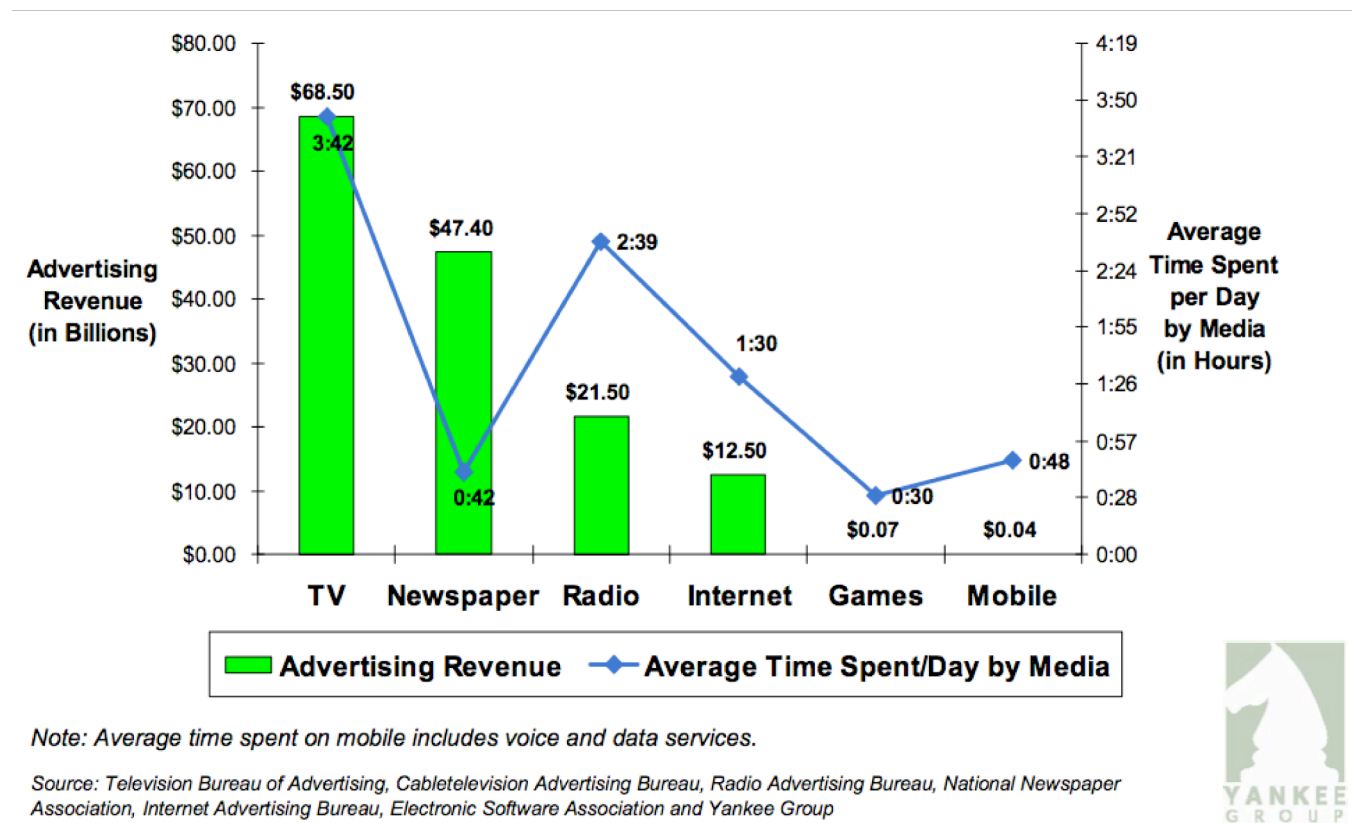
See Section 10.2 for what's in a name. See 10.8 for Licensing discussions. Additional details on the financial structure of Headwaters (as of Jan 2010) can be found at:

<http://www.hdwtrs.com/elements/pdfs/InvestmentProfile.pdf>

10.8 In March 2005, *Research in Motion (RIM)* vs. *Network Technology Partners (NTP)* concluded a prolonged patent fight. Describe RIM's service offering and what NTP patents they were violating. How did RIM address the patent challenge? What is NTP's business model?

11.13 Exercises

- 11.1** There continues to be a disparity between the advertising dollars spent on reaching TV views and Internet users vs. the amount of time that is spent interacting with each media. A large degree of Google's success is attributable to taking advantage of this large gap. Research to determine (a) TV advertising dollars and Internet advertising dollars spent, and (b) amount of time spent watching TV vs. using the Internet. How has Google taken advantage of this disparity? Are there other major societal trends forecasted that will continue to shift advertising dollars to new mediums?



As consumers spend more time online, the disparity between advertising dollars spent per hour using each medium will encourage continued investment in online advertising. Google was able to take advantage of this with their strong presence in search by creating AdWords and AdSense to allow advertisers to market to searchers.

Mobile advertising and mobile marketing is an emerging hot area given the amount spent on advertising and the amount of time spent with mobile devices (voice & data).

- 11.2** With the explosion of mobile handsets worldwide, many marketing and advertising firms are looking at how to take advantage of the ubiquity of a communications device carried everywhere. Describe why marketers view the mobile handset as such a valuable marketing platform. What types of mobile advertising challenges do you foresee arising?

11.3 What is viral marketing? Provide an example of a start-up using viral marketing to promote and sell its product or service. Why does it work (or not work)?

MySpace in 2006 was the king of the social networking world. Social networks by their nature encourage members to “market” the service to their friends to create a larger social network of friends. User driven invitations for new members leverages users to do sales & marketing for the new company.

Facebook grew considerably from a college centric core to a large degree due to the competitive nature of having higher friend counts.

Twitter got on the map with some key real time search events. When it mainstream, celebrities having races to #s of followers drove more interest in Twitter and more main stream awareness.

In the case of many social networks, advertising is the key source of revenue. The more eyeballs and the ability to either contextually or behaviorally target, the higher the potential revenues.

11.4 Facebook and MySpace are rapidly growing social networking sites based in the United States but with global reach. Prepare a positioning map for these two firms.

11.5 BusinessWeek with Interbrand conducts an annual worldwide brand survey ranking the top 100 global brands. Examine the most recent survey and choose a new entrant to the list. Describe that company’s marketing objectives and customer target segments.

See Business Week for the 2009 survey and short explanation of methodology:

http://bwnt.businessweek.com/interactive_reports/best_global_brands_2009/

The majority of the list is made up of companies re-arranging from previous years.

Extra Credit: Determine how realistic Interbrand’s calculation of “Value” that associated with the company brand actually is. How could this be tested?

11.6 Powerful brands are built on innovativeness and advertising. Examine the brand value for Genentech, Merck, and Apple, and describe the reasons for their brand power.

Merck made similar strides as a brand in the pharmaceutical field. Building upon the Merck Manual’s commitment to further medicine by “providing information that is current, concise, and complete,” Merck brought this philosophy to field of therapeutics and with its innovativeness in research was able to bring high impact, high profile drugs, such as penicillin, to market.

Much has been written about Apple’s brand and the loyalty of it’s customer base. Focus on “great” products has continued to encourage this brand strength as Apple slowly extends beyond the personal computer market.

11.7 Electronic Arts EA Sports has gained large brand value by securing an exclusive five-year license from the NFL. Determine if EA Sports has reaped the rewards from acquiring the rights to use a valuable brand.

See the following for details on the \$2.0+ billion franchise:

http://www.monstersandcritics.com/gaming/xbox360/news/article_1391089.php/EA_extends_its_NFL_contract_to_2012

http://en.wikipedia.org/wiki/Madden_NFL#Licensing

<http://uk.xbox360.ign.com/articles/851/851316p1.html>

11.8 HDTV is an emerging consumer electronic technology. Discuss the marketing challenges associated with HDTV (e.g. HDTV content, devices, HD DVD players, etc.). Use the categories of Table 11.9 to describe where the market response to HDTV is today and how long adoption has taken for each group.

11.9 Identify a high-tech firm that uses an indirect sales channel model. What is the model used? Why was the indirect sales model chosen for its particular products or services?

Flip (<http://www.theflip.com>) is an example of a consumer electronics company that highly leverages retailers and distributions for its products. It is extremely costly building channels and relationships to reach the consumer. It is more profitable for Flip to leverage existing sales channels to sell its products.

Apple is an example of a company that has adopted a hybrid model. A larger percentage of Apple's hardware sales continue to be indirect through distributors. However, the Apple Store serve as a sales and marketing channel.

11.10 What is the best way to reward salespeople: salary, commission, or a mix of the two? How do the rewards motivate different selling behaviors? What is the best method for a new emerging medical technology business such as Enzo Biochem (www.enzo.com), or a clean-tech business such as Ausra (www.ausra.com)?

12.14 Exercises

12.1 **Examine the beginnings of a technology venture that currently has lots of “buzz”. Who were the company founders? What background, capabilities, and qualities did each bring to his or her new role? Who was hired next and why?**

Wikipedia is a good source for a number of histories on companies. Some recent examples include:

<http://en.wikipedia.org/wiki/Google>

<http://en.wikipedia.org/wiki/Facebook>

<http://en.wikipedia.org/wiki/Twitter>

[http://en.wikipedia.org/wiki/Foursquare_\(service\)](http://en.wikipedia.org/wiki/Foursquare_(service))

It is valuable to recognize the impetus for many a startup is a specific problem the founders are struggling with (either from a technical or business perspective). The business model and monetization of solving that problem does not always match the initial founding principles and goals (i.e. Google began trying to sell search engine capabilities to existing Internet portals and enterprises, moving towards an advertising business model motivated by the large amount of search traffic and keyword search innovations by Overture.)

12.2 **Matthew Smith knows his talented people are the reason for the success of ElectroMag. Smith has noticed that the costs of medical and dental benefits are escalating, and he needs to control them. With 800 employees, the firm’s profitability is threatened. He has three options: (1) eliminate health benefits, (2) try to find a cheaper plan that covers fewer medical and dental procedures, or (3) withhold a fixed amount of each person’s salary to use to fund the benefits. Which would you recommend he choose?**

Critical to making this decision will be Smith’s ability to communicate with his employees, both in terms of explaining his decision to the 800 workers as well as gathering feedback and perspectives from the team members. Eliminating health benefits altogether would likely not be a wise decision in the long run, as a certain percentage of talented staff would no doubt be frustrated with the firm. Options 2 or 3 are more reasonable solutions; while the final decision needs to be made by Smith, input from the team will be a critical ingredient in making the right decision.

12.3 **Genentech has a unique culture known for rigorous science, guarding of industry secrets, and rigid rules. Its key principle is: good scientists make for good science make for good products make for a good company. Describe Genentech’s culture in terms of norms and rituals. See www.gene.com.**

See:

<http://www.gene.com/gene/careers/culture/>

<http://www.gene.com/gene/careers/culture/pdf/FortuneBetsyMorrisStory.pdf>

<http://www.gene.com/gene/careers/culture/values.html>

12.4 Take-Two Interactive (www.take2games.com) develops entertainment software games. Revenues grew from \$19 million in 1997 to \$1.5 billion in 2008. Describe the organizational design for Take-Two, which has about 2,100 employees. Use Figure 12.1 to help determine its organizational model.

12.5 Getty Images, founded in 1995, offers still and moving images distributed via its website (www.gettyimages.com). Examine its 2007 annual report and determine how the firm motivates its employees. Describe its employee stock plan and its organizational design using Table 12.2.

Note Getty Images agreed to be acquired by Hellman & Friedman in early 2008.

http://media.gettyimages.com/article_display.cfm?article_id=171

http://contributors.gettyimages.com/img/articles/images/PR_Q1_08_-_Final.pdf

12.6 Red Hat is the leading distributor of Linux software and services. The firm had about 2,500 employees and revenues of \$650 million in 2009. Using the concepts of Section 12.7, describe the firm's organizational culture.

See <http://www.redhat.com/about/culture/> and use Section 12.7.

12.7 24/7 Customer provides services to U.S. firms that wish to outsource call centers and CRM activities to India. Using the information provided at the firm's website, describe the founding team of this firm. Also, describe its organizational design (www.247customer.com).

See:

<http://www.247customer.com/whoweare/managementteam.php>

12.8 Examine Google's corporate philosophy "Ten things Google has found to be true" (www.google.com/corporate/tenthings.html). What does Google's "do no evil" phrase mean? How are these broad truth statements translated into action within the Google organization and culture?

13.12 Exercises

13.1 In 2005, Google released Google Earth and the Google Map APIs. Google is bring compelling mapping and visualization functions within reach of all web developers. In 2006, Amazon released a grid storage web service called S3 which stands for “Simple Storage Service.” Amazon positions the service as a highly scalable, reliable, and low-latency data storage infrastructure at very low costs. What business models are these two companies pursuing with these products? How are these types of web services impacting the resource acquisition strategies of new ventures (e.g. Web 2.0 companies)?

Google has focused on helping customers organize and search available information. Google continues to enable this vision with a number of products designed to make search easier. GoogleEarth and Google Maps API are focused on the complex field of GIS and spatial intelligence. Google has placed an intelligent bet that organizing “things” spatially will grow in importance and Google will be well positioned to be an infrastructure provider to this market.

Amazon with it’s S3 initiative is growing outside of it’s traditional web distribution model of physical products. For Amazon to continue to see growth, it is important they experiment and determine potential roles in the digital distribution world. S3 is an initial strategy to explore this space. S3 is also complementary to Amazon’s existing web infrastructure, allowing Amazon to take advantage of idle resources.

Both of these examples are of traditional Internet companies providing infrastructure enablers to Web 2.0 developers. It becomes challenging to bet on what Web 2.0 companies will be successful, but both Google and Amazon are able to provide infrastructure services to all and take advantage of the winners in their customer base.

13.2 Determine who is or was one of the most persuasive people you have known. Using Table 13.2, describe how this person exercised his or her sources of legitimacy.

13.3 Four of the most popular U.S. locations for technology firms are Boston, San Francisco Bay Area, Austin, and Seattle. Using Table 13.3, determine the most attractive location for an orthopedic medical devices start-up.

Use the criteria listed in Table 13.3 and Section 13.3.

Boston and Minneapolis would be two choices to consider. Boston has a history of medical devices and a large number of hospitals. Minneapolis has a large number of health care companies and strong hospitals (Mayo Clinic nearby). There are other choices as well. But an ecosystem of talented employees to hire and immediate customers (hospitals, clinics, larger medical device companies) are obvious important criteria in locating the firm.

13.4 Identify a local start-up company (or select one from another part of the world). Does this company operate in a specific industrial cluster? What local resources or local advantages

does the company leverage? Why is the company located where it is?

13.5 Research In Motion develops and manufactures wireless handheld devices and provides the Blackberry service. The firm is located in Waterloo, Ontario, Canada. Study and describe the locational advantages and disadvantages of the firm. Is it located in a cluster setting?

Ontario has a cluster of communications firms and is an appropriate location for RIM. Waterloo is also where the University of Waterloo is located which is the premier engineering university in Canada. Waterloo has traditionally been strong in telecommunications and wireless research.

13.6 Identify a firm that operates on a hybrid model of using the Internet as well as physical facilities and stores. Describe the advantages and disadvantages of the hybrid model for the firm.

13.7 There is a strong trend in many IT fields of overseas outsourcing. What are the primary motivations for this movement? How and why are startups participating in this trend? What are some of the risks for a newer company in outsourcing?

See Section 13.7 and Tables 13.6 and 13.7.

Cost. Hardware devices can be cheaply sourced and manufactured in Asia (for instance). Strong software programmers are available in India, China and Russia at fractions of cost in Silicon Valley and other US cities. To be cost competitive, many startups are doing product specification and design in the US and outsourcing manufacturing to cheaper companies. In software, specifications and architecture are being done in the US but coding is being outsourced to reduce the cost of development and in some cases speed the software release cycles.

Especially in the case of a new company, it is risky to outsource development of the product since much of the learnings are developed in the initial rev of the product. Communication challenges (especially with developers) can be a challenge if the product definition continues to evolve with beta customer feedback and changing requirements. Copyright issues (fourth shift) is also a growing concern with some outsourcing, where your product is produced and sold in additional markets without company knowledge or consent.

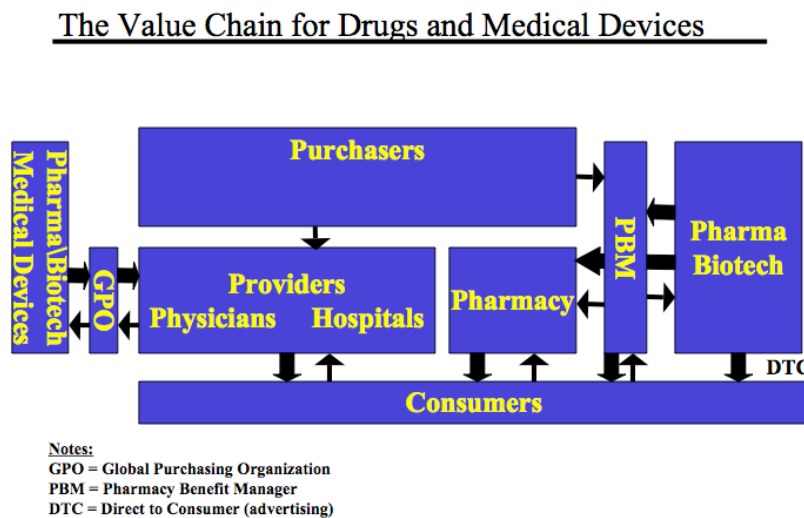
14.8 Exercises

14.1 Select a startup of your choice. Using the format of Figure 14.6, prepare a value web diagram for this company.

Figure 14.7 gives an example for Cisco.

Figure 14.14 gives an example for AgraQuest.

An example from the pharmaceutical and medical device industries is listed below (source from Zenios and Chess @ Stanford).



14.2 Flextronics manufactures products for many electronic companies (www.flextronics.com). It is a global company, headquartered in Singapore, and has over 120,000 employees. The company's core competence is lean manufacturing. Where does Flextronix fit in the value web for Microsoft, Ericsson, and Dell?

14.3 China is a world-class manufacturer and has advantages of size, scale and cost. Identify a Chinese assembler of electronic products for European companies. What advantages does China have versus manufacturing in Europe?

Labor costs are significantly cheaper in China. Many raw materials will also be cheaper in China. Distribution costs of the final product will depend on where the good is being shipped. However delivery has become a small percentage of most BOMs given bulk shipping of product and lower transportation costs.

An interesting example in computers is much of the PC manufacturing is done in Asia. However the Intel CPU is usually added in the country where the PC will be sold. This is due to the large % of BOM the CPU makes up and significant price declines of CPUs, making it advantageous to install the CPU as close to customer ship as possible.

14.4 Prepare a road map diagram for the development and launch of a new model of a hybrid automobile to compete with the Toyota Prius.

14.5 Wal-Mart has invested heavily in RFID technology to improve the efficiencies of its warehouse operations and inventory control. Outline Wal-Mart's value web. How has Wal-Mart's adoption of RFID influenced its supply partners? What new opportunities have been created with RFID? What have been the results for Wal-Mart from this push?

See Figure 14.6.

In 2005 and 2006, Walmart has focused on adding RFID tags to pallets at the warehouse level. They have not extended this to their distribution network. Walmart is mandating their largest suppliers use RFID tags, adding momentum to the entire RFID industry. This has allowed Walmart to track in a more automated manner the flow of goods through their warehouses, without the need for manual scanning and checking of goods. Given the scale of Walmart's operations, any time improvements in the warehouse and closer to real-time tracking of inventory movement and use translated to significant savings.

14.6 The use of a new technology can bring new life to a mature industry such as the plastics industry. Logistics, supply-chain, and scheduling software enable large productivity increases in several mature manufacturing industries. Examples of such software firms are i2, Moldflow, Quad, and Keane. Select one of these firms and describe an actual application for operations productivity improvement.

14.7 About 5 to 10 percent of pharmaceuticals produced do not meet specifications and have to be reworked or discarded. Quality testing is done by hand, and the batch process method is widely used. A new venture has been launched to design new processes for drug makers. What new methods and approaches should it develop to sell to drug makers?

A new venture should seek to either increase the throughput efficiency during production or increase quality during production, or both. Such system changes would result in a lower cost per unit production. It may mean successfully automating the step of quality testing, by using infrared technologies to measure drug content. Or it may mean switching production from batch processing to continuous processing. Or it also might mean reworking the front of the production line to reduce defects.

14.8 Describe and contrast the operational challenges faced by the following start-ups: (a) consumer Web services start-up, (b) iPhone application company, and (c) electronic

device company.

14.9 Describe and contrast the operational challenges faced by the following start-ups: (a) new drug discovery company, (b) medical device company, and (c) bio-fuel company.

Use Sections 14.1 and 14.3 to discuss the unique industry specific aspects of each of these 3 examples. Each example has different models for production and what is performed day to day within the company.

Use Sections 14.2 and 14.5 to analyze the differences in a primarily pure research company, a physical mechanical device, and a raw materials and refining centric business.

15.6 Exercises

15.1 An acquirer looks for a company with a good profit margin, a proven history, and a fair price. Choose an industry of interest and list five criteria for selecting candidates for acquisition.

Search for:

- Undervalued and cash-strapped firms
- A firm with quality people who will agree to stay on under new ownership
- Unique Assets that are not easily imitated
- Compatible company cultures and operations
- Opportunities for synergy

15.2 A software firm is available for purchase, but it has experienced no growth for several years. The firm provides a cash return annually before taxes and owner's salary of \$100,000. It has annual sales of \$1 million. As a purchaser of this firm, you select a discount rate of 14 percent. Calculate the price you would offer for the firm. Assume that you can increase and maintain a growth rate of sales and cash flow of 2 percent annually.

The current value based on cash flow is ($g = 0$):

$$\frac{1}{r - g} \cdot \text{earnings} = \frac{1}{.14} \cdot \$100,000 = \$700,000$$

The value assuming you can boost growth 2% ($g = .02$):

$$\frac{1}{r - g} \cdot \text{earnings} = \frac{1}{.12} \cdot \$100,000 = \$850,000$$

Offer between \$750,000 and \$800,000.

15.3 Describe how the acquisition strategies of these firms have differed: Apple, Google, Microsoft, Oracle, and Qualcomm.

This question is somewhat open ended and benefits most from using recent acquisitions to build a case for a specific position. Reasons for acquisitions will vary greatly.

Apple – Apple has primarily acquired core technology to better control Apple product destinies. Apple has also acquired products to help differentiate Mac hardware in particular verticals (pro video, pro music, pro photography). Apple has targeted synergistic acquisitions more than as a growth strategy.

Google – Google has acquired both engineering centric and eyeball centric (i.e. AdMob, YouTube), serving for both internal synergies and as growth strategies.

Microsoft – similar to Google in acquiring both engineering and acquiring into new markets.

Oracle – Oracle has been aggressive in acquiring primarily competitors (Siebel, PeopleSoft) and technologies (Sun). Buying market share and consolidating supplier markets has been a strategic driver for many.

Qualcomm – Qualcomm has primarily acquired intellectual property to extend its IP licensing business model and to differentiate its hardware and software portfolios.

- 15.4 Identify a technology-based company that used acquisition to enter into an international market. Describe the strategic alignment and the executed deal terms. Was it a success? What were the key challenges that arose?
- 15.5 Interview a technology executive based in a country different from the company's headquarters. How are various company functions handled (e.g., marketing, sales, operations, development)? What are the key challenges of operating away from company headquarters?
- 15.6 Social networking is one of the most prevalent Internet user activities today in many countries. However, given the geographic virality and social aspect of social networks, it has been very challenging for any specific network to dominate internationally. Le Monde created a compelling graphic describing this dynamic in 2008 (radar.oreilly.com/archives/2008/04/worldwide-social-network-market-share.html). Leveraging the concepts in Section 6.3, Section 13.3, and Section 15.3, (a) describe the international expansion strategies selected by top social networking companies (e.g., Facebook, MySpace, Friendster, Bebo, Cyworld, Orkut), (b) describe some of the reasons each social networking firm has developed the global presence it has, and (c) how could this impact the business models chosen by each company.
- 15.7 Neopets (www.neopets.com) offers its virtual world of virtual pets globally. The firm offers its service in two languages, English and Chinese. Study the Neopets site and determine if it should be offered in many languages. What are the advantages of establishing a Neopets site for each language?**

See:

<http://www.neopets.com/aboutus.phtml>

and note the expansion of languages to address additional markets.

- 15.8 When Google initially expanded search services into China, there was surprise over Google's decision to censor some content per requests by the Chinese government. Why was this viewed as "evil" by some? How did Google view the concern? What are other challenges facing companies expanding into international markets?**

See for history:

<http://googleblog.blogspot.com/2006/01/google-in-china.html>

<http://news.bbc.co.uk/1/hi/technology/4645596.stm>

Google's primary position is that failing to offer Google search to a fifth of the world's population is a worse violation of Google's corporate mission vs. filtering some search results. Before the agreement, the Google experience in China was spotty. Providing some search results was deemed more valuable than providing none. It is also challenging to stop information once it begins to flow.

See:

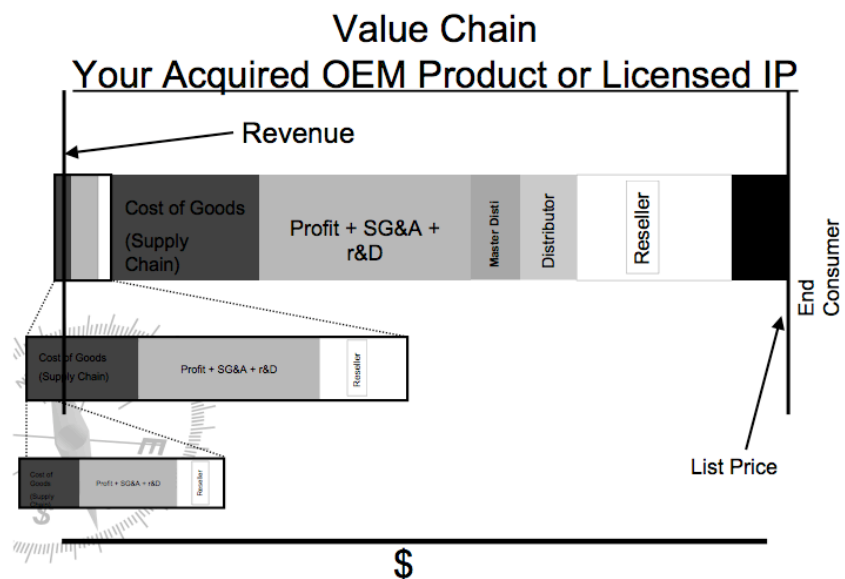
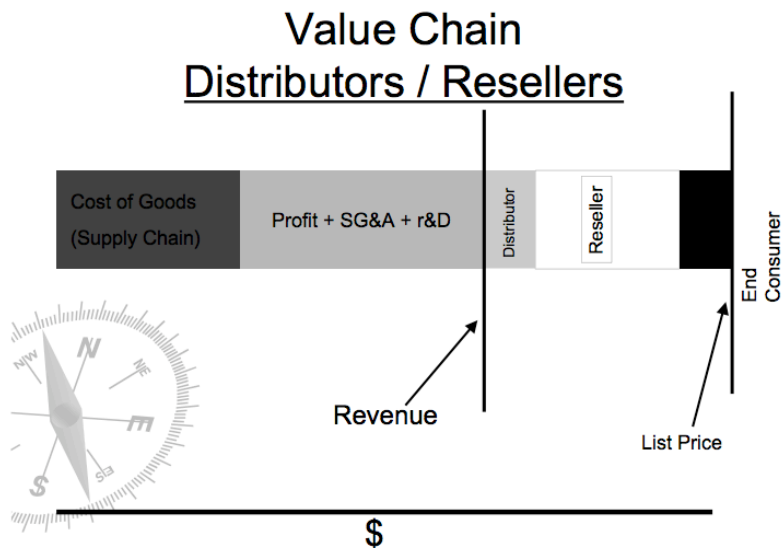
<http://googleblog.blogspot.com/2010/01/new-approach-to-china.html>

for a recent policy change update.

16.9 Exercises

16.1 A company's Value Chain was discussed in Chapter 14.1. Figure 16.1 outlines the division between profit and cost. Extend Figure 16.1 to account for the profits and costs of partners and suppliers in a company's value chain.

Two generic examples follow (source Mark Leslie). It is important to realize customer pricing can be very different than product pricing.



16.2 Google, the search engine firm, uses a complex revenue model and a related profit engine. It has a large base of users and advertisers, and works to link its users to retailers. Describe its revenue and profit model. Contrast this with Yahoo's revenue model. Examining recent quarterly reports will give an indication of the "split" of revenue amongst business units.

See the following for recent financials:

<http://www.google.com/finance?q=NASDAQ:GOOG&fstype=ii>

<http://finance.yahoo.com/q/is?s=YHOO>

Google uses an advertising revenue model and a new business profit model. It essentially is taking over the role of an advertising agency and bringing web users closer to retailers. The majority of its revenues come from being able to target advertisements to focused audiences. This model is paying off by letting small vendors compete with larger ones. Whereas, some vendors were too small to use an ad agency, Google allows these small vendors to get in the game without needing to pay upfront.

Yahoo has traditionally had a more diversified revenue stream. Google has continued to derive the majority of their revenue from keyword search. Google continues to explore other sources of revenue but have not been successful to date in replicating their revenue success of keyword search.

16.3 Zipcar gives its members short-term, on-demand use of a fleet of cars (www.zipcar.com). Before launching this service, Zipcar proposed a pricing scheme of a \$300 refundable security deposit, a \$300 annual subscription fee, and \$1.50 per hour plus 40 cents per mile. Create another pricing scheme that will be more profitable.

ZipCar has evolved to an annual fee and time based model for renting of vehicles:

<http://www.zipcar.com/rates/>

<http://www.zipcar.com/sf/rates/savings-compare-own>

There is a discount provided to drivers with a monthly minimum commit. These pricing schemes also mirror more closely rental car options, and should be easier for customers to understand vs. driving mile based pricing.

16.4 Skype offers Voice over Internet Protocol (VoIP) telephoning services and PC to PC calling. The telephone service began as a free service. Describe the revenue and profit model for Skype specifically. Has the eBay acquisition changed the revenue model?

16.5 Salesforce.com sells software as a service delivered online. Corporations pay about \$60 per month for each user. Describe its revenue model and profit model.

Use Table 16.1 and Table 16.3.

16.6 Research and determine the most profitable industry sector in a country of interest (profitability on either a relative or absolute basis). What is driving this high profitability? Is it sustainable, and for how long?

16.7 Compare the most recent yearly income statement for Microsoft, Dell, Sony and Qualcomm. Examine the gross margins for each of these companies (cost of goods sold COGS divided by revenue). Do a similar ratio analysis against Sales, General & Admin (SG&A) and Research & Development (R&D). What do these ratios when normalized against revenue tell you about the kinds of businesses these companies operate in?

Updating this chart can be done at the student's preferred online financial web site.

Microsoft is in a software business where product costs are relatively small and the majority of investment is in SG&A and R&D. Dell and Sony are both in primarily hardware businesses where COGS will dominate the expenses of the company. QCOM is primarily a IP licensing company, reflected in the lower % of COGS and higher relative % of money spent on R&D.

FY 2005	MSFT	DELL	SONY	QCOM	GOOG
Revenue	\$ 44,282	\$ 55,908	\$ 63,541	\$ 5,673	\$ 6,139
COGS	\$ 7,650	\$ 45,957	\$ 43,787	\$ 1,645	\$ 2,577
SG&A	\$ 6,584	\$ 463	\$ 17,500	\$ 631	\$ 855
R&D	\$ 13,576	\$ 5,140		\$ 1,011	\$ 600
Common Sizing					
% COGS	17%	82%	69%	29%	42%
% SG&A	15%	1%	28%	11%	14%
% R&D	31%	9%	0%	18%	10%
Net Margin	37%	8%	4%	42%	34%

Generating these %s for 2009 time period would be interesting for contrast, where the hardware centric companies would show a tougher time in the downturn.

17.12 Exercises

17.1 Define the inter-relationships between an income statement, balance sheet and cash flow statement. What financial view is most important for a new venture and why?

See Sections 17.4, 17.5 and 17.6 for the definitions of each statement and the interconnections.

See Figure 17.2 and Figure 17.3. for a graphical representation of what key components make up each type of financial statement.

The income statement is an accounting representation of the financial performance of the company through time (changes from period to period). The balance sheet is the snapshot view of the status of a company (the stock). With the income statement and balance sheet, the cash flow statement can be calculated. The Cash Flow Statement provides a cash based view of what is changing within the company.

Generally, the cash flow statement is the most important view for a new company. Cash is king and if the company runs out of money, then the venture is done. It is possible profitable companies can go bankrupt (challenges with working capital), this is more apparent by using the Cash Flow Statement as the way of examining the financial status of the company.

17.2 Examples of Revenue Models are listed in Table 16.1. Select three of these Revenue Models and explain the challenges in creating a Sales Projections for each.

17.3 Viscotech Inc. is planning to enter the field of electro-optical systems for automated optical inspection and detection of defects in manufacturing components and modules. The projected financial revenues and income are shown in the table below. The firm plans to start with an equity investment of \$1,000,000 and a five-year loan of \$500,000. Determine the cash on hand at the end of each year. Also, determine the return on equity and the return on investment for each year.

Please note that the exercise incorrectly states in the text that the firm plans to start with an equity investment of \$10,000. The text should read (as the Table does): \$1,000,000.

We can assume that this equity investment will go toward the acquisition of fixed assets and that the loan will provide working capital.

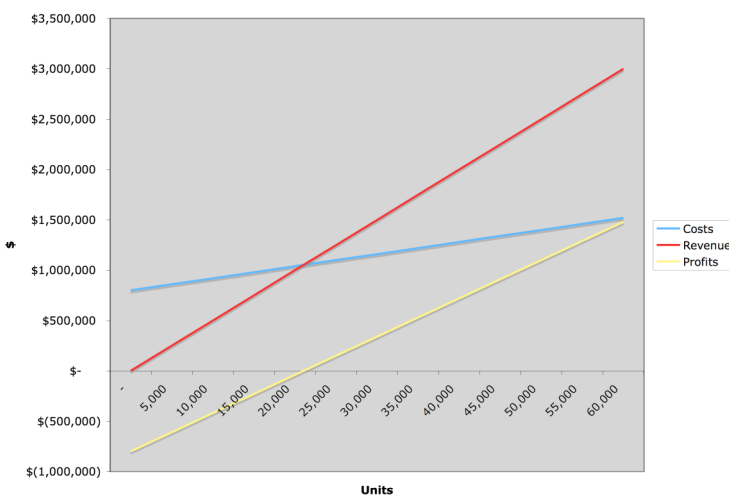
	Year	0	1	2	3	4	5
Initial Equity		-1000					
Initial Debt		-500					
Revenues			1500	3400	5900	10600	15400
Income (after tax)			-500	-100	200	400	600
Depreciation			250	300	350	400	400
Average Shareholder's equity			1000	700	600	800	1400
Long-term debt			500	450	300	200	100
Cash on hand		\$500	\$250	\$150	\$250	\$600	\$1,100
ROE			-50%	-14%	33%	50%	43%
ROI			-33%	-9%	22%	40%	40%

17.4 A new venture is launched with an initial investment (cash on hand) of \$80,000 and generates sales of \$40,000 each month. It has monthly operating costs of \$36,000. The firm purchases equipment costing \$30,000 each month for the first four months. Calculate the return on investment at the end of 12 months. Determine if the cash on hand remains positive at the end of each month. What, if any, investment is required and when?

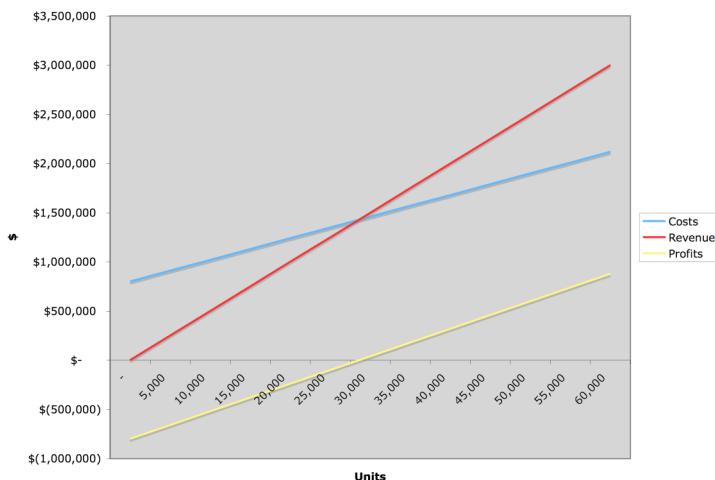
17.5 A software firm has fixed costs of \$800,000 and variable costs of \$12 per unit. Calculate the breakeven quantity (Q) when each unit sells for \$50. If the firm sells 50,000 units in a year, what is its profit for that year? Assume the tax rate for the firm is 20 percent.

Assume variable costs include SG&A and R&D.

Without considering taxes, 21,053 units must be sold to return a profit. With 50k units sold, profits would be \$1.1M.



Assuming a tax rate of 20%, 28,571 units would need to be sold to make a profit. With 50k units sold, profits would be \$600k.



17.6 A new firm, Sensor International, is preparing a plan based on its new device to be used in a security network. The cost of manufacturing, marketing, and distributing a package of six sensors is 14 cents, and the price to the distributor is 68 cents. The firm calculates its one-time fixed costs at \$121,000. Determine the number of units required for breakeven.

17.7 Continuing exercise 17.6, Sensor International sells 300,000 packages in its first year and 400,000 in its second. If the investor's original investment was \$100,000, determine the return on investment in year 1 and year 2 for the firm. Assume a tax rate of 20 percent.

Problem # 17.5				
	Year	0	1	2
Investment		\$ 100,000		
Units Sold			300000	400000
Profit per unit			\$ 0.54	\$ 0.54
Income (before tax)			\$ 162,000	\$ 216,000
20% tax rate			\$ (32,400)	\$ (43,200)
Income (after tax)			\$ 129,600	\$ 172,800
ROI			130%	131%

17.8 Reconsider the firm described in exercise 17.6 when it is determined that fixed costs have declined to \$30,000 and the firm has determined by studies that it can only expect to sell 60 units this year. What price should it select to ensure selling the 60 units profitably?

17.9 Superconductor Inc. is planning to start on January 1, 2010, with an initial investment of \$200,000 from its founder team. It projects sales of \$12,000 in February 2010 and a growth rate of sales of 10 percent per month for the foreseeable future (at least two years). It expects to receive payment upon delivery for its unique devices. Its costs are \$18,000 for its first month of operation, and it

plans for a growth rate of expenses at 2 percent per month. Prepare a cash flow statement for the first 24 months of the firm, and determine if and when an additional investment would be required.

Note normally the expenses would have some variable component tied more closely to the revenue (and assumed unit) growth.

The goal of this exercise is to calculate the cumulative cash flow position of the firm over time.

- Scaling revenue from \$12K in Feb 2010 until the end of 2011 results in total revenue of \$954,516
- Scaling expenses from \$18k in Jan 2010 until the end of 2011 results in total expenses of \$547,594
- This results in operating cash flow (over the first 2 years) of \$406,923

A spreadsheet allows for calculation of monthly operating cash flow and cumulative operating cash flow. One finds that in Month 7 (July 2010), the firm reaches the lowest point for cash required at \$41,230. Given the initial investment was \$200,000, there is not additional capital required to fund the business to profitability (assuming the financial estimates become reality).

17.10 A new clean technology company has fixed costs of \$420,000 and variable costs per unit of \$3,100. Competitor analysis shows that the price for a comparable product ranges from \$6,500 to \$9,300. The goal of the firm is to attain profitability this year while increasing its market share next year. What price should the firm select? What is the break-even quantity for the selected price?

Without knowing the elasticity of the demand, the firm will be forced to choose a price point in the middle of the pack and hope that enough units can be sold to accomplish the objectives.

$$TC = FC + VC$$

$$= \$420,000 + (\$3,100 \cdot q)$$

If we set the price at \$8,000, we find

$$qP = \$420,000 + (\$3,100 \cdot q)$$

$$q \cdot \$8,000 = \$420,000 + (\$3,100 \cdot q)$$

$$\$4,900q = \$420,000$$

$$q = 85.7$$

86 units are the breakeven quantity. The firm would have to sell more than that to reach profitability. With a \$9,100 price point, we find that:

$$qP = \$420,000 + (\$3,100 \cdot q)$$

$$q \cdot \$9,100 = \$420,000 + (\$3,100 \cdot q)$$

$$\$6,000q = \$420,000$$

$$q = 70$$

70 units would bring the firm to breakeven. Market share would likely be lower with the higher price point.

18.15 Exercises

18.1 Viscotech Inc. is described in Exercise 17.3. Determine the percentage ownership an angel group may demand for investing the \$1 million sought by Viscotech at the start of year 1. If Viscotech is unable to obtain the bank loan of \$500,000, it will need an equity investment of \$1.5 million. What ownership percentage will the angel group demand for this investment? Assume the annual interest payment on the loan was planned to be 10 percent of the principal.

a) With the loan in place, the angel group's investment will be leveraged; the debt provider only requires a 10% interest payment and by authorizing the loan, the institution essentially shows the investors that the firm is credit worthy. As a result, we can assume the return on capital required by the angels will be at the lower end of the spectrum (40%). From Section 18.8, we apply the formulas as follows: $I = \$1$ million investment, $S = \$15.4$ million rev, $G = 40\%$

$$CR = (1 + G)^N \cdot I = M \cdot I$$

$$CR = (1.4)^5 \cdot \$1\text{million}$$

$$CR = 5.3784 \cdot \$1\text{million}$$

$$CR = \$5.4\text{million}$$

Percent Ownership is based on Market Value that relies on industry comparables. Since no information is available for this particular company, we will assume a Price-to-Sales ratio of 2. ($S = \$15.4\text{million}$; $PS = 2$)

$$PO = \frac{CR}{MV}; MV \approx PS \cdot S$$

$$MV \approx 2 \cdot \$15.4\text{million} \approx \$31\text{million}$$

$$PO = \frac{\$5.4\text{million}}{\$31\text{million}} \approx 17.5\%$$

b) Without the loan in place, the angel group will be required to invest an additional $\frac{1}{2}$ million dollars. In addition, because the loan is not being granted to the firm, the investors must assume that the project has a higher risk. As a result, we can assume the return on capital required by the angels will be toward the higher end of the spectrum (60%). We apply the same formulas with slightly different variables as follows: $I = \$1$ million investment, $S = \$15.4$ million rev, $G = 60\%$

$$CR = (1 + G)^N \cdot I = M \cdot I$$

$$CR = (1.6)^5 \cdot \$1.5\text{million}$$

$$CR = 10.48576 \cdot \$1.5\text{million}$$

$$CR = \$15.75\text{million}$$

Below we see the Angel group will demand a higher percent of the company.

$$PO = \frac{CR}{MV}; MV \approx PS \cdot S$$

$$MV \approx 2 \cdot \$15.4\text{million} \approx \$31\text{million}$$

$$PO = \frac{\$15.75\text{million}}{\$31\text{million}} \approx 51\%$$

18.2 Glenn Owens's attractive technology start-up requires \$10 million to launch. Projections show earnings of \$10 million and sales of \$80 million in the fifth year. The venture capital firm expects a return of 50 percent per year for the five-year period prior to an IPO. What valuation would you assign to the new venture? What ownership portion should the venture capitalist expect to receive? Perform a sensitivity analysis on the valuation and rate of return.

18.3 DGI, a new firm in formation, has developed a set of projections shown in Table 18.21. The expected and pessimistic cases are shown. The harvest of the firm is planned for the fifth year. The firm is seeking an initial investment of \$1 million before launching in year 1 as well as a commitment for \$1 million at the end of year 2 for expansion. Acting as an adviser to a venture capital firm, prepare an offer of investment to submit to DGI. Assume the PE ratio in DGI's industry is 15.

Assuming the VC firm is seeking a 50% return on its investment ($G=.5$) we calculate the following:

$$CR = (1 + G)^N \cdot I = M \cdot I$$

$$CR = (1.5)^5 \cdot \$1\text{million} + (1.5)^3 \cdot \$1\text{million}$$

$$CR = 7.59375 \cdot \$1\text{million} + 3.375 \cdot \$1\text{million}$$

$$CR = \$11\text{million}$$

Based on expected net income forecasts:

$$PO = \frac{CR}{MV}; MV \approx PE \cdot E_{\text{expected}}$$

$$MV \approx 15 \cdot \$5.86\text{million} \approx \$88\text{million}$$

$$PO = \frac{\$11\text{million}}{\$88\text{million}} \approx 12.5\%$$

Based on the pessimistic net income forecasts:

$$PO = \frac{CR}{MV}; MV \approx PE \cdot E_{pessimistic}$$

$$MV \approx 15 \cdot \$1.81\text{million} \approx \$27\text{million}$$

$$PO = \frac{\$11\text{million}}{\$27\text{million}} \approx 41\%$$

The VC firm should seek between 12.5% and 41% of the company in return for their investment.

18.4 The CEO of an early-stage software company is seeking \$5 million from venture capitalists. The reasonable projected net income of \$5 million in year 5 can be valued at a PE of 20. Furthermore, the sales in year 5 are projected at \$25 million. What share of the company would the venture capitalists require if their anticipated rate of return is 50 percent? The company has 1 million shares outstanding before the venture capitalists purchase shares. What price per share should the venture capitalists pay?

18.5 Consider a new firm in the nanotechnology field that seeks a second round of financing. This year, it has revenues of \$2 million and projects profitability of \$200,000 next year on revenues of \$3 million. It is raising \$1 million from a new set of investors. What share of the company should it offer to the new investors? Assume it can increase profits at a rate of 25 percent per year over the next five years.

Assuming an aggressive comparative PE multiple of 20 and a desired return on investment of 50% for the investors, the % to be offered to investors for the \$1 million investment can be seen calculated below.

$$EN = (1 + G)^N \cdot E = (1.25)^5 \cdot \$200,000$$

$$EN = 3 \cdot \$200,000 = \$600,000$$

$$CR = (1 + G)^N \cdot I = M \cdot I$$

$$CR = (1.5)^5 \cdot \$1\text{million}$$

$$CR = 7.59375 \cdot \$1\text{million}$$

$$CR \approx \$7.6\text{million}$$

$$PO = \frac{CR}{MV}; MV \approx PE \cdot E$$

$$MV \approx 20 \cdot \$600,000 \approx \$12,000,000$$

$$PO = \frac{7.6}{12} = 63\%$$

18.6 Rackspace is a Web hosting company that went public in 2008 (www.rackspace.com). The firm had sales of \$362 million in 2007. The firm went public via an OpenIPO auction process using bids for shares (www.wrhambrecht.com/ind/auctions/openipo/index.html). Examine the OpenIPO

auction process and the Rackspace offering. What was the offer price and offering size? What was the post-money valuation of the firm? Was this valuation reasonable?

18.7 Consider the Netflix IPO Prospectus beginning on Figure 18.5. Calculate the percentage of Netflix that is being sold to the public. Assume all issuable stock options (including unvested shares) and warrants were exercised before the IPO. What percentage of the company would then be sold?

(1) 5.5M common shares issued with 20,648,074 outstanding after the offering.
 $5,500,000/20,648,074 = \sim 27\%$ public ownership post-IPO.

(2) 5.5M common shares issued with 32.6M outstanding after excluded shares are executed and included. This results in $\sim 17\%$ of NetFlix being owned by the public post-IPO.

18.8 Explain the purpose and value of staged financing for investors. For the entrepreneur.

See Table 18.7 and Table 18.8.

The purpose of staged financing is to minimize the risk taken on by investors and to identify clear milestones (operational, sales related, etc.) that can be used to track progress for the firm. Investors prefer staged financing since it provides more control over what the \$ is used to accomplish. Instead of fully funding a company, the investor is able to re-examine the operational performance of the company periodically once certain milestones are reached. This is more relevant for startups performing heavily research or development since it allows the investor to invest in getting the first product shipped vs. product shipped + building the sales channel.

Staged financing poses more of a challenge for entrepreneurs. It is safer to have all of the \$ upfront. However this will usually require selling a significant percentage of the company. With staged investment, the entrepreneur is able to demonstrate the viability of the business over time, warranting a higher valuation, allowing the owners to give up less of the company in staged rounds. Staged investing also ensures entrepreneurs are focused on most important milestones for the company since further funding is dependent on interim success.

18.9 In what circumstances should grants be viewed as an attractive source of capital? When would a grant be less appropriate?

See Section 18.6 for a discussion of the appropriateness of grants.

19.7 Exercises

19.1 Twitter allows customers to send (tweet) and read short messages to and from friends, colleagues, and others to answer the simple question “What are you doing?”. Write an elevator pitch for this venture.

See:

<http://twitter.com/about#about>

19.2 Business plan contests offer an opportunity for entrepreneurs to present their business plans. The Clean Tech Open in the United States offers one such contest (www.cleantechopen.com). Visit the site, study the description of the winners, and prepare a brief report on an enterprise that most interests you.

19.3 As the CEO of a new technology venture, you and your team have set a valuation for your firm of \$10 million (pre-money) and found a willing venture capital firm. The venture capital firm, however, has set a valuation of \$6 million. Revenues next year are projected to be about \$6 million, and the firm will be profitable next year. Identify a negotiation approach for achieving a reasonable compromise valuation.

See Section 19.3.

If the founders strongly believe in their projections, the round could be structured to imply a \$6M valuation if the targets are wildly missed, or re-price or issues warrants for the founders in the VC round to the founders pre-money valuation if the projections come true. This could get complicated in account for edge cases and a consistent valuation for middle ground cases. Investors will be more comfortable with a higher valuation if performance milestones are reached.

19.4 What is a term sheet? Specify three clauses in the term sheet that you would want as an entrepreneur. Specify three clauses in the term sheet that you would want as an venture capitalist. Why is it important both parties are happy with the resulting deal?

See Section 19.3 and the following link for further details:
http://www.feld.com/blog/archives/term_sheet/index.html

A term sheet is a proposed legal agreement between an investor (venture capitalist) and entrepreneur. It sets out the terms of the investment (amount, timing, associated investor and owner rights).

Three important terms that should be considered when negotiating a term sheet are:

- Company valuation

- Board composition
- Liquidation preferences.

There are a number of other factors that should be considered. It is worthwhile to examine the term sheet from the context of what if everything goes right, what if everything goes wrong. Make sure both parties are comfortable with the answers to these two extreme situations (which more than likely will occur).

It is critical to get to a term sheet both parties agree with since after the term sheet is signed, both parties should have aligned incentives. The success of the firm should be the goal for all stakeholders. When this is not the case, problems can arise when entrepreneur and investor incentives are not aligned. Many VCs will negotiate aggressively with the term sheet. However, after it is signed, it is in their best interest to make the company and entrepreneur successful, maximizing their chance of a high return.

19.5 What are the key factors a venture capitalist uses to value a new venture? Describe what value parameters are mostly likely different between an investor and an entrepreneur.

The most critical factor is comparable valuations or deals being done of companies in a similar space or similar risk profile.

Generally, VCs act in a herd mentality and can at times bid up valuations for companies in a hot space.

VCs also use desired ownership shares to assist in valuing a venture.

The entrepreneur's financial forecasts are usually looked at as informative for a wildly successful case, but are generally challenging to use for company valuations.

19.6 What deal terms can a venture capitalist suggest to ensure entrepreneur incentives are aligned in both good and bad times for the firm? What are deal terms an entrepreneur would suggest to ensure investor incentive alignment in both good and bad times for the firm?

See the following link for further information:
http://www.feld.com/blog/archives/term_sheet/index.html

Warrants or incentive based options can be specified depending on the success of the company. It is challenging to align incentives for the entrepreneur in bad times since the valuation usually is low and any further investment significantly dilutes the original founders ownership percentage.

Liquidation preferences specify what happens when a firm is liquidated. This is relevant both for bankruptcy and for IPO/M&A exit. For the entrepreneur, it is important that investors always profit more from the success of the firm vs. the failure of the firm.

19.7 Why is it critical both the investor and the entrepreneur are happy with the final deal? Who loses if this is not the case?

See Section 19.3.

The most important aspect of the deal is to ensure both parties have incentives that are aligned. The deal should put both the investors and the entrepreneurs on the “same side” with the same goals for the joint venture. After the deal is done, both the entrepreneur and investors have a strong mutually beneficial goal of making the new venture successful.

20.7 Exercises

20.1 In May 2003, Zipcar of Boston decided it was time to bring in new funding to reach profitability (see www.zipcar.com). However, the willing investors insisted on replacing the CEO and the board of directors. Examine Zipcar's subsequent progress in terms of execution and need at different stages of the life of this company.

See:

<http://www.inc.com/magazine/20080301/how-fast-can-this-thing-go-anyway.html>

<http://en.wikipedia.org/wiki/Zipcar#History>

20.2 The global financial crisis in 2007–2010 drastically impacted the spending patterns of many businesses and industries. Select an industry, list specific spending changes that occurred during this period, and describe how a start-up selling into this industry should adapt its strategies to account for the broader market conditions.

20.3 Your emerging new company is selling a high-priced software system to newspapers and magazines. Each sale amounts to \$100,000 or more. Your firm is scheduled to deliver a system next week to one of your best customers. However, your chief technical officer has just told you that they have found a major software error that will take two to three weeks to fix. You are counting on the sale within this month so that you can meet payroll and pay all your delinquent bills. Your CFO suggests you ship the system now and send in a team later to fix the error. Your CTO wants to fix it first and then ship. What should you do?

Assuming your actions will fall within legal boundaries, your decision must include the consideration of all the relevant factors, including what the customer's expectations are. While taking the CTO's advice might appear to be the safest solution in the long-run, it may be more beneficial to the customer, as well as your company, to ship the software sooner rather than later. On-time delivery may be of the utmost importance to the client, even though short-term efficacy may be sacrificed; a financially sound supplier might also be more advantageous to an end-user instead of a vendor who has difficulty delivering agreed upon contracts due to financial turmoil and distractions. In any event, open communication and honesty is generally a good policy in most situations and including the customer in the decision process might even be an option in this case.

20.4 Southeby's and Christie's are the two largest upscale auction houses. Both enjoyed a growing business in the boom years of the late 1990s. In 2000, both firms were accused of price fixing. The Sherman Antitrust Act was passed in 1890 to control the power of trusts and monopolists. In 1995, both firms announced they would charge a fixed, nonnegotiable sliding-scale commission on the sales price. Is this the age-old tactic of price fixing? What constitutes legal pricing policies versus illegal price fixing?

Legal pricing policies are policies that are made in effort to compete for business, while illegal price-fixing is done to reduce and eliminate competition. Christie's and Sotheby's did engage in the age-old practice when they agreed in 1993 to set fixed prices to avoid the cut-throat competition that they had faced between each other during prior years.

20.5 Your cash-strapped company is bidding for a badly needed contract. As the bid deadline nears, an employee of your nearest competitor pays you a visit. He says he'll provide details of your competitor's bid in return for the promise of a job in six months, after the dust has settled. You know your competitor can survive losing this contract; you can't. Unfortunately, hiring a new employee will mean someone who currently works for you will have to go. Even so, is this an offer you can't refuse?

Providing information to a competitor usually is illegal. Accepting such an offer needs to be made by the individual or board members directly involved. They understand the ins and outs of the particular situation and should carefully consider all of the information. On the surface, it appears that agreeing to the proposal goes against the law as well as the heuristic "golden rule." If the roles were reversed, would you think it fair that your competitor did the same thing to your firm? From a practical standpoint, it is also important to note, that this individual cannot be trusted and would not likely be as loyal an employee as one currently on the team.

20.6 Your new firm is considering offering one of two health benefit options. One is more complete but also more costly than the other. Should you ask your employees to all accept the lower-cost option? Should you explain the benefits of both plans? If you do, most people will prefer the better plan. What should you do?

This is an instance in which the company can demonstrate effective communication with its employees while developing and fostering an environment of trust and collaboration. Describing the health plans, and their costs and benefits is critical to not only gaining the acceptance of employees but also encouraging an aligned perspective with the company. Wherever possible, the company should give its employees individual and group information regarding such a resource as benefits. The company, however, must retain the final decision rights. The company should strive to structure the choices so that they are cost neutral to the company so that the majority of workers will be able to choose the best benefit plan for their needs.

20.7 You attend a critical partner meeting with your CEO. After the meeting, your CEO misrepresents the results of the meeting to the broader management team to further a different agenda. How do you handle this situation with your CEO? With your other team members?

20.8 Select an example of a white-collar (business) crime such as the Enron case and describe what happened. How could have this crime been avoided?

Use Table 20.6.

There are a number of examples in the news today related to back-dating of stock options.

An interesting example of a company ensuring their supply chain follows similar labor practices is a Apple and iPod manufacturing example.

<http://www.apple.com/hotnews/ipodreport/>