Finding Gold in Glitter: A Framework for Assessing the Prospects of Early Stage Ventures

By

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Abstract

During the last decade and half, the hi-tech industry has seen a phenomenal pace of innovation fueled primarily by venture capital funded startups. In spite of the innovation pace, very few of these ventures have gone on to become successes that have created wealth for all the stake holders involved. The failure rate of early stage ventures is still very high. A maxim of the VC industry from the late 90's and 2000's is, for every 10 venture investments in a VC portfolio, two fail soon; five were walking dead and unless someone bought them out they would eventually die; two returned average returns and only one would go on to become the phenomenal success - an outlier like Google, Amazon, eBay or an YouTube, on which the entire portfolio return depends. The current approaches to evaluating these early stage venture plans are not very reliable. What we need is a new paradigm.

To pursue any endeavor and achieve desired success repeatedly we need certainty, consistency and predictability – none of which exists in the hi-tech venture business. In order to get there, we need a shift in our current paradigms on evaluating hi-tech startup ideas. We need a new model that clearly explains the forces that the products from those ventures would be subject to and help us understand why things happen the way they do. It should help us clearly relate the effect with the actual cause. This would go a long way to help us make better decisions and would provide a start in introducing certainty, consistency and predictability in the business of hi-tech ventures. This would improve the rate of venture success. Early stage ventures would not be a game of chance anymore. This thesis puts forth a new framework drawn from multiple sources to help assess how a proposed early stage venture may perform with its intended strategy. The framework is then validated by applying it to a series of ventures - past and present, to check how it stands up.

Thesis Advisor:

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Acknowledgements

We don't realize the significance of events that happen in our life till years later, when we look back to see the dotted lines of life connecting them. Each one leads to the next. The seeds of this thesis were sown almost 10 years back when my passion for technology led me to a career as a Software Engineer at a hi-tech MNC and three years after that, when I made my decision to quit my job there and join the fast paced, roller coaster world of venture funded technology startups. I continued to be in that world till I enrolled at MIT. Even though commercially, these startups were not a hit, I have no regrets about joining them. They offered me splendid learning experiences. They helped me meet some very bright people and make some good friends along the way. They exposed me to the world of venture funding. They also brought me to MIT and will serve as the foundation for the successes in the next phase of my life.

There possibly isn't a better place than MIT to work on this thesis. The last two and half years here have been one of the most stimulating and exhilarating times in my life. During this time, I had the opportunity to listen, meet and discuss with many of the brightest minds of the world both here at MIT and Harvard Business School where I spent part of my time during three terms and where I was exposed to many of the concepts I write about in this thesis. These two great institutions on either of the Charles are hallowed grounds to me and will always have a special place in my heart. I will eternally be thankful for this opportunity to experience and enjoy the best of both these institutions. In particular I need to thank Pat Hale, Director of the System Design and Management program for giving me the flexibility and letting me choose what and where I wanted to learn.

There are a handful of courses that I would consider eye opening, out of the many that I took during these last two and half years. "Winning in Technology Markets" by Prof. Henry Weil is one of them. I first met Henry in the spring of 2008 when I enrolled in his course. He is a very rare individual who is not only a brilliant thinker and thoughtful speaker but is also a personification of humility in spite of his achievements. I have been blessed to have him as my advisor for this endeavor. He has not only been an outstanding sounding board but also put me in

touch with many of his friends and colleagues who helped me in ways only they could have. I believe, I have gained a lifelong mentor and friend in him.

I need to thank four other people in my life who enabled me to come to MIT. My parents – mom and dad, laid the ground work. They not only encouraged me to pursue my own dreams and not what they had for me but also instilled in me to aim to be the best in whatever I do. They deferred many of their own dreams to help me achieve mine. I wouldn't be where I am today, had it not been for them. My wife, Meena has been my pillar of strength and provided me with the material and emotional support I needed during this time. Without her love and support it would have not been possible to have done this. It was due to her encouragement that I decided to quit my job and enroll in the program full time. She deferred many of her dreams to help achieve this dream of mine. I am eternally grateful for having her as my wife. The idea to apply to MIT was sown by my former boss Amit Kinariwala. He has been a mentor and friend for the past 10 years. It was because of his insistence that I began to seriously consider enrolling at MIT. I am thankful to him for forcing me to do that. I hope someday I can repay him in some way. In addition to these folks, I have to thank another remarkable person – Alex Shyan, to whom I reported in the last venture I worked for. During the initial few months of this program when I was experimenting juggling work with school, he stood by me and gave me the flexibility that I needed. He is a remarkable individual who knows how to motivate people with words and earn their trust. From him, I learnt the art of influencing others - to get them to do what you want, without ever having to throw your weight around.

During my time at MIT, I developed some great friendships that I am sure will continue as long as I live. Those friendships and shared dreams made the last two and half years memorable. One of those is my good friend Leonard Francis. He is a very rare individual who like Henry, is wise, humble and in-depth thinker. Every word that he utters is a word of wisdom. He patiently read through the numerous drafts of this thesis that I sent along his way and gave me valuable comments. I am very thankful to have known him and be called his friend.

This section wouldn't be complete without thanking two other very kind and helpful souls - Bill Foley and Chris Bates, program administrators in the System Design and Management Program. Both of them had made my stay here memorable. Bill, especially has been kind and generous with any help that I sought from him and has gone out of his way to accommodate me. The

System Design and Management program wouldn't be a great program without them. In addition I would like to thank numerous others – professors and lecturers at MIT and HBS; the many VC partners and associates who gave me their valuable time for discussions and questions; many others who have enriched my life during these two and half years without being aware of it. Without all their support, this thesis wouldn't have been possible. I thank them all.

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1. Introduction

The main motivation for this thesis topic is my own personal experience working for venture capital funded technology startups. Out of 10 years of my professional career as a software engineer, I spent close to 7 years working in two venture funded software startups. The first venture's product was an enterprise class network and application performance monitoring solution. It sold just a handful of licenses and was eventually acquired by another vendor in the same space for a paltry amount compared to the original investment. The second venture went through a near death experience before it managed to get its application configuration management solution right. Ultimately a bad economy and some of its key clients going out of business caused its undoing and the firm was sold off to another large player in the market for less than its cost. These two ventures together, spent around $50M in the development and marketing of their products. These two are not isolated cases. Speaking with friends in other venture funded startups, I noticed a common pattern of venture failure in many of their cases too.

Much later while at MIT, when I shared my observations with a professor involved in entrepreneurship activities, he remarked "some ventures succeed and some don't"; but to me it appeared as if just a handful did and others did not. Both the firms that I had worked for had some of the smartest people that I had known in my career. The products that we built were conceived after thorough market research and interviews with potential clients. They seemed to clearly articulate their needs and promised to buy the product once it was available. Yet many of these same potential clients once they saw it in action didn't want it anymore even though they agreed that this was what they thought they wanted; so much for market research and client interviews. After pondering about this during the last two years at MIT, I am not entirely surprised at that outcome. No amount of effort using traditional market analysis tools could have helped conceive an Apple iPod/iPhone, Nintendo Wii, Facebook and many other killer products and services which have had phenomenal successes in customer adoption. The current approaches of market research used to conceive the products in many venture funded tech startups are flawed. This is just one example of the many shortcomings that plague them. Ultimately the effects of many of these different forces come together to cause their failure.

The Venture Capital (VC) firms through years of experience backing these startups have come to recognize the uncertainty associated with this business of funding the startups. The only way they could find to manage this uncertainty is, to follow a diversified portfolio approach to manage the startups they back. A maxim of the VC industry from the late 90's and early 2000's was, for every 10 venture investments in a VC portfolio, two fail soon; five were walking dead and unless someone bought them out, they would eventually die; two returned average returns and only one would go on to become the phenomenal success - an outlier like Google, Amazon, eBay or an YouTube, on which the entire portfolio return depends. Not much of that has really changed even after almost a decade. For a VC firm, a portfolio approach may seem to offer a way out of the uncertainty since that eliminates putting all their eggs in one basket. But, if you are a founder or an employee of a startup, working more than 70 hours a week and have all your hopes pinned on that one egg, this doesn't offer any help.

Even for VC's, the current approach of using a portfolio based approach to manage their investments doesn't seem to be a very good approach. An yet to be published research by Prof. Josh Lerner and Paul Gompers at Harvard Business School at the time of writing this thesis but whose findings were shared in class, found that the aggregate returns of all venture funds exited between 1998 to 2005 to their Limited Partners (LP's) who funded them have in fact been substantially below their original investments. This broadly coincides with my own observation that very few venture backed firms have actually succeeded to go on to make money in spite of the startup frenzy and the pace of innovation in the hi-tech industry we have seen during the last decade.

To study this problem and understand if the process of building a successful venture backed startup was a game of chance and random as it seemed, I had decided to take a break and return to academia. I wanted to understand if there were common underlying forces in action that we have not yet understood that caused these ventures to fail and if one could do something about it. When I came to MIT, the one important question to which I was seeking an answer was "How do you build a successful and sustainable hi-tech enterprise repeatedly?" and hidden within that was the second question "How does one build a product or a service that goes on to become a hit in the market place ?". I couldn't have found a better place than MIT with its focus on technology and the Sloan School of Management, with its focus on entrepreneurship to do this.

To my surprise and delight, I found a lot of papers, books and other work from academic scholars explaining some of the very causes of failures that I had observed while in the industry. Yet, there was no single body of work or a playbook to which an entrepreneur or a venture investor could refer to and understand what they are dealing with. This thesis is an attempt to collect in to a single framework, some of that work which I found very helpful in analyzing early stage ventures. This framework could be used as a lens through which to view a startup idea or an existing early stage venture which aims to create a specific product or service and make a reasonable forecast or prediction as to how the venture may in fact do in the current circumstance if it continued with what it did. I am not addressing the kinds of early stage ventures which aim to commercialize technology but is still in the process of figuring out what may be the right application for it. Even to them, many of the concepts that I discuss here would in fact be very helpful in choosing a path that would lead to success.

I cannot in anyway claim this framework to be all mine. I have compiled them from different sources, but synthesized them and supplemented them with examples I have personally observed in the field. Only those concepts that I have been able to validate on past early stage ventures with products and services that have failed or succeeded and able to explain convincingly, why they turned up the way they did has made the cut. These could be applied to ventures in progress to make forecasts on how they may turn up if they continued with what they did. A major hurdle I had to face during this process was getting access to information about past ventures. When I embarked on this, I naively thought that VC firms would be willing to share business plans and other details from their past investments that have already exited - considering that, with hundreds of millions at stake, they would be the ones who have the most to gain from an endeavor like this. I had assumed that they would be interested in learning from past mistakes. What was disconcerting was that, from an institutional point there wasn't any willingness on their part to share any information even though I had offered to sign a non disclosure agreement. I had to scale down my ambitious agenda. But in spite of that, many partners and associates gave me their valuable time for interviews and discussions and helped me network within their community; for that I am most grateful. For the past information on ventures, where possible I relied on interviews/discussions with few founders and employees of those ventures; however for the most part, I used archived or current public data sources available online. Given the time constraints and the scope of a Master's thesis, this framework is not an exhaustive work. This

does not cover every single scenario that may be found in the market place but mostly the predominant patterns. Someday I would like to return to MIT to pursue a doctoral thesis in this area once I achieve my dream of being a successful entrepreneur.

2. The need for a paradigm shift

Interviewing partners and associates in VC firms, listening to them speak in public, reading many of their interviews online and in other publications, it became clear that all of them have their own rules of thumbs to make investment decisions in startups. But one theme that emerged consistently from all of them and which factored as the primary criteria on which they based their go/no go decision was the strength of the founding team. All the VC's that I interacted with stated that they don't invest in ideas but rather on people. The rationale is that, smart people will figure a way to navigate the waters when things don't turn up as anticipated. In the new venture business uncertainty that arises during different stages of the business has been known to play havoc with the plans of the venture. The VC's have no tool at their disposal to tackle this, other than to rely on the people who run the startup and hence want to make sure that the team has what it takes to navigate the uncertainties. But interestingly enough, even though this logic has been applied for many years, ground reality is that the success rate for startups is still fairly low. This clearly proves that this safety net rule doesn't always help. Even founding management teams that proved successful in one venture have been known to fail in subsequent ventures. The most high profile example of this would be the founders of Skype and Kazaa who weren't able to replicate the same success with their new venture Joost which will be analyzed in one of the later sections.

2.1 Bringing Certainty, Consistency and Predictability into the Process

To pursue any endeavor and achieve desired success repeatedly, we need certainty, consistency and predictability – none of which exists in the hi-tech venture business. In order to get there, we need a shift in our current paradigms on hi-tech startups. We need a new model that clearly explains the forces that the startups and their products and services are subject to and help us understand why things happen the way they do. It should help us clearly relate the effect with the actual cause. This would go a long way to help us make better decisions and would provide a start in introducing certainty, consistency and predictability in the business of hi-tech ventures.

Thomas Kuhn introduced the term paradigm shift in his influential and landmark book "The structure of Scientific Revolutions". He showed that every significant scientific breakthrough was a break with tradition, old ways of thinking and old paradigms. Without a paradigm shift progress doesn't come. When we change the way people think, we sow the seeds for progress. To understand what I mean by a paradigm shift, let's go back in time a little more than a century ago to the late 1800's and consider an analogy from a different field – the field of medicine.

Medicine was more of an art than science then. No one had any idea as to why more soldiers died from cuts and wounds from wars than from other serious injuries or why a high percentage of women and children died during child birth. Not even doctors of that era clearly understood what actually caused many of the diseases. Medicine was an intuitive art and the efficacy of the treatment depended very much on the doctors of that era. Some cures worked and most didn't since the doctors had to rely on correlations as they didn't know the actual cause of them yet. For example, they noticed that, eliminating or keeping the rat population under control, prevented plague. It was not until germ theory was put forward did people actually understand what was the root causes of these diseases. Germ theory established that tiny micro-organisms that couldn't be seen with naked eye were the cause of many fatal diseases. This was a paradigm shift from what was commonly known at that time. It established a clear causality. That alone didn't result in curing all diseases. Further research based on that sound theory helped identify different categories of microorganisms - bacteria, fungi and virus. Each required a treatment of its own. That information helped figure out the correct cures, made the treatment consistent and predictable and made the field of medicine a science.

The field of business management especially managing hi-tech startups is very much in the same stage that medicine was more than a century ago. It is more of an art than a science and practioners have to rely on intuition. This is understandable for many reasons. This is not a field where one can quickly replicate a market condition and study in the lab and prescribe solutions. There is a clear separation between people in the academia where many of the business problems are studied, theories put forth and the people in industry who are the actual business practioners. Many academic professionals consult for businesses but it is not same as actually running the firm. Unlike in medicine or other sciences, very rarely do we see a professor who teaches entrepreneurial business management actually go on become the CEO of a startup and put his

theories to rigorous tests or a CEO who regularly goes back to academia to research and publish papers on some of the problems he faced. In recent years, we are beginning to see a few rare cases and the results from that kind of cross pollination have been really remarkable. Some of the work that has emerged from such collaboration is causing the kind of paradigm shift in thinking that was needed. It has resulted in theories that help us clearly establish the cause and the effect of many of the business problems in startups. We need more such reliable theories to make this field of hi-tech ventures consistent and predictable.

2.2 Stochastic and Deterministic Systems

While discussing the need for a paradigm shift and for new theories that give us better understanding of why some ventures succeed and some don't, the VC partners I interviewed argued that this was not possible. They reasoned that, uncertainty with new ventures was so great that deterministic theories and tools wouldn't be of much help and only stochastic processes and statistical tools like the portfolio approach made sense. Interestingly, most of them have a background in finance and all the stochastic and statistical modeling tools they employed actually originated in the field of money management. By any approximation the money markets cannot be treated as deterministic systems. George Soros, the very successful money manager explains the behavior of money markets through his theory of reflexivity. He argues that, the state and hence the behavior of those systems changes almost every second because of the actions of hundreds of thousands of observers who also participate in the very same system they are trying to observe. All their decisions are based not on reality but on expectations of the future and on what other players might do. Because of this near simultaneous observatory and participatory role by so many of these observers, there is a reflexive two way feedback loop at work that interferes with both these actions. This introduces an element of contingency or uncertainty into the course of events, negating any observation made on these systems to qualify as knowledge on which further decisions could be based. One has to rely on stochastic and statistical tools to manage such systems. In contrast to these systems, we have the physical systems like the Universe which are really slow moving and their state changes after many millennia and for all practical purposes are deterministic systems. The observers (and their

expectations) don't have any participatory role in the physical phenomenon like gravity, acceleration, velocity, mass that characterizes these systems. Physicists have identified clear principles or laws that govern the behavior of these systems. I would argue that these two systems are two extremes of the same continuum.

Hi-tech venture ecosystem, falls somewhere in the middle of this continuum. They are definitely very slow compared to money markets. The effect of any reflexive behavior because of competition is limited and there is sufficient time lag between events to be able to react to it. Unlike financial markets which have an added complexity because the same participant could reverse their role as a buyer or seller any time, here there is a clear distinction between buyers and sellers whose motivations could be well understood. For all practical purposes, the effect of any reflexive feedback loops (especially at the early stage) can be ignored while studying these systems. One could treat them as deterministic systems whose behavior explained and predicted to a high degree of certainty.

A far better analogy to the hi-tech ecosystem would be, biological systems mentioned earlier. The biological systems mutate as new generations of microorganisms emerge and become resistant to old cures. Our very act of participating in that system by introducing cures has actually changed the state of that system. But the change usually takes years; may be even decades. During that period for all practical purposes the system is still deterministic. The underlying theories that have explained the behavior in the past still hold true. We may need to do further research to come up with new cures to the mutated germs but the underlying principles don't change. It could be argued that early stage ventures are very similar. Customer behavior and competitor behavior in hi-tech ventures will change with time. The system would mutate because of a growing sophistication in competition among sellers as well as usage and behavior among buyers, but this takes time - at least a 5-7 year period while that happens. But the system's behavior is still deterministic and can be studied and sound theories put forth that explains them. We may need to tweak these theories as the system mutates but yet the underlying fundamentals are not going to change. I hope this should convince critics of the soundness of this paradigm shift needed towards causal theories.

3. Factors that affect a hi-tech venture

The factors that affect a new venture could be broadly categorized along the following three dimensions:

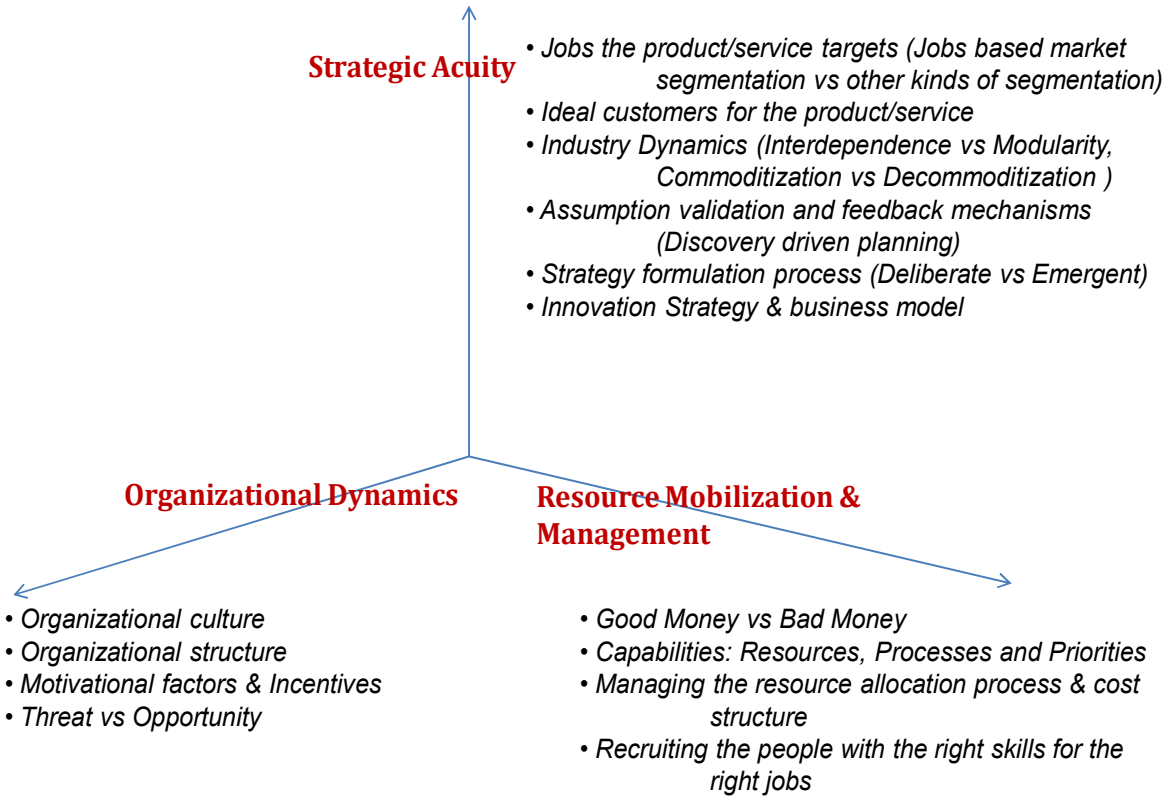
Strategic Acuity

Resource Mobilization and Management

Organization Dynamics.

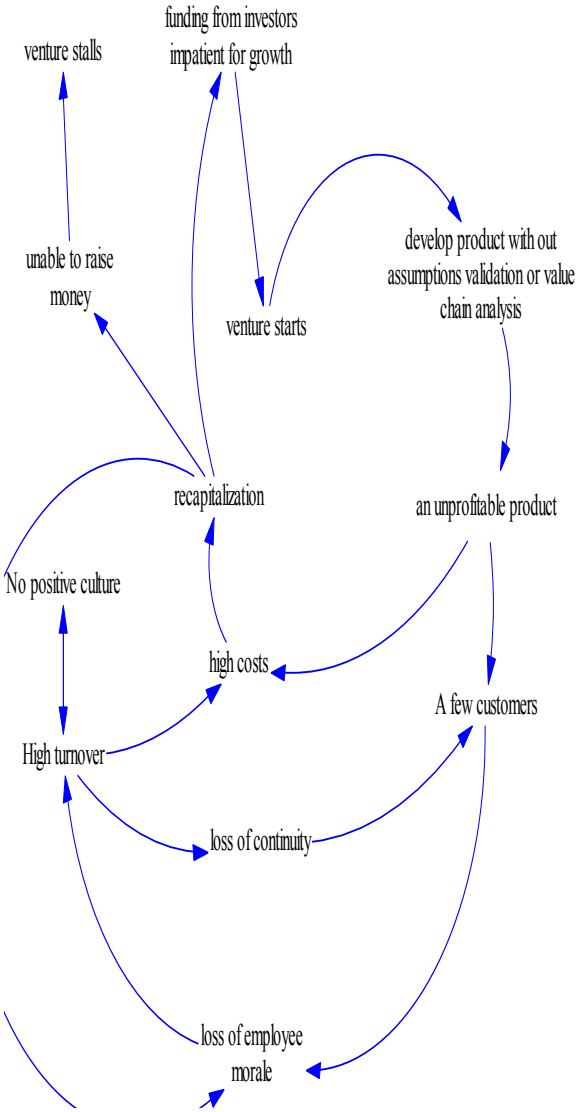
Each of these in turn is composed of numerous other parameters as shown in the figure below. These three dimensions are like the legs on which a stool rest. Keeping them aligned determines how stable and successful the venture is going to be.

Factors affecting the success of a hi-tech venture

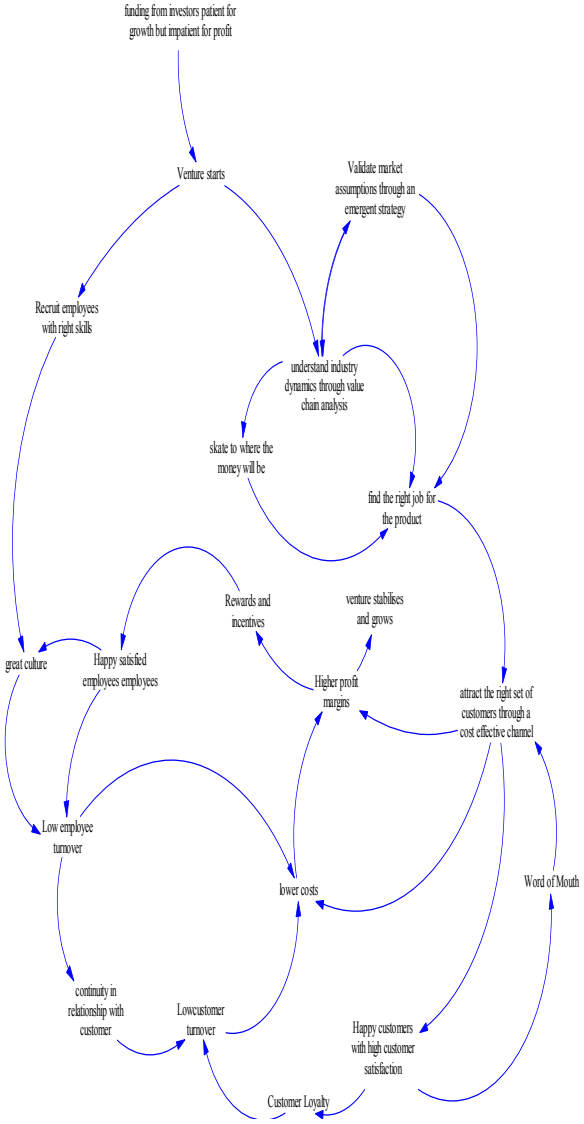


All ventures that have gone on to become successful firms in their own right, managed to get these three dimensions correctly aligned as time progressed, even if they didn't have all of them at the start. At the beginning of a new venture, it may not always be possible to get all these right; but knowing the missing pieces of the puzzle and identifying the weaknesses would help in filling them and strengthening them in future. Given the limited amount of resources a new venture has, making changes to a venture's strategy or product much later in its life can prove very expensive, morale sapping and many times lead to its demise. These three can be used to determine what changes need to be done very early on and what changes can wait till later. Not all parameters across the three dimensions can be evaluated at the stage of the business plan or early stage either. Here is a fairly simplified version of the dynamics in a venture that is in a cycle of failure and one that is in a cycle of success.

Cycle of failure



Cycle of success



The strategic acuity failure is the most common and most difficult to recover from. Also at the stage of the business plan or early stage, one would expect that most of the strategic acuity parameters would be known and addressed in detail. Hence for the purposes of this thesis, the framework addresses only that.

4. A framework for assessing the prospects of early stage ventures

The framework below is a collection of theories and concepts from different sources. It can be used as lenses to peer into an early stage venture that plans to create a specific product or service, and help predict how it may do if it continued down the path it was going. That insight could help identify and rectify any weaknesses. The term "product" wherever it occurs refers to both products and services unless explicitly stated otherwise.

4.1 Jobs Analysis

Every year thousands of new products/services are launched in the market. Countless hours of effort and millions of dollars are spent in conceiving, materializing, marketing and selling them. Obviously someone envisioned a need for each one, yet only a miniscule percentage of them succeed and the rest bite the dust. A handful of those go on to become killer products on which fortunes are made. What distinguishes the successful ones from the not so successful ones? If one wants to create a killer product in its category, is there a reliable guide? These are some of the important questions both product developers and academics have been trying to answer for a very long time. Yet many of the explanations over the years when put to test seem to fall short in explaining all the scenarios. For example, what explains the phenomenal success of the simple Flip Camcorders compared to far superior products from competitors like Sony and cheaper ones like Canon (At the time of writing this, Flip's maker Pure Digital was acquired by Cisco Systems for around $590M). They don't provide a robust and reliable enough strategy to craft a play book. A job based market segmentation lens pioneered first by Anthony Ulwick (HBR article - Turn Customer Input into Innovation) and referred to by Prof. Clay Christensen (SMR article - Finding the Right Job For Your Product) in most of his works, provides a fairly reliable paradigm to answer those questions. Using this lens at the stage of the business plan or even at

the early stage of a venture would greatly help avoid very expensive mistakes and improve the odds of the venture's success tremendously.

An age old advice to entrepreneurs has been "find a need and fill it". It's easier said than done. A needs analysis, a commonly followed industry practice to create products doesn't always provide a successful outcome. A personal example of that will be discussed later in this section. On the contrary a jobs analysis provides a far accurate outcome of creating successful products. A job is a situation that arises in the lives of the customers: either consumers or businesses. When customers need to accomplish a job that arises in their lives they look for solutions that can get it done. All the killer products/services (e.g.: Apple2 computer, Google search, Apple iPod/iPhone, iRobot's Roomba robotic vacuum, Flip Camcorder etc) went on to become killers in their category because they were squarely positioned on the job that a lot of people were trying to get done and helped them get it done far better and more conveniently.

People generally confuse a jobs based analysis with a needs based analysis. There is a fundamental difference. The difference is in the unit of analysis. A job is independent of the user and closely tied to the situation that a user may find themselves in; whereas a need is tied to the user and their needs may change significantly from time to time. To reinforce this further, here is an example from my own personal experience. The second venture that I went to work for was founded by two field engineers who worked for an enterprise software firm. As part of their work, they travelled to clients in large datacenters across the US and a common observation they made was that the engineers at those sites spent an enormous amount of their time fixing application configuration problems that occurred frequently during maintenance. Most of these engineers used multiple instant messaging windows simultaneously to coordinate with their geographically distributed counterparts during this process. The process was chaotic and cumbersome but got the job done. After speaking with these engineers, the founders of my firm saw a need for a user friendly, distributed collaborative configuration management tool that would be far easier and reliable to use to solve the configuration problems. After extensive client interviews they pitched this idea to VC's. The VC's as part of the due diligence called up many of those same clients who agreed with the need. The venture was funded and after spending about $10M, when they took back a collaborative tool, they were in for a big surprise. Many of those same clients now didn't feel a need for a pricey tool for a trivial task they could anyway

get done through instant messengers. Of the few that bought it, they found it difficult to adapt and change their existing habits to suit the new tool. The first version of the product was a complete disaster that almost took the venture down. But during many of the conversations trying to sell the product, the sales and professional services team realized that a far important job clients actually want done was to help eliminate the configuration chaos happening in the first place rather than just help troubleshoot them. A second version created from scratch at an additional cost of $7M did exactly that through a centralized configuration repository that kept master copies of all configurations in use and a compare feature which helped compare them instantaneously with what was in use by applications and recover from any problem in matter of minutes. This second version helped the venture resurrect itself. A job based approach during the concept stage would have identified the right solution in the first place, pointed the venture in the right direction and avoided the very expensive failure (monetarily and in terms of morale) of the first version.

Especially when there is no comparable in a category, a jobs based approach offers the only reliable way to conceive a product that would have a very high chance of being successfully adopted by consumers. This approach could also help create new markets by identifying new consumption contexts. In many cases identifying the job is not always an easy task. It calls for patience. Clients typically are not good at articulating it and many times don't really recognize it themselves. Empathic observation of compensating behaviors in a situation helps identify the job.

4.2 Basis of Competition & Customer Analysis

For a venture to become commercially viable, its product has to be adopted by a critical number of customers, who have the particular job that the product is designed to address. The revenue either directly or indirectly from the product must be more than what it costs to materialize it. These customers need to be ignored by competition, while the new venture has sufficient time to take root and defend itself. Hence finding this initial segment of customers who would provide the most valuable foundation for future growth is very critical to the survival of a new venture.

Yet so far there has not been a fool proof way to identify this initial customer segment. This had to be done through trial and error which is not only expensive but is also not an option in all cases. Many networked platform businesses like online auctions (e.g.: eBay), social networks (e.g.: Face book) and content delivery platforms (e.g.: Akamai) do not have room for more than a few players in their categories and in some cases they may operate in markets that have the characteristics of a winner take all or winner take most. The only way to survive in those markets is to get it right, the very first time. Many startups have been driven out of business for getting this wrong. This is where a paradigm based on categorizing customers on the prevailing industry circumstance proposed by Prof. Clay Christensen, Scott D. Antony & Erik Roth in their book "Seeing What's Next" provides a reliable answer to identifying this initial all important customer base.

Based on the circumstance that a particular industry category is in, the paradigm categorizes customers as

- Undershot customers
- Overshot customers
- Non Consuming customers

4.2.1 Undershot customers

Undershot customers are those who have already been consuming a product but the product falls short along specific dimensions that matter to them causing them frustration. These customers typically would be willing to pay a premium for an enhancement along those dimensions. Here is an example: By 2006, enterprise datacenters came to realize that they were juggling too many things - 1) trying to keep the company's mission critical data on centralized storage servers and serve that data to many application servers on a large storage network; 2) keep that information 100% available even in the face of major disasters; 3) manage an increasing amount of information while their IT budget gets cut every year, and 4) comply with all the laws and regulations for storing, securing and tracking the various types of information stored in digital form. Several datacenter managers simply didn't know how to do all of this with the products

available then. At best, they were able to put together various point solutions that solved only a piece of the problem. These solutions required integrating a variety of components and lots of administration to get everything working together. These undershot customers were willing to happily pay more for improved products along the dimensions that mattered to them - a relatively simple, integrated solution to these four requirements. Incumbent storage players like EMC and IBM were strongly motivated to take advantage of this situation and introduced new products that have commanded a premium price.

Another example of a successful service targeting the underserved customers is "TheLadders" - a job search service targeted at qualified people seeking the $100K+ jobs. Common job search sites like Monster, CareerBuilder, and Hotjobs are targeted at the mass market and under serve the users in this $100k+ job category. Even if a job posting with a salary in that range is posted on any of these sites, it got bombarded with 1000's of applications, most of them not qualified enough for the job. The resume's of applicants with the right qualifications end up in the same pile and most often missed by recruiters because of the sheer volume. These typical online job boards charge the recruiter and the firms posting these jobs and serve the users looking for jobs for free. "TheLadders" started in late 2003 targeted this underserved customer category with a plan to charge job seekers instead of job posters - which went totally against the then conventional wisdom. The assumption was that these users would be willing to pay a premium for a service that lists only the high end jobs. It charges potential job applicants seeking these high end jobs a monthly/yearly subscription fee and lets recruiters/firms post jobs for free. The fee initially set at $25 and later hiked to $30/month has been nominal enough to attract only those people who know they are qualified enough and have a sure shot at getting a job through the paid service discouraging other unqualified users wasting money. This self selection process has worked very well for the service and it has spawned a reputation of a quality job site both among high end job seekers and recruiters.

4.2.2 Overshot customers

Overshot customers are those who do not value and hence do not want to pay anything extra for a products improvement along the dimensions that historically had attracted a price premium from them. In many cases they would prefer a cheaper alternative. Here is an example: Movie rental businesses like Blockbuster rented DVD's for 5 days and charged close to $3-5/DVD rental for many years. A delay in their return after that time frame could attract stringent late fee penalties. For a long time customers were willing to pay that price because of 1) availability of wide selection of movies and games 2) instant availability of new releases 3) advice and help from in store customer service. But over the years customer expectations has changed and many of these features were in fact not valued anymore. When Netflix launched its fixed price monthly subscription based mail rentals with no late fees it soon attracted a lot of these overshot customers and became a big hit. But now some of those same customers' expectations have in fact changed again. They feel that they are being overcharged by Netflix. What was initially perceived as low fixed monthly subscription of $10-20/month that provided them with unlimited rentals now seems a waste of money. Due to their busy lives, these customers aren't able to rent more than a few movies a month- mostly new releases. Netflix doesn't mail them a new movie on DVD till they mail back the previous one. The result – another overshot circumstance. These overshot customers are now targeted by Redbox through a DVD vending machine placed at supermarkets where customers can pick up mainly new releases for just a $1 + taxes overnight when they come to pick up any groceries and just pay an additional dollar for each extra day they keep it.

4.2.3 Nonconsuming customers

Nonconsuming customers are those who historically lacked the wealth or skill or ability to conveniently and easily accomplish an important job for themselves. They typically had to hire someone else or cobble up less than adequate solution or go to a particular location to get the job done. Here is an example: For a long time even for common legal tasks like creating wills,

incorporating businesses or registering trademarks, people had to hire a lawyer and pay them by the hour which could be very expensive. They lacked the skill to do these themselves. Recently many of these non consumers are being solicited by online legal sites like Legal Zoom, that offer many of these same services through a do it yourself format for a cheap fixed rate that they could do online without having to hire an expensive lawyer.

Even customers who consume a product in one context could become nonconsumers under a different context. A new product could be created to target them under that context. Here is an example: To connect to the internet, for long consumers had to rely on a wired or a Wi-Fi network tied to location. These don't allow them to be on the move. These same consumers are now being targeted by wireless network providers offering 3G mobile phone connectivity on smart phones that lets users browse, check email, and watch online video clips. Even though this costs much more than a regular internet connection, consumers are willing to pay for this new flexibility.

4.2.4 Understanding the basis of competition

The above customer segmentation scheme based on the industry circumstance provides a different basis of competition that offers unique opportunities to a new venture. It could mould its strategy to target any of these different categories of customers. But, identifying the industry circumstance first, helps determine what sort of innovation would flourish. For example, when most of the customers in a market are undershot by existing products, any new innovation from any new venture targeting the overshot customers would not be able to attract a critical mass of customers and be commercially viable. Let's consider the case of a startup called Elastra in the cloud computing space. Cloud computing is a fairly recent development that has gained prominence during the last two years. The basis of competition between Clouds and in house datacenters is that, Clouds provide on demand compute and storage capabilities through a pay for what you use model. This model eliminates the need for any upfront high capital expenditure required to buy the computing infrastructure and converts it into a periodic operating expenditure. Amazon spawned this model by letting customers use its excess capacity in its data

centers and other big players like HP, EMC, IBM, Microsoft and Google are beginning to follow suit. But the architecture of each of these different services is still proprietary. One cannot easily move applications and compute resources across these different providers. Elastra provides a solution that acts as a broker that lets users move their applications and resources between these different cloud providers or between a public and private clouds. When looked through the above lens, it appears that the industry circumstance is still undershot. Applications running on any of these public clouds need a lot of tweaking to adhere to their proprietary architecture and provide the adequate application performance needed. This means that the cost of multi homing is very high. In many ways customers using them are still undershot. Hence at this stage they would be less inclined to move their applications across the different providers just to get the best price during peak usage. Elastra's current strategy needs to be rethought.

Here is another example of a venture being launched for the wrong reasons, without understanding the prevailing industry circumstance. Vyew launched in 2006, is a free browser-based conferencing and "always-on" collaboration platform. It provides instant desktop visual communication along with white boarding, annotating, text chatting, and phone conferencing without the need for client downloads or installations. By the time Vyew was launched, there was already strong competition from WebEx (acquired by Cisco later), Microsoft live meeting and numerous other smaller players. This new product category had come in to existence just a couple of years back. Explaining why his firm had decided to invest in yet another web conferencing tool in an already crowded market, Guy Kawasaki, the famous VC wrote in his blog – "If most venture capitalists weren't liars, we'd tell you that if we had the opportunity to fund Google, we would have passed. Seriously, who would have thought the world needed another search engine in 1995? Fast forward to 2006. Does the world need another web conferencing product? Maybe. ". Without trying to understand the root cause of the phenomenal success of Google's search engine, using a rationale like that to invest, is absurd. This probably is a recipe for failure. When Google launched its search engine, the predominant industry circumstance in the search engine product category was one with millions of undershot customers around the world. None of the search engines of that era did their job well. The results from them rarely returned what the users were looking for. Users had to wade through pages of search results to find anything relevant to what they were searching. In contrast to those, Google was squarely positioned on the job users wanted done and helped them get it done conveniently

and quickly. It returned quick and relevant results in the first few links of the first page. Rarely did anyone even needed to visit the second page of search results. Users switched in droves. At the time of writing this in 2009, Vyew still hasn't gained much customer traction – may be a sign that most of the customers are still not undershot in anyway.

4.3 Value Chain Analysis

A VC backed venture has between 7-10 years from its inception to create value to all the stake holders involved. The reason is the time limit on the life of a VC fund. The fund that backs a venture typically lasts around 10 years after which the returns have to be distributed back to their LP's. By that time, the firm needs to exit either through an IPO or through a strategic acquisition. VC's normally prefer an IPO since the valuation and hence the returns tend to be higher through that route. Hence they claim to invest only in ventures that are being built to last and not in ones that are being built to be flipped. But in reality not all ventures have a chance of making a decent IPO. It may be synergistic to be acquired by a strategic investor to whom it may provide more value than being a standalone entity. Making this distinction very early on would help decide the maximum investment to make in a venture and hence get a better return on the investment. The greater the investment, the greater the returns a VC would seek and hence, lesser the chances of finding a strategic acquirer who would be willing to buy it at a price acceptable to the VC. This often leaves the venture languishing for long enough to drag the returns down for everyone involved. This is where a value chain analysis would help.

It could help determine the profitability of that part of the value chain in which the venture plays in. Not all nodes in a value chain are huge wealth creators on which fortunes are made and not all ventures can operate end to end in the chain. Even if a venture knows that the part it plays in is not the most profitable part in the chain, it may not be able to easily skate to where the money is within the 7-10 year time frame, either because of the new capabilities required or because of other barriers to entry like patents and other IP protection. A value chain analysis may help rethink the suitability of investing in it, however attractive the product may sound. Later in this section, an example describes this precise situation.

4.3.1 Skate to where the money is

Prof. Charley Fine at the MIT Sloan School of Management in his book "ClockSpeed" talks about how all advantages a firm may enjoy in its industry over its competitors is temporary. The faster the industry evolves, that is faster the industry clock speed, a firm's advantage over others is more temporary. The clock speed and hence the rate of innovation of the hi-tech industry in which most of the venture funded startups exists is very high - typically 3-7 years. Hence even if the venture happens to enjoy an immediate advantage, in order to continue to be in that situation, it becomes very important to understand where most of the profitability may reside during the next stage of evolution which will arrive quickly. Value Chain Evolution theory put forward by Prof. Clay Christensen in his book "Seeing What's Next", helps identify that. It asserts that a firm needs to integrate across interfaces of the value chain that proves to be a bottleneck on improvement of the dimensions of performance that matters to the end user. This "not good enough part" of the system is where most of the money in the chain will end up. For example, consider the mobile phone industry. Before the Apple iPhone was released, anyone who used a regular cell phone from OEM's like Nokia, LG, Samsung and Motorola knows how painful it was to use the phone for anything other than to make a phone call. In spite of the enormous effort put in to offer many additional features like browsing, streaming video, voice memo, games and plethora of others, most of these other features on the phone were hardly used. The single biggest problem was the very poor user interface design. Even so called smart phones from these OEM weren't any better as far as the user experience was concerned. While the handset hardware was made by OEM's like Nokia, LG, Samsung and Motorola and scores of others, the operating system software was made by Microsoft, Openwave, Symbian and a few others (copying the practice from the PC industry). The integration of these two in most cases proved to be a big bottle neck on offering a better mobile phone user experience – the dimension of performance that was beginning to matter to the users after almost a decade since the mobile phone became mainstream. Apple circumvented this by integrating the hardware and software interfaces to seamlessly operate in its iPhone platform. Its state of the art touch screen design and well thought out features provides a far superior user experience. Hence it has attracted customers in droves. In this process it has also skated to where the money is in this phase of evolution.

4.3.2 Contextual Analysis

As explained in the previous section, the category of customers targeted by the product determines its basis of competition. That indicates the performance dimension that matters to the customer. For example when targeting undershot customers, the basis of competition is providing a better product and hence the performance dimension that matters to those customers is functionality and reliability. When targeting overshot customers the basis of competition could be simplicity and cost and hence the performance dimension that matters to them becomes convenience, customization and low prices. The parts of the value chain that acts as a bottleneck on those dimension that matters to the overshot customers is very different from the parts that affects the dimensions that matters to the undershot customers. Hence value chain analysis needs to be done in the context of the customer category and the basis of competition. The firm then needs to integrate itself across those interfaces which affect that particular performance dimension, to provide a product that appeal to that segment as well as to capture the most profits in the chain. Consider this example in the same mobile phone industry almost 5-7 years back. At that time, the performance of most of the mobile phones in the market with regard to how long their battery lasted without recharge was really bad. For an important segment of users – corporate customers, the products in the market fell short in terms of this functionality and hence less reliable. RIM in its Blackberry, integrated across both the hardware and software interfaces that impacted this performance dimension. That integration offered a far superior product that conserved battery power through a variety of means. This wasn't possible by just clubbing the off the shelf hardware handsets and OS software from different providers as was prevalent in the market then. The device – Blackberry, didn't require to be charged for days and it attracted a lot of those undershot corporate customers who were willing to pay a premium for it.

4.3.3 A Case in Point

Let's see how the Value Chain analysis can explain why a startup that developed what seemed an innovative product still struggles to achieve profitability. Way Systems was launched in 2002 to

provide a mobile, point of sale (POS) solution. The solution uses custom built cell phones that has a credit card reader slot attached to them and is targeted at vendors/merchants like pizza delivery personnel and taxi cab drivers who are always on the move and hence can't make use of the regular POS credit card equipments. The solution was innovative and seemed well targeted towards mobile merchants who would be served well by it. Yet, it has failed to achieve any great success that it once promised. A value chain analysis would reveal that the solution just replaced one node of the chain - fixed POS card equipment with a mobile POS terminal via a cell phone. But, it still relied on the same network of banks, card processors and card networks which were not going to forgo the fee that they currently charge. To sustain itself, Way Systems had to charge a fee that is higher by at least a few extra percentage points than the original fee of 3-6% of the transaction amount charged by the existing node in the value chain. The job that Way Systems was trying to accomplish for those merchants on the move was to provide them with a reliable and convenient instant mobile payment solution for which it thought they would be willing to pay that few extra percentage points. In reality, with the existing low margins on the product or service they provide, many of those mobile merchants cannot afford to pay more than what they already do. The alternative they have is an offline solution of taking a carbon copy of the credit card. This has been fairly reliable though not entirely secure. But with many card networks absorbing fraud charges, security may not matter to them. Unless Way systems by passes some of the existing nodes in the chain by integrating across them, it may not be able to match the price point. But this is not fully possible because of other barriers to entry in those nodes controlled by more powerful players like the banks and transaction networks. A value chain analysis would have revealed this long back. The better option would be to sell to a strategic acquirer within the current chain to whom the solution may be more valuable. But finding an acquirer who would be willing to pay a price acceptable to the VC's may be challenging after having gone through multiple rounds of funding. Similar problems are bound to exist in startups involved in mobile payment solutions as well as in software as service payment solutions since they too have to play in the same chain.

4.4 Network Effect Analysis

With certain categories of products, how well they help a user accomplish a job they are intended for, would depend on how many others are already using them or could be expected to use them going forward. Hence, the initial customer adoption with these types of products could become challenging since they resemble a chicken and egg situation. For example, in order to adopt Yahoo/AOL/MSN/Google instant messengers (IM) to communicate with friends and contacts, a user needs to be sure that either they already use it or would soon use it. Even if they have a preference of one over the other, they are forced to adopt one which most of their friends and contacts use. These types of products are considered to be networked products and the markets in which they operate networked markets. Because of their intra-connected nature, these networked markets don't have space for more than a handful of products in those categories and in certain instances have room for just one which would be gifted with a near monopolistic market share. Here are some examples: eBay, Microsoft Windows, PayPal, YouTube and Akamai all have managed to build and retain a near monopolistic market share in their product categories with almost no credible competition for years and in some cases even decades; in the IM markets and the online job search markets, there are just a handful of products who have divided the market among themselves in those categories. Yet, every year hundreds of new ventures are started with an aim to cater to these networked markets without a clear understanding of either the structure or the forces which govern these markets. How can a new venture go on to become a category dominant like Microsoft Windows, PayPal, YouTube, Akamai or Facebook and not become a Billpoint, Flooz, Cuecat, Thirdage or Friendster which have ceased to exist or long forgotten? This is where paradigm based on network effect offers help. It not only explains but also helps predict which products will be able to successfully maintain their adoption momentum and which ones may fail in networked markets.

The paradigm of network effect explains that, products in networked markets are strongly prone to a phenomenon called network effect which determines their rate of adoption which in turn determines their survival. A venture that can successfully spark and harness this force will achieve an exponential growth and the one that doesn't, will be wiped out without any chance to fight back. The products and services prone to network effects are commonly referred to using

the term platform since it brings groups of users together to facilitate some kind of transaction between them. (In this section alone, the term platform would be used to refer to products). Network effect refers to the idea that, a user's preference for adopting a platform depends on the number of other users who are already using it or expected to use it. This is because, how well the platform accomplishes a job for them is directly dependent on the number of others using the same platform.

Prof. Thomas Eisenmann at the Harvard Business School has extensively studied this phenomenon. He has identified that 60 of the world's 100 largest companies by market cap earn greater than 50% of their revenues from platforms that bring different groups of users together to transact and hence prone to network effects. Because of the internet, this proportion is even larger in hi-tech businesses. In addition to the previous examples, platforms like Google Adsense, game consoles like Play Station/XBox, payment systems like the credit card networks, online dating sites like Match.com/eHarmony, social networks like MySpace/Linked In, online restaurant promotional sites like OpenTable, Virtual worlds like SecondLife and massively multiplayer online games like World of Warcraft are all prone to strong network effects. Unlike regular businesses, these also bring very distinct management challenges.

4.4.1 A Primer on Network Effects

There are two kinds of network effects.

- Same Side Network Effects
- Cross Side Network Effects.

A same side network effect is when, potential users of a platform exhibit preference regarding the number of users in their own group. How well a platform accomplishes a job for them depends on the number of other users in their own category, who are using it. For example, the benefit from using a PC to PC VoIP service like Skype depends on how many of a user's friends and contacts are already using it or could be expected or persuaded to get on it. If they are too few, it may mean that the platform would not help the user accomplish the job of communicating

with them, however great its features are. Having more of them onboard will strengthen this same side network effect increasing the platform adoption.

A cross side network effect is when, the potential users exhibit a preference for the number of users in other groups that they are not part of. How well the platform accomplishes a job for a user depends on the number of users in the other categories which the user is not part of. For example, in a platform like Microsoft Windows which support running other PC applications, the value of it to a consumer depends on how many different types of applications are available on it; the value of it to an application developer who develops those applications would depend on how many users are already using that platform to make it worthwhile developing them. The consumer and the application developer belong to two different categories of users on the platform. In fact the main reason for IBM's OS/2 to fail against Windows was their inability to solve the above problem. Developers didn't think it worthwhile to develop applications and users didn't want to adopt a platform with not many applications. Auction sites like eBay also exhibit the same dynamics. How well a job the platform does for a buyer who visits it, would depend on the variety and choice of products on it and for sellers (who list those products) - the number of buyers who visit the site. From the above examples, we can clearly see that having more users on each side strengthens this cross side network effect increasing the platform adoption.

Both the same side and cross side effects could be either positive or negative. With positive network effect, a large user base is appealing because of the incremental benefits an existing user gets with every new user who begins to use the platform. Microsoft Windows and eBay mentioned above are examples of positive network effect. With the negative network effect, a large user base is not appealing because of congestion/competition/spam issues that may arise with every new user who joins the platform. In certain platforms, as more users join in, what may start as a positive network effect could quickly turn to a negative one, decimating the growth of the platform stalling its adoption. For example, during the early days of the cell phone industry, a lack of adequate network capacity meant that as the volume of new users grew, many cell network providers like AT&T became too congested at peak usage times resulting in calls being dropped degrading service quality. Many users switched to competing networks that didn't have as many users to get over this problem. A similar dynamic could be observed in online dating sites. As more users sign up and the mix of users changes with lesser of one sex over the other,

dating sites like eHarmony/Match.com could run into the same issue because of competition - quickly converting what was a positive network effect into a negative one driving away users. This has also been a problem with the online chat rooms offered by many of IM services. Overtime they have been filled with spammers and bots which over the years have made them unattractive driving the users away.

A platform could be subject to same side network effect or cross side network effect or a combination of both. For example, consider an online payment service like PayPal. If someone wants to send/receive money for any purpose between friends and contacts, they would want to be sure that either they already use it or could sign up with no hassle – a case of same side network effect. In addition they would want to be sure that most online merchants from whom they may buy goods and services accept it too – a case of cross side network effect.

A platform which has more than two groups of users associated is referred to as multisided platform. What makes it trickier to analyze these kinds of multisided platforms is that, depending on the number of these distinct groups of users affiliated with it, the number, strength, polarity and timing of these effects could in fact vary a lot. Theoretically an n sided platform can have n*n network effects. In some businesses all possible network effects may not be obvious and would require a rigorous analysis. Consider the following example: Not many ventures that went into the web content distribution business figured that there was an inherent network effect between their number of POPs (point of presence) in the last mile, closer to the end customers and businesses that were willing to sign up to the service who wanted their web content distributed for a better performance at peak usage times. Only Akamai recognized this early on and spent a few hundred million dollars to scale the POPs globally before they had any steady revenue. This made sure that it not only survived but also thrived in this winner take all market while others went out of business. Any venture that is getting into a platform business that helps groups of users to transact/interact with each other needs to thoroughly analyze the impact of these network effects. It needs to understand what the possible network effects are and what kind of system behaviors they may cause under different circumstances. It is very difficult - almost impossible, for a platform to recover from a network effect gone bad as will be shown in a later example. A system dynamics approach using a tool like Vensim to model the multisided platform dynamics can greatly help in identifying and analyzing these effects as well as the

circumstances when they would be active – a far cheaper way than figuring out after spending millions.

4.4.2 Comprehending the Market Structure

As explained earlier, a market prone to network effects typically doesn't have room for more than a few platforms. In fact, under certain circumstances it can support only one. Understanding the potential market structure is important in predicting how successful a venture would be. Two platforms are considered part of the same networked market if, changing the cost (monetarily or otherwise) to users affiliated with one platform influences the volume of transactions mediated by the second. For example, if Monster.com, a job search platform decided to substantially hike its job posting fee, others like Career builder or HotJobs may see an increase in the number of jobs from posters who may switch to them. In this case, all the three would be considered to be in the same market. But if LinkedIn - a professional social network site, increased its subscription fee, Facebook – a personal social network site, may not see any increase in new users. They would be considered to be separate markets.

Winner Take All (WTA) is a circumstance where a market will support only one platform (e.g.: eBay, Facebook, Craigslist). No one else can survive. A circumstance where one platform could take greater than 50% of the market share leaving the rest carved up by others, is called Winner Takes Most (WTM) (e.g.: NTTDoCoMo's iMode in Japan). A venture that plans to enter a networked market needs to understand what the market structure is going to be - will it be served by a single platform or by multiple platforms. If it will be a WTA market, it needs to make sure that it gets it right the very first time to avoid being driven out of business. Miscalculating this can lead to an expensive failure. Four factors determine WTA/WTM circumstances. They are 1) how strong the network effects are between or among the different user categories 2) how high the costs of multihoming are for one or more user categories 3) how strong the preference for transaction partner variety is for one or more user categories 4) how minimum the preference for differentiated platform features by one or more user category is. In addition to these, in some cases a platform may also be a natural monopoly because of declining average costs with scale,

further reinforcing the WTA/WTM behavior. Let's consider an example to understand this. Consider eBay, which could infact be a poster child for a WTA scenario. Let's see how the above criteria apply here. 1) The online auction business that eBay participates in is characterized by very strong cross side network effects between buyers and sellers as described earlier. eBay further reinforced this effect through its buyer/seller feedback rating system, innovative for its time. 2) Atleast during the early days of the online auction business, the costs for sellers to open and manage their stores on multiple online sites was prohibitively expensive in terms of time, effort and money. Many of these sellers were only making thin margins on the products they sold and couldn't afford to pay all kinds of fee that all those sites charged. In addition they would also have to manage their stores on multiple sites - a time consuming task. All this meant that the multihoming costs for the sellers was indeed very high and they would prefer to be on one. 3) Buyers required variety as well as a wider selection of products in every category - this meant they had a strong need for transaction partner variety. The same was true even for sellers since many of them were selling all kinds of stuff in their stores which meant that they wanted diverse sets of buyers on the platform. 4) In addition to the above, most buyers had relatively homogenous needs – just be able to search and buy products they wanted. They didn't have any specialized requirements. This eliminated the need for any differentiated platform features targeted to attract different customer segments. Sellers would have preferred different privilege/fee levels based on how much they sold on eBay but this was not a necessity since they valued the buyer traffic more than that differentiation. But, eBay seems to have taken care of it later by conferring statuses like "high powered seller" tags on their profiles to keep them happy. That also provides them a few additional benefits like reduced fee. 5) Also, growing scale economies attained by serving a very large customer base helped eBay keep its infrastructure costs of running and maintaining the platform to a minimum compared to any potential rival during the early days. All this has helped eBay to be able to quickly build momentum edging out any competition from others like Amazon and Yahoo in the auction business. Ironically these same conditions helped Yahoo attain its WTA status in online auctions in Japan and eBay itself couldn't dislodge it. Once a very strong network effect takes hold and successfully consolidated, it may take years if not more than a decade before there is any chance of it weakening – as in the case of eBay. The effect may eventually weaken either because of overshot/undershot customer circumstances caused by changing consumer expectations (as explained in the previous section).

Interestingly, at the time of writing this there is some evidence that eBay is experiencing this; both buyers as well as sellers are beginning to move to rival platforms like Amazon.

Another example of a WTA market instance worth discussing happened during the recent high profile battle between the BlueRay and HD-DVD formats. Though it wasn't between new ventures it is still very illustrative of the WTA signature 1) Clearly, the DVD player market was prone to very strong network effects. There was a strong cross side network effect from both the studios and customers who wanted more of each other – consumers wanted all the major studios to support their format and publish their movies and studios wanted to sell to all consumers in the market which would help them achieve economies of scale in producing the DVD's. There was a weak same side network effect on the consumer side - if you buy a Blue ray or HD-DVD, you may want to be able to share it with friends and relatives. This was only possible if they too had the same kind of DVD players to be able to play it. Hence the preference (possibly influence) by consumers for more people they know, to buy the same type of player spawning this. 2) The multihoming cost for both consumers and studios was also very high - with new DVD players costing greater than $300, consumers wouldn't want to buy more than one type and studios wouldn't want to hold inventory of all different formats since this would increase their inventory costs substantially, impacting their bottom line. 3) Both consumers and studios had a need for strong transaction partner variety – consumers wanted access to all movies and studios all types of consumers. 4) Consumers had relatively homogenous needs – watch the movies and special features, play games; hence opportunities for technical differentiation on the part of the DVD players for each consumer segment were fairly limited. In addition many old TV's probably can't take advantage of new features anyway. Clearly all this indicates that this would be a WTA market and Sony with its BlueRay format won after an expensive battle.

Not studying a market prone to network effects, before entering it may result in a sure shot expensive failure especially in the case of a WTA outcome which could have been avoided in the first place. Consider these examples. Google Lively – a virtual world, failed to gain any traction against the main competitor – Second Life. Google seemed to have recognized the WTA dynamics fairly early - within 5 months of launching it. It rightly decided to shut that down at the end of 2008. But there are other numerous venture funded virtual worlds whose fate may have already been sealed; eBay had to abandon its own online payment service and ended up buying

PayPal after losing an expensive battle to it; both Yahoo and Amazon failed in the US online auction market against eBay after spending many millions; numerous classified sites targeted at mainstream customers over the years have failed to make a dent on craigslist for the very same reason.

4.4.3 Mobilizing a platform

One of the biggest challenges for any new venture entering a networked business is successfully mobilizing the initial users of the platform. The discussion in the previous section on "Basis of Competition & Customer Analysis" offers a sound paradigm to help pick an initial customer segment that would not only offer sufficient customer thickness but also greatly improve the chances of the venture's success. Even with that, the biggest hurdle to launching a multisided platform is the chicken and egg problem – which side to get onboard first. Get it right, the platform succeeds. Get it wrong or unable to consolidate the initial momentum (as will be shown in the case of Friendster later), the venture fizzles. This is where the paradigm of network effect helps again. A thorough understanding of the possible network effects that the platform would be subject to can help formulate the different strategies to mobilize the platform. What works would vary with the industry circumstances and the type of the venture.

A simple solution, if it can be done would be to stage it as single sided and later add the other sides. This would eliminate the need for any strong cross side network effects initially - greatly reducing the marketing effort and resources needed. It's comparably easier to mobilize a single sided platform than a multi sided one. A single sided platform can then be mobilized by targeting a group of users who could be offered some sort of standalone value – help them accomplish a job that doesn't require the other user categories or even a large number of users on their own side. This would eliminate the need to have a strong same side network effect which would require a large user base immediately. For example, single sided platforms like Skype/Fax/Email all were mobilized initially by targeting a small closed community like a group of friends and contacts or a large distributed organization for their internal communication.

Another strategy that can be followed would be to begin as a vendor selling or licensing the platform for a fixed fee, to someone else who already has the customer base to be able to spark the network effects. For example, Google followed this strategy. It offered its search engine to yahoo for a fixed license fee that kept it going without having to worry about mobilizing users on its own. It went solo later and it added advertisers and affiliates who brought in the revenue much later to make it multisided. A third strategy would be to become a merchant and disintermediate the different groups by buying from one and assuming the inventory risk and then selling to the others – eliminating at least some strong cross side network effects initially needed for a successful two sided platform. For example, Amazon was a merchant buying goods from the vendors and selling it to its consumers for very long. But recently it started to add secondary stores run by other smaller vendors who are allowed to sell directly to customers through Amazon. It just charges them a percentage of the transaction amount and doesn't take on the inventory risk from them. In the process, it has transitioned from a merchant to a platform.

In certain cases there may not be any alternative but to bring the different sides in simultaneously. A strategy of subsidizing one side either temporarily or permanently could be used. Typically the side that is more price sensitive needs to be subsidized. A network effect analysis could help identify that side. For example, Microsoft permanently subsidizes the application developers by giving them free tools, inviting them to developer conferences and tech talks but charges the consumers because they value the variety of applications more and are willing to pay for them. Most of the first generation job search sites including Monster allow free access to job seekers and charge job posters mobilizing the platform.

4.4.4 A lost opportunity

Let's now see how the network effect paradigm could have helped venture investors make better investment decisions. Friendster founded in late 2002, had literally invented the online social networking category. It attracted 7 million users in its first 18 months of operation. Unlike most of the prevailing services at that time that let users enroll anonymously and keep their real life separate from their life online, Friendster was aimed to improve the real-life experiences of users

by networking online without hiding their identity. As the initial growth rate indicates, it seemed that Friendster was squarely positioned on a job that users really needed to get done.

The site was targeted at users above the age of 18. Members posted personal profiles specifying their age, hometown, current geographic location, schooling, occupation and relationship status. They could also indicate an interest in finding dates, activity partners or friends, provide a list of their favorite books, movies, and TV shows, and provide short descriptions of themselves and the kind of person they hoped to meet. They could then extend their networks by inviting others to join, by asking existing members to connect to them, or by accepting such overtures from existing members. Connections had to be agreed to by both parties. Every profile page contained a list of the member's friends accompanied by their photos. By clicking on such a photo, a member would be redirected to that member's profile, which in turn listed that member's friends. Every profile page also included a depiction of the path of friends connecting the current viewer of the page with the target member. Members could also search for others directly by typing in their names. Finally, they could contact other members through Friendster's internal messaging system. During the first year, members could only contact or view the profiles of members within four degrees of separation but this was later removed letting anyone connect to anyone.

Clearly, the social networking space of that era had all the characteristics of a single sided networked market as there was just one category of platform users. The important question is – what is the structure of the market that Friendster was targeting. Could it support multiple players or would it be a WTA? Applying the earlier criteria for a WTA market:

1) Is there a strong network effect? - Considering that this is a networking tool, a new member's preference to adopt the platform would depend on how many of his friends and their friends and the extended community of their friends have already signed up or could be expected to sign up. This means that there is a very strong same side network effect whose strength incrementally increases with the number of platform members, not just immediate friends. The polarity of the network effect is positive since more new members make it more attractive driving the growth rate along an exponential curve. There were three things that could reverse the polarity of the network effect 1) congestion – too many users during peak times can make it difficult for users to enter and browse the network degrading the user experience 2) spam – members getting

bombarded with unwanted overtures from others, degrading the experience 3) no stickiness – lack of features/activities that keeps members engaged and get them to come back often. At least during the initial months the growth rate suggests that these didn't seem issues.

2) Is the cost of multihoming high? – The service didn't have any competition initially. But even if a member wanted to move to new competitors as they emerged, they cannot force their social network to move with them. This acted as a virtual lock in. The bigger the social network, stronger was the lock in. Hence, it doesn't make any sense for members to waste time and effort creating profiles on multiple sites. All this meant that the multihoming costs were high enough.

3) Did users have a need for a strong transaction partner variety? – Different users have different social networking needs. Hence they exhibit different preferences. Some may be looking for activity partners, some may be seeking new dating partners and some may just want to keep in touch with friends and acquaintances. Clearly this indicates that there was a need for a strong transaction partner variety.

4) Is there a need for differentiated platform functionality? – The initial users between ages of 18-30, to whom the service was appealing, all seemed to have fairly homogenous needs – network with people online and continue the relationship in the real world. Hence, it doesn't appear that there was a need for any differentiated platform functionality.

All this means that, it was undoubtedly a WTA market - no room for error at least till the network effect was consolidated. This lack of understanding of the market structure proved fatal to Friendster when it ran into issues. So what did go wrong? Two things triggered the strong positive network effect polarity reversal immediately after the first year. As the number of users increased, an inadequate infrastructure as well as a poor engineering implementation greatly increased the member login and page load times at peak hours. As a Friendster member during the initial days, I can state that this was a great source of frustration. After having gone through the frustration of logging in, there was also not much to do after the first few times of browsing through the profiles. Members didn't update their profiles often. You can send messages to others. But they weren't always returned immediately- sometimes for weeks. Even if some of the users wanted to respond back quickly, the poor performance of the site didn't allow them to.

Hence, once the initial novelty wore off, there was no stickiness and many old members even stopped logging in.

Once competition like Facebook and MySpace emerged, these undershot customers migrated en masse to these competitors – negating the high multihoming cost that would have been a competitive barrier. Interestingly, these competitors didn't compete in the same market – Facebook was exclusively targeted at college students and MySpace was targeted at high school kids and others. Both went on to become WTA players in those market segments. Friendster was unable to fix its engineering issues for a longtime letting the prize slip off its hands. In recent years it has managed some growth in the Far East markets.

How does this analysis help venture investors considering that the venture actually fumbled its advantage rather than a lack of initial success? Friendster was recapitalized 3 times after the initial investment each at a lower valuation than the previous. To date it has received a total of over $45M of which the second and third round together was $13M. The second and the third round funding were to help the venture recover from the loss of the initial momentum in the US market. But, by then it had already ceded its lead to others – MySpace and Facebook had taken a very convincing lead, with MySpace already sold to Fox Networks for $580M. Network effect analysis would have revealed that it was in a WTA market. As shown earlier, reclaiming the lost lead in a WTA market segment is not possible. Spending any more money to do that would be a sheer waste. It would have helped convince the management team and the investors to focus quickly on other markets which didn't have any competition rather than competing head on with the current leaders. If they still insisted on doing that it may have been wise to cut the losses and exit the venture rather than pouring any more money into it. It has taken a real long time for Friendster to realize that. After a fourth round of $20M investment a year or so back, it has started to focus completely on East Asian markets. Only time will tell how well it does in the new markets.

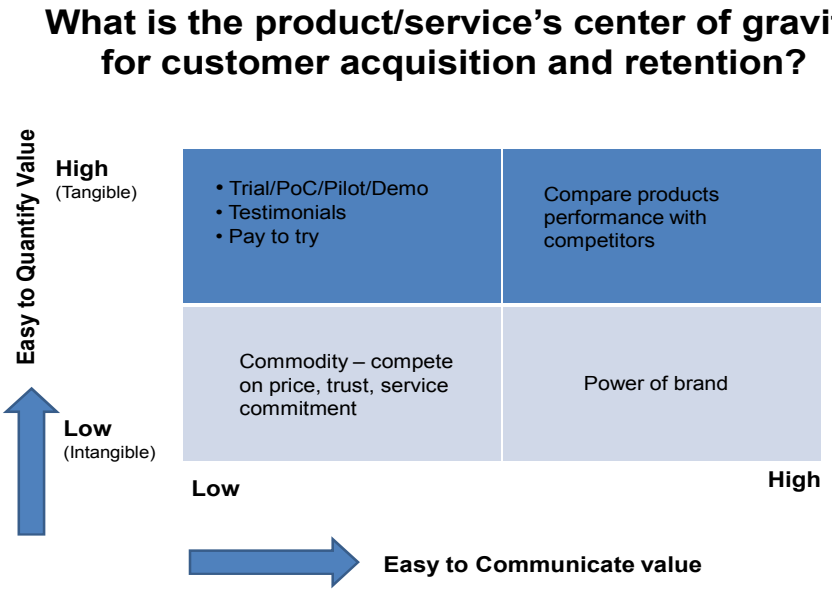
4.5 Customer Acquisition Analysis

At its core, any business is a game of arbitrage – make/buy low and sell high. Hi-tech ventures are no different. Once a product is ready to be sold, a major cost that a new venture has to incur is the cost of sales. This is rarely given its due consideration early on during development but affects the profitability of the venture. Cost of sales refers to the cost of acquiring new customers and retaining them. Many ventures with great products have gone out of business by spending more on customer acquisition than the money they were making from them. The root cause of this is the inability to quantify and communicate the products value to potential customers in a cost effective way to help create the customer pull needed to make the venture sustainable. An example of this scenario that comes to mind is the last venture that I worked for. The product targeted at enterprise customers didn't have a comparable in its category and hence struggled to communicate its value easily to potential customers beyond the few who had requested it in the first place. The firm had to employ an expensive dedicated sales team who ran proof of concepts with every potential client to quantify the savings and through that communicate the value of the product to them. This resulted in a sales cycle that lasted 6-9 months. Clearly this was not a scalable model. The cost of sales in most cases was more than the money from that sale.

There are other ventures with seemingly trivial products but have managed to attract customers successfully. They did this by clearly quantifying and communicating the products value through a cost effective channel that reached a critical mass of customers who had a job that the product did. For example, Tickle – a subscription based online assessment tests service, incentivized third party online marketing affiliates to promote the tests through a cost per acquisition model. It paid a onetime $5 to the affiliates for every new customer who subscribed to the $14.95/ month service through them. This was a highly scalable model and the service was able to quickly ramp up customers with little effort. The service remained profitable and was acquired by Monster.

A venture needs to understand its products center of gravity on customer acquisition and retention even before the product is built. It should not be an afterthought. Even if the product is squarely positioned on a job that a particular segment of customers (as explained in the first section) want done, if it can't communicate its value in a cost effective manner to a critical mass

of them, it has to rethink its offering. The following matrix (Prof. Narayan Das at HBS introduced me to this) lists a few effective techniques to use based on how easy it is to quantify and communicate a products value to potential customers.



If the ease of quantifying and communicating the value of a product is very low, it typically is a commodity as indicated by the lower left quadrant. Then the business has to rely on price, trust, service and commitment to attract customers. Most of the retail department stores like Macy's, Kohls and even wholesalers like Costco, Sams Club fall under this category. No VC backed hi-tech venture normally gets into a commodity business.

When it is difficult to quantify the value the product offers but easy to communicate it because customers have used something similar or at least clearly understand what job it does, the business has to build a strong brand to help in customer acquisition. This is typical of many businesses offering intangibles like services. For example most of the hotels and resorts spend a lot to build their brands through TV or other kinds of advertisements to help attract customers. They want their brands to pop up in customer minds when they make travel or vacation plans. But initially when a hi-tech venture starts, it doesn't have any brand power or can it afford to spend to create one to attract customers. It has to find a way to effectively operate in the top two quadrants. Hence it should design the product such that it is very easy to quantify its value

proposition with minimal effort. If it can't, it may need to rethink its offering. But, after being in the market for a while and depending on how well it does the job it is meant for, a venture has an opportunity to create what is known as a purpose brand with almost no expenses towards marketing. This happens when customers return to its product automatically after being very satisfied with their prior use, when they needed the job done again. They begin to associate the job with the products brand name when they think of it. When this happens, it has the potential to spawn a positive word of mouth advertising that can cause a bandwagon effect. Given the viral nature of the internet, one can see this happening more often there. For example, Google became a purpose brand once customers realized how well it served their online search job. The term "Google" is now synonymous with the job "search for information online". That in turn spawned a band wagon effect through positive word of mouth advertising without Google ever having to spend a dime on marketing its search engine.

If the venture finds it difficult to communicate its value, then it could use techniques like trials/pilot/demo or testimonials from current customers or just pay customers to try. These techniques help especially when there is no comparables in its category. For example, when PayPal was launched, it was very early in the online payment service category and there was no clear comparable. It was easy to quantify its value in terms of savings in time, effort and fee/commissions over other prevailing payment mechanisms with which customers were familiar. But, in order to communicate its value and get customers to try it, PayPal decided to offer every customer who signed up, a $10 credit to promote this product. This was a temporary subsidy to get the initial customers onboard. In the process it successfully mobilized and established itself as a leading online payment service.

Typically if the venture's product has comparables to which customers have already been exposed, it becomes easy to communicate its value. Under such circumstances, the venture can compare its product features with the competitors to communicate its value proposition. This is seen often in software products. For example, software application virtualization solution providers like Appstream, Thinstall and Microsoft Soft Grid promote themselves by comparing their feature set with competitors.

4.6 Assumptions Analysis

All new ventures have to make assumptions while creating financial projections at the stage of business plans. Very few of them actually test those assumptions before steaming ahead to implement the plan. In most cases, it's only those few that go on to succeed. The rest that didn't succeed seemed to have forgotten that their plans were based on assumptions which haven't been tested. Validating assumptions is not an easy task, especially if the product has no comparable and is targeted at consumers. That is why assumption validation needs to be built into the planning and product development process. In many cases the VC's themselves need to be blamed for this problem since in order to get the venture too big too soon, they force the entrepreneurs to make many of these assumptions and not give them enough time to test it out. Typical business plans look something like this

- Make assumptions about the product, market and customers (eg: Users will love this feature or We will have 20 new customers / 1M users by year 3)
- Define a Strategy based on those assumptions and build financial projections based on that strategy
- Make decisions to invest based on those projections
- Implement this deliberate strategy to achieve the projected financial results

This open loop process doesn't have any steps to validate those initial assumptions on which the whole venture rests and many times those assumptions are soon forgotten. Managers behave as though this is a sure shot. This is why we need a new paradigm for venture planning.

Rita Gunter McGrath and Ian C McMillan's Discovery Driven Planning offers that new paradigm. In this model validating the assumptions is built into the plans before a strategy is embarked on. The model turns things head on. It starts by making the targeted projections first and then compiles all the assumptions made to achieve the projections. These assumptions are rank ordered from most crucial to the least that must be true for the venture to meet those numbers. Many of those assumptions may be related to the questions in the previous sections like who are the right customers, what jobs do they want done, how is the venture going to attract them and what channels to use, what part of the value chain should it play in to be profitable and

reach the numbers and so on. Then a plan needs to be implemented to test many of those crucial assumptions before charging through the strategy unlike the present way of doing things. If any of those assumptions prove false, the venture can revise the strategy before any significant investment is made. In most cases this emergent strategy formulation process itself helps identify a correct strategy.

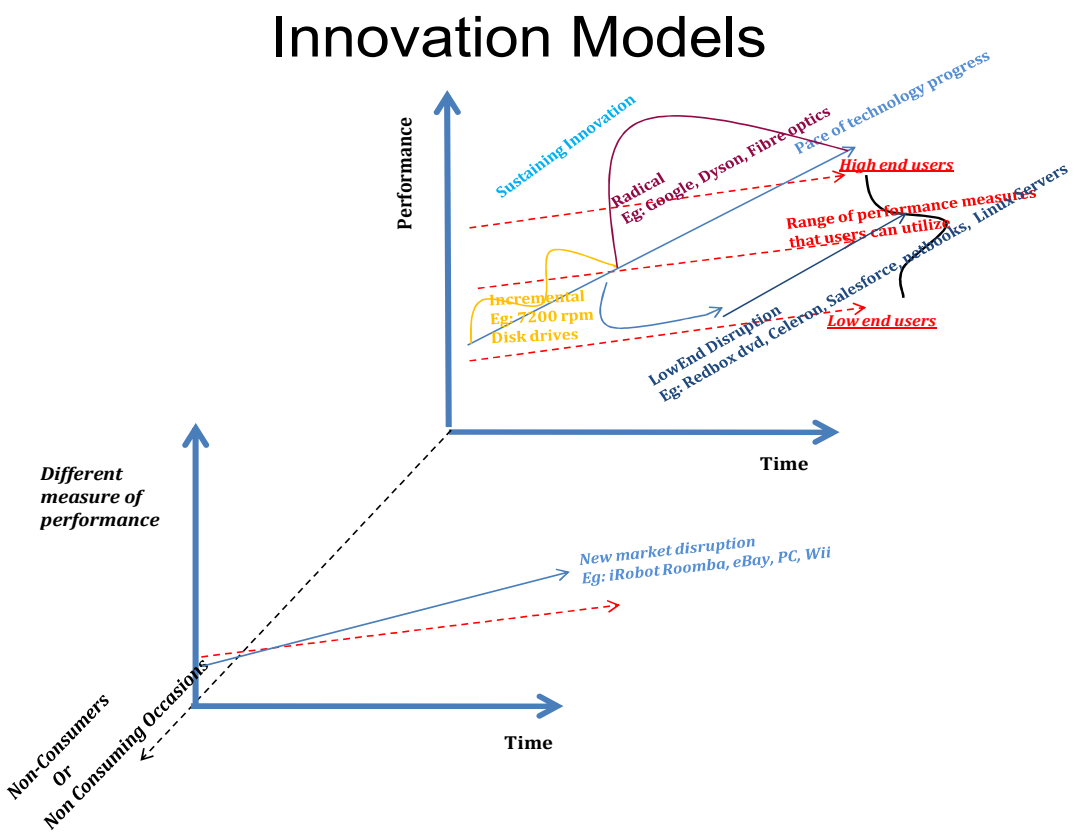
Here is an example of assumptions gone wrong even in the case of entrepreneurs who were very successful more than once in the past. Niklas Zennström and Janus Friis, successful co-founders of Kazaa which had disrupted the music industry and Skype which had disrupted long distance telephony, started the Venice Project later renamed Joost to do the same with cable/television viewing. The idea was to change the way people view TV. It planned to provide near DVD quality, on demand TV content through peer to peer technology via broadband to the PC. Everything on Joost is on-demand: no worrying about schedules. Since it's on the Internet, Joost has many interactive features including ability to chat with friends while watching a show, program comments, recommendations, etc – all geared for an active TV viewing experience on the PC. They went ahead full steam spending venture backed money to the tune of $124M implementing this deliberate strategy. They had made a crucial but untested assumption that customers would embrace Joost the way they did with Skype and Kazaa and that they are craving for an active TV viewing experience on the internet. So far by all accounts this assumption seems to have gone badly wrong. At the time of writing this, the venture has been struggling to make progress and had to go through cost cutting through massive layoffs.

Skype offered free PC to PC VoIP services and initially free PC to phone services too. It provided the convenience of talking to anyone anywhere in the world without having to pay the exorbitant price of the prevailing long distance and international calling rates. Kazaa situated outside the US, offered an alternative to Napster to share music when that ran into legal issues. Both were squarely positioned on a job that consumers wanted done and both didn’t become big overnight. The founders inadvertently had followed an emergent strategy process. They started small and figured out what worked and worked and through that tested many assumptions. Over time those services experienced exponential growth common to successful networked businesses. Unlike these two, Joost is very different and it is not clear if there is indeed a job to be done. Watching content on the cable TV and the internet, serve two different purposes. Cable

TV offers consumers a passive viewing - a form of mindless entertainment with minimal effort. Consumers just want to be entertained without much effort other than browse channels using the remote. The format Joost is trying to promote is a more active format where they actively browse/read/comment/watch the content - more suitable for short user generated/uploaded clips than live or even recorded complete TV shows. There are already many content sites including YouTube which offer this format though not as elegantly designed as Joost is. All this meant that Joost would never have been able to generate and sustain the network effect needed to mobilize the service. In addition, recently launched sites like Hulu & Fancast backed by some major studios and cable TV providers have opened up their entire content library in a YouTube like format. So it is not entirely clear how Joost will fare going forward.

4.7 Formulating the Innovation Strategy

There have been numerous models proposed that try to explain the hi-tech innovation landscape. Most of these descriptive models fall short in one form of the other in explaining all the major observed scenarios and hence never made the transition to that of prescriptive models on which venture practioners could base their firm's innovation strategy. The one prescriptive model that I found very useful to analyze the innovation strategy is described below. The models underpinning is a circumstance based innovation categorization scheme that helps analyze the potential competitive dynamics as well as help choose one that offers a venture an improved chance of success.



The above figure helps illustrate the first two of those innovations. On the figure there are two types of improvement trajectories. The solid line (in blue) between the axes illustrates the trajectory of product improvement over a period in time. The dotted lines (in red) indicate the performance of those products that different categories of customers can utilize during the same period. As these trajectories suggest, the products improve at a faster rate than customers can utilize. Customer needs typically tend to be relatively stable over time. With these in mind, let's look at the models. All hi-tech innovations could be categorized under one of the following: Sustaining Innovation, Disruptive Innovation and Displacement Innovation.

4.7.1 Sustaining Innovations

Sustaining innovations illustrated by curved arrows between the top axes in the figure are improvements to existing products along established improvement trajectories. They are improvements to existing products on dimensions historically valued by customers. Every year, car engines offer more speed, computer processors can process faster, and cell phone batteries last longer. All these are examples of sustaining innovations. Some of these improvements may be incremental relative to what already exists e.g.: A 7200 rpm hard drive relative to a 5400rpm drive. These are incremental sustaining innovations. Others may be revolutionary or radical and offer a far superior performance over the products that exist at that time. E.g.: Dyson Vacuum cleaners uses a radical “Cyclone" suction technology over conventional bag vacuum cleaners and offered a far superior performance, Google’s page rank algorithm enabled it to provide far superior search results that were right on the search target compared to common search engines like AltaVista and Lycos of that era. These are examples of radical sustaining innovations.

4.7.2 Disruptive Innovations

In contrast to the sustaining innovations, disruptive innovations introduce a new value proposition. They can reshape existing markets or create a new market. Low end disruptive innovations occur when existing products are too good hence over priced relative to the value existing customers can use. E.g.: Redbox DVD offers a far cheaper alternative to Blockbuster or even Netflix for new releases as described in one of the previous sections; For customers interested in just browsing, emailing and may be editing few documents once in a while, netbooks offer an alternative to pricey laptops which don’t last more than a few years and have to be replaced.

The second type of disruptive innovation - new market disruption occurs when characteristics of existing products limit the number of potential customers or force them to consume at inconvenient central locations. The characteristics of these products may even allow them to be consumed in new use contexts. They make it easier for people to do something that historically

required deep expertise or lot of effort or immense wealth. E.g.: Traditional Upright or handheld vacuum cleaners require a lot of effort on the part of the user to vacuum homes. iRobot's Roomba, through its robotic technology is clearly disrupting them by automatically cleaning floors at a scheduled time; Traditional game consoles like Sony's play station and Microsoft's Xbox are normally targeted at hardcore gamers with high skill levels. Nintendo's Wii offers a easy to use hand held interface that requires no skill. This appeals to non gamers and has captured the imagination of millions of users new to video games pushing its sales through the roof.

There could be innovations that are a hybrid of both low end and new market. Eg: Salesforce.com was initially targeting small businesses that did not have eCRM systems like Siebel installed but have now have attracted even medium sized businesses that once used those systems.

4.7.3 Displacing Innovations

Displacements are a distinct class of innovation that takes place at a point of modularity. It helps take market share from an incumbent and targets the mainstream customers. Displacements do not necessarily involve products with significant performance limitations like in low end disruption. Typically specialists who focus on one particular piece of a product or service tend to introduce displacements. But for displacements to succeed they need to be introduced at the point of clean modular interfaces in the system currently used by customers. If there is no well defined interface, the interactions of the system components across that interface cannot be well understood and unpredictable and hence may not succeed. E.g.: Millions of customers have already spent a lot of money on pricey phones and EPBX hardware that interfaces with the landline telephone providers like AT&T and Verizon. Vonage uses VoIP technology targeted at mainstream customers to displace the incumbent's service. Its service interfaces easily with the existing customer instruments because of well defined interfaces that already exist; another firm called iBasis offers a cheap IP based infrastructure in place of expensive dedicated undersea cables and satellite links to telecom service providers to transmit international voice traffic

across the globe. This would never have been possible had there not been clear well defined interfaces in existing telecom networks to which iBasis could connect to; Third party computer equipment suppliers are able to sell consumers, replacements to batteries, hard drives, motherboards and many other components to PC's and laptops from established providers like Dell only because of well defined interfaces.

4.7.4 Which model do we use?

Few technologies or innovations are inherently sustaining, disruptive or displacements when they emerge from the minds of innovators. A venture needs to shape them consciously into a form that improves the chance of its success and the above model provides a guide to that. Research has shown that when an entrant attacks incumbents through a sustaining innovation, they attack back and fight ferociously especially if it is a profitable core business. The entrant has a very low chance of success especially if it is offering just an incremental sustaining innovation since the incumbent may soon do the same and has deeper pockets to fight a competitive battle. Even in the case of a radical sustaining innovation, incumbents are motivated to fight back. But normally trade secrets, patents or network effects may provide some form of protection. But either way, entrants require a lot of money to be able to do that. E.g.: When Hoover the incumbent copied Dyson's vacuum cleaner technology and Dyson sued, Hoover finally settled it out of court after a prolonged legal battle. But this was possible only because Dyson had the resources to fight this costly and prolonged battle; Network effect and trade secrets (the page rank algorithm) helped Google upset incumbents like AltaVista, Lycos and MSN in online search. But Microsoft is still fighting back.

Research has also shown that typically new markets disruption have induced incumbents to ignore the attacker (e.g.: Nintendo's Wii vs. Sony's PlayStation) and low end disruption motivates incumbents to flee the attack (e.g.: SGI kept moving to high end graphic work stations when attacked by firms like nVidia until it was too late). But of late few firms are beginning to recognize the threat from low end disruptions and are fighting back. e.g.: When AMD launched its low end Duron line of processors targeted at customers like home users of laptops who have

been overshot with Intel's Pentium line, Intel fought back with its Celeron line of processors which now have become highly profitable for Intel.

Even in the case of displacement innovation, the incumbents fight back E.g.: Verizon sued Vonage over patents when its market share in the landline market was seriously threatened by it.

It is very important for a new venture to understand these competitive dynamics and shape the innovation accordingly. It's not always possible to take the path of least resistance but at least being aware of it early on would help identify potential exit scenarios and plan accordingly given the 8 -10 ten year time frame within which the venture has to create value for all the stakeholders involved.

5. Applying the framework to evaluate early stage ventures

The previous framework has been used to formulate the following set of questions to help evaluate how the early stage venture will fare with its intended product strategy going forward. This can help identify any weaknesses and improve the venture's chance of success.

5.1 Analyzing the job	
1.	What job is the venture's product designed to address?
2.	What is the relative importance that the customers place on that job being done?
3.	What other things compete with the potential customer's attention for the same job?
4.	What is the price (in terms of money, effort, time) that customers now pay for them?
5.	What are the dimensions of performance salient to this job that the product is addressing compared to other things that are competing and how much do the customers value that to warrant a trial/purchase?
6.	What channels do customers normally turn to hire a product to get this job done and is this product compatible with that channel?
7.	What assumptions have we made about these jobs and how do we validate them and get feedback on users evolving job requirements?
5.2 Analyzing the potential customers and the basis of competition	
8.	What is the prevailing industry circumstance for majority of the potential customers – overshot, undershot or non consumption?

9.	What is the basis of competition - the dimension of performance that customers value, in this prevailing circumstance?
10.	What category of customers is the product targeting now and how big is this segment?
11.	Will this customer segment be ignored by any existing competitors giving us protection till the venture takes root?
5.3 Analyzing the network effects	
12.	How many distinct groups of users does the product require to be adopted successfully? Are they prone to network effects? What are the types, strength, polarity and timing of these effects? What conditions can trigger their polarity reversal?
13.	Is the market structure that the product targets a WTA/WTM? Are there well healed competitors in those markets already?
14.	What is the mobilization strategy for each of the sides? How feasible and economical is it? What are the potential pitfalls?
15.	What product features will help reinforce and consolidate the network effects?
5.4 Analyzing the customer acquisition strategy	
16.	How easy is it to quantify the products value and how easy is it to communicate the products value; in other words, in which quadrant does the product fall in?
17.	Are there comparables?
18.	Have customers been exposed to an existing product in this category?

19.	What channels does the product plan to use to reach the customers?
20.	Do the channel partners require a lot of training to sell this?
21.	How will any channel partners be incentivized to cooperate and how economical would that be with the resources that the venture has?
22.	Is the incentives one time or on going for the life of the product?
23.	How is it going to affect the cost of sales and the product price the customer pays?
24.	Can the channel spawn on any viral effect/word of mouth or a network effect?
25.	How easy is the product to be customized for use with the different channels?

5.5 Analyzing the value chain	
26.	What is the end to end value chain associated with this product or service and who in it makes the most money now?
27.	What is the basis of competition (dimensions of performance that is a bottleneck on what matters to the user) now (e.g.: Is it reliability and performance in some attribute, or is it speed / flexibility / cost / customization)?
28.	Are there barriers to entry to integrate across the interfaces that affect the dimensions of performance that is the bottleneck ("not good enough") part where the money is or will be?
29.	How long will it be before the basis of competition changes and what would that be? How do we identify the situation when that happens?

5.6 Analyzing the assumptions	
30.	What is the targeted financial projection?
31.	What are all the assumptions made to achieve that projection?
32.	What the most crucial and least crucial assumptions and how do the others rank in comparison to them?
33.	How do we test these critical assumptions with minimal cost?
5.7 Analyzing the Innovation Strategy	
Is This a Sustaining Innovation Strategy?	
34.	Is the venture trying to bring a better/breakthrough product into an established market?
35.	Are these measures of performance improvements incremental or radical in character to what the customers have already been exposed to?
36.	Are there any barriers (IP/Proprietary knowledge/network effect) to sustain the competitive advantage or and can it be easily replicated by competitors?
37.	Will the venture have the resources to defend itself and how much would it need?
Is This a Low End Disruptive Innovation Strategy?	
38.	Is there any evidence of overshot customers in the mainstream market and are there ways to test this assumption?

39.	Does the product appeal to the overshot customer category and would they be happy to purchase a product with less (but good enough) performance for their needs in the dimensions that they value?
40.	Can it make a profit (through a business model with an operating or financial approach or both) at the discount prices required to win business at the low end of the market?
41.	What is the evidence that existing competitors will ignore the less profitable lower end of the mainstream market that the venture targets and refocus on the most profitable upper market tiers?
42.	Will this product be ignored by all the significant incumbent firms in the industry or are there others who will fight that?
43.	Who are the channel partners who would be incentivized to sell the product at the discount prices and what is their motivation to do this?
Is This a New Market Disruptive Innovation Strategy?	
44.	Does the product offer a lower performance in traditional attributes valued by mainstream customers but improved performance in any new attributes – simplicity, convenience or others?
45.	Is there a large enough segment of potential customers who would value these new attributes and willing to pay a premium for it? or Is there a segment of potential customers who historically have not had the skill or resources (equipment or money) to do what the product/service does for them and had to do without it or pay someone with expertise to do it for them? or

	Is there a segment of population who need to go to an inconvenient location to do this now?
46.	Would this be ignored by all the significant incumbent firms in the industry and how sure can we be?
47.	What channels are being used to promote this product?
Is This a Displacement Innovation Strategy?	
48.	Could the product easily replace part/parts of any existing modular components in a system that the customers currently use?
49.	Are the interfaces in the current system with which the product interacts, clearly defined to prevent any unforeseen challenges and interference with other components?
50.	How profitable is that part of the value chain or does it help the venture develop capabilities that could be used to skate to where the money is or will be and how long will that take?
51.	Are there any legal barriers (IP) that incumbents may use to sustain the competitive advantage?

6. Case Studies

For any framework to be considered reliable, it has to be able to convincingly explain the reasons for past venture successes and failures. Only then can we trust its predictions on current or future situations. When I initially embarked on this thesis, I had originally planned to validate the framework by applying it on name masked early stage business plans of ventures that had been funded and had exited (successfully or otherwise). The framework lenses would have been used to predict how successful those ventures product strategy would have been and the results would have then been verified against what actually happened during their course. But, I had to abandon my original plan due to the lack of cooperation from VC firms - the only place where I could have found many early stage business plans that I needed as well as people who would have known their early history. Instead as I mentioned earlier, I had to rely on interviews/discussions with founders or employees where possible (not a scalable process as I soon realized) and for most part archived public data sources, blogs, HBS cases to piece together early product strategy of ventures. Even though this removed the venture anonymity from the validation process that would have made the framework more credible in the eyes of the readers (eliminating the notion that I may be second guessing what may seem obvious in hindsight), the purpose of this exercise was to check if the framework lenses could unambiguously and convincingly pinpoint the root cause of the way those ventures went.

Due to time constraints, I have limited the synthesized written analysis of the framework application to the following six cases for which I found enough information to piece together their early product strategy. They are a mix of firms that have exited (IPO, acquisition or shutdown), ongoing but reached profitability and those that are still relying on venture funding. They have been subjected through the framework to help understand why those that exited in the past succeeded or failed and how, those recently started may turn up if they continued with the current strategy.

6.1 Yahoo

A lot has been written about hi-tech successes like Microsoft and Google. But Yahoo never attracted the kind of attention they did in spite of being very successful. It was one of the three most visited internet sites for more than a decade and half. Most of its peers like Lycos and Excite who had started around the same time either went out of business or were bought out by then. Yahoo began to attract a lot of scrutiny only recently, because of its slowing growth rate and Microsoft's attempts to acquire it. What were the causes of its incredible early growth that led to its success? That early success provided it the much needed momentum that has kept it going since then. I decided to subject Yahoo through the framework lenses. The analysis will dwell only on the very early days of Yahoo until its IPO. I have relied on my own personal experiences with the service during its very early days as well as archived online public data sources for most of the information from that time.

Yahoo began as "Jerry's guide to the world wide web" in Jan 1994 before being renamed to Yahoo in April 1994. Its founders Jerry Yang and David Filo started the service for their personal use when they were students at the Stanford University. It was opened to others, later. These were the very early days of the internet and the World Wide Web - soon after it was opened to the public. Not many people outside of academia especially the computer science community had known about the internet until then. NCSA Mosaic was the only browser available initially (Netscape Navigator became available much later towards the fourth quarter of 1994 after Yahoo had started). But the internet's popularity was growing and numerous online communities and information resources on every possible topic began proliferating on it. Yet at that time, there was no easy way to navigate around the web to find the information that users were looking for. This was years before anyone had even heard the term "search engine". One had to know the URL and type it in directly into the browser to get to an online information resource (if it wasn't already hyperlinked from other sources). This meant that users had to have knowledge about their location in the first place. Hence finding information online wasn't as easy as is today.

Looking through the "Jobs Analysis" lens it becomes clear that as the internet grew in size, users clearly had a job that needed to be done – navigate around the web easily and find resources of

interest quickly. They were clearly underserved with the tools available then. As the information on the web and its popularity grew, the relative importance of this job grew as well. Yahoo squarely positioned itself to help users do this job very well by creating an online directory on a single page to help them navigate the world wide web of those early days. It improved on the dimensions that mattered to those users by integrating across parts of the technology value chain that proved to be the bottle neck to get that job done – the user interface for browsing that online information. The founders spent enormous amount of time manually categorizing and ordering the web resources in to neat, easy to browse hyperlinked lists and displayed it all in one page as an information portal. The very early versions looked similar to what's on this page - http://web.archive.org/web/19961017235908/http://www2.yahoo.com/ (without the search box of course; this is an archived page from 1996). This may seem trivial now, but this was a far superior approach in those early days of the public internet. Users could easily navigate to interested sites from a single location - the yahoo home page which had hyperlinked categories and other sub categories. The "Customer Analysis" lens reveals that the service initially targeted at the underserved Stanford community and the founders internet savvy friends outside provided it a fairly protected customer base (along the same lines as Google and Facebook which started with college students) free from any major competition while the venture was taking root and spread its wings. The early address of yahoo was http://akebono.stanford.edu/yahoo.

Even though Yahoo may not have known at that time there were clear cross side network effects in play. When looked through the "Network Effects Analysis" lens, it is clear that, the more categories of information the portal displayed, more users were attracted to it. This spawned a positive cross side network effect that strengthened as the categories and subcategories of information listed increased. Once users saw how well Yahoo did the job of finding information they needed, they were drawn to it more often. The "Customer Acquisition Analysis" lens shows that, it helped create a purpose brand around the service – Yahoo's name immediately popped into their mind when someone wanted to locate any information online. This in turn spawned a bandwagon effect through positive word of mouth advertisement – a cost effective way to attract customers to Yahoo without any promotional spending. This helped it soon cross a million hits a day within a year that kept growing.

Yahoo raised $3M through two rounds of venture capital investment to finance the infrastructure needed to continue to grow the positive cross side network effect. Its continuing growth helped raise $33.8 million through an IPO in April 1996 – 2 years after it started. It then figured an advertisement based business model that provided a sustainable revenue stream. Over the years, Yahoo has continued to grow by acquiring other online products (to date it has acquired around 56 companies) like email, search, photo and video sharing, social media and many others that were positioned on a job and integrated them into its portal. This has continued to spawn new network effects as well as strengthen existing ones making it very difficult for any potential competitor to displace yahoo. Each acquisition has also greatly improved its purpose brand that helped drive word of mouth traffic for almost a decade and half keeping it successful.

6.2 Mozy

Mozy is an online backup and storage service started with a venture funding of $2M. It launched its service in April 2006 targeted primarily at home users. It helped users backup their data to a remote server, from any Windows or Mac machine. With the free version of Mozy, a user can back up as much as 2 GB of data from up to two computers while the paid version was priced at $5/month allowing unlimited backups from one computer. Within one year of its launch, Mozy attracted 175,000 customers – a phenomenal feat making it a killer product in its category. That success encouraged Mozy to launch a professional version – MozyPro, aimed at businesses. MozyPro was similar to the consumer targeted Mozy service, but included backups of server located at customer premises, 24/7 support, as well as admin control for their IT department. Businesses paid $4/month for each employee, plus $0.50/GB/month of stored data. In short time 3,200 businesses - small, medium and as large as GE, signed up for it. In Oct 2007 – a year and half after it launched its service, Mozy agreed to be acquired by the storage giant EMC for $76M. What was the reason for this phenomenal success of Mozy in a short time? Let's subject it through the framework lenses.

Computers have become part of our everyday life. For a consumer it is not only a portal into the online world, it is also a data vault that stores very valuable personal as well as business

information. The frequent need to replace hardware almost every two years either due to their technology obsolescence or hardware failure, along with the proliferation of viruses and malware in recent years has made data integrity and security a major problem in the minds of consumers. I can vouch for that from my own experience during the last two months. At the time of writing this thesis, I encountered two incidents that drove home the importance of a disciplined regular data backup – 1). My laptop became infected with a new worm; while trying to clean it I corrupted the OS. I had to reinstall the OS requiring me to go through a very elaborate backup and restore process that took me hours. 2). A few weeks later my hard disk crashed possibly because of the intense heat my laptop had been generating of late. I did not have a backup copy of updates to this thesis jeopardizing three weeks of effort. I had to scramble to recover the data and spent quite a bit of time, effort and money doing this. For businesses, data loss could have serious consequences of impacting not only their operations but also affecting their bottom line.

Everyone knows that they should backup their files, but few actually do. There are many reasons 1) data backup is not an easy task and required expensive hardware and software until Mozy appeared. 2). The task required a minimum skill level to be able to do it on one's own and required to pay someone else to do it. 3). One has to have the patience to devise a solid backup schedule and strategy and the discipline to stick to that routine; given the frequent changes to data, doing it once a month or even every week doesn't really help. Looking through the "Jobs Analysis" lens, it is clear that there was a job that needed to be done and the relative importance that consumers placed on it being done had also grown in recent years. Mozy positioned itself squarely on this job and targeted the nonconsumers initially - both consumers and small businesses who needed data the backup facility but couldn't get it done easily without paying a lot to do it. This was a large enough segment of potential customers. When looking through the "Innovation Strategy" lens, it is clear that Mozy formulated and followed the new market disruptive innovation strategy. It relied on a desktop software client on the PC that automatically backed up data every two hours without any user intervention to a remote server on the internet. It competed on the performance dimensions that mattered to those traditional non consumers – simplicity and convenience, eliminating any skill required. As yahoo did, it integrated across parts of the technology value chain that affected those dimensions - a very simple and convenient user interface to help backup and restore the data.

The “Customer Acquisition Analysis” lens reveals how it attracted the early customers. During its early days, even though it was easy to communicate the products value since data backup as a category had existed before, it wasn’t easy to quantify its value. So, Mozy initially got consumers to try it for themselves by giving away 2GB free backup space. This also helped validate its assumptions about the job and get users to try it out and give feedback. It advertized its service using low cost online affiliates as well as incentivized its own customers to attract others (every time a free user referred another user, they got an extra 250MB free space which prompted them to refer it to their friends). The cost of sales was low enough and the customer acquisition model was scalable. In addition it kept the subscription prices low enough - $5/month, to convert many of those who initially signed up for free to paid customers and ward of any potential competition till it was strong enough. The word of mouth from the happy customers helped create a purpose brand around its name that fueled its popularity even further.

Ultimately the stellar reviews of Mozy from many top magazines including NewYork Times brought it to EMC’s attention. It agreed to be acquired by it. Speaking with a senior manager at EMC, he mentioned that Mozy acquisition was synergistic to EMC. Considering that EMC already makes and sells business storage hardware and owns data centers around the world, it would be far cheaper for EMC to run Mozy to utilize that existing capacity than for Mozy to build new data centers on its own as it experienced further growth. The acquisition would also help EMC - a traditional hi-end business storage hardware provider, with its stated aim of moving closer to the consumer space where a lot of innovation seems to be happening. Over the longer run it would also tie into its proposed cloud strategy of providing value added services over the consumer data stored in its data centers.

6.3 Plenty of Fish

Online personals sites have been around from the early days of the internet. Many have come and many gone but the space didn’t completely take off till the early 2000’s. Changing customer perceptions and expectations finally overcame the social stigma associated for long with online dating. Online dating finally became mainstream and fueled the growth of Match.com, Yahoo

Personals, eHarmony and many other niche sites like JDate.com, ChristianSingles.com, LDSsingles.com targeted at specific communities. In addition to those, there were others that targeted every possible demographics - RichorBeautiful, HotEnough, or HotorNot, as well as SingleParentLoveLife, SweetOnGeeks, FarmersOnly, SugarDaddyForMe, VeggieFishing, and GothScene, not to mention MarriedButPlaying. Overall there were at least 850 different personals sites on the Internet. About the same number entered the industry every year, with most failing quickly without making a penny of profit. The primary source of revenue for all these sites has been user subscription. But in recent years, ad revenue has also become an additional source of income given the number of users visiting these sites. But in most cases, that alone has not been sufficient to keep the sites running given their high overhead costs.

But the fastest growing among the online dating sites is "Plenty of Fish", founded in the middle of 2003, by a 29-year old entrepreneur in Canada, Marcus Frind. It reached profitability within its first year. Its 2008 revenue was around $10M with 50% gross profit margins. The site is free - doesn't charge any money for user subscription. It makes it money mainly by displaying ads served via Google's adsense on its apprx. 1.6 billion WebPages/month (end of 2008). By the end of 2007, "Plenty of Fish" had become the most frequently visited dating site in the U.K. and Canada and had reached No. 4 in the U.S. By end of 2008, his creation was the largest dating website even in the U.S. and quite possibly the world according to the research firm Hitwise. Its traffic is four times that of the dating pioneer Match.com, which has annual revenue of $350 million and a staff that numbers in the hundreds but has been losing subscribers steadily. "Plenty of Fish" could be a poster child for a frugal and profitable venture without ever needing any venture capital. To get a sense of how efficient its operations are, consider this - the social news site Digg generates about 250 million page views each month, or roughly one-sixth of "Plenty of Fish's" monthly traffic, and employs 80 people; "Plenty of Fish" has 4 employees including Marcus Frind himself. Its traffic is four times that of the dating pioneer Match.com, with a staff that numbers in the hundreds. Most websites as busy as "Plenty of Fish" have hundreds of servers; it has just eight because of very efficient coding as well as keeping the computational power to minimal by eliminating any feature that Frind thinks doesn't add much value to the basic job of finding user's a date.

What explains the phenomenal success of “Plenty of Fish” making it another killer product while all the other major competitors have been steadily losing users and revenue? Let’s subject it through the framework lenses.

The “Jobs Analysis” lens would reveal that the job that visitors expect online dating sites to do for them is very simple - help me find someone who is attractive and compatible enough to go out on a date. They could be looking for a short term relationship (STR) – casual dating; or a long term relationship (LTR) – that led to marriage. The number of people in the STR category is many times higher than LTR. The “Basis of Competion & Customer Analysis” lens reveals that till around 3 - 4 years back, LTR seeking users were under served by the prevailing online dating sites since the sheer volume of users in them made it very difficult to distinguish who was there for casual dating and who was seriously looking for LTRs. At the time of writing this, that segment of customers has already been successfully targeted by sites like eHarmony and Chemistry.com (owned by the same firm that owns match.com). These undershot customers were willing to pay a premium to find other LTR seekers. Sites like eHarmony charges anywhere from $60/month to $240/year and puts them through a grueling 2-4 hours signup form to fill their initial personality profile and other preferences. This self selection process along with strict screening of members who sign on has helped eHarmony and Chemistry.com continue to be successful in the higher end of the market.

That leaves us with the STR seeking customer segment. These are mainstream customers looking for casual dating and the volume of customers in this category is far higher. Sites like Match.com, Yahoo Personals and innumerable others targeting mainstream customers operate in this category. Over the years these sites have continued to add new features in the hope of differentiating themselves from competition and attracting more users. Almost all of these casual dating sites that charge a subscription fee now offer a snazzy layout, easy-to-use search features, numerous magazines, newsletters and advice columns that round out the already jam-packed site layout. In fact Match.com special features outnumber their regular ones. Even though these sites allow members to register for free, they can't look at someone else's profile much less reply to a paying member who has sent them an email without first paying the monthly fee. They can peek around a little bit after creating a profile (called a 'portrait' at Match.com), but they won't get very far without becoming a full fledged member. In addition, many of these sites pricing structure is

also not very clear. Even though the current monthly rate for Match.com is $30/month (with additional costs for some of their unique features like MindFindBind™ With Dr. Phil, which is an extra $8/month) it is normal practice to bill automatically for another month (or whichever package a user had chosen previously) once the customer's service term has ended. The "Basis of Competition & Customer Analysis" lens shows that, over the years two things seemed to have happened - 1). All these services have completely overshot many of their customers' needs who no longer are willing to pay for any improvements along the dimensions that no longer matter to them. Some of them have started to leave in droves to get back to old ways of dating – meeting people in bars and pubs. 2). In addition, there was also a huge segment of nonconsumers for whom then current monthly subscription fees that these sites charged was still way too high and hence had been left out of them. So what we have is a predominant industry circumstance in this STR category with plenty of nonconsuming and overshot customers. This is a perfect situation ripe for disruption – new market and low end disruption, when looked through the "Innovation Strategy" lens. Clearly "Plenty of Fish" is following just that.

Intuitively Marcus Frind had recognized this before he started the site. In an interview with *Inc.* he states that his blue print for success has been to "Pick a market in which the competition charges money for its service, build a lean operation with a "dead simple" free website, and pay for it using Google AdSense". But that strategy alone wouldn't have been enough to succeed. As explained earlier, the only reason the site has witnessed traction is because the prevailing industry circumstance has been one with plenty of overshot and non consuming customers - which the "Basis of Competition & Customer Analysis" lens clearly reveals. By keeping the site free and very simple with no frills, the site has focused only on the dimensions of performance that these customers now value – price and how well it does the basic job of "find me a date easily and quickly". Compared to other sites, the user interface of "Plenty of Fish" is really bare bones. Yet, as its phenomenal growth clearly indicates, customers don't seem to mind that at all. In addition, the site has also improved on the basic job it does for the users by not listening to them but by empathically observing them; when a member starts browsing through profiles, the site records his or her preferences and then narrows down its 10 million users to a more manageable group of potential mates. "Users never see the whole database," Frind says. "It gets smaller and more focused on what you're actually looking for. In other words, if you tell "Plenty of Fish" you want to date blonde nonsmokers but spend all your time gawking at nicotine-addled

brunettes, the site will adjust. People think they know who the perfect person is, but that's not always who they really want". Also by eliminating all add-ons like IM's or video profiles that other sites offer, the cost structure of the site has been kept really low enough to rely on minimum infrastructure needed to run it and create a profitable business model relying only on ads.

The early customers that the site attracted were clearly non consumers who didn't want to or couldn't afford to pay subscription fees there by keeping the site out of the cross hairs of the competition and protected it till the network effect took over. Looking through the "Network Analysis" lens would reveal that, clearly a dating site like "Plenty of Fish" is prone to a strong positive same side network effect. But, given that the multi-homing costs are not that high the market in which "Plenty of Fish" operates is not a WTA market. During the early days, the network effect was sparked by targeting the site within the founder's home town in Canada and relied on word of mouth which eventually created a purpose brand around the site driving further traffic and eventually pulling overshot customers from other paid sites. As seen with most sites prone to network effects, there was always the problem of network effect turning negative because of congestion/competition/spam. By delegating moderation powers to thousands of community users on the site to remove any offending members, bots and spam the site has managed to keep its costs low as well as consolidate the positive network effect and keep it growing.

At the time of writing this the growth of "Plenty of Fish" has been continuing and I anticipate this to continue till industry circumstances change again or for some reason the positive same side network effect turns negative.

6.4 Cuil

Cuil is a venture funded startup founded in 2008 by a "dream team" of former engineers from Google, eBay, IBM and AltaVista. They had been involved in developing search engines in those firms. The firm had raised $33M from VC firms so far. Its stated purpose is to dethrone Google as the lead search engine. Anna Patterson, one of Cuil's founders is quoted in a wall

street journal article as saying "You can't be an alternative search engine and smaller. You have to be an alternative and bigger." Cuil claims to cover three times the number of webpage's that Google covers - 120 billion web pages compared with Google's estimated 40 billion, through a faster and better way to index the web pages relying on fewer servers in the background. It aims to deliver better results than other major search engines by searching across more web pages and studying them more accurately. It also displays search results that organizes web pages by content and displays relatively long entries in a new magazine like look and feel format. It has successfully raised a first round funding of $33M from VC investors. How successful will Cuil be going forward with its current strategy? Let's subject it through the framework lenses.

When looked through the "Innovation Strategy" lens, clearly Cuil is trying to bring what it considers a better product – a search engine that tries to cast a much wider net with three times more indexes, in to the existing search market. But, compared to what already exists out there, the performance improvements are incremental along the dimensions that customers have come to value – relevancy of search. This makes Cuil an incremental sustaining innovation to the current search incumbents like Google, Microsoft and Yahoo. The key question is how valuable are those improvements to majority of the customers in the prevailing search industry circumstance and how does it affect the basis of competition? The "Basis of Competition & Customer Analysis" lens reveals that, unlike the undershot circumstance when Google made its debut, the current industry circumstance appears overshot along the current search metrics; majority of the customers appear happy and satisfied with the results for most of their searches from incumbent search engines. All the prevailing search engines already display fairly relevant and good enough results to a search query within the first few links. This is also a reason that Google continues to be a leader with a major market share in spite of Microsoft's immense efforts. Cuil's innovation is targeting these overshot customers along the dimensions that do not matter to them anymore. A "Jobs Analysis" lens would reveal that customers don't care how big the search index of a search engine is or how many servers it uses behind the scenes. All they care is – how relevant are the search results to the job they are trying to achieve. That job has already been taken care for most part by others. The look and feel of a magazine like format of Cuil doesn't seem to be very impressive either to give a reason for customers to switch. In addition, these incremental innovations are not hard to copy nor can they be protected via IP either. All this means that it is very unlikely that Cuil is going to see any major success at all

against any of the incumbents - especially against Google for which search is a core business. In spite of the immense visibility it received during its launch almost a year back, Cuil still languishes with web traffic below 0.005% of internet users unlike the incumbents all of whom rank within the top 10 most visited sites in the world. This is a clear indication of how customers seem to value it.

What would offer Cuil a better shot at success? The "Jobs Analysis" lens offers an answer to that.

Cuil needs to improve on other dimensions that may matter to the predominantly overshot customers. Most of the prevailing search engines require that users perform searches on separate tabs for websites, images and videos. For anyone who doesn't know what data format the information they are looking for is in, this can be a problem. It is frustrating to do three separate searches in each category. If Cuil can integrate all the three and present the relevant results together it would be helpful. But, this would still be an incremental sustaining innovation and hence it may not be possible to prevent incumbents from copying it, if that proves a hit.

Another improvement that may offer it a fighting chance is the following radical innovation to search that improves on the dimensions that would matter more to the users: Most of the current search engines are only good at finding information that already exists. They cannot manipulate the existing information to provide more relevant results. Users have to do those themselves. For example when the search query "Cambridge, MA" is typed into Google, at present it just lists websites that its thinks are relevant to the query based on the weight its algorithms assigns to those results. What may be more relevant to a user planning to move to the city may be a neat list of its vital statistics, such as location, population, crime rate, ranking of best areas in the city to live in, school district ratings, etc and probably compare that to other neighboring cities like Waltham, MA on how they rate. This requires the search engine to perform complex new computations using the available data. This sort of innovation is radical and may be difficult for incumbents to copy immediately. That will also help Cuil spark strong positive network effects and bandwagon effects giving it a purpose brand from users who may switch. This would offer a better chance at success. At the time of writing this the "Wolfram Alpha" a prototype search engine from Stephen Wolfram, a well-known mathematician, scientist and entrepreneur promises to do just that. Wolfram Alpha answers questions, often by doing complex, and new

computations. It would be interesting to see how it does when it makes its commercial debut. Cuil needs to rethink its current offering it wants a serious shot at success.

6.5 Dash Navigation

Dash Navigation is a venture funded startup founded in 2006. It introduced a navigation product into the already crowded GPS based navigation devices category. Dash Express was released in Feb 2008 and received a lot of buzz from the press as well as online community. Navigation systems based on GPS technology have been around for almost a decade. But, in recent years GPS technology has become ubiquitous having been built into a wide variety of devices including everyday cell phones. This has made it very difficult for standalone GPS products from incumbents like Garmin and TomTom to differentiate themselves from the others in the current predominantly over served industry circumstance. With GPS enabled cell phones that offer pretty good navigation features proving to be a low end as well as new market disruption, the incumbents are struggling to justify the premium price they have been charging and have started to load up on unrelated features. For example, Garmin's GPS device, the Nuvi 880, in fact has an MP3 player for listening to songs and books, a photo viewer and even an alarm clock – all in addition to the core navigation feature itself.

Given all that, Dash Navigation's innovative "Dash Express" has tried to differentiate itself through a two way interconnected GPS navigation unit that promised to offer real time traffic dependent navigation that would help a user navigate smartly from point A to point B along with information on restaurants, gas stations and others between them that may be of interest to the users. To provide a real time traffic based navigation, Dash relied on its own users as well as data from road sensors, commercial fleets and other sources through partnership with Inrix, a traffic flow data provider where possible. But the accuracy of its real time traffic based navigation primarily stemmed from its own users. In essence, the service relied on a network of drivers with Dash Express as the "hive mind" - the aggregation of what everyone in a group senses individually with regard to traffic. These devices transmitted the speed and location of those drivers back to a central server which performed calculations to estimate the traffic in an area

and used that to navigate others driving into that zone. Dash also created open protocols and API's to allow developers to create "mash-ups," or applications that offered a variety of functionality that drivers using "Dash Express" may find useful. For example, there were applications that helped find the cheapest gas station near a driver at a particular time or show houses for rent or sale in a particular neighborhood that a driver was in or help identify if a speed trap was set up by a cop along the route that a driver took. The device initially priced at $600 was later reduced to $299. After the initial three month trial period, there was also a monthly subscription fee that varied between $9.99 - $12.99/month depending on the period of subscription (2 years to month on month) if the user wanted to continue having the smart real time navigational capabilities. Without that it was a regular GPS device with a few incremental improvements (like ability to email the destination addresses directly to the device through Wi-Fi connectivity) over others in the market. All in all, it seemed like a great product. Lets now subject it through the framework lenses to see how Dash may do going forward.

When looking through the "Innovation Strategy" lens, Dash Express with its subscription service promises a breakthrough product compared to what already exists in the market. The job that any GPS based navigation product promises to do is to guide a user get from point A to point B. What Dash promises is a much smarter approach depending on the time of the day – help users get from point A to B taking the current traffic and any possible detours into account. This is a drastic improvement making it a radical sustaining innovation along the performance dimensions that commuters would be expected to value. Considering that the incumbents are bound to fight back since it is their core business, what are the barriers to their entry? Dash probably has the IP but could be relying on the network effect. Later let's see how strong those network effects would be and how much of a protection would they offer.

When looking through the "Basis of Competition & Customer Analysis" lens it is clear that, for the product to be successful it needs to be adopted by a critical number of undershot customers who really value the smart real time traffic based navigation performance improvement and would be willing to pay the premium price (including the monthly subscription fee) that Dash charges. Dash's solution would not only be competing with other navigational solutions (standalone as well as good enough software solutions bundled with cell phones) but also with free traffic updates on radio's, traffic alerts on mobile phones, online traffic update services via

the browser on the mobile phone that users can access to while commuting as well as online traffic update services that users can look up before leaving their origin. Most of these are free or very cheap. All this means that, only those commuters who are constantly on the road like sales men (who could already be expected to have a navigational unit) would probably value the job it does so much, to be willing to pay the monthly premium it is charging. That customer base probably doesn't look very large.

As discussed earlier, Dash's competitive advantage relies on the radical performance improvement that it brings - its ability to provide smart traffic sensitive real time navigation. Because of the inherent systemic feedback its technology relies on, that feature depends very much on its own customers – the more number of drivers use it, the more accurate will its service be. Most of the other features on Dash are incremental to others and easy to copy. Looking through the "Network Effect Analysis" lens, clearly the adoption and mobilization of its service will be dependent on strong positive same side network effect - driver's preference for other drivers to adopt the platform, before they adopt it. There is also a possibility that this may turn negative because of congestion once it becomes adopted by a critical number of drivers - there are only so many paths that the service can redirect its user to without creating congestion. But for now let's ignore that situation.

Let's analyze its market structure to see if it's a WTA market. That would be entirely dependent on any competing technology - if they don't require the positive same side network effect needed for navigational accuracy but rely on others like satellites or stationed observers, then it would not be a WTA market. But if the competing technology also relies on network effects, then the market could be subject to WTA dynamics. Let's see if the other conditions match for a WTA market. Given the initial price incurred, there is a non trivial switching cost involved (unless any competing product is free). If the competing product too charges a monthly subscription, then the multihoming costs are high. Even if that is not the case it still is non trivial – there is only one place holder for the device on the car and it takes effort to switch between one or the other. Considering the nature of the job, there is no transaction partner variety required. Also by providing developers the ability to create mashups, Dash has addressed the constraint on differentiated platform functionality through its homogenous platform. Hence, the market does

exhibit WTA dynamics within the tiny undershot category if we assume that any competing technology too will have to rely on network effects for real time traffic sensitive navigation.

As identified earlier, the small potential market size may pose a serious problem in mobilizing the platform and sparking the network effects needed for successful adoption. Dash would have to seed each geographical market with a minimal critical number enough to guarantee the accuracy by giving it away for free or subsidizing through other means. In cases where users stop their subscription after the trial period, there is no feedback from those units and system can't rely on them to improve its navigational accuracy. All this makes the platform unlikely to be a major success. At the time of writing this Dash had sold very small number of devices forcing it to lay off employees and change strategy. It has also decided to stop making the devices and instead license its platform to others

6.6 Revolution Money Exchange

Revolution Money Exchange is an online payment service – a direct competitor to PayPal, that lets users send and receive money online. The service was launched at the end of 2007 by the venture backed startup - Revolution Money. It's backed by a number of financial services industry players like Citigroup, Morgan Stanley, Deutsche Bank as well as by Steve Case - the co-founder and former CEO of AOL. The startup has raised $92M to date through two rounds of venture funding. In addition to Revolution Money Exchange, it has two other products – RevolutionCard, a pin based credit card with improved security features and RevolutionGift, a prepaid pin based gift card. (This analysis will be restricted to the Revolution Money Exchange service only). Unlike PayPal which charges the funds receiver a fee of 2.9% of the transaction amount (which decreases to 1.9% with transactions greater than $100k), Revolution Money Exchange doesn't charge any fee for online to online transfers. It does charge a minimal fee of up to 0.5% if any other forms of offline processing like checks are involved in the transaction. Without wanting to get into a competitive battle with PayPal that dominates the online payment space especially in the online auctions market, Revolution declared that the initial target market would be the "millions of young people who spend hours online at social network sites" and help

them transfer money to one another. But, in reality nothing prevents online merchants in ecommerce sites like eBay and Amazon from accepting it as a substitute to PayPal. Ted Leonsis, chairman of Revolution Money declared in the Web 2.0 conference "We want to be to social networking what PayPal is to eBay." How successful with Revolution Money Exchange be with its strategy? Let's look at it through the framework lenses.

The "Jobs Analysis" lens reveals that the job that Revolution Money Exchange does is to help users send and receive money online easily – what PayPal already does well. Feature wise there is not any improvement over PayPal. If you have ever known any "young people who spend hours online at social networks", you can safely say from a jobs perspective that the relative importance that these intended target customers place on this job of sending and receiving money to one another is very minimal. Even otherwise, unlike online auctions the opportunity to send and receive money between users in this category doesn't arise often. Considering all this, it probably is a wrong customer segment to start with. The lack of any customer traction and the failure to mobilize the platform even after the initial $25 free credit for early users who signed up indicates that.

The dimensions of performance the service has improved on – eliminating the transaction fee, is more advantageous to online merchants. Let's see if this service will be adopted successfully in the online auctions and other ecommerce markets. Applying the earlier criteria for a WTA market, we can clearly see that the online payment services market in general has always had the characteristics of a WTA – 1) very strong positive cross side network effects at work between buyers and sellers on the preference for a payment mechanism 2) high multihoming costs on the part of the buyers and sellers (but sellers could be tempted to multihome through no transaction fee that may affect their bottom line) 3) both buyers and sellers need transaction partner variety and 4) both buyers and sellers have homogenous needs - eliminating any need for differentiated platform functionality. Hence for more than a decade this market has been dominated by PayPal. Other's including eBay's own payment system (closed after it bought PayPal) as well Google's "Checkout" has never been able to receive much traction at all. At the time of writing this, there is evidence that many merchants are unhappy with many of eBay's (which still accounts for a very high share of online transactions through PayPal) policies but still they do not have the power to force buyers to use only Revolution Money Exchange that favors them more. Hence the

strong cross side network effects that favor PayPal can be expected to keep it dominant for a while. Also, on the buyer's side there is no evidence of any overshot or undershot industry circumstance for them to go out of their way to adopt this. Hence, even with no transaction fee this service doesn't really have much chance of succeeding in the online auctions market in which a vast majority of transactions happen.

7. Final Thoughts

This framework is just the beginning towards a more causal approach of analyzing the strategic acuity of early stage ventures and help improve their chances of success. Further research needs to be done to make the framework mutually exclusive and collectively exhaustive to cover all possible situations. As we continue to iterate over it with time, the robustness of the framework can be improved. I hope to continue this process over the years.

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