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The Entrepreneur's

Technology Commercialization Framework

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The Entrepreneur's
Technology Commercialization Framework

by

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Abstract

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The goal of this thesis is to develop a framework for technology commercialization specifically geared towards the capabilities of an entrepreneur. The entrepreneur in this case is typified by limited capital assets and minimal visibility to mainstream consumers. This affects many aspects of business including manufacturing, marketing, advertising and customer recognition. This thesis defines the entrepreneur's technology commercialization framework in discrete steps based on existing and widely accepted technology commercialization models. The developed framework is specialized for the entrepreneur by proposing methods that leverage existing infrastructures to maximize the effectiveness of the entrepreneur. Two existing technology commercialization models were used as a foundation for the proposed framework. By combining the product-centric model developed by Vijay Jolly with the market-centric model developed by Everett Rogers and further refined by Geoffrey Moore, a foundation for the entrepreneur's technology commercialization framework exists. The

entrepreneur's technology commercialization framework consists of four phases and four links that can be associated with the combined commercialization model described earlier. Further research examining processes and rules that so-called successful entrepreneurs follow was also required. Key activities successful entrepreneurs perform were identified. These activities were integrated into the entrepreneur's technology commercialization framework. Following development of the entrepreneur's technology commercialization framework, the application of the framework is described. The application focuses on the introduction of new products in the golf equipment industry, specifically golf club iron sets. The application of the framework is prefaced by two case studies specific to the golf equipment industry that reinforce the utility of the proposed entrepreneur's technology commercialization framework. The application describes in detail the plan for developing and introducing an innovative golf club iron set.

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Chapter 1: Introduction

Golf is a popular pastime for 28 million Americans and 33 million other people around the world. (2005 Golf Economy Report) I am one of the millions of Americans who is obsessed with the game. This fascination with the game has driven me to learn as much as possible about the way it is played. This passion for golf has been the inspiration for this thesis. One of the most important aspects of the game of golf is the equipment the golfer uses. Golf equipment is one of the most outwardly visible and concrete aspects of any golfers game. The golf equipment industry represents a great source of revenue, totaling about $7.5 billion in 2010. (Street and Smith's Sports Business Daily) In 2008 a leader in the equipment industry, TaylorMade Golf, spent ~$30 million on R&D for new golf products. (Crockett) Golfers are willing to pay large sums to buy performance and equipment manufacturers understand this. The large golf equipment manufacturers are regularly introducing innovative products and expect to introduce these products every 12 to 18 months. (TaylorMade-adidas Golf Strategy) Intense competition exists between manufacturers to be the first to market with the newest technology.

THE GOLF EQUIPMENT INDUSTRY AND GOLF CLUB DESIGN

The golf equipment market is a fast moving environment typified by innovation and application of high technology to increase both the top professional's and the recreational golfer's performance. Paradoxically, the game of golf is very much steeped in tradition, with great respect for its history. The dichotomy between respect for tradition and adoption of new technology requires a fine balance and can determine the fate of many products introduced in this market. Small and unknown golf equipment manufacturers face great challenges with respect to customer recognition and competition. "Consumers will not buy a product they do not know and that is without

credibility, especially if it is an expensive product." (Yoh et al, 125-135) In addition to this, entering the golf equipment industry requires that the newcomer steal market share from entrenched manufacturers. (Foust, 112-116) Barney Adams, owner of Adams Golf sums up the plight associated with the current state of the golf equipment industry. "The business is flat, the costs of manufacturing are increasing, and sales prices are decreasing—why would anybody get into this business?" (Foust, 112-116) These factors can make entry into the golf equipment industry seem daunting to outsiders.

Most golfers are always looking for a competitive edge. This fact is the basis for TaylorMade's product development strategy. Sean Toulon, executive vice president of TaylorMade Golf's product and brand creation division states "…when we bring a new driver to the market place, its number one goal is it has to go farther… That's why people are driven to buy new clubs." (Baldwin) It is no surprise that there are a multitude of products that claim to provide that competitive edge. Many of these products do not deliver the promised performance improvements. It is understandable that some golf equipment consumers could approach any new concept or product with a sense of skepticism. Therefore, introducing any innovation that promises this performance advantage by fundamentally changing the nature of the golf club can be potentially devastating to the manufacturer's credibility and profitability. This could explain why certain aspects of golf club design have not changed in many years.

One particular aspect of golf club design has maintained consistency in recent history. This design philosophy permeates every major club manufacturer, almost without exception and concerns the features of a golf club "iron" set. The typical iron set consists of eight different clubs sold as a complete set. The clubs are numbered three through nine (3, 4, 5, 6, 7, 8, 9) and Pitching Wedge (PW). As a general design rule, iron club length increases by half-inch increments starting with the PW, usually 35.5 inches

long and finishing with the three iron, usually 39 inches long. Each club is designed to make the ball travel incrementally farther than the previous club. This allows the golfer to select a club based on the distance to their target. The PW travels the shortest distance and the three iron the longest. Each club accomplishes this variation in distance primarily by varying the loft angle of the clubface and to a lesser extent by combing adjustments in the length of the club shaft. "…the loft separation accounts for 80 percent and the length separation for the other 20 percent of the distance between any two clubs in your bag." (Wishon, 6) (Figure 1 and 2)

Although this design aspect sounds benign, it has a great effect on many other features of the iron set. For each club to feel the same in the golfers hands during the swing, club fitters focus on swing weight. Essentially swing weight indicates the moment of inertia of the club. The incremental increase in club length requires the mass of the club head to be reduced incrementally to maintain the same "feel" in the golfers hands. This incremental change in club head mass and length require that club shaft be trimmed specifically for the club head to which it is mated. Both the tip and butt end of the shaft must be trimmed to tailor the flexibility of the shaft (tip trim) and total length of the club (butt trim) after shaft installation. Club designers have learned that shaft flexibility has an effect on the launch angle trajectory of the golf ball. Increasing shaft flexibility typically creates a higher launch angle trajectory. Golf club designers have used this to their advantage. Iron sets are designed to provide the lower lofted, longer clubs with the most flexibility, helping golfers "get the ball in the air", therefore increasing trajectory and carry distance.

Figure 1:   Loft Angle Description

Table 1:   Typical Iron Set Technical Specifications, 2011 TaylorMade Burner 2.0

The length variation in a conventional club set also puts additional demands on the golfers physical abilities. Each club requires the golfer to position the ball varying

distances from their body. For a standard iron set, this leads to eight clubs with eight different swing planes and address / setup positions. This intrinsically seems to reduce the chance of achieving a repeatable golf swing that makes consistent, solid contact with the golf ball on the center of the clubface. Research verifies this assumption and will be discussed in more detail in the following section.

Figure 2:   Typical Iron Set, Ping Eye 2+
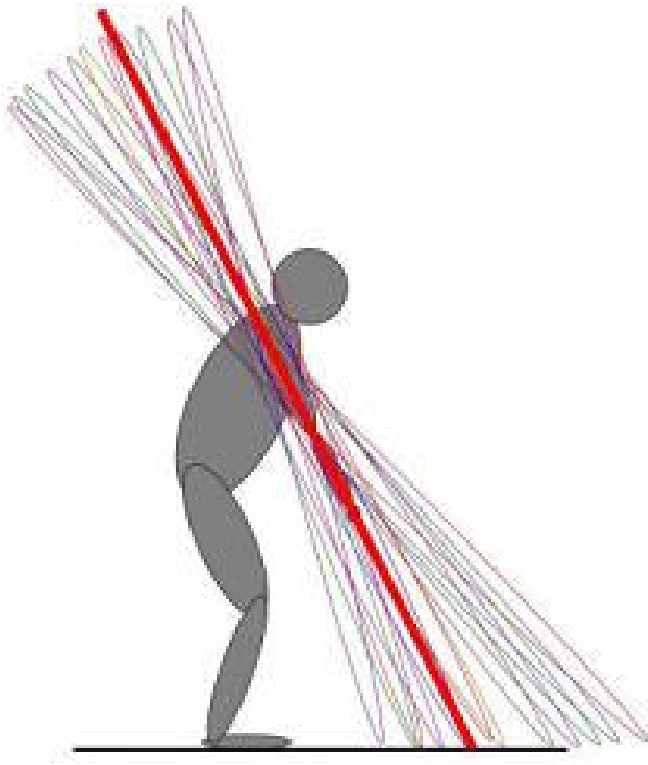
Figure 3:   Variation of Swing Planes With Typical Golf Club Set (simpletonsgolf.com)

There is one key design feature of the iron set that has been changing over time with little notice. The change has been to the detriment of most amateur golfers. The reason for this change is the fierce competition in the golf equipment industry. Manufacturers will do many things to convince golfers to purchase their clubs over the competition. This includes claiming that their clubs hit farther and farther every year. As described previously, this is the model by which TaylorMade Golf markets their products. The reality is that the many irons aren't hitting farther, in fact the manufacturers are simply reducing the loft and increasing the length of the clubs while leaving the same number on the bottom of the club. So, the typical 6 iron that comes with most new sets today is the same as a typical 5 iron in the 1980s and a typical 4 iron in the 1960's – 1970's. The main problem with this so called "vanishing loft disease" is that it has

created a portion of the conventional iron set that is nearly unhittable by most amateurs. (Wishon, 7) In golf club design there is a rule known as the "24/38 Rule". The 24/38 Rule says that most amateurs do not have the "…ability to hit consistently an iron that has a loft angle of 24 degrees or less and more than 38 inches in length." (Wishon, 140) Today, the 3, 4 and 5 iron in many club sets lie on the other side of the 24/38 dividing line, making them unhittable for most amateurs.

ALTERNATIVE GOLF CLUB DESIGN APPROACH

Taking a fresh look at the design of the standard iron set could be the answer to increasing the amateur golfers' consistency and enjoyment of the game. The "vanishing loft disease" plaguing iron-sets being developed and sold today has created an opportunity in the market for an iron-set that actually increases the ability of the golfer to make consistent contact with the golf ball, especially with the lower numbered clubs. This opportunity has not existed in the past and has simply been created by the major golf club manufacturers competing with themselves and alienating their customer's needs. Using a more scientific approach based on increasing the consistency with which the golfer makes good contact with the ball and adjusting design parameters (shaft length, shaft flex, loft angle, head weight) to accommodate the necessary ball flight characteristics an maintain performance could be the new approach and an attractive alternative to many amateur golfers.

Research confirms the observation that consistency of on-center contact of the golf ball on the clubface is greater with shorter clubs than with longer clubs. A study of golfers with scratch (zero) to 36 handicaps revealed that greater distance and accuracy was attained with a 43" driver compared to a 45" driver. (Wishon, 9) Although the club was shorter, all golfers enjoyed increased distance as a result of superior control. According to Tom Wishon, a recognized expert club fitter and designer, "The proper

length [club] for all golfers is the longest length [club] the golfer can hit solid and on-center the highest percentage of the time". (Wishon, 9) Based on the correlation recognized between the length of golf clubs and consistency of contact, the most evident solution to increasing consistency is to design a set of irons to a length and head style that amateurs make the most consistent contact with and hit comfortably. This design philosophy implies that the iron set should meet the following requirements. (1) The clubs should be the shortest length possible while maintaining performance with respect to the distance each club can hit the ball; (2) The iron set should not violate the 24/38 rule described previously; (3) The configuration of the set should minimize the variation in club lengths to maximize consistency in setup positions. This must be a "plug-and-play" clubset that immediately improves the golfer's ball striking ability. This methodology leads to a clubset that is split into three discrete lengths.

37.5 inch long "distance" clubs using "hybrid" iron heads to replace 3, 4, 5 irons

36.5 inch long "mid-range" clubs using standard heads to replace the 6, 7, 8 irons

35.5 inch long "scoring" clubs using standard heads to replace 9, PW, (gap) GW

Figure 4:   "Triple-Length" Iron Set

ACTION PLAN

With the background for this idea laid out, the question becomes, "what is the best method for turning this idea into reality" and "if this can work how can it become the mainstream technology used by all golfers?" The goal of this thesis is to develop a framework that answers these questions and describes the application of the framework to the "Triple-Length" iron set concept. Starting any new business endeavor should begin with a strategy. In fact, many successful entrepreneurs believe it is a requirement. Peter Drucker states, "A company without a clear strategy is like walking through the fog in the

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dark of night blindfolded." (Rowe, 42-45) Surprisingly, only 25% of recent startups have created a formal strategy. (Rowe, 42-45) The developed framework will provide a strategy for entrepreneurs to get something started, build momentum and gain a foothold in the mainstream market. This framework will be general enough to apply to any product or service that an entrepreneur has an idea for. The deliverable of the research contained in the thesis will be an entrepreneur's technology commercialization flowchart. The flowchart will combine the discussed steps and strategies into a flowchart that facilitates visualization of the process of commercialization from idea to mainstream adoption. A review of other disruptive golf equipment technology will be discussed in case studies. The cases will highlight the success and failures of the golf equipment technologies in terms of mainstream market acceptance. A comparison between the highlighted golf equipment technologies and the proposed framework will provide validation of the framework's methodology.

Chapter 2: Literature Survey

There is an extensive amount of literature available on marketing new products. Most strategies are aimed towards the needs of large organizations, likely already established in some mainstream market. This fact provides these firms with the luxury of performing extensive and expensive market research prior to the introduction of new products. Many firms can also take advantage of the fact that they have credibility and are fully entrenched with mainstream consumers. This provides an interesting position for these companies. They have the ability to introduce innovative technologies in untested markets while also maintaining the comfortable security of their mainstream market presence. One of the most prominent examples of this situation is Microsoft. Microsoft's ownership of all of the clients in a client/server world allows them to have a permanent presence in the mainstream market. When competitors arrive with discontinuous innovations, Microsoft can shut them out. When Microsoft shows up with its own versions of the same innovations, it can facilitate its adoption. (Moore, 72) Innovative products introduced by this type of firm could avoid the scrutiny associated with innovative new products introduced by a lesser-known organization. As well, marketing studies are typically based on existing types of products, not disruptive technology. This makes any marketing analysis for disruptive technology nearly impossible because the market isn't clearly defined or developed. (Moore, 90) The goal of this research is to develop a framework that provides the entrepreneurs with greatest possibility of overcoming the hurdles associated with marketing and technology adoption by consumers. Two main markets are of concern, early markets and mainstream markets. The goal of the entrepreneur is to develop an early market following and use the

knowledge gained in the early market as momentum to gain a foothold in the <u>mainstream market</u>. The literature survey intends to focus on these two markets to gain a better understanding of the psychological attitudes and the functional requirements demanded by of each market's constituents.

"DIFFUSION OF INNOVATIONS" AND THE "TECHNOLOGY ADOPTION LIFE-CYCLE"

Some background information on market demographics and consumer philosophies is required to explain the development of this framework. One commonly accepted model used to describe the demographics and lifecycle of a new technology, product, or idea is a bell-shaped "Technology Adoption Life-Cycle". Everett Rogers is given credit for developing this curve in his book *Diffusion of Innovations*. The bell-shaped curve is split into five groups. "Each group represents a unique *psychographic* profile – a combination of psychology and demographics that makes its marketing responses different from those other groups." (Moore, 11) The groups are the "Innovators/Technology Enthusiasts", "Early Adopters/Visionaries", "Early Majority/Pragmatists", "Late Majority/Conservatives" and "Laggards/Skeptics". These terms will be used interchangeably throughout. The divisions between the psychographic groups align roughly with locations where standard deviations would fall on the bell-shaped curve. Further evolution of this bell-shaped curve, specifically with reference to more recent high-technology products, has brought to light the application of Rogers' original ideas. Geoffrey Moore's *Crossing The Chasm* identifies and details gaps between all of the different sections of the Technology Adoption Life-Cycle. At each transition from one psychographic group to the next, a firm must re-focus its strategy to suit the requirements of the particular group. This requires that the firm make a leap from one group of customers to the next, hopefully not falling somewhere in between. Nowhere on the Technology Adoption Life-Cycle is this gap greater than between the early adopters

and the early majority consumers. The transition between these two groups can be the undoing of previous success. This "chasm" defines the main barrier between relative obscurity and mass commercialization. The Technology Adoption Life-Cycle provides insight into the requirements needed to take technology from one group of consumers to the next and defines a basic marketing roadmap.

Moore indicates that there are four key requirements required to cross the "chasm" between the early market and the early majority. First, An organization must select a niche mainstream market segment to target. Second, The new product or service must be a "whole product" solution. This means that the product or service must integrate into existing infrastructure, be compatible with other existing technologies commonly used and must be supported by the parent company. Third, the product or service must be positioned against the competition in a way that allows early majority consumers to understand whom the product or service is intended for and how specific features differentiate it from other disruptive products or services that could be applied to the niche market segment. Fourth, a distribution and pricing network that meets the needs of the early majority consumer must be established. (86-87) All of these aspects will be addressed by the entrepreneur's technology commercialization framework proposed in this thesis.
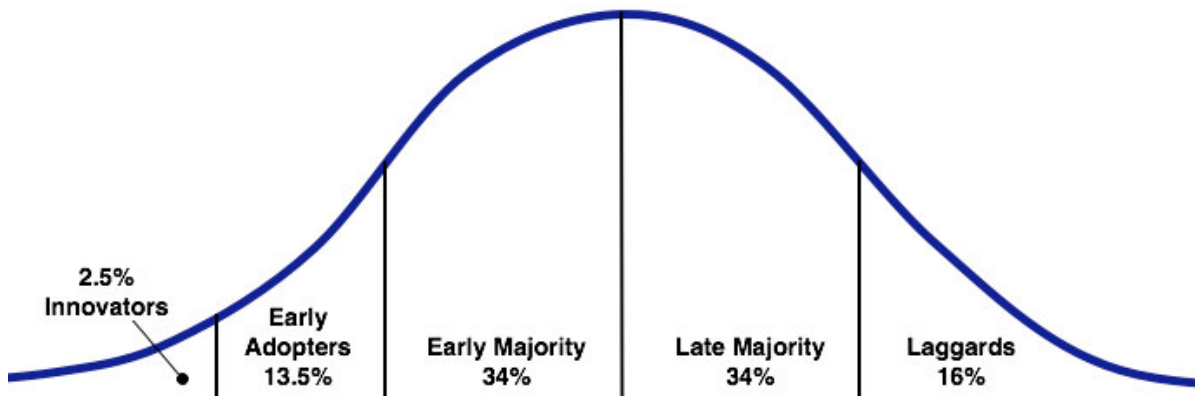
Figure 5:   Everett Rogers' "Diffusion of Innovations"
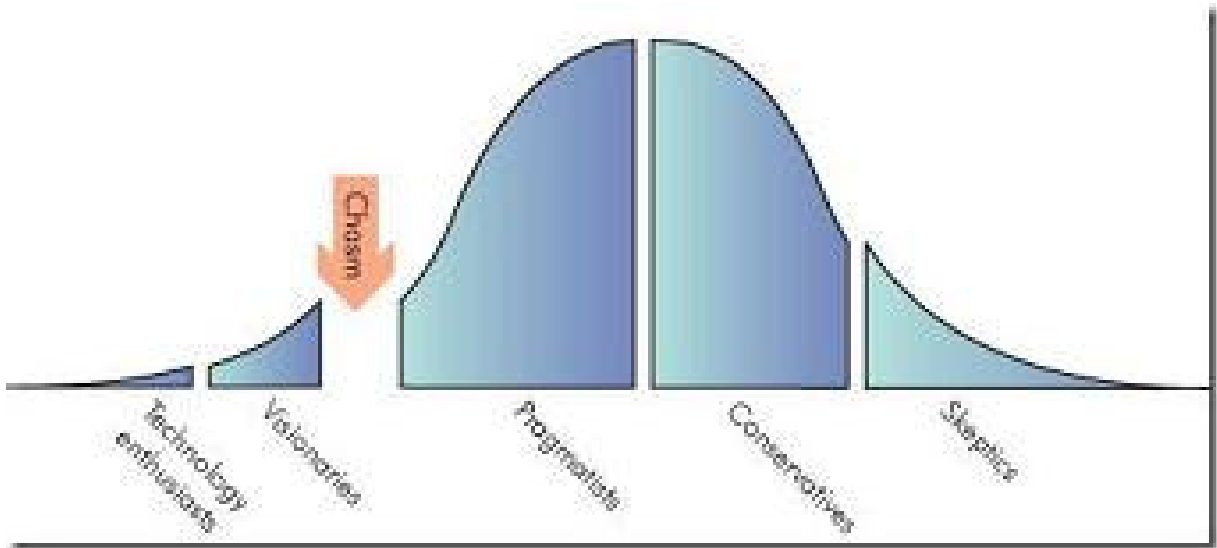
Figure 6:   Geoffrey Moore's "Technology Adoption Life Cycle Curve"

VIJAY JOLLY'S MODEL FOR COMMERCIALIZING NEW TECHNOLOGIES

Another model focuses on the product development aspect of technology adoption as opposed to market development. *Commercializing New Technology* by Vijay K. Jolly

defines the product commercialization process through a five-step model. (Figure 7) The steps in the process are as follows: "*imagining* a techno-market insight; *incubating* the technology to define its commercializability; *demonstrating* it contextually in products and/or processes; *promoting* the latter's adoption; and *sustaining* a commercialization." (Jolly, 3) The "imagining" step simply consists of applying a technological breakthrough to a product aimed at a specific market with potential. The "incubating" step further refines the "imagining" step. "The idea needs to be proved in some unequivocal manner, both technologically and in terms of the need it is supposed to fill" (Jolly, 6) "Incubating" fully defines the parameters of commercialization and makes the decision to commit resources and capital to the idea. Definition of functional requirements of a prototype could be accomplished in this stage. "Deciding whether and how to take a technology further is what the incubating stage is about" (Jolly, 85) The "demonstrating" step is actually showing the technology applied to a product or process. This step typically involves demonstrating developed prototypes. Prototypes can also be used as marketing tools to gauge a market's response to the application of a new technology. For a number of reasons, the target market might not immediately accept many new products or processes. "Regardless of how extensively one performs market research prior to developing a product, acceptance by a market is never assured." (Jolly, 10) The following step in the process attempts to address this problem. The "promoting" step involves increasing the odds of market acceptance of the new product. The final step in the process is "sustaining". This step is a simple as it sounds. The goal is to maximize the length of time the product or process is available to the intended market while striving for continuous improvement and cost reduction. Extending the duration and increasing the value of the annuity created by technology should be the ultimate goal of "sustainment".

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The steps in the Jolly adoption model are linked with four "bridges". The "bridges" define the resources required to continue to the next step in the process. "They [bridges] have to do with satisfying the various stakeholders of the technology at each stage, without whom the technology's value does not get recognized, nor is there an impulse to take it further. Each "bridge" is targeted at a different group of shareholders. The shareholders in this sense are anyone who has invested in the product/technology (i.e. innovator, early adopter, early majority, etc). Each shareholder has different requirements that must be addressed to continue to the next stage.

FIGURE 1-1
THE PROCESS OF TECHNOLOGY COMMERCIALIZATION

SUBPROCESSES: BUILDING THE VALUE OF A NEW TECHNOLOGY

1. IMAGINING the Dual (Techno-Market) Insight
2. Mobilizing Interest and Endorsement
3. INCUBATING to Define Commercializ-ability
4. Mobilizing Resources for Demonstration
5. DEMONSTRATING Contextually in Products and Processes
6. Mobilizing Market Constituents
7. PROMOTING Adoption
8. Mobilizing Complementary Assets for Delivery
9. SUSTAINING Commercializa-tion

BRIDGES: SATISFYING AND MOBILIZING STAKEHOLDERS AT EACH STAGE

Figure 7:   Vijay Jolly's Model of Technology Commercialization

THE LINK BETWEEN MOORE'S "PSYCHOGRAPHS" AND JOLLY'S "BRIDGES"

These "bridges" to some extent mirror the *psychographic* groups defined by Moore's adapted technology adoption life cycle curves. Each bridge represents a new set

of constituents that must accept the new technology. As stated earlier, each group has different requirements that must be addressed to continue the commercialization process.

The bridge between the "imagining" stage and the "incubating" stage can be correlated to the "innovator" psychograph described by Moore. According to Moore, "In business, [innovators] are the gatekeepers for any new technology. They are the ones who have the interest to learn about it and the ones everyone else deems competent to do the early evaluation". (Moore, 32) The level of acceptance of a new technology by innovators can determine the fate of the technology. This aligns with the requirement to mobilize interest and gain endorsement. Jolly says "…the need for early endorsement by those whose opinion matters" (Jolly 58) is critical to mobilizing interest and gaining endorsement, the first "bridge" of technology commercialization.

The bridge between "incubating" and "demonstrating" can be correlated to the "visionary" (early adopter) psychograph described by Moore. The "visionary" has the foresight to apply the technology to a business opportunity. Their ability to see an application for a new technology as a business advantage is what separates them from the "innovator". Jolly seems to agree with this theory. He states that the "inability to translate applications conceived into concrete products" (Jolly, 123) can prevent a technology from further progress. If the innovator does not see an opportunity for advantageous application of the technology, this portion of the early market cannot be obtained.

The bridge between "demonstrating" and "promoting " can be associated to the "pragmatist" (early majority) psychograph described by Moore. The "pragmatist" has a very different view of technology advancement and adoption than the "innovator". Stability, commonality and support are very important to the "pragmatist". "When pragmatists buy, they care about the company they are buying from, the quality of the product they are buying, the infrastructure of supporting products and system interfaces,

and the reliability of the service they are going to get" (Moore, 43) As well, the "pragmatist" psychograph represents a large portion of the market volume, roughly twice that of the "innovators" and "visionaries" combined. Effort towards developing relationships with "pragmatists" is necessary to commercialize new technology. Jolly states "the key is to find out who the key influencers are and to work out a strategy for co-opting them in delivery of the technology and the creation of its demand". (Jolly, 181) This is very similar to Moore's first step in gaining a foothold in a saturated mainstream market. Mainstream technology adoption requires targeting a specific niche market and applying all effort to becoming the leader in that niche. The niche should be a market that has what Moore refers to as a "broken mission-critical process". By targeting and demonstrating the way a new technology can fix this broken process to those who "feel its pain", one has essentially found the key influencers that Jolly describes. These influencers have the capabilities to mandate that your technology be applied to the problem. A key characteristic of the "pragmatist" is that they look at their industry as a whole for references for technology adoption. "Word-of-mouth corroboration of buying decisions is a key criterion in the pragmatist's adoption process". (Moore, 86) The "pragmatist" has the ability to create the widespread demand via word of mouth referencing in the early majority that Jolly describes as a key to promoting new technology. (Moore, 46-49)

The final bridge between "promoting" and "sustaining" can be associated with Moore's "conservative" (late majority) psychograph. The late majority represents the same market volume as the early majority. Although this is the case, the late majority is often overlooked and not aggressively pursued by many 'high-tech' companies. The final bridge in Jolly's model leads to the "sustainment" phase. The sustainment phase addresses what is required to attain the late majority consumer. Jolly seems to understand

that the large portion of any markets' value lies with the late majority adopters, recognizing that "The value of a new technology… is realized in the process of sustaining its commercialization" (Jolly, 306) The goal of sustainment is to "migrate [technology] to new segments of the market or to new applications" (Jolly, 283) Moore states that "Conservatives have enormous value to high-tech industry in that they greatly extend the market for high-tech components that are no longer state-of-the-art." (Moore, 48) The "conservatives" are the new market segment that Jolly references. Attaining sustainment involves attracting customers beyond the early majority. Ultimately the only way to sustain commercialization is to capture the late majority adopter market by providing low-cost products with robust functionality.

THE COMBINED PRODUCT AND MARKET COMMERCIALIZATION MODEL

By combining the product-oriented focus of the "Jolly" commercialization model with the market-oriented focus of the Technology Adoption Life-Cycle, a detailed model of technology commercialization exists. Both of these models provide extensive insight into the product attributes and consumers' psychological mindsets associated with introducing new technology. This combined model will be used as the foundation for the proposed framework described in chapter three. This thesis is focused on successful introduction of a product or service into the mainstream market. Therefore, the combined model is truncated and will not focus on the "late majority" psychograph required for successful sustainment. The following paragraphs will address the stages and bridges of the combined commercialization model with concrete activities that can be used to accomplish the goals described by Jolly and Moore.
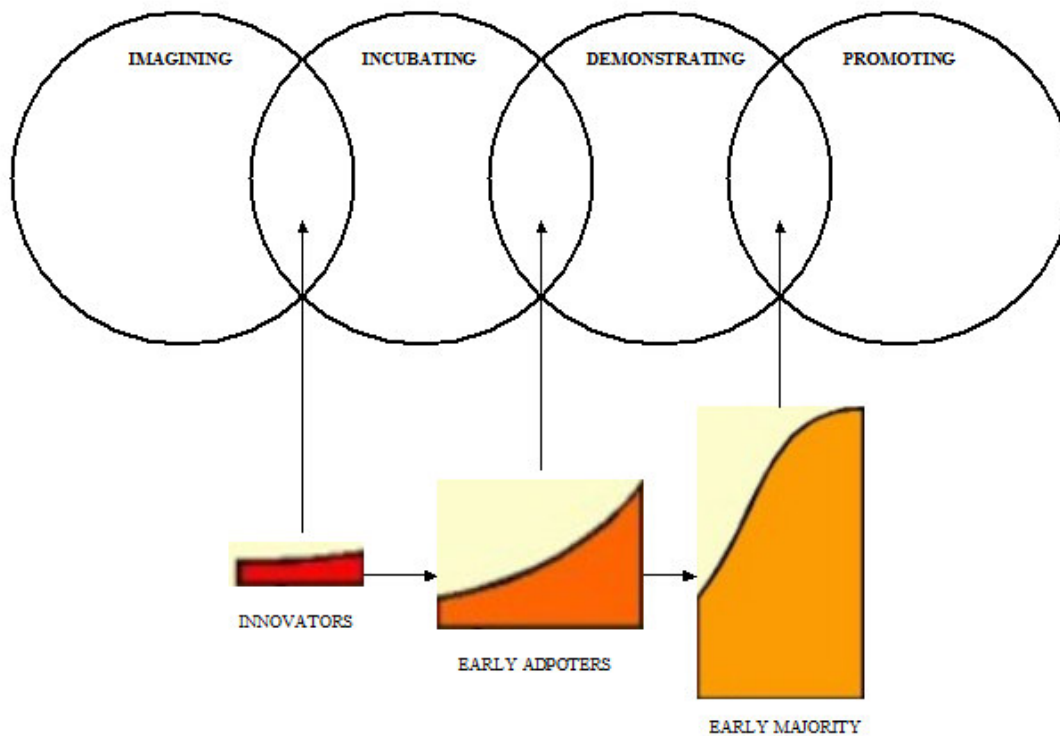
Figure 8:   Combined Product and Market Commercialization Model

"GRASS-ROOTS" TECHNOLOGY COMMERCIALIZATION

Further research was completed to attain a "grass-roots" view of product commercialization. The goal was to generate a list of specific activities or techniques defining the application of the theories proposed by Rogers, Moore and Jolly. This research is focused on true-life experiences of successful entrepreneurs to identify critical aspects related to success. It is proposed that the extent to which these points are reiterated by independent sources can be an indicator of the importance of the activity or technique.

Entrepreneurial Personality Traits

The focus of this thesis is to develop a process by which an entrepreneur can have the greatest chance of successfully commercializing new technology. For this reason the techniques described in the literature survey have been discrete activities rather than focusing psychological or personality traits of so called "successful" entrepreneurs. This thesis makes the assumption that those interested in pursuing the process will possess some of the traits common to the stereotypical successful entrepreneur. With this being said a brief description of those personality and psychological traits will be discussed.

The mindset of this aspiring entrepreneur sets them apart from others. They are the "go-getters". "…it has been made clear that a large number of entrepreneurs affirmed personal initiative as one of the major key to success." (Rose et al, 74-80) If they cannot convince themselves to initiate the process, success is impossible. Successful entrepreneurs also have the drive to constantly learn. Specifically, by learning what is critical to making their current venture successful. "Outstanding entrepreneurs are driven by compelling visions and learning, and the creative capacity to acquire and use information is instrumental to business success." (MacPherson, 46-51) The success of entrepreneurship classes is proof of this innate drive to learn. Given the opportunity to learn entrepreneur specific skills, many aspiring entrepreneurs take advantage. "Today entrepreneurship education is everywhere. More than two-thirds of U.S. colleges and universities-well over 2,000, up from 200 in the 1970s-are teaching it…" (Whitford)

Personal Investment In An Idea

Before any entrepreneur can get started he or she must have an idea. The inspiration, passion and belief in this idea must be genuine. Many successful entrepreneurs agree that being truly excited about the ideas they had is one of the most important factors that lead to their success. In Fried and Hansson's book *Rework*, this

concept is stated very early. "To do great work, you need to feel like you're making a difference [and] that you are part of something important". (31) Guy Kawasaki mirrors this statement very early in his book *The Art of The Start*. The first thing Kawasaki lists as the most important things an entrepreneur must accomplish is to "Make Meaning". "The best reason to start an organization is to make meaning – to create a product or service that makes the world a better place". (3) This meaning should have little to do with monetary rewards, ego or pride. Robert Touchman, owner and Founder of TSE Sports Entertainment and Author of *Young Guns* describes how a personal attachment and passion for your work is required. "You have to commit yourself without reservation to do something that you love to do". (13) All of theses statements repeat the same concept; Belief in the vision or meaning, and total personal commitment to making something better, be it your own life or someone else's, is a prerequisite for success. Many challenges exist on the road from idea to success. Having an emotional investment in what you are trying to accomplish can provide the strength and resilience to get through the tough times, which will inevitably arrive. Making the idea real means starting by putting it on paper. Defining a list of goals and specific tasks followed by tying those to a timetable initiates commitment to pursue the idea. The simple act of stating one's intentions creates commitment and a sense of urgency to produce results. Inc. Magazine creates a list called the "Inc. 500" every year. A study of companies that made the list in 1997 shed light on their success. The study revealed that verbalizing their intentions was a pivotal moment for the founders. "Once these entrepreneurs had announced their ambitions to their colleagues, their siblings, their mothers...and themselves, there was no time to waste." (Greco, 28)

Where To Find Great Ideas

Great ideas can come from a number of sources. One of the repeating sources for ideas came from the entrepreneur's own needs or problems, and the lack of a suitable solution in the existing market. "The easiest, most straightforward way to create a great product or service is to make something *you* want to use." (Fried et al, 34) The insight and understanding of the problem and possible solution are very well connected in this scenario. "This is the best kind of market research – the customer and the designer are the same person." (Kawasaki, 12) By using one's own desires and needs as motivation to create a new product or service, there is a higher probability that the personal investment in the idea exists and is much stronger than just randomly selecting a market to enter. "…this "solve your own problem" approach lets you fall in love with what you're making". (Fried et al, 36)

In Peter Drucker's book *Innovation and Entrepreneurship*, he identifies "Seven Sources for Innovative Opportunity". He describes "incongruities" as a source for innovation. Incongruities come in four forms; (1) Incongruous economic realities (2) Incongruity between reality and the assumptions about it, (3) incongruity between perceived and actual customer values and expectations, and (4) incongruity within the rhythm or logic of a process. (Drucker, 57-58) The study by Inc. Magazine referenced previously revealed that 60% of the start-up founders identified an opportunity in the industry they were employed in at the time. Generally, familiarity with available products and services allow the entrepreneur to recognize these incongruities. "The incongruity within a process, its rhythm or logic, is not a very subtle matter. Users are always aware of it." (Drucker, 68) This recognition of a gap between what exists and what is required can be the entrepreneur's impetus to create an innovative solution to fulfill the need.

Those who consistently generate ideas do some things in common. Those who generate ideas purposely dedicate time solely to idea generation. They make a point to delegate tasks and responsibilities to other capable people or organizations so their time will be available for idea generation. "…the CEOs who generate ideas most consistently are mindful of doing whatever they need to--hiring, delegating, reorganizing--to give their minds time to roam." (Greco, 76-82) Scott Berkun reiterates this point. "In any field, creatives are those who dedicate themselves to generating, working and playing with ideas". (88) Sean Toulon, executive vice president of product and brand creation at TaylorMade Golf attributes the success of the company to the extensive amount of effort put into the idea generation process. "We spend more of our time here on the creation of whatever it is, idea, product… than anything [else]." (Baldwin) The ideas generated must be maintained in an organized fashion. This prevents ideas from slipping through the cracks and allows for reviews at a later time. Brad Cary, CEO of CIBT Inc., a travel services company prescribes to this process. "Just logging his ideas into a computer every week can help him assess whether a concept is worthy of future follow-up. "The exercise is as valuable as the idea itself," says Cary." (Greco, 76-82)

The time dedicated to idea creation should be organized in a way to maximize its effectiveness. Linus Pauling, the only winner of two solo Nobel Prize awards in history, had this to say about finding ideas: "The best way to have a good idea is to have lots of ideas". (Berkun, 85-86) Effective use of "brainstorming" can generate many ideas. Alex F. Osborn coined the term "brainstorming" in his book *Applied Imagination*. Based on his research, he identified four rules for idea generation in this book. First, produce as many ideas as possible. Second, produce ideas as wild as possible. Third, build upon each other's ideas. Fourth, avoid passing judgment. (Berkun, 92)

At this point the entrepreneurs should have a list of ideas that can be pursued. The problem now becomes how to select the most promising idea. A multitude of processes exist for ranking ideas. Entrepreneurs should consider their selections based on their capabilities. For example, the selection process should account for availability of resources, complexity of the product or service and legal liability attached to the product or service. (Greco, 76-82) It is an assumption that most entrepreneurs have limited capital. The idea selection process should have a built in "Bootstrapping" bias, which will be discussed in further detail in the "Business Models" section.

Business Models

The goal of the business model is to begin with a "ground-up" approach rather than a "top-down" approach. Instead of basing financial projections on attaining a share of the total market size, as with the top-down approach, the projections should be based on the organizations capabilities. The extent to which the organization can produce a product or perform a service, the extent to which the organization can reach customers, the extent to which the organization can increase its capacity. This is a much more accurate approach to a business model than the top-down method. "…[the] bottom-up model yields a much more realistic forecast than even the most pessimistic market share estimates…" (Kawasaki, 82) The result of this model will be a "sanity check" to determine if the idea is worth pursuing. All aspects of pricing should be manageable and adjustable through this model. The prototype phase will provide the entrepreneur with information on expenses required to deliver the product or service. Based on this information a price point can be set and evaluated for competitiveness.

For small organizations, cash is typically a scarcity. While profitability is a key requirement for any successful business, the goal at the fragile beginning stages should be for cash flow. Guy Kawasaki refers to this overall concept as "Bootstrapping". The goal

of bootstrapping is to spend the least amount possible to attain the most cash flow. Bootstrapping should be considered in all phases of the commercialization process. Kawasaki notes a few key characteristics that can accomplish the bootstrapping business model: (1) Low up-front capital requirements, (2) short (under one month) sales cycles, (3) short (under one month) payment terms, (4) recurring revenue, (5) word-of-mouth advertising. The main goal of "bootstrapping" is to challenge the organization to minimize expenses. This priority can increase the odds of maintaining positive cash flow. (80) Asking oneself "do I really need this?" can facilitate the bootstrapping process. (Fried et al, 53) For example, Tomima Edmark created a hair-braiding device called the "TopsyTail". Her idea has grown into a multimillion-dollar company that only has two fulltime employees. By leveraging many aspects of the business from manufacturing to filling orders and shipping products, Edmark has used outsourcing to bootstrap her business. (Gettes et al, 21-27) The methods selected to manufacture and deliver a product to the customer can dictate expenses. The prototype phase allows for experimentation to determine the ideal manufacturing and distribution network which is critical to development of a bootstrapping business model.

A further discussion of business models leads to a question of whether or not external funding should be pursued. Many entrepreneurs envision pitching their great ideas to venture capitalists. The notion of attaining funding from outside sources can seem very tempting but it comes with problems. The main reason for eliminating or at least minimizing outside capital is to maintain control of the business, to stay focused on the product or service. This ensures that target customers remain the center of attention. By introducing venture capital, an organization has allowed an outside influence to gain partial or even majority control of the organization. As well, venture capital isn't free. Considerable effort must be expended to secure the capital, while foregoing opportunities

to promote and develop the product or service further. The goal of the venture capitalist does not necessarily align with those of the customer. Customers want products and services that help them, venture capitalists want returns on their investment. This puts the organization in a tough spot, torn between the demands of their benefactors and the needs of their customer base. The potential for neither party to be satisfied is a reality. (Fried et al, 50-51) A 1997 study by Inc. magazine polling companies that made the Inc. 500 list revealed facts about sources of funds for their start-ups. 79% percent of the companies polled were started with funds that originated from the founders personal savings. In contrast only 3% were started with funds originating from venture capital. (Greco, 28)

Prototypes

The value of the idea does not come to fruition until a concrete product or service exists. "Prototypes transform an idea into a product you can see and touch. You can then detect potential design flaws, as well as test the product out with potential customers, lenders and contract manufacturers." (Gettes et al, 21-27) Creating a prototype is the first step towards a finished product or service. Fried and Hansson agree with this sentiment. "Until you start something your brilliant idea is just that, and idea." (38) Surprisingly, this is where many entrepreneurs stall on the road to commercialization. "Few of us ever follow through, though, because the notion of actually producing it seems so daunting." (Gettes et al, 21-27) Kawasaki states, "The hardest thing about getting started is getting started." (10) The key requirement is that the prototype has the minimum level of functionality to do what it was intended to do and can be demonstrated publicly. Perfection is not the goal here. "When good enough gets the job done, go for it". (Fried et al., 113) There are many methods that can be employed to create a prototype. Annmarie Gettes and Laurel Touby of Executive Female Magazine identify four ways to have a prototype built. These ways are to build the product yourself, to have a factory make it

for you, buy it wholesale and repackage it or assemble the product from components. (21-27) The cost and energy required by the entrepreneur to manufacture the product themselves or to have a factory build it can be daunting. Building a factory can require a large up front capital investment. Contracting an existing factory can be an expensive proposition also, requiring up front investments for tooling and design. The latter two options apply the "bootstrapping" philosophy by leveraging existing products and capital investments made by others. The investment made by the entrepreneurs is in the integration effort. By assembling a product from components or buying a product wholesale and repackaging it, the entrepreneur can avoid the costs associated with new design and manufacturing.

As discussed in the literature survey, Geoffrey Moore explains that one of the keys to gaining acceptance by early majority consumers is to ensure a new technology can easily be integrated into the existing infrastructure. This must be considered when designing a prototype. Features designed into the prototype can control the ease of integration into and existing infrastructure or way of doing things and must be closely considered. Scott Berkun describes this theory graphically in his book *The Myths of Innovation*. He defines better ideas as having more "goodness". Ease of adoption and "goodness" intersect at the innovation sweet spot. (Figure 9) "…the most successful innovations are not the most valuable or best ideas, but the ones that appear on the sweet spot between what's good in the expert's perspective, and what can be easily adopted…" (Berkun, 123)
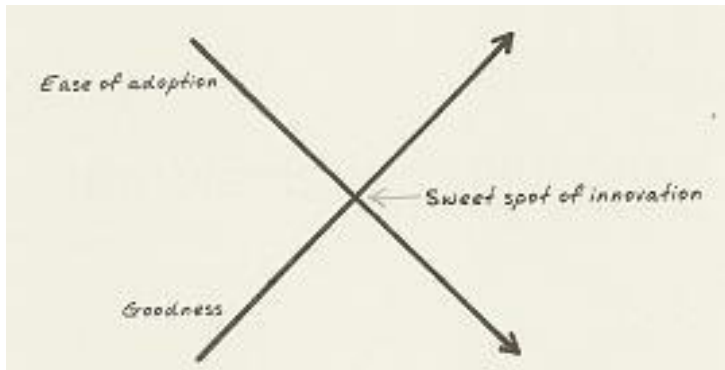
Figure 9:   Berkun's "Goodness" / Ease of Adoption Relationship

Demonstrate The Prototype and Adapt Based on Feedback

Demonstrating can be one of the most value-added steps in the commercialization process. Demonstration serves more than one purpose on the path to commercialization. The goal of demonstrating is to allow customers to test a new product or service and submit feedback concerning product features and functionality. Feedback is used to refine and adapt the product or service. Demonstrating can also help more accurately define the target market segment, which will be necessary later in the commercialization process.

Feedback based on live interaction with users and products is very valuable. "To be absolutely confident that the design outcomes at any particular stage still coincide with the customers' requirements, it is necessary to involve customers in a verification role throughout the [new product development] process." (Campbell et al, 617-35) Making a new product or service easy to demonstrate is required. A study performed by The Central Technology University in South Africa and Loughborough University in the UK recognized the value of hands-on customer testing. By using rapid prototyped physical models during the product development process, they were able to get instant feedback on functionality and ergonomics. This ensured that "…evolution of the product design [was] kept consistent with customer requirements". (Campbell et al, 617-35) For

example, the entrepreneur can facilitate customer testing by allowing trail periods for software or allowing interested constituents to "test-drive" a product for a short period of time to better understand the benefits it can provide.

Experience with a product or service should elicit a reaction for the end-users. Both very positive and negative reactions are to be expected. The goal is to create an emotional response to what you have done. In *The Art of The Start* Guy Kawasaki says the goal should be to "polarize people". (10) A product demonstration in which user reactions are neither highly positive nor negative could be an indicator of a poor product. As stated in the "Prototype" section, a product or service is ready to demonstrate when the fundamental functionality exists. It does not have to be perfect and in fact it is ideal if it is not. The input provided by those users that seems to really like the product should be considered during the refinement and adaptation stages. Instead of guessing how to change the product or service, demonstrating and receiving feedback from interested end-users explicitly directs refinement and adaptation efforts in a way that is valuable to end-users. This is critical to success. "…Effectively capturing and understanding customer requirements and responding to them promptly in a product offering is a prerequisite for gaining market acceptance and customer satisfaction." (Park et al, 10683-10647)

There must be a forum for feedback integrated into the demonstration so a communication channel from users back to the product designers exists. The forum for feedback can assume numerous forms. "How to collect such data has been the main theme of previous studies and various methods have been suggested, such as comment cards, formal surveys, focus groups, direct customer contact, field intelligence and complaint analysis. These methods have proved to be quite useful, but most of them are subject to problems of cost and geographic reach." (Park et al, 10683-10647) The entrepreneur's "Bootstrapping" focus suggests that the most effective forum would be

one that maximizes reach while minimizing cost. Online forums can overcome some of the deficiencies that make traditional feedback methods undesirable for "Bootstrapping" entrepreneurs. "…such problems can be relieved to some extent with the development of information technology (IT), facilitating and enhancing the intensity of customer–firm interactions beyond the geographic boundary at a low cost, thereby creating new avenues of value creation." (Park et al, 10683-10647) "Recognizing the virtue of online channels as a medium for customer–firm interactions, firms are now running their own online customer centers dealing with customer requirements." (Park et al, 10683-10647) "Therefore, online customer centers can be an ample source of customer knowledge, full of customer reactions on existing products and customer expectations on new products." (Park et al, 10683-10647) Forums for feedback should facilitate interaction not only between the end-users and the designers, it should allow end users to communicate and exchange ideas with each other. The refinement and adaptation effort can be idealized as an iterative loop. Refinement and adaptation allows for the integration of tester recommended changes or upgrades. This refined and adapted product or service can be released again and the demonstration process can start again. Thus, the product or service can loop between demonstration and refinement numerous times. There must be a focus placed on minimizing the time cycle associated with iteration process.

The demonstration process reveals insight into market segments that are interested in the capabilities that the product or service can provide. By identifying those who are the most interested (those who feel the most pain from the problem that is being solved by the new product or service), a target segment of customers can be defined more accurately. This insight presents a clearer picture of the stereotypical end user and their mindset. How to use this information will be described in the following section. The demonstration process allows for a relatively low cost marketing analysis and research.

This is essentially marketing on a "Bootstrapper's" budget. The demonstration and refinement loop adds value to the product or service in the future customer's eyes and can be relatively inexpensive. Once again, this process is only possible if a forum for feedback exists.

This forum for feedback also presents the opportunity for the owner of the new technology to create a fan base or a following. This can be leveraged as a marketing and advertising tool. The reason for this is because "Evangelists believe in your product or service as much as you do, they want to carry the battle forward for you and with you." (Kawasaki, 173) A Dedicated fan base can be employed to spread the word about your product or service to other possible users. The goal is to recognize those "evangelists" and provide them with the tools and motivation to continue the mission to spread the word about the product or service. These people should be recognizable based on their enthusiasm. They will present themselves. "An audience returns often – on its own – to see what you have to say." (Fried et al., 170) Fostering the growth of a community that rallies around one's organization should be a priority. The "evangelists" will act as the core of the community. Creating a community around your product or service "[provides] customer service, technical support, and social relationships that make owning a product or utilizing a service a better experience…" (Kawasaki, 177) Ultimately, leveraging end-users passion and enthusiasm for a product or service can be a cost effective bootstrapping strategy for furthering the extent to which a new product or service is adopted. As discussed in the literature survey, word of mouth advertising is a very important method of information exchange between "pragmatist" consumers. These evangelists will be the loudspeakers that broadcast this message. It is in the entrepreneur's best interest to facilitate their communication.

Targeting Niche Market Segments

One common theme reiterated by almost all successful entrepreneurs and leaders of small organizations is to start entry into a mainstream market by targeting a niche mainstream market segment. "According to experts, choosing a niche is a smart strategy for businesses with fewer resources than their corporate competition. They say that entrepreneurs who can manage this are much more likely to succeed and thrive than their general-market counterparts." (Turner, 93-100) The goal of targeting a niche is to identify a mainstream segment in which to fully focus ones sales and marketing effort. This methodology puts focus on the segment most likely to accept the new product or service. Also, this provides a reference point for other early majority consumers, which as discussed previously, is necessary for continued mainstream success. Based on the demonstration and refinement process detailed in the previous paragraph, the target segment should become easier to identify. This section will describe techniques used to more clearly identify a niche segment to target.

Targeting a niche is one of the four goals described by Geoffrey Moore in *Crossing the Chasm*. The goal is to identify those in the mainstream that could most benefit from the advantages provided by a new product or service. The goal is not to target the market segment based on size or potential revenue, but by the need to fix a broken mission-critical process and the potential that the selected niche has to facilitate entry into larger market segments. "…when you are picking a chasm-crossing target it is not about the number of people involved, it is about the amount of pain they are causing." (Moore, 78) Moore describes two factors to consider when determining the niche segment. First, the niche must be readily achievable. Second, the niche should have the capability to be directly leveraged into long-term success. (67) Moore further describes the necessity of targeting a niche segment that should be of interest to a bootstrapping

entrepreneur. By picking a tightly bound market segment, one can leverage word-of-mouth advertising. "The more tightly bound [the segment] is, the easier it is to create and introduce messages into it, and the faster these messages travel by word of mouth." (Moore, 66) Moore follows this by stating, "Numerous studies have shown that in the high-tech buying process, word of mouth is the number one source of information buyers reference…" (Moore, 69) The self-referencing nature of the early majority consumer can be used to the advantage of the entrepreneur. The only way an entrepreneur can leverage word of mouth advertising though is to ensure a niche market segment is specifically defined and targeted. Moore's explanation for targeting a niche segment coincides Kawasaki's bootstrapping strategy discussed in the previous sections. Both agree that by leveraging word of mouth advertising the entrepreneur can minimize expenses and maximize reach into a specific group of consumers. Kawasaki also adds two thoughts to consider when determining a target market segment. First, it should be immediately obvious to the target market segment that they need your product or service. Second, the target segment should convince themselves that they need to buy what you are offering. (81) This so-called "auto-persuasive" nature of the product or service is obviously desirable. Robert Tuchman agrees with the strategies proposed by Moore and Kawasaki. "In fact, it is essential to have a specific focus when you are starting a business." (43) Tuchman frames the question of determining the niche target segment in an alternative manner though. He asks, "Who would I be helping with this business?" (43) Surprisingly, many entrepreneurs believe that targeting niche markets it exactly the opposite approach they should take. By striving to appeal to a broad base of mainstream customers, they prevent their product or service from being adopted by any specific market segment. This ultimately leads to death in the "chasm".

Standing out in the eyes of the target niche segment is a key to positioning a product or service. The product or service should differentiate itself based on both market alternatives and product alternatives. A description of these market alternatives follows. The use of market and product alternatives depends on two competitors as references to help the market understand the advantages provided by one's product or service. The *market alternative* is the incumbent organization that the target segment has been buying from. To differentiate oneself from the market alternative, the new product or service must "use a discontinuous product innovation to address a problematic limitation in the traditional offer." (Moore, 138) The *product alternative* is a comparable technology that can be referenced to validate the application of the new technology to the problematic limitation in the traditional offer. The difference between the product alternative and the new technology is that the product alternative is not as specialized for the task required by the niche market segment as the new technology being offered. This method of positioning clarifies to the market where the new product or service exists. It explains how the methodology of the solution and specialization of the technology combine to create a superior process to accomplish a task. Guy Kawasaki created an interesting but easy to understand image of product positioning. Only two factors exist in his consideration of positioning. (1) Value to customer of the product or service. (2) Ability to provide a unique product or service. (Figure 10) Both factors must be high to potential customers. (Denoted by the large '**X**' on Kawasaki's graph) If one wishes to position their product as well as possible, searching out market segments that would see value in the product or service being offered is necessary. This provides insight into the niche market segment to target.
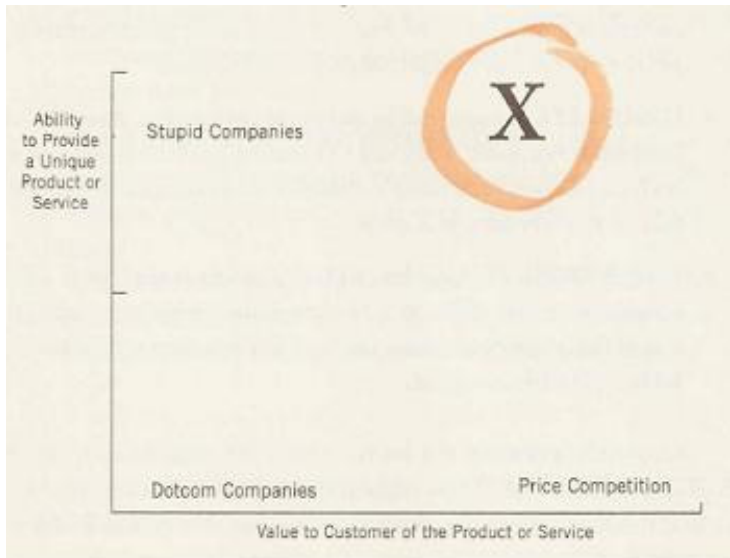
Figure 10:   Kawasaki's Product or Service Positioning Graph

I can be advantageous for the bootstrapping entrepreneur to differentiate its products or services from those of an established competitor. "Positioning against the leaders or standard ways of doing business can save lots of marketing, PR, Promotion, and advertising dollars…" (Kawasaki, 91) Taking advantage of this positioning technique requires that you select a point of differentiation in one's product or service that customers actually care about. Three other conditions must be met too. (1) The leader is worth positioning against; (2) The leader doesn't eliminate the advantage one's product or service provides; (3) The product or service surpasses the competition's in a truthful, perceptible and meaningful way. (Kawasaki, 91)

The demonstration and refinement phase should have provided insight into those who were most interested or would benefit most from the demonstrated product or service. With information about possible customers in mind the entrepreneur already has a starting point for defining the target niche segment to focus on. In *Crossing the Chasm*, Moore presents a framework for identification of a niche segment. Moore characterizes

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target customers by the use of "scenarios". "The idea is to create as many characterizations as possible, one for each different type of customer and application for the product." (Moore, 94) Following the development of characterizations a fictional scenario can be developed. The scenario aims to paint an image of life before and after the application of the new product or service. At this point the scenarios can be rated based on what Moore calls "show-stopper" factors. These factors are "Target Customer", "Compelling Reason to Buy", 'Whole Product", and "Competition". (99-101) There must be a target customer identified and capable of paying the price for the product or service. The target customer must have a compelling reason to buy the product or service immediately. Moore states "If pragmatists can live with it for another year, they will." (100) The entrepreneur must be able to field a "whole product" solution quickly. The "whole product" includes support and infrastructure required to maintain the product or service beyond the initial purchase, and to truly make it function as promised. (Moore, 108) This "whole product" concept allows for increased ease of adoption. The closer to a "whole product" the offering is, the closer it moves to the "Sweet spot of innovation" noted in Figure 9. Moore's use of scenarios is just one way to hone in on a niche market segment. This methodology provides the greatest chance of gaining a foothold in the mainstream market and becoming a legitimate supplier of products or services to the valuable market of Early Majority / Pragmatist consumers.

Chapter 3: The Entrepreneur's Framework for Technology Commercialization

Based on the combined product and market commercialization model developed in chapter two (Figure 8) and the "grass roots" technology commercialization strategies described in the literature survey, a framework tailored for the entrepreneur that describes product or service commercialization can be defined. This framework proposes that there exist some specific and important strategies that many successfully entrepreneurs use to successfully commercialize innovative products or services. The framework attempts to define and organize these strategies into a process that can be followed. The framework does not guarantee an entrepreneur's success commercializing a product or service, but asserts that it could increase the potential for that outcome. Based on the research presented in the literature survey, by foregoing application of the strategies entailed in the framework, the entrepreneur's potential for successful commercialization of a product or service would decrease.

FRAMEWORK ARCHITECTURE

The framework is broken into four discrete phases defining the steps to mainstream product or service commercialization. Market constituents connect each phase to the previous phase. For this reason they will be referred to as "links". The phases are defined as "Idea", Prototype", "Demonstrate and Adapt" and "Target and Differentiate". The goal of each phase is to define <u>what</u> must be done, <u>why</u> it must be done, and <u>how</u> it can be done. The "what", "how" and "why" change at each discrete phase. The "what" defines strategic goals that must be accomplished during the phase. The "how" highlights specific tactics that can be used to accomplish the strategic goals.

The "why" gives an explanation for why the strategic goals must be accomplished. The goal of the "why" is to give the entrepreneur insight into the process. This could inspire independent thought and allow for creative additions to the "how". The final pieces of the framework are the links. They define the "who" of the entrepreneur's commercialization process. The links represent those who must be involved, identified or satisfied to allow the process of commercialization to continue to the next phase. The links between each phase are unique to that transition alone. Correctly identifying these links is required to progress through the process. The framework will be drawn as a diagram that parallels the combined model proposed in Figure 8. The following paragraphs will define and discuss the variables of each phase and link. Finally, a flowchart will summarize the components of the entrepreneur's commercialization framework discussed in chapters two and three.
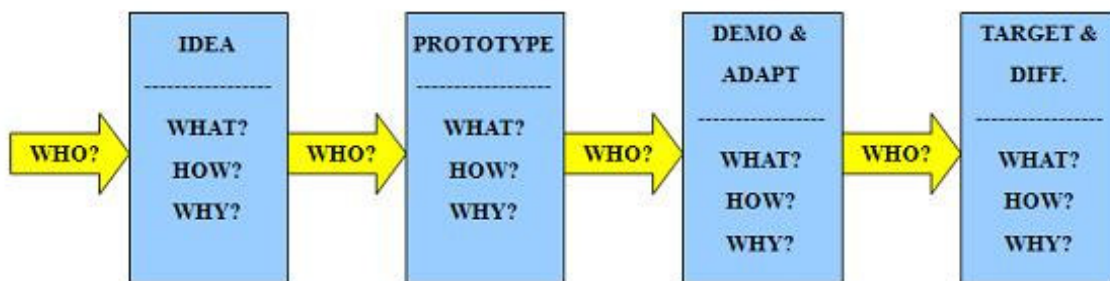
Figure 11:   The Entrepreneur's Technology Commercialization Framework
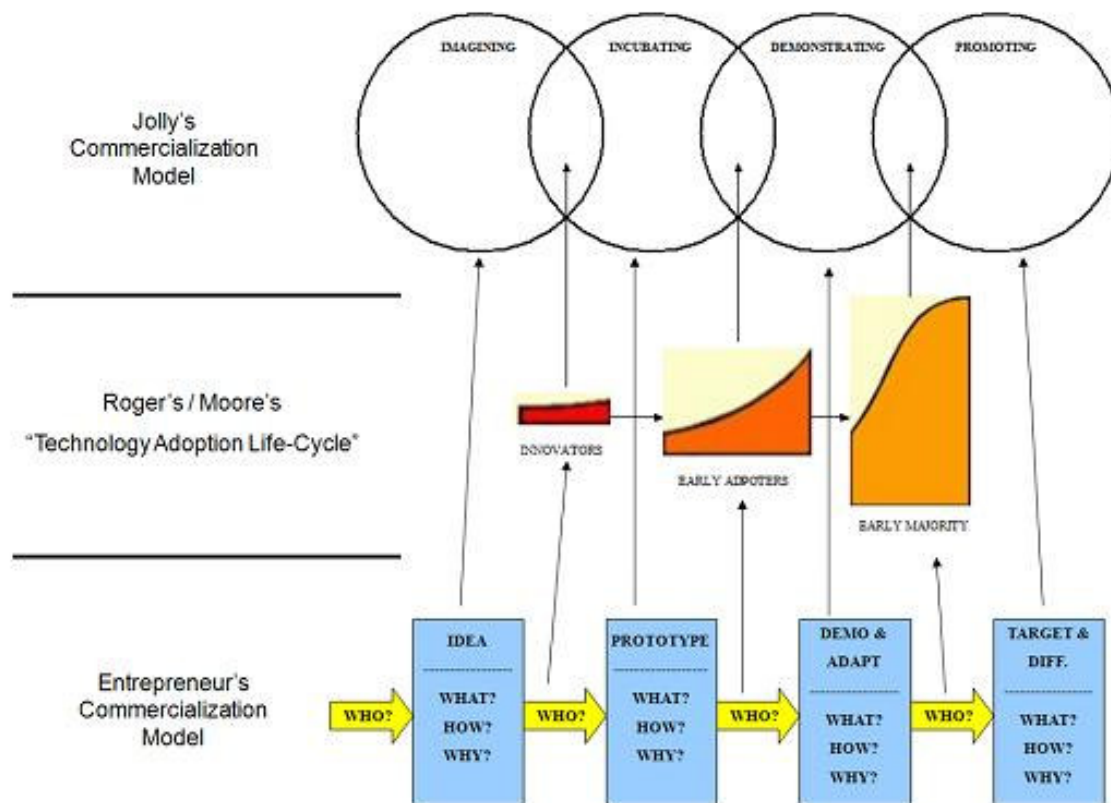
Figure 12:   Comparison of The Entrepreneur's Technology Commercialization
              Framework and The Combined Technology Commercialization Model

Idea Phase

There are two main requirements in the Idea phase. The first is to generate a good
idea for a new product or service. The second is to have a personal commitment to that
idea. These two go hand-in-hand and must exist together. The people who pursue the
entrepreneurial path have certain characteristics that set them apart from others. Those
traits will be discussed briefly.

The precursor to the idea phase is a link. This link is not noted in the combined
technology commercialization model described in Figure 8 but is implied. Before the idea
phase begins there is one constituent that initiates the process. The "who" in this link is

the aspiring entrepreneur himself or herself. The mindset of this aspiring entrepreneur sets them apart from others. Entrepreneurs are motivated to succeed. They possess strong personal initiative as well as a desire to continuously learn about the environment in which they work.

The entrepreneur must have a strong personal commitment to their idea. The personal commitment creates a direct link between customer needs and product or service's functionality, since the customer and designer are one in the same. These goals can be accomplished in a number of ways. By making something you want, personal commitment to the idea can be forged. Familiarity with problems in a process, product or service gives the entrepreneur insight that outsiders might not have. Recognizing incongruities in existing processes, products or services can spawn ideas. This search requires time. Time must be dedicated to the idea generation process. This time must be used wisely with the use of organized brainstorming. Maintaining a database of ideas ensures none are lost and allows for review at any time. The review process should include metrics that allow the idea's promise to be measured quantitatively based on the capabilities possessed by the entrepreneur.

Prototype Phase

There are two goals associated with the Prototype phase. The first goal is to develop a functioning prototype of the product or service generated in the Idea phase. The prototype must have a minimum level of functionality required for demonstration. The second goal is to develop a business model based on the information gathered designing or building the prototype.

Those who are associated with the link between the Idea and Prototype phases must be identified. These constituents are the Innovators / Technology Enthusiasts described in the literature survey. Recognized technical experts can provide insight into

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the idea, offer suggestions or point out serious deficiencies in concept or understanding. The goal is to identify non-starters if they exist and to garner support for the technical foundation and feasibility of the idea.

The entrepreneur must begin by defining a basic level of functionality required by the prototype. Building a prototype can be accomplished multiple ways. The prototype can be built by manufacturing all of the required components oneself. Alternatively, identifying a manufacturer that possesses the capabilities to manufacture the required components and contracting the production is an option. Both of these options can require significant up front capital investment. Leveraging existing products manufactured by suppliers is typically a low cost option available to bootstrapping entrepreneurs. This includes repackaging existing components into kits or building a prototype by making it from combination existing components. The business model can shed light on areas where expenses can be reduced and "bootstrapping" strategies can be applied. Reducing the amount of or eliminating outside funding required to accomplish these tasks allows the entrepreneur to maintain control of the product or service and keep the customers needs as the top priority.

The design of the prototype must consider ease of adoption for end users. Design features and configurations employed during the prototype phase will have a great effect on the cost and ease of adoption of the end product. Understanding the limitations of the existing infrastructure in which a new product or service will exist is necessary.

Demonstrate and Adapt Phase

The goal of the demonstrate and adapt phase is to allow people to test the product and to use their feedback in the adaptation process. The feedback facilitates definition of a niche market segment to target, which will be necessary in the following phase.

Those who are associated with the link between the Prototype and Demonstrate and Adapt phase are the Visionaries / Early Adopters described in the literature survey. The goal is to attract these constituents by showing them the possibilities offered by the product or service. Typically, these people have specifically searched you out and found your product or service as a possible new solution to an existing problem or a better way to get something done.

Demonstrating a prototype allows the entrepreneur to gauge the level to which the prototype performs the desired functions. A forum for feedback provides a communication channel between testers and designers. Information from demonstration and feedback is used to adapt and refine the prototype into a product that can be taken to the mainstream market. The demonstration process also facilitates the identification of evangelists that can be the leaders of a community based around a new product or service.

The entrepreneur must make it easy for interested consumers to test their products. This can be accomplished with live product demonstrations, free sample trial periods or free products with limited functionality. Research indicated that the use of websites for customer feedback aligns with the bootstrapping mindset. The low cost relative to other forms of feedback along with the extensive reach make websites an appealing option.

Target and Differentiate Phase

There are two goals in the Target and Differentiate phase. The first goal is to select a niche market segment on which to target and focus sales and marketing efforts. The second goal is to differentiate your product or service from alternatives.

Before the mainstream adoption of a product or service can occur, those who constitute the link between the Demonstrate and Adapt phase and the Target and Differentiate phase must be identified. These people represent the Early Majority / Pragmatists described in the literature survey. They are used as references by other Early Majority / Pragmatists when making buying decisions. The fact that they reference each other is very critical to successful mainstream commercialization. By adopting the new product or service, the niche segment has created a reference point for other Early Majority / Pragmatists. This self-propagating adoption process is the advantage to targeting a niche. The most prominent form of referencing in this psychograph is by word of mouth. The niche must be sized properly to facilitate effective word of mouth advertising. Evangelists can facilitate this word of mouth advertising and they should be encouraged to do so. The entrepreneur must assess the attainability of the niche when making the targeting decision. By focusing on a niche segment the entrepreneur has selected a group of Early Majority / Pragmatist consumers that are most likely to accept the new product or service. Using information from the Demonstrate and Adapt phase the entrepreneur can start to narrow the search for a niche market segment to target. The use of "scenarios" described by Moore can enlighten the entrepreneur as to exactly which niche seems to be most attainable. Ultimately, the use of scenarios can reveal the specific niche whose "pain" would be relieved by the new product or service, therefore making it the most attainable niche segment.

Differentiating a product or service positions it against alternatives. This allows consumers to identify the value of the product and where the product exists in the market. Differentiation can be accomplished by positioning the new product or service against a market alternative and a product alternative. Another "Bootstrapper's" method of differentiation is to position the new product or service against a market leader. This

method leverages the extensive reach and budget that most market leaders have the luxury of spending on advertising, marketing and public relations.

THE ENTREPRENEUR'S TECHNOLOGY COMMERCIALIZATION FLOWCHART

The preceding strategies and framework have been combined into a flowchart that facilitates visualization of the entrepreneur's technology commercialization framework.

Idea Phase

- **What?**
  - Have a good idea
  - Personal commitment to the idea
- **Why?**
  - Creates bond between entrepreneur and idea
  - Direct link between customer needs and product functionality
- **How?**
  - Make something you want to use
  - Look for incongruities
  - Dedicate time to idea generation
  - Use "brainstorming" process for idea generation
  - Log ideas
  - Rank ideas
- **Who?**
  - The aspiring entrepreneur

Prototype Phase

- **What?**
  - Build a prototype with minimum required functionality
  - Develop a business model
  - Consider ease of adoption while designing
- **Why?**
  - First step in creating value
  - Need Something to demonstrate
  - "Bootstrapping" mentality adopted early
- **How?**
  - Make product from existing components
  - Repackage existing components
  - Leverage existing suppliers capabilities
  - Focus on low up-front costs, shorts sales / payment cycles
  - Use you own money
- **Who?**
  - Technology Enthusiasts / Innovators

Demonstrate and Adapt Phase

- **What?**
  - Demonstrate a product or service to people
  - Make refinement based on feedback
- **Why?**
  - Identifies areas for product or service improvement
  - Provides information about the market (who's interested?)
  - Identifies evangelists who can help build a community
- **How?**
  - Make it easy for people to test the product or service
    - "test-drives", loaners, live demos, free samples
  - Create a forum for feedback
    - Websites provide wide reach for relatively low cost
  - Apply feedback to refine the product or service
- **Who?**
  - Visionaries / Early Adopters

Target and Differentiate Phase

- **What?**
  - Select a niche mainstream segment to target
  - Differentiate your product or service against alternatives
- **Why?**
  - Puts focus on segment most likely to accept new product or service
  - Creates point for other mainstream consumers to reference
- **How?**
  - Use feedback from demo and refine to guide identification of niche
  - Look for market segment that "feels / causes the most pain"
  - Assess attainability of niche
  - Assess ability of niche to provide exposure to other market segments
  - Size niche to maximize word of mouth advertising
  - Use "scenarios" to envision application of the product or service
  - Position against competition via market and product alternatives
  - Position against competitors advertising
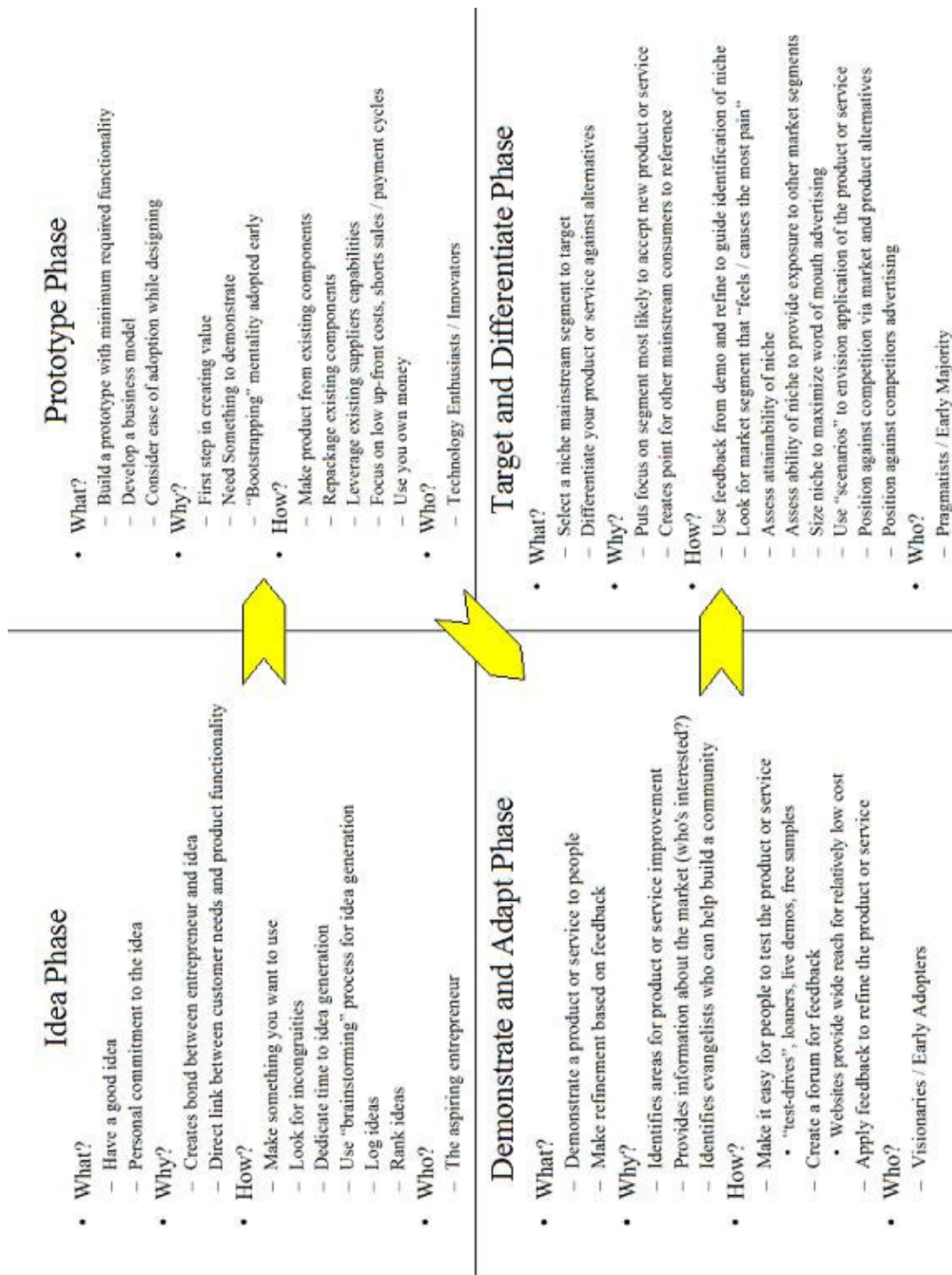- **Who?**
  - Pragmatists / Early Majority

Figure 13:   The Entrepreneur's Technology Commercialization Flowchart

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FRAMEWORK OVERVIEW

The previous paragraphs outline the steps associated with the proposed framework for an entrepreneur to commercialize a new product or service. The framework is unique and specifically oriented for use by entrepreneurs based on importance of "bootstrapping" along the entire process. The framework is based on a combined commercialization model based on Jolly's commercialization process and Rogers' and Moore's technology adoption life-cycle. This combined model is adapted to include "grass roots" techniques described by successful entrepreneurs. The outcome is a framework that defines the process of commercialization in terms of four parameters. Those parameters are <u>who</u> must be identified, involved or satisfied at each stage, <u>what</u> must be accomplished at each stage, <u>how</u> these goals can be accomplished, and why there is a need to accomplish the goals.

CASE STUDIES

Examples exist of both successes and failures in the golf equipment industry. The following case studies describe specific instances in which manufacturers have introduced new products. The degree of their success can be correlated to the requirements proposed by The Entrepreneur's Technology Commercialization Framework.

Adams Golf: "Tight Lies" Fairway Wood

Adams Golf is a relative newcomer to the golf products market. Founded in 1987 by Byron "Barney" Adams, the company has grown into a publicly traded organization generating over $86 million of revenue in 2010. (Adams Golf, Inc.) No small feat in the highly competitive industry. Adams has a passion for golf and played collegiate golf at Clarkson University as an undergrad. He admits that at a young a fear is what motivated

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him to constantly improve and challenge himself. "…to this day I live with the fear that if I don't give my all, failure is just a step away." (Adams, 5) After a number of positions in corporate jobs and a stint at Pelz Golf, Adams opened his own golf club company. The start was rough. He could not sell his golf clubs. He turned to live demonstrations at the Haney Golf Ranch near Dallas, Texas. Included in these live demonstrations was a custom fitting process for the clubs he managed to sell. His real breakthrough came with the "Tight Lies" fairway wood. He realized that many golfers had problems hitting their fairway woods. "While working as a custom fitter, his customers repeatedly asked for a club they could play from "long iron" distance, 180-220 yards to the green." (2010 PGA Ernie Sabyrac Award) He developed a new fairway wood that was easy to hit off of the ground without at tee. The key performance factor was the ability the club had to get the ball to launch on a high trajectory. This allowed golfers to carry the ball further and promoted a soft landing ball that didn't roll far from its intended landing point. This was unlike any long-range club that golfers had in their bags at the time. This immediately resonated with golfers. Sales of the "Tight Lies" fairway woods spiked dramatically. "From 1995 to 1996, sales exploded from $1 million to $3.5 million." (Hise, 114-115) Compared to modest sales of $300,000 in 1992, this was a breakthrough. (Hise, 114-115)

The story of Adams Golf highlights some of the strategies defined in the Entrepreneur's Technology Commercialization Framework. First, Adams actively decided to enter the golf business and design golf clubs. His business was based on his passion for golf and his commitment to the idea that innovative equipment could improve the quality of the game in terms of enjoyment and ease. This aligns with the goals of the first phase of the Entrepreneur's Framework. Adams' personal initiative motivated him to pursue a career in an industry that he wanted to be involved in. He made meaning by designing equipment the he felt would make the game more enjoyable to all who used his

products. He was committed to improving the quality of the game. This commitment for improvement spawned an innovative idea. The idea for the "Tight Lies" fairway wood addressed an incongruity in the game of golf, the inability for many golfers to easily hit their fairway woods far and high. Max Puglielli, Director of Tour Operations at Adams Golf has been with the company since it inception. In a interview he provides insight into Barney Adams focus on idea generation by describing a typical day at Adams Golf. "[Barney] would just walk in, no smiles, no nothing, and he's been dreaming or sitting somewhere creating something having breakfast and he would just throw a piece of yellow paper and go 'What do you think?'" (Adams Golf Videos) Simply put, Adams dedicated time to idea generation and he logged his ideas by writing them down on a legal pad.

Demonstrating developed products was a key part of Adams early business. He spent many hours on the driving range the Haney Golf Ranch near Dallas, Texas allowing patrons to demo his products. This also provided instant feedback via face-to-face interactions with customers and testers. Adams also learned through feedback that his customer had additional demands. He was able to recognize a market demand for a product that didn't exist, which ultimately led to the success of the "Tight Lies" product line. By listening to feedback and providing results, Adams created a cult following. "…through the years [Tight Lies woods have] received rave reviews and unprecedented loyalty. Even today, years since it was first introduced, hundreds of thousands of golfers worldwide still have Tight Lies in their bags." (2010 PGA Ernie Sabyrac Award) Adams recognized the needs of potential evangelists and fulfilled them, creating a community around his product. None of this would have been possible without the Demonstrate and Adapt process.

Adams Golf targeted a niche segment with the "Tight Lies" fairway woods. First, Adams Golf did not attempt to field an entire clubset, instead the focused on the niche segment of fairway woods. Further refinement of the niche narrowed the focus to golfers who needed help getting the ball "in the air" with their longer clubs. This segmentation method puts the focus on golfers with slower swing speeds typically possessed by recreational golfers. Adams Golf also chose a specific avenue to gain the attention of their niche segment. Aggressive use of infomercials allowed Adams Golf to go straight to the consumer, heavily supplementing the existing retail presence. Adams positioned themselves against the big-name club manufacturers by focusing on the needs of recreational golfers. Adams Golf differentiated their "Tight Lies" fairway woods against other fairway woods by providing a unique flight path desired by many recreational golfers.

Tommy Armour Golf: "EQL" Iron Set

The Tommy Armour Golf Company was a predominant golf equipment manufacturer in the 1980s and 1990s. Riding the wave of success gained from the popularity of their "Silver Scot 845S" iron set, Tommy Armour Golf introduced the "EQL" iron set. This was a most unique iron set. Every club in the set was the same length. Cut to the length of a six iron (37.5 inches) the clubs promised increased consistency based on the constant geometry. (Gould) Although the idea has technical merit, the Technology Enthusiasts / Innovators of the golf world were not sold. Two expert club designers, Tom Wishon and Ralph Maltby have both weighed in on the outcome of the failure of the EQL iron set. Ralph Maltby describes his experience with the "EQL" iron set during the prototype phase. "Tommy Armour EQL was a huge failure in the marketplace because it simply did not work. The purpose of a set of irons is to provide two things; first, provide consistent incremental yardages and two, provide

greater accuracy as the golfer gets closer to the hole. The EQL's failed on both." He continues by saying "…longer irons were jacked so strong in loft for their shorter length that is was very difficult to hit them solid and thus the proper distance that was required (very inconsistent)." (Maltby) Tom Wishon believes that the reason for failure lies with the consumers. "…the concept of all woods and all irons being the same length was much too radical for golfers to accept." (Wishon) The head of Marketing for Tommy Armour Golf at the time Rick Papreck seems to agree with Wishon's sentiment. "When you're trying to present a radical product idea," he points out, "it's twice as tough to sell it first to retailers and golf pros then turn around and help them it sell it consumers…" (Gould) This story is unlike the Adams "Tight Lies" fairway woods profiled in the previous case study. The "EQL" iron set failed to gain acceptance by the Technology Enthusiasts / Innovators that constitute the link between the Idea and Prototype phases (golf club design experts and top players) due to so called design flaws. The Early Adopters / Visionaries that represent the link between the Prototype and Demonstrate and Adapt phases (interested recreational golfers) discounted the iron set possible due to the radical nature of the design. Although this was the case Tommy Armour Golf continued to full scale production. Not surprisingly, the "EQL" line failed to gain mainstream acceptance.

Both of these case studies reinforce the strategy defined in the Entrepreneur's Commercialization Framework. The first case study highlights many of the similarities between the success of Adams Golf and the strategies described in the proposed framework. The latter case study describes how disregarding necessary steps in the process defined by the framework can lead to less than adequate results.

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Chapter 4: Application of The Entrepreneur's Technology Commercialization Framework

The reason this topic was chosen as the study of this thesis was to increase personal knowledge of techniques use by successful entrepreneurs to bring their ideas into reality successfully. Ambitions of achieving similar entrepreneurial success have always been a personal goal. As discussed in the introduction, the goal of the development of the entrepreneur's framework for commercialization of a new product or service was the application of the framework to an idea for an innovative golf club iron set design. The following paragraphs will describe the proposed application of the framework.

IDEA PHASE

The inspiration for this idea is based on my passion for the game of golf and my desire to play as well as I can. During a particularly poor round of golf, I forced myself to play the remaining three holes with just a single club (besides my putter) I picked my favorite club, the seven iron, and it served me well. I finished with two pars and a bogey from the professional tee boxes. I realized that the consistency gained from repeatedly hitting a club that I was confident with made me play better. I also recognized that the configuration of the standard golf club set did not promote this kind of consistency. Every club is a different length and some of the clubs don't meet the basic rules of thumb for iron design. Club manufacturers tout "hybrid" irons as being easier to hit than a regular long iron. The increasing popularity of the "hybrid" iron is a clear example that I was not the only one struggling with certain clubs in my set. Unwittingly I had already accomplished the two main goals of the idea phase. I recognized two incongruities in my

golf game due to the standard design of the golf club iron set. First, the standard iron set configuration allows for only the best ball strikers to consistently hit their three, four and five irons. The remaining "hackers" struggle to hit these clubs well, and approach long-range shots that require the use of these clubs with little confidence they will hit the ball as far as the shot requires. Second, the variety of club lengths was introducing more variables into my swing. More variables lead to a wider variety of results and typically that is not a desirable while playing golf. Golfers trust their swing to produce consistent results with respect to distance and direction. Reducing the number variables by reducing the differences in club lengths could result in more consistent ball striking, distance and direction control. I used my passion and excitement for the game of golf and came up with an idea for something that I wanted to use. My need to make my game better, the lack of an existing solution and my infatuation with golf came together at this point. This is the epitome of the idea phase; personal commitment to an idea combined with building something you want to use based on the realization that you need to fix a problem for which there is not currently an obvious solution.

The advent of the Internet has made communication much easier than in the past. This was a critical factor in allowing me to identify the link between the Idea and Prototype phase. Tom Wishon is a recognized expert in golf club design. He is personally responsible for many design 'firsts' in the golf club industry. He owns the premium golf club manufacturing company Wishon Golf. He represents the Innovator / Technology Enthusiast that must be identified and involved in this link. During the early phases of my research I reached out to Mr. Wishon to discuss my ideas and to my excitement he responded. After a few discussions it became aware to me that the basic "triple-length" iron set design concept was technically feasible. More importantly, Wishon explained that the "regular" golfer could accept this "triple-length" design concept. As noted in the

second case study, these two factors were the downfall of the Tommy Armour E.Q.L. iron set.

PROTOTYPE PHASE

I am currently immersed in the prototype phase. I am building my prototypes by combining existing components. The availability of low cost club making components makes this phase very flexible. Golf club components are very modular. A wide variety of club heads, shafts and grips can all be purchased individually and assembled with few tools and relatively no special training required. There are also a wide variety of suppliers of these components. This allows for extensive testing and design iterations without significant cost to the builder. It also allows for thousands of combinations to fine tune the final product. The club maker does not have to undertake the design of golf club heads or shafts, a costly endeavor. It is a practice of technology integration and assembly. After building a prototype club a performance review can be completed. The use of a launch monitor can provide immediate feedback concerning distance the prototype club hits the golf ball. The launch monitor is small, portable and can be setup at the driving range to monitor golf ball flight. It uses radar to track the golf ball flight and an integrated digital read out displays distance and initial golf ball velocity. This tool provides immediate quantitative feedback concerning club performance. Using the standard club as a baseline allows for comparative analysis and ensures that one of the key design requirements is met: Golfers must not notice any reduction in performance with respect to the distance they can hit each club. As described in the second case study, this lack of performance could be attributed to the failure of the Tommy Armour "EQL" iron set.

A baseline business model has been generated to help define the price point for this club set. Table 2 provides and itemized breakdown for the components that will be used to manufacture the complete clubset. Pricing information was obtained from

component suppliers Golfsmith and The Golfworks. All components are available for purchase online through each company's website. The cost associated with manufacturing this clubset provides flexibility with retail pricing options. The retail cost of an iron set varies based on features and manufacturers. For example, Golfsmith currently offers 385 different iron sets priced from $150 to $1400. 25% of the iron sets offered retail for less than $500. (www.golfsmith.com) The manufacturing costs associated with Triple-Length iron set allows for competitive pricing at the low end of the pricing spectrum.

Hardware Description	Club Components	Quantity	Price	Total
hybrid iron head	CER VX (25 deg, 22 deg, 19 deg)	3	$17.99	$53.97
standard iron head	Maltby KE4+ Tour (6 - GW)	6	$12.99	$77.94
shaft	Apollo Standard Stepless	9	$2.99	$26.91
grip	Grip One G1 Tour X	9	$1.49	$13.41
ferrule	Golfworks 61PW	9	$0.21	$1.89
weight	8g Tungsten Screw In Weight	8	$2.99	$23.92
weight	10g Lead Tip Weight (6 pcs)	1	$1.99	$1.99
	Manufacturing Supplies			
grip tape	Golfworks pre-cut	9	$0.25	$2.25
grip solvent	Golfworks FP142+	A/R	$1.00	$1.00
shafting epoxy	Golfworks High Strength	A/R	$1.00	$1.00
	Packaging Supplies			
club box	USPS 6" X 38" Tube	1	$0.00	$0.00
protective wrap	Bubble Wrap Pouch	9	$0.10	$0.90
tape	2" Wide Acrylic Tape	A/R	$0.04	$0.04
zip ties	13" Cable Tie	6	$0.06	$0.36
			Total	**$205.58**

Table 2:   Itemized Bill of Materials and Pricing, "Triple-Length" Iron Set

After the prototypes are complete, those who make up the link between the prototype phase and demonstration and refinement phase must be identified. These people are the Early Adopters / Visionaries. The clubs will initially be aimed at golfers with aspirations of progressing their game and willingness to experiment with non-

traditional approaches. Recognition that their equipment could be hindering their progression will be a common trait. These golfers can be identified at the driving range. One can learn a lot about where a golfer exists on the technology adoption curve by simply looking in their golf bag. Some golfers carry the most modern equipment and are constantly upgrading to stay at the leading edge. Others carry equipment that is decades old and have little knowledge concerning modern equipment technology.

DEMONSTRATE AND ADAPT PHASE

This phase of the process requires interface with potential customers but yields the most information concerning product performance, customer values and market demographics. The framework mandates that a forum for feedback exists between the end user and the entrepreneur. The easiest way to facilitate this communication is via the Internet. A website with a discussion forum is an effective medium for communication of this nature. The message board also allows the exchange of ideas between users and could be a source of innovative ideas for future products. Another typical method used by many golf club manufacturers is to do live demonstrations. This allows the club manufacturer to setup shop at a golf course driving range with a wide array of products. Patrons of the golf course are encouraged to test the clubs on the range. The club manufacturer sends fitting experts to help golfers find the best club and shaft combination for their swing. In fact, this was the exact method used by Adams Golf described in the first case study. One possible idea would be to allow golfers to test the clubs for an entire eighteen hole round. By setting up at a local golf course one could allow the golfers to exchange their iron set with a "triple-length" iron set and play an entire round with them and return the set when they were done. This would give the golfers an opportunity to test every club in real playing conditions. Also, this would allow for the production of just a few prototype iron sets that could be tested by many golfers.

TARGET AND DIFFERENTIATE PHASE

The final link exists between the Demonstrate and Adapt phase and the Target and Differentiate phase. These people are the Early Majority / Pragmatists. Identifying the constituents that occupy this link is critical to reaching the mainstream market. These people should have access to other golfers and their opinion about golf equipment should be respected. As Moore described in *Crossing The Chasm*, A key factor in selecting a niche segment is to strategically pick one that acts as a "head pin". In effect knocking over the head pin will lead to other pins falling over. In a marketing sense this means market segments other than the initial niche adopting the new product based on acceptance by the niche segment that the following segment references for decision-making purposes.

TaylorMade Golf prescribes to a tiered marketing strategy they refer to as the "triangle of influence". In graphical terms the strategy would look like a triangle split into horizontal sections. The upper tip of the triangle represents elite tour golfers. Following the elite players come collegiate golfers, recognized professional instructors and finally recreational golfers. (Figure 14) TaylorMade introduces innovative products at the top tier and expects the technology move downward. Their hypothesis is that each segment references the next higher on the triangle to make decisions with respect to equipment adoption.
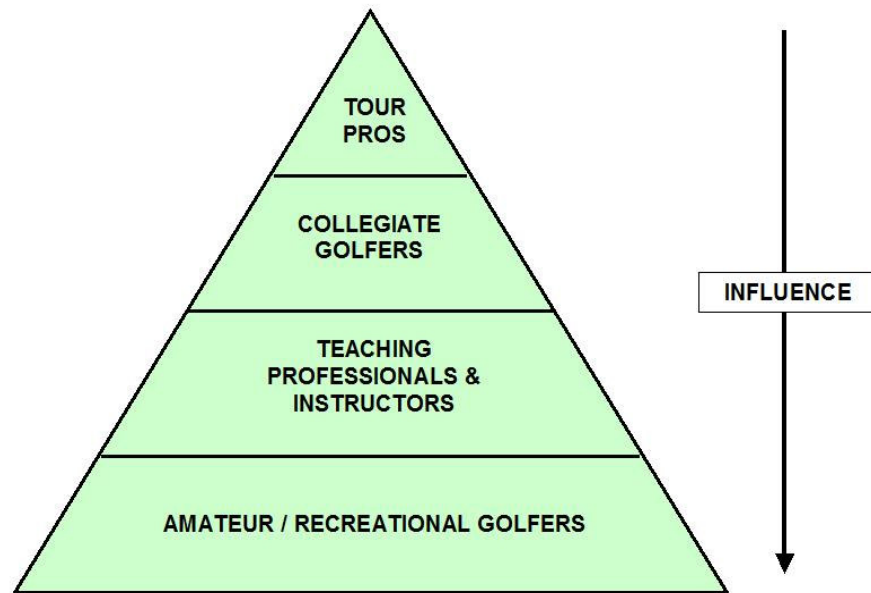
Figure 14:   TaylorMade Golf's "Triangle of Influence"

Club pros are typically responsible for instructing golfers and staffing assistant instructors at their home courses. Instructors are also used as a reference source by amateur golfers according to TaylorMade's "triangle of influence" marketing strategy. (Baldwin) The relationships developed between student and instructor is the type of personal relationships that a study revealed was one of those used for decisions about purchasing golf equipment. The study found that "Approximately 85% of golfers stated that their primary information sources for purchasing golf clubs were personal references" (Yoh, 125-135) Yoh continues this by stating "References with high credibility, such as those having high expertise, will serve as primary sources of information." (125-135)

Based on both TaylorMade's tiered equipment introduction theory and the results of the independent study, a niche segment can be identified. A dose of reality is required to determine a niche segment to target. It is highly unlikely that an unknown golf club manufacturer would have access to elite tour or collegiate golfers. Nor would it be realistic to believe that an elite player would bet their livelihood and reputation on an unproven product. A realistic entry point could be at the professional instructor level. Professional instructors exist to teach the game. Their livelihood depends on their ability to make people better golfers. As well, their expertise in the game of golf will provide a valuable and credible reference for their students. The key is to convince these instructors that the clubset can make their job easier, by making golf easier for their students.

An interesting example supports this strategy. Wilson Sporting Goods golf division was slumping in the Late 1990s. New CEO Jim Baugh had an idea on how to change that. "Instead of investing in pros, Baugh has made a career of enlisting club pros to push sporting goods. He did it first in the 1970s with tennis equipment at Prince Manufacturing, where he helped lift revenues from $4 million to $65 million in nine years; then he did it again in the 1980s at Wilson Tennis…Baugh's reasoning: Local pros come in contact with average players every day; get them on board, and they'll become a powerful sales force." (Foust, 144-148)

Baugh recognized that golf instructors have extensive personal networks in the golf community and a strong influence on their students and colleagues. This tight knit network can provide tremendous reach in terms ability to exchange information. This exchange of information is one the keys to capturing an early majority niche segment. (Moore, 69) Small successes with a few instructors could generate acceptance of this club set design. This represents the "head pin" that must be targeted to gain a foothold in the

mainstream market. Further refinement of this niche is required. Limitations in geographical reach will determine the quantity of instructors that can be targeted.

Chapter 5: Conclusion

Having a clear strategy in place is critical to organizing activities required to accomplish a goal. This thesis proposes that there is a way for entrepreneurs to organize their actions with little capital, infrastructure or standard practices in place. The proposed framework provides a strategy for entrepreneurs to commercialize a new product or service. The framework is one (not the only) legitimate strategy that entrepreneurs can follow as a guideline to commercialize new products or services. The framework is based on existing product commercialization models and technology adoption theories. The framework is further supplemented by research based on numerous successful entrepreneurs. The goal of the research was to identify critical factors that these entrepreneurs attributed to their success. By combining the critical factors identified by successful entrepreneurs with the framework based on existing product commercialization and technology adoption theories, a new framework emerged that was specifically targeted towards entrepreneurs. The application of this framework does not guarantee entrepreneurial success, but the research indicates that it would increase the chance compared to applying no strategy at all. Two case studies were discussed to reinforce the strategies proposed by The Entrepreneur's Technology Commercialization Framework. The latter portion of the thesis details application of the proposed framework to a new product directed towards the golf equipment consumer. The intent is to demonstrate the application of the framework towards a specific product. The framework is intended to be applied to any new product or service that an aspiring entrepreneur has envisioned.

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