Until one is committed, there is hesitancy, the chance to draw back – concerning all acts of initiative (and creation), there is one elementary truth that ignorance of which kills countless ideas and splendid plans: that the moment one definitely commits oneself, then Providence moves too. All sorts of things occur to help one that would never otherwise have occurred. A whole stream of events issues from the decision, raising in one's favor all manner of unforeseen incidents and meetings and material assistance, which no man could have dreamed would have come his way. Whatever you can do, or dream you can do, begin it.

*Boldness has genius, power, and magic in it. Begin it now.*

Johann Wolfgang von Goethe

**Course:** Tech Startup: Tools and Techniques – 95794 – Mini 1

**Location:** HBH 1003

**Time:** 6:00 PM – 8:20 PM

**Instructor:** Mark DeSantis, PhD

C: 412.414.5003

Email: markd2@andrew.cmu.edu

Please call to arrange for office hours.

**Course Description:**

The first three years of a technology start-up are the most critical. That is when the company’s “DNA” or trajectory is set. Too few entrepreneurs appreciate this fact and many start without the essential skills, talents and capabilities needed to set the company on a successful path. Some of these skills can only be learned through starting and growing a business while others can be learned. This course introduces you to those learnable skills:

- *Creating, developing and evaluating your “concept of a business”* – Is my idea a real innovation? Is it also a business or a product or neither? How do I know how big the market is for my product? What are the technology, market and competitive risks in my idea and how do I assess them? Can I compete with the big boys? Can I sell it? How? When? Where?

- *Identifying, managing and evaluating a start-up team* – Do I have the skill, motivation and ability to be a tech entrepreneur? Can I build a company from scratch (really?)? Should I be the CEO, Sales Account Manager, VP of Engineering or something else altogether? What should my team look like on day 1, a year from now, or three years?
from now? How do I incent them? Manage them? Lead them? How do I evaluate whether people have the skills, knowledge, abilities and attributes necessary for a) this team generally, b) the role I’ve picked for them specifically, and c) the long haul?

- *Raising money* – I know I need money what but how much, where, when and what *kind of money*?

Students will apply their newfound practical skills, gathered, in part, from lectures from experienced entrepreneurs and investors, to case studies and role-playing.

**Course Objectives:**

Each student will be better able to do the following by the end of the course:

- Create a *venturable* business.
- Understand how to resource, sequence and time the core activities of a brand new tech venture.
- How to build and manage a start-up team.
- Know why, when, where and how to raise capital.

**Course Requirements:**

Each student must complete two team-based hypothetical case studies and two role-playing assignments. Students are, of course, encouraged to draw on resources beyond the assigned reading and lectures.

Grade weighting is as follows:

| Hypothetical Case Study Team Presentation 1 | 40% |
| Hypothetical Case Study Team Presentation 2 | 40% |
| Role Playing and Class Participation       | 20% |
| Course Grade                               | 100% |

**Hypothetical Case Studies**

Students will serve on a consulting team (team size depends on class size) that is assigned a sequence of two hypothetical technology start-ups facing complex challenges. Ideally, the consulting team will draw heavily from the course content to develop practical recommendations to address the issues and advance the goals of the company. The consulting team will present their recommendations to the role-playing team (see below) in

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1 The hypothetical case studies are based on the experiences of the professor and colleagues.
a ~25 minute presentation followed by a ~30 minute Q&A.

**Hypothetical Assignment Role Playing**

Students will also serve in a role-playing capacity, as various members of the hypothetical case study companies and as a member of the hypothetical management team each student will receive and critique the recommendations of their opposite on the consulting team. Therefore, each student can expect not only to develop and provide recommendations in two case studies but also receive recommendations (in a role-playing capacity) from their class peers in two other case studies. Presentations will be judged on the quality and depth of the analysis and clarity of presentations (see attached presentation assessment forms).

**Group Evaluations of Team Presentations**

All team presentations will take place on the last three sessions and at the conclusion at each of these sessions the students will collectively evaluate the quality, depth and usefulness of the recommendations of their peers for that session. Though course grades will be assigned by the professor, consideration will be given to the quality of the discussion in final grade.

**Required Readings:**

**Suggested Readings**
- *Art of the Start: The Time-Tested, Battle-Hardened Guide for Anyone Starting Anything* by Guy Kawasaki
- *The Myths of Innovation* by Scott Berkun
- *Founders at Work: Stories of Startups’ Early Days* by Jessica Livingston
- *Competitive Strategy* by Michael E. Porter
- *The Rise and Fall of Strategic Planning* by Henry Mintzberg

**Resource Readings:**
- *Done Deals: Venture Capitalists Tell Their Stories* by Udayan Gupta
- *Selling the Invisible: A Field Guide to Modern Marketing* by Harry Beckwith
- *Real Time: Preparing for the Age of the Never Satisfied Customer* by Regis McKenna
- *Inside the Tornado: Strategies for Developing, Leveraging, and Surviving Hypergrowth Markets* by Geoffrey A. Moore
• *The Innovator's Dilemma: The Revolutionary Book that Will Change the Way You Do Business* by Clayton M. Christensen

• *Crossing the Chasm* by Geoffrey A. Moore

• *The McKinsey Way* by Ethan M. Rasiel

• *High Tech Start Up, Revised and Updated: The Complete Handbook For Creating Successful New High Tech Companies* by John L. Nesheim

**Course Schedule:**

**Session 1 – *The tech startup***

*Learning Objectives:* (1) understanding the importance of and challenges in the first three years, (2) learning core operational, funding, planning and market challenges unique to tech start-ups and (3) understanding strategy and tactics: the difference between the two and why both are important for tech start-ups.

*To Do:* (1) quick review of the syllabus and course requirements, (2) teams identified and organized and (3) address student questions.

**Session 2 – *Creating, developing and evaluating your concept of a business***

*Learning Objectives:* (1) learning the “Venture Opportunity Screening Analysis” tool, (2) learning how to sort out interesting ideas from opportunities and (3) learning how to sort a good business from a “venturable business.”

*To Do:* (1) teams assigned to real-world companies, (2) teams assigned to case studies and (3) teams assigned to role-playing.


*Guest Lecture:* TBD

**Session 3 – *Identifying, managing and evaluating a start-up team***

*Learning Objectives:* (1) understanding the basic principles of Project Management as applied to starting a new tech venture, (2) learning who, why, and when to hire in the first three years and (3) managing and motivating a tech team.

*Guest Lecture:* TBD

**Session 4 – Raising money**

*Learning Objectives:* (1) learning and applying the sources and uses of funds tool, (2) understanding equity investment and all that it implies and (3) why raising money is and is not as hard as you think.

*To Do:* Q&A regarding case presentations


  *Guest Lecture:* TBD

**Session 5 – Hypothetical case team presentations**

*To Do:* Group evaluation of presentations

**Session 6 – Hypothetical case team presentations**

*To Do:* Group evaluation of presentations
Hypothetical Case Studies

MedScan

The history: MedScan is a “leap forward in medical imaging technology” according to the company’s website. The product relies, primarily but not entirely, on proprietary tomographic body scanning software. In fact, the system is a combination of proprietary software and hardware and resembles a standard body scanning system. It allows medical professionals to “see” the clearest picture possible of the human body for a variety of medical diagnoses. They’ve passed the final required certification hurdle about a year ago and they began selling the software to large medical centers immediately. Their product will compete directly with GE CT scanning technology among others similar products.

The CEO and CFO are convinced they need to raise an additional $5M within the next 90 days and, if successful, they believe they will reach “cash flow positive” within the next 3 years.

The CTO is the founder of MedScan and a board member (along with the CEO). He does not agree with this fundraising strategy (though he has not said so to either the CEO or CFO) and believes MedScan could and must “ride out” these tough economic times by cutting costs and, if needed, raise far less money (perhaps $500K). It is not that the CTO is against raising money – he supports it – just not now. The CTO believes the company needs to show more progress in technology and market development before they go out again to raise “big money.” Otherwise, the CTO contends, MedScan will get a “far low valuation than could if they tighten their belts for the time being.”

MedScan has raised 3 rounds of capital since its founding 5 years ago which includes: (1) an initial “seed” round of $650,000 in the form of convertible notes from friends and family, (2) $2.3M in preferred equity from a New York City based VC about 18 months after founding, and (3) $2.7M in preferred ($1M more from the NYC VC and $1.7M from the Silicon Valley-based VC 40 months after founding.

The challenge: The company will run out of money in 6 months with the current burn rate of $200K per month and the management needs your help to decide what to do. Specifically, they want to know the top three things they should understand and be prepared for as they think if, how, from whom, where and when to raise this capital.

Role-playing:

CEO: This individual was brought in by the New York City VC at the second round of financing to, in the CEO’s words, “to clean up the mess the founders made.” He has raised a great deal of VC in the past. He is a board member on a five-person board.

CFO: The CEO immediately hired the CFO after taking the helm of the company. Both the CEO and the CFO are finance pros by background. Though she has not sourced VC money she has worked with entrepreneurs who have. She is also a board member.

CTO: This individual is an MD and PhD and researcher by training. He has a generally functional working relationship with the CEO but it is strained at times. She is the founder and also a board member.
**SurveilSoft**

The **history**: SurveilSoft was founded six months ago by two Carnegie Mellon researchers. Their core product, EyeView, grew out of their respective research with the Defense Advanced Research Projects Agency and other US federal intelligence agencies. Specifically, they worked on a number of machine learning-based sensor fusion technologies. The EyeView software platform gives users the ability to take advantage of existing physical sensor systems (i.e., surveillance cameras in, say, a bank) and use them alone or in combination with other types of sensors (i.e., IR, seismic, motion, heat) to autonomously ID a wide variety of objects of interest (i.e., people, vehicles,) and send alerts to the user – the bank guard in this instance.

Though they are pre-revenue they expect to have their first paying customer within 6 months. The two founders invested $50K each of their own money in the business. However, they’ve reached the point where they need to raise an additional $500K to hire technical staff to further develop and productize the platform as well as pay other essentials services such as attorney’s and consultant fees. They have no experience raising money and are somewhat concerned about their ability to do so in a timely and effective way, though they have not verbalized this to anyone but one another. They’re fearful, as they’ve heard horror stories of founders giving up their entire company after building it and raising all of the money!

Some have recommended using a fundraising “broker,” whereby a certified broker takes a percentage of capital raise as compensation for assisting in raising the funds. Others have suggested hiring a CEO with experience raising funds and, equally important, a network. Still others have encouraged them to give it a try themselves and take advice and guidance from a few wise people in their respective personal networks.

This discussion is complicated by the fact that one investor prospect, a very high net worth individual, has told the cofounders on several occasions that she can and will “take up the whole $500K.” However, trusted friends of the founders, who know this individual well, have expressed ambivalence about “… going in to business with her.”

The **challenge**: You were hired by the board to sort out what is the best fundraising path forward for the founders. Specifically, you must (1) assess all alternatives and present your reasoning and evidence as to why they should pursue your recommended path, (2) highlight the risks of the path your recommending and (3) propose contingency plans should your recommendation not go as planned.

**Role-playing:**

The Founders: Dr. Peterson and Dr. Harris, not only have zero fundraising experience they have no real business experience either. Yet that doesn't affect they’re view of themselves and their ability to raise money. In fact, some good friends of Drs. Peterson and Harris joke, “they are the two most arrogant yet-to-be-successful entrepreneurs they know.” Both are board members on the three-person board of directors.

The Wise Adviser: Mr. Carter is the outside director on the company’s three-member board. Mr. Carter is ambivalent about the high net worth individual, but Dr. Peterson and Dr. Harris believe the prospective wealthy individual could get them out of bind for
raising the $500K round. Mr. Carter also has concerns about Messrs. Peterson and Harris raising the money alone. Nevertheless, he has offered to do what is needed to get the job done.
WeTutor.com

The history: WeTutor.com was founded about three years ago through a licensing arrangement with Carnegie Mellon University. The product, SmartTutor, is a web-based tutoring software for the 5th through 12th grade and relies on a combination of proprietary artificial intelligence (“AI”) enhanced software and access to live tutors. The core technology is an artificial intelligence (“AI”) enhanced software engine that takes each student down their own “learning path,” depending on how students respond to the questions and the prompts in the system. In addition, the student experience is enhanced through continuous access to a live tutor.

SmartTutor currently provides math and some science tutoring. However, they’re considering several other subjects including writing, reading as well as greatly expanding the math and science offering. There are two reasons for considering expanding the offering to include subjects beyond math. First, some customers are asking for it and saying that, in effect, “If you had reading and/or writing, I would buy your math product also.” Second, the “suite solution” (e.g., bundling a variety of subject offerings in one offering) seems to be where the competition is headed, particularly the larger online tutoring competitors.

The multi-product “suite solution” option is supported by the VPs of Sales, the VP of Marketing and the VP of Services.

The CEO and VP of Products have a very different view, however. They’re ambivalent about the suite option because, they contend, WeTutor.com must “focus, focus, focus” in the words of the CEO. First, math and science are the academics topics most conducive to being taught online while the other offerings such as, say, reading and writing, might require dramatically more human interaction, thus compromising scalability of the offering. Second, additional products will likely require another round of substantial investment, including likely outside capital. Third, in the words of the CEO, “I’d rather be THE best in one thing than really good in a few things.”

The challenge: There are literally hundreds of online tutoring companies and there are several very large players including Pearson, Sylvan Learning, and EDMC to name a few. These companies are aggressive and are now investing substantial amounts of money in on-line tutoring, particularly in math. You were hired to investigate the challenges and opportunities in choosing a single versus multi-product strategy for such a young company. In addition, you are asked to explore practical ways to implement your recommended strategy.

Role-playing:

VP of Sales, VP of Marketing and VP of Services: They support a multi-product strategy and are concerned that if the company does not move quickly it will lose out.

CEO and VP of Products: They’re ambivalent (to say the least) but are fairly open-minded about looking at alternatives.
Blue Demon Harmonics

The history: Blue Demon Harmonics, founded 2 years ago by Abhishek Chatterjee, former senior executive of a large metals company and Dr. Onu Kotozumi, a professor of materials science from the University of Pennsylvania, developed the “Harmonizer” software kit. It optimizes cutting tool action on a machining center and does so by taking a "digital fingerprint" of the machining center’s spindle vibration, thus enabling for balancing harmonic vibration on cutting tools and tool holders. The Harmonizer improves metal removal rates from 30 percent to as much as 200 percent in some cases.

The company has 8 customers and is already cash flow positive. The sales and business development funnel is growing as heavy users of machine tools seek ways to cut costs. Abhishek runs operations day-to-day while Dr. Kotozumi is quarter time.

The company was initially funded by an infusion of $200K from the former executive/co-founder, $250K from friends and family and $1M from corporate investor/partner (e.g., a large metals manufacturer that was the former employer of the co-founder/executive). Lately, there has been an increased tension between the corporate partner/investor and the management of Blue Demon. Specifically, Blue Demon management is complaining privately that the corporate partner/investor is placing far too much emphasis on financial performance and not appreciating the larger market opportunity the company sees. In fact, Blue Demon management wants the corporate partner to make another significant investment of “growth capital” now.

Carol Barker, who represents the corporate partner, on the other hand, believes Blue Demon should do more manage cash flow properly and grow the company organically, before they seek outside investment from them or anyone else.

The challenge:

Analyze the situation and see if there is a business relationship of some kind that allows Blue Demon and the corporate investor/partner avoid a conflict and all that entails.

Role-playing:

Abhishek Chatterjee: He has thirty years of operating experience in the metals and machine tool industry. He is getting increasingly nervous about the relationship with the corporate partner/investor and is, in fact, starting to get the feeling that the corporate partner/investor wants to “take over the company!”

Dr. Onu Kotozumi: He believes he is “caught in the middle.” He shares Chatterjee’s concerns about the tenuous relationship with their corporate partner but also does not want to cause a conflict that would wreck the company.

Carol Barker: She believes Chatterjee just “wants to do his own thing” and she believes he does not appreciate the fact that Blue Demon’s key investor has an obligation to ensure their investment is well managed.
Andy’s Robots

The history: Andy is the CEO and founder of Andy’s Robots. This very innovative company makes robotic action figures. The one-foot tall robots walk, talk, climb and move about with an almost human quality and currently sell for $499 each. However, the company expects significant price reductions with volume. Though the robots have received a great media attention, including a recent feature story in Playthings.com, sales have not yet taken off as everyone expected. Nevertheless, the company is well capitalized and about to launch its first real and large national marketing campaign.

The company was founded about two years ago and has survived to date on very little cash, mainly because the founder receives a salary as a faculty member (he is a part-time CEO) and two key employees, the Chief Marketing Officer and Chief Operating Officer, have received only a $1K per month in salary each since joining – though both have heavy stock incentives. Nevertheless, the company has raised $750K (from a local angel group) to date.

Andy is a personable and likeable guy. In fact everyone loves Andy! His natural charm and good nature are compelling and he is a “big picture” guy with little patience or interest in the day-to-day details. He is also the consummate salesman and always selling. Andy hired, Beverly Altruse, the Chief Marketing Officer (CMO) and she is quite good in that capacity. Beverly has also served (in an unacknowledged capacity) as a de facto Chief Operating Officer. The VP of Products, Victor Diaz, is a highly talented individual with a fierce loyalty to Andy and he is considered to be the ultimate creative genius behind the company’s extraordinary products.

Most interestingly, the company was approached by Hasbro and Mattel Corporation since the publication of the Playthings.com article. Though the discussions were “very preliminary” according to the representatives from Hasbro and Mattel, both companies indicated they wanted to “explore all options.”

The challenge: The board of directors of Andy’s Robots has lost confidence in the Andy’s leadership and they need your help to figure out what to do, if anything, about it and when to do it. First, Andy is, by his own admission, “a terrible manager.” Second, he is prone to emotional outbursts that often leave his colleagues emotionally wounded and confused. Third, his credibility with the board diminished significantly over the last year as he, according to one board member, “spent money on stupid stuff.” However, they do have a dilemma: he is closely identified with the company and his status as the “toy robot guru” had helped brand the company.

Role-playing:

The board of directors consists of Andy, two individuals representing the investors and two outside directors appointed by Andy at founding.

Board member one: Represents the angel investors and does not know Andy well.

Board member two: Is a significant angel investor and has known (and liked) Andy for years.
Look See

The history: Look See was founded 8.5 months ago by two experienced and successful entrepreneurs, Dave Cartso and Missy Walters, and their main product is a hardware/software tool that aggregates all of the roughly 3,000 free TV channels available globally on the internet into one “programming guide.” It also has the capability of accommodating paid programming such as some professional and collegiate sports programming, faith based programming and adult entertainment. In effect, the user can build their own paid cable system—a la carte—one channel at a time.

The product, Look See Channel Guide, is a small device (manufactured by a third party) that connects to the internet—wired or wirelessly—and then to any type of display device. The Look See device: (1) reaches out and gathers the free and paid program, (2) ports it into an easy to use program guide (as you find on a standard cable TV menu) and (3) sends it to any available display device such as flat screen TV or computer display.

The “alpha” version of the device is being tested by a number of carefully selected users and a beta version of the software is downloadable free from the company’s website. The “beta” version of the hardware—that will include commercial version 1 of the software—will be ready in six months, as the founders originally committed.

Dave and Missy are “co-CEOs” and each invested $100K and raised another $250K from friends and family. The staff includes, in addition to Dave and Missy, two java programmers, one embedded programmer and several consultants. Up to now, Dave and Missy have had a positive working relationship. However some serious conflicts have come up lately over everything from the color of letterhead to the length of their bios on the website. Needless to say, things are getting pretty ugly at Look See. Dave has admitted to friends that he feels Missy does not respect his judgment. Similarly, Missy has said that Dave is at time “just too careless with details.”

The good news is that there is real interest from some powerful partners including CBS Sports and MSNBC, to name just two.

The challenge: The “friends and family” investors have gotten wind of the co-founders recent conflicts and are concerned enough to call you in as consultants to try to come up with a solution. Frankly, they’re ambivalent about “this co-CEO notion,” as one investor put it, and believe one person should be in charge. Nevertheless, Howard Kelly, who represents the friends and family investors, insists something must be done immediately.

Role-playing:

Dave Cartso: Started his first company at 25 and sold four years later for $5.5M. Look See is his third company.

Missy Walters: Started and sold an IT consulting business last year.

Howard Kelly: He is sympathetic to the co-founders concerns. However, he wants a real resolution of this now.
Prevent Maintenance, Inc.

The history: Prevent Maintenance, Inc. was founded two years ago by the company’s CEO Wayne Dugan for the express purpose of reducing maintenance cost of large power generation equipment. Actually, the company is recasting of Wayne’s power generation equipment consulting business. Their one product, GenPulse, is software platform that monitors all of the available sensory outputs of typical power generator (i.e., voltage, acoustic, vibration, heat) and looks for patterns that can predict equipment failure. The software is billed as “an easy-to-use EAM/CMMS software that is well suited to maintenance best practices.” The tech team recently developed a 3.0 version that is compatible with Microsoft’s .NET Framework and the result, according to Wayne, “is a huge leap in usability, power and connectivity.”

They’re software is really a platform that easily “snaps into” existing power generation and monitoring systems. As a result, there is no need to install hardware or disrupt the operation of the customer’s operations or equipment. In sum, the customers love GenPulse!

The company has been successful selling regionally to local power companies in the tri-state area. However, they’re looking to expand nationally and, perhaps even internationally. Wayne has been approached by at least two prestigious VCs and a NYC based PE fund each wanting to invest serious capital (e.g., $10M+) and on a very good pre-money valuation. Wayne “boot strapped” this business and is hence the sole owner.

The challenge: Wayne has hired you to understand if, when, where and how he might consider marketing his product on a national and/or international market. He really does not understand the competitive landscape, at least nationally. He is less interested in a specific proposal than you helping him think through all of his alternatives should he take a $10M+ investment round.

Role-playing:

Wayne: He started out a machinist and is a self-taught programmer. He is in his mid-sixties and has told his wife on several occasions that he is looking forward to retirement.
Secure Financial Data Corporation (SFDC)

The history: SFDC was co-founded by three entrepreneurs, Harry Squent, CEO; Margerit Debonet, CTO and Monica Gerstenwaller, VP of Marketing about three years ago with the express purpose of making large, complex and multi-party financial transactions “ultra secure,” according Monica Gertenwaller. All three founders were earlier in their careers financial industry executives with large investment banking or retail banking companies. Most recently, each went off to start their own respective businesses and SFDC is, in fact, the product of a three-way “merger” between their three respective firms: a security software firm, a boutique management consulting firm focused on financial services and a financial services firm.

SFDC sells a suite of software security products that provides “level 9” security for international complex financial transactions. The company has a half a dozen very large banks and financial institutions and is growing. It has sustained positive cashflow for two years and an annual growth rate of 40 percent. The company has been self-funded to date but is now seeking about $30M in investment capital.

The company has suffered some stresses and the three-way “merger” is still incomplete. In fact, some preliminary due diligence by a potential VC has revealed some potential problems that may prevent investment including: (1) the intellectual property and patents are still owned by one of the “merged” companies, (2) Margerit is doing consulting work on the side for a potential competitor, (3) all three founders are fully vested and none have non-competes, and (4) Harry has intimated he wants to start his own company again.

The challenge: Your consulting team was hired to understand the implications of the issues uncovered in the due diligence by the VC fund.

Role-playing:

Harry Squent, CEO: He is growing weary of working with his co-founders and likes “the freedom of making his own decisions.”

Margerit Debonet, CTO: Margerit’s former company, which still exists in legal form, owns the rights the core software of SDFC.

Monica Gerstenwaller, VP of Marketing: She is concerned about what the due diligence revealed and, apparently what has been revealed in the effort so far was a “complete surprise.”
Presentation Evaluation Form

Team: ___________________________________

Date: _________

Content = 33%

Poor __ Fair __ Average __ Good __ Excellent __

Comments:

Clarity = 33%

Poor __ Fair __ Average __ Good __ Excellent __

Comments:

Analysis = 33%

Poor __ Fair __ Average __ Good __ Excellent __

Comments:

Overall _____