



Title: Entrepreneurial Success: How It Relates to the Management of Innovation

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**Entrepreneurial Success: How It Relates to the  
Management of Innovation**

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Entrepreneurial Success: How it Relates to the Management of Innovation

## **Abstract:**

The purpose of this paper is to examine the linkage between effective management of innovation and ultimate entrepreneurial success.

There is a very strong link between the management of technological innovation and successful entrepreneurship. Entrepreneurs tend to be the drivers of technological innovation. However, the ability to truly manage that innovation has historically amplified their successes. Several examples of effective management of technological innovation are outlined in this paper. In addition, examples of entrepreneurs who failed to use all of these concepts are shown, along with the relationship between their lack of ultimate success and their limited management of innovation.

The examination of past and present entrepreneurial ventures show that the use of engineering management tools allows entrepreneurs to successfully manage innovation and achieve good results.

## **Introduction:**

It takes a special kind of person to lead the innovation task successfully—the entrepreneur. Webster defines this person as "a person who organizes and manages a business undertaking, assuming risk for the sake of profit." [28]

The entrepreneur is a kind of "business hero". Like all heroes, he has qualities to be admired: initiative, daring, courage and commitment. These values are especially admired in turbulent business conditions, when initiative is required for survival. [29]

The development of technological innovation is a characteristic commonly associated with successful entrepreneurs. However, the management of technological innovation appears to be more rare. By the management of technological innovation, Thamhain's "...biggest challenge..." to Engineering Managers is appropriate: "...integrating and transferring technologies into marketable products and services." [1]

Entrepreneurs who strive to manage innovation, in addition to the mere development of it, will be shown in this paper to achieve the next level of success. To accomplish this, several examples of failure (successful entrepreneurs who did not effectively manage the innovations which they developed) as well as examples of successes from effective management of innovation will be shown.

## **Historical Perspectives:**

### ***An Example of Limited Success: The Silk Road***

Reading through the history of old civilizations, we often hear about the Silk Road. The caravan routes that connected the East with the West. This historic road was once the major overland connection between Asia and Europe.

The Silk Road started in eastern China at Xi'an, a major city in the province of Shaanxi, and known as Chang'an in ancient times. Then passed through modern Afghanistan and Iran and from there to the Mediterranean which eventually linked to the Europe by sea. According to Peter Young, "The Silk Road consists of two separate routes: the northern and the southern routes. ... They traversed Dzungar and passed by Yumenghan on the way to Loulan, in the vicinity of Lopnur. There, one route branched off northwards to pass between the southern foothills of the Tianshan and finally Kashgar. The southern route turned southwest at Loulan ... (passed) Samarkand, Bokhara and Merv and then on through Iran and Iraq to the Mediterranean, with its sea lanes to Rome." [4]

The first pioneer in the Silk Road is Zhang Qian of the Western Han Dynasty, who was sent to the Western Region in a diplomatic mission in 139 B.C.. He is known to be the first person who took a trip from Chang'an to Darouzhi (northern part of modern Afghanistan), and thus to be the person who opened up the Silk Road [3].

Qian played the role of a political ambassador for the Chinese government and he knew that his main mission was to establish ties with the western countries. But in the meanwhile he realized the importance and market potential of these nations for the Chinese merchants and began to think as an Entrepreneur.

It is obvious that Qian had vision and creativity, by accepting the responsibilities assigned to him; and his unique trip to the unexplored regions exemplifies his reality testing. However, he never expanded his vision and creativity by extending this ancient highway to further places as far as Europe. But, certainly he established a foundation for the future Entrepreneurs to complete this mission. As Che Muqi mentions, "Chinese and foreign historians appraise highly the role played by Zhang Qian of the Western Han Dynasty in opening up the Silk Road. They believe that he promoted economic and cultural inter flow between East and West that was beneficial to the progress of mankind" [2].

When Zhang Qian reached his final destination, he identified the western region countries as a golden opportunity for the Chinese government to open up a great market place for its productions. While Staying in the western territories, Qian collected a wealth of information on the history, geography, and political and economic conditions of different places in the Western Regions and indirectly learned about Persia or modern Iran, Arabia and the Eastern Roman Empire [2].

When Zhang Qian was sent to the western regions, his objective was to establish political ties with those countries, but when he saw the opportunity, he was flexible enough in his strategic thinking to establish economical ties as well. On the other hand we could say that he lacked a continuous innovative behavior by not expanding those ties to other nations.

In his way to Darouzi (assignment distillation), Qian was captured by a group of tribesmen and imprisoned for a period of ten years. Then, somehow he managed to escape and reach Darouzi. The fact that after ten years of detention he still remained committed to completing his assignment, shows the degree of Diligence and Tenacity of this person.

When Qian returned to Xi'an after thirteen years, he was determined in bringing his dreams to the reality. Therefore, he went west once again, but this time he took a different approach. According to the Pictorial Publications, "This time he led a party of 300, ... they brought with them thousands of cattle and sheep and large quantities of gold coins and silk goods as presents." [3]. This points out that Qian had actually identified the importance of deal making and contacts and networking, plus the trust and development of people.

### ***Observations:***

Stabilizing the Silk Road could be considered as the greatest achievement of Zhang Qian. As was mentioned earlier, he is credited with the cultural and economical connection between West and East in the history of mankind.

Although in his time he came up with the bright idea of making economical ties between China and Western Asia, he didn't recognize Europe as the most potential market place. If Zhang was continuously innovative and prepared for new ideas, he would have extended his vision to other countries in the world and consequently expanded the market for Chinese products.

**An Example of Success: Marco Polo**

One Entrepreneur who achieved great success by following up on the previous work of the blazers of the Caravan Routes (Silk Road) was Marco Polo.

Actually, he took advantage of an opportunity made possible by Genghis Khan. By 1227 A.D., Genghis Khan had laid waste to the lands between the Pacific and the frontiers of Europe, but in his wake was a coherent system of patrols, pickets and garrisons at strategic geographic locations. [5] This situation made safe travel much more possible than during the previous period, when constantly warring kingdoms made safe, unmolested travel almost impossible. [7]

The initial trip to China from Venice was made by Marco's father and uncle, Nicolo and Maffeo, respectively. However, they failed to document their trip well and, upon returning to Venice in 1269, decided to take the young Marco Polo on their second journey. [5]

Leaving Venice in 1275, the three reached Kublai Khan (a successor of Ghengis Khan) in 1275 and were welcomed immediately, [5] since the two elder Polos had promised during their earlier trip to return.

The reason for the fame of Marco Polo was the fact that he documented his travels, including his 15 year stay in Kublai Khan's court working as an ambassador of sorts. This recount of his journey was later written and published by Rusticien, [7] a scribe whom he met while a prisoner of was several years after returning to Venice. Indeed, the details of his travels were considered so remarkable for centuries afterward that they were read more for their entertainment value than their historical content. [6]

However, Marco Polo did achieve great financial success from his travels, [6] which allowed him to profitably trade and increase his wealth up to the time of his death in 1324.



### ***Observations:***

As an Entrepreneur, he used his vision, based on his father's tales and his youthful adventurous spirit. He practiced creativity by going where very few people had ever gone, [5] but understanding that the truly distinctive feature of his trip would be his subsequent recording of it. Since he succeeded, we must assume that he was proficient at reality testing, and some of his flirtings with illness and disaster [7] would support that assumption. Certainly his discarding of his entire future in Venice at the young age of seventeen would constitute opportunity identification. His venture evaluation, venture start-up action and venture strategy were all accomplished before he and the two elder Polos left Venice.

What separated him from previous, less successful Entrepreneurs who used the "Silk Road", was his adherence to certain fundamentals.

Specifically:

#### ***Continuous Innovation and Flexibility:***

Since he was a merchant, and since his father had recently remarried, one must assume that the intent of the Polos was to return to Venice with commercially successful results, perhaps at the end of four or five years of travel. However, upon their arrival in the court of Kublai Khan, Marco Polo realized the opportunity present to him by becoming a trusted confidant of the most powerful man in the world at that time. [7] This complete shift in the strategic plan displayed continuous innovation and flexibility.

#### ***Diligence and Tenacity:***

To make a journey of three and one half years to China and a return trip of greater difficulty obviously required diligence and tenacity.

#### ***Ethical Assessment:***

This point is probably not well demonstrated, since the venture was so unique in its time. However, one must assume that since the Polos were of upper middle class status, [5] then the ethical assessment of the venture had been settled before its undertaking.

#### ***Deal Making:***

The fact that the Polos dealt successfully in a culture totally foreign to them indicated a proficiency toward deal making. In addition, the fact that, after returning to Venice, they kept their acquired valuables completely hidden for several days and only revealed their existence when they were prepared to capitalize on them, indicated an almost artful mastery of this skill.

*Contacts and Networking:*

Several points are of interest here. First, the elder Polos had acquired the "Golden Tablet of the Great Khan" [5], which gave them unquestioned passage throughout the Mongol territories. (From the European frontier to the Pacific Ocean.) In addition, they had been authorized by Kublai Khan himself to act officially on his behalf in communicating with the Pope, the Christian world's ruler of the day. On their return trip to China, the Pope granted them authority to represent him to Khan. Finally, not only did they again make personal contact with Kublai Khan on that second journey, but he expanded their official powers to include representing him to the "Kings of France and Spain, and all other Christian Princes" [7]. Being the personal representatives of the most powerful man in the world to the remainder of the world's leaders is the best example of contacts and networking imaginable. He used these contacts at length in his later successes as a merchant.

*Trust and Development of People:*

Here the Polos had a marked advantage. Their entire venture was centered around two brothers and a son, giving the opportunity for unlimited trust and development of people. Without this ability, the success of their venture would have been less likely.

Marco Polo was successful at developing innovation using many tools. In addition, he displayed continuous innovation and flexibility by staying 15 years in Kublai Khan's court. (Assuming that he did not originally plan to stay away from Venice that long.) This is a prime example of successful management of innovation; i.e., allowing the vision itself to remain flexible in order to transfer technologies into marketable products.

In summary, Marco Polo capitalized on the secure routes to China available after the conquests of Ghengis Khan. [5] He added to the success of the previous journey made by his father and uncle. By documenting his travels, remaining flexible enough in the venture to remain in Kublai Khan's court long enough to develop a solid relationship of trust, and then using that relationship to represent himself to the rest of the world, he became one of the most successful Entrepreneur in history.

## **Modern Perspectives:**

### ***An Example of Failure:***

First, it is important to define what we mean by failure. We consider that the entrepreneur fails if his business stops or if it is not developing very fast. Then, in some cases, what we consider a failure in the entrepreneurial point of view, can be a success for others whose goals are less ambitious.

Failure can occur at many stages of the entrepreneurial venture.

### ***How to fail becoming an entrepreneur:***

One major cause is to lose his interest for adventure, risk taking and doing something that no one else did before. This doesn't mean that doing things others don't want to do is an easy way to become an entrepreneur! Failure also occurs if you are not realistic enough. Imagination and creativity are keys for success but the entrepreneur should always have an idea of the feasibility of his project. An adequate knowledge of the factors involved is necessary. Entrepreneurs have a natural inborn sense to get away from the influence of others that present the same facts colored by their own way of thinking.

### ***Personal aspect***

Hard work is necessary. A lot of entrepreneurs are ready for sacrifice since they think that once they will achieve their goals, they will be able to change their habits and lifestyle. It is quite true but there are limits.

First you can spend some time if you do not believe that every aspect of the business needs your involvement: do not feel competent in all areas. It is vital to delegate.

Second, it is one thing to think about work and to work hard, but don't focus on your business. It is essential to keep time and interest for family, sports, readings, etc.

## **Two cases of failure in the computer industry**

**1st case of failure:           Mike Boich,  
  Radius Inc.   [8], [9]**

In 1985, Mike Boich started Radius Inc. This Harvard M.B.A. had for previous experience: 9 months as a Product marketing manager for Hewlett-Packard and 3 years of participation to the development of the Macintosh at Apple.

At this time, Macintosh only worked with 9-inch black and white monitors. This was a huge hole in the Apple product line. Mike Boich and his partners saw this opportunity and decided to fill the gap. The market was ready and waiting. In just five months they brought a circuit board and high resolution monitors for the Macintosh on the marketplace. In its first fiscal year (1987), Radius was profitable on revenues of about \$7 million. One year later profits on revenues increased to \$33 million.

In 1990, other competitors came on the market place with cheaper products. Even if Radius had better to lower its prices just before the competitors arrived, it wasn't too late to take decisions that could give advantage to Radius over its competitors. But Boich's willingness to apply Jobs philosophy in management by empowering people in the company lead the latter in the red. He didn't manage to copy Apple's organization: some groups (R&D) were more empowered than others. While marketing wanted to compete, engineers were interested in designing state-of-the-art products. They spent 11 months on a project called Radius-TV, that should turn the Macintosh into a television. By the spring of 1991, it was too late. Barry James Folsom replaced Michael Boich at the head of Radius, and fired the executives who ran the two groups: engineering and marketing. He also failed.

This is the case of an entrepreneur that was very good at perceiving opportunities. A big part of his initial success is due to his visionary skill.

What went wrong concern the management. It is one thing to bring new or modern management ideas in an organization, but one has to be very careful not to eliminate management. Boich, was too soft and delegated to much so that he lost his abilities to manage his company. His authority remains only informal.

Second, it is often said that a strong R&D department that develops new products is an asset. Many companies failed because they didn't work enough on R&D. In this case, it is not a lack of R&D that lead the company in the red. The problem was that the functional groups didn't cooperate. Internal communication is very important to make a good business. This went wrong at Radius. It is not possible to make a good strategic business planning without the involvement of all the groups and without considering the external environment.

**2nd case of failure: J. Wiley, A. Ackerman,  
Microbits Peripheral Products  
The role of experience [10], [11]**

In 1982, John Wiley and his partner Alan Ackerman started Microbits Peripheral Products, a company based in Albany. They made hardware products for the Atari personal computer. Within a year they had \$80000 in orders. They were very deeply involved in their business, used to have 14 hours days at work while doing everything (packaging, assembly, sales and shipping). In a few years they grew into a \$3 million company with 55 employees. But they grew too fast and out of control while the Atari market was collapsing taking many companies with it. When Wiley and Ackerman realized that they needed some help and hired a controller, it was already too late. In spring 1985 the bank sold some of the company's assets and put the business on the market.

Nowadays, opportunities change very quickly. In consequence, risk is a key for success. But if one want to stay successful, one should adapt the business plan to the changes that are dictated by the realities of the marketplace and customers. It is very important to look at the changes in the external environment. When the market is very hazardous, it is a good precaution to diversify its products to prevent market changes. In the 90's, anticipation of constant change and flexibility are more vital than ever before.

After this failure, John Wiley and his partner Alan Ackerman with other investors bought back their company and founded Supra Corp. , and decided to product telecommunications equipment. What they learned from their previous failure, helped them to turn their new company into a success. This time they emphasized structured management and financial reporting procedures. They also decided to develop new products for brands of computer so that their business would not be too dependent on the fortunes of any one company. In 1992, Supra had about 110 employees, a new building and \$35 millions in sales.

This case showed us again that success is dependent of a good management, one that does not neglect any aspect of the internal business (finance, production, organization, marketing, ..) but also of the external environment (customer expectations, evolution of the market, ...).

Moreover, we learned from this example that if a business failure sometimes corresponds to the end of the road for the company, it is not necessary the case for the entrepreneur. A lack of experience is often the major cause for business failures. However, even if an entrepreneur fails, this experience can be very positive for his future ventures. The latter has to establish precisely what went wrong to avoid a repeat performance.

### ***Observations:***

In both cases outlined in this section, a lack of basic management skill prevented ventures from achieving ultimate success. The technological innovations were developed well, but then failure to manage those innovations using basic engineering management concepts was evident.

### ***An Example of Success: Bill Gates***

The William H. Gates III's (better known as Bill Gates) story is not one of rags-to riches. Opportunities presented themselves early and well to this computer genius who at the mere age of 19 co-founded Microsoft Corporation, the first personal computer software company and consequently established the microcomputer-software industry. Currently the Chairman and chief-executive-officer, Gates, a born technical wizard and businessman became a billionaire at the age of 31 [14] and is often referred to as this generation's most successful entrepreneur [18]. Gates earliest display of successful venture evaluation, venture start up action and venture strategy was when he gave up his studies at Harvard for a programming career together with his high-school chum, Paul Allen. His success is assessable by the soaring growth that Microsoft has undergone. Since its conception in 1975 it has climbed to become the top software company for personal computers. It is currently worth more than 21 billions [16] and Bill Gates currently worth 7.4 billions [21].

Like many other successful giants Gates possessed a vision very early in life and more importantly, was unafraid to take risks and act upon it. His willingness to run with a dream and a knack for taking up challenge are traits which made his company the giant it is today. Gates envisions to have a computer at every desk and in every home all running the Microsoft software.

Today, Microsoft is the largest supplier of the widely used operating systems program, MS-DOS (Microsoft's Disk Operating System) which Gates initially developed for IBM. It (MS-DOS) resembles a traffic cop that regulates a computer's electrical circuits and applications programs in almost all of the world's personal computers [27].

In the mid-1980's, Gates developed applications software programs which specifically instructs the computer how to perform certain tasks e.g. financial analysis (spreadsheet program) and word processing. Within a few years Microsoft became one of the leading software firms in the US beating competitors like Vision Corp., MicroPro and Digital Research [14].

Gates demonstrated an astuteness for business by establishing dependency on his software programs therefore achieving near monopoly in the software industry. He is "chameleon-like" i.e. has an uncanny ability to change his personality and eventually his company's in order to do business. He transforms from being a creative genius to a shrewd businessman, which is evident in his proficiency in deal making. After selling the MS-DOS program to IBM, he managed to convince the giant to reveal its secret design specifications in favor of an open system for its personal computers. With knowledge of how the operating system functioned, many more software designers were able to create new software for IBM's personal computers. Since MS-DOS was the operating system software installed in IBM's personal computers, computer companies desiring to be IBM-compatible had no alternative but to obtain licenses for MS-DOS as well, thereby making it (MS-DOS) the major operating systems for personal computers.

More recent innovations by Microsoft includes the new WINDOWS 3.0 which was initially introduced in 1985. It enabled IBM-compatible PC's to be operated with a hand-held mouse and on screen symbols rather than typing in commands. Following reports of being slow, the original version was later updated and new versions were reintroduced in 1986 & 1988.

WINDOWS 3.0 was an instant success and a year after it was marketed, the company had sold more than 6 million copies of the program. Gates aspired to make WINDOWS the standard graphic interface for microprocessor software development and this he achieved with overwhelming success. With MS-DOS and WINDOWS running in a majority of the world's personal computers the war to dominate operating systems clearly ended in Microsoft's favor. Today anyone who intends to write an applications program has no choice but to cooperate with Microsoft and conform to its standards.

Achieving software dominance was a wise marketing strategy which, along with his other colossal achievements, proves Gate's competence at reality testing.

Bill Gates was first introduced to a computer in 8th grade (1967) and has been hooked on it since. He, together with Paul Allen (co-founder of Microsoft) and along with several other computer whiz kids formed the Lakeside Programming Group and with this began their programming career. Amongst Gates early creative achievements included writing a scheduling program for the Lakeside School from which he earned \$4,200. His other accomplishments include developing programs to computerize the payroll system for Lakeside School and an analysis program for traffic inventory for a traffic consulting firm.

Gate's possessed entrepreneurial instincts which he displayed while working as a congressional page in the summer of 1972. During the George S. McGovern-Thomas Eagleton presidential campaign, he (Gates) bought campaign buttons for a nickel each after Eagleton was dropped from the Democratic ticket and proceeded to sell them at \$25.00 a piece [14]. This ability to identify opportunities plus having the guts to act upon it are attributes that gained Bill Gates success in his later business ventures.

People who knew him repeatedly referred to his tenacity, fearlessness and inability to see limits in his strife to achieve a desired goal. When Microsoft first went public in March 1986, its stock worth \$21.00/share. Gates who then owned 45% of the company's shares became an instant billionaire when Microsoft's stocks hit \$90.75/share in March 1987 [14]. He was however, unimpressed by his own wealth and was not contented to just sit back and rake in profits from the company's existing product lines. Instead he continued to diligently make innovations in Microsoft's software product-line to meet with the increasingly competitive market.

In 1985, Microsoft together with IBM developed OS/2, a new and more versatile operating system program than MS-DOS that was able to perform several functions simultaneously. It was introduced in late 1987 and replaced MS-DOS in PS/2, a new line of IBM personal computers. Gates increased efforts to reduce Lotus's domination of the office-spreadsheet software market which presented a lucrative business. As an aggressive move to undercut Lotus 1-2-3, Microsoft produced the Excel spreadsheet program and proceeded to launch an aggressive campaign to promote it. Microsoft's most recent creative innovation in operating systems software is the revolutionary WINDOWS NT which links the newest and biggest mainframe-class machines to the speediest personal computers.



In keeping with Gates' continuous innovation and flexibility, Microsoft attempts to introduce new product models either upgraded or first-time product monthly on the average. Gates envisions a network information system where most homes are linked to and that allows users to shop, order films and even transmit messages. Microsoft aims to make all the information in a digitized form universally accessible to all users i.e. to provide an "information at your fingertips" software which enables access of data or videos from anywhere in the world [15].

Even as a child Gates displayed the kind of obsessive focus that kept his attention tuned in on achieving a specific goal even long after others had given up. It is this characteristic, a level of commitment and diligence that Bill Gates possesses and in turn seeks in people that he hires to hold top management posts in his company. He looks for people who have dealt successfully with failure and setbacks, someone with the guts to bet on a vision and who learns, adapts and is active in the process of learning from mistakes [22].

His company is also well known for hiring the brightest and sharpest from America's academic elite [13]. Gates advice for other entrepreneurs just getting started is to hire people with the energy level and commitment to persevere through inevitable disaster periods and see beyond them. To have a basic business sense, the understanding of profits and losses and to be a remarkable salesperson who not only sell products but is also able to attract people to work and invest in your company. A successful entrepreneur, he claims, must build a level of enthusiasm and possesses the confidence and willingness to learn. Being lucky is also necessary but being smart is absolutely crucial as an element for success [18].

As a leader, Gates demonstrates effective management skills in his willingness to give others credit and his ability to delegate authority. Esther Dyson, publisher of Release 1.0 a software newsletter, comments, "Bill Gates is still in control because he had the guts to give up some control". Gates' drive and commitment does rub off on of his employees because although many Microsoft's employees put in 75-hour weeks, the company's turnover rate is low at less than 10%/year for marketing and administrating personnel and even lower for programmers [14]. He acknowledges that the success of his company is attributed to loyalty, cleverness and foresight of his work force. His company encourages creative ideas and his staff are provided with the opportunity to identify and develop "killer" features in a product e.g. development of a killer feature for the Excel spreadsheet program.

Gates' management strategies inspires loyalty among the employees in his company. Although they are not paid exorbitant salaries nor lavished with many perks, Microsoft is generous with its stock options. All of its programmers (numbering several hundreds) were given stock options similar to those given to the company's top managers before it went public in March 1986. A stock purchase plan enabled 75% of its employees to acquire stock at a 15% discount rate.

Despite its swelling size, Gates puts in considerable efforts to spread himself around and maintains effective communication throughout the company. To facilitate management and communication, the company is broken down to smaller independent "business units". Each "business unit" is in charge and responsible for the performance of a particular type of software. This allows Gates to be more interactive when attending meetings with key members of individual units allowing him to personally contribute ideas and make critiques. He maintains interest and enthusiasm in the company's development and progress by exhibiting personal involvement wherever and whenever possible, be it from participating in brainstorming sessions for new products to criticizing vague marketing strategies [25].

In an attempt to maintain the feeling of "smallness", Gates makes himself accessible by encouraging his employees to communicate with him directly through the company's e-mail and tries to respond to each message the same day he receives it.

In spite of Microsoft's tremendous success, Gates is still not contented. The company, he claims, has yet to fulfill it's founder's ambitious goal, to have a computer on every desk and in every home all running Microsoft software [26].

**Observations:**

Bill Gates' success is due to his personal entrepreneurial traits and his ability to apply engineering management tools in managing continuous innovation. He has demonstrated the use of engineering management concepts in managing technical people, and channeling his staff's ideas and work into meeting corporate objectives. Some of the key elements that have contributed to his success are his ability to manage his technical people, achieve balance between control and freedom over his people, communicate effectively, delegate authority, and forecast the marketplace (integrating technology into his strategic business plan), all of which are basic elements of the management of technological innovation.

## **Conclusion:**

The common factors found among successful entrepreneurs are listed below.

### ***Common Factors for Entrepreneurial Success:***

- Vision
- Creativity
- Reality Testing
- Opportunity Identification
- Project Evaluation
- Project Start-up Action
- Project Strategy
- Continuous Innovation and Flexibility
- Diligence and Tenacity
- Ethical Assessment
- Deal Making
- Contacts and Networking
- Trust and Development of People
- Seek Feedback and Make Changes as Needed

However, the entrepreneurs that were able to achieve the next level of success (Marco Polo, Bill Gates), were those that displayed the same entrepreneurial traits (as listed above), but who used those same tools to effectively manage the innovations which they had developed. This is a very important point in Technology Management. That is, *the key to success in Engineering Management is not just in the development of innovation, but in the management of it.*

### **Areas for Future Study:**

An entrepreneur who achieves the next level of success is referred to by Arkebauer as an "ultrapreneur". For an individual to be an ultrapreneur, certain differentiating factors need to be evident: [12]

#### Entrepreneur

First time start-up  
Not sure where to go for advice  
Doesn't know what advice is needed

Feels competent in all areas  
Seeks professional help in  
    response to problems  
Lacks key skills in industry  
Operations-oriented  
Fairly well educated

#### Ultrapreneur

Prior start-up experience  
Knows where to seek advice  
Knows what specific advice is  
    needed

Feels weak in certain areas  
Seeks professional help in  
    anticipation of problems  
Has acquired key skills  
Total business-oriented  
Slightly better educated

The linkage of these "differentiating factors" and entrepreneurs who achieve ultimate success would add to the body of knowledge in engineering management and be an appropriate topic for future research.

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## APPENDIX A

### Origin of the name "Entrepreneur"

According to Fernand Braudel [1], the term entrepreneur had entered the French language by the beginning of the eighteenth century, but its use was still quite rare. It was not adopted by English-speaking writers until at least the middle of the nineteenth century (though the Oxford English Dictionary cites two fifteenth-century examples of its use in a manner close to its current connotation). Earlier in the nineteenth century it was employed in English to refer to a "director or organizer of musical entertainment"(!).

Richard Cantillon is generally credited as the first to use the term entrepreneur in a work on economics [2], (1755). Cantillon uses the term to refer to merchant wholesalers who bear the risk of reselling agricultural and manufactured produce. Henry Higgs (see Cantillon [1755]) translates the term as undertaker, presumably following Malachy Postlethwayt's Dissertation of 1749, which reproduces extensive portions of the missing original English version of Cantillon's *Essai*. Probably J. B. Say [3], (1803, 1829) is responsible for popularizing the term. He uses it to denote any organizer of a firm, who is carefully distinguished from the capitalist, that is, the supplier of funds. But Say also places considerable emphasis upon entrepreneur as an intermediary between the work of the scientist and an industry's workers.

Before the word entered the English language, writers would sometimes instead employ the term undertaker, which is, of course, a direct translation of the French term and of its German equivalent—*unternehmer*—one who undertakes. But the more common, and probably far older, English term is *adventurer*, as in the fifteenth-century society of overseas merchants in London, the Merchant Adventurers. The term itself can plausibly be interpreted to derive from the comings and goings of the merchants, for as the dictionary suggests, it derives from the Latin or Italian, *ad*, meaning to, as in *to and fro*, and *venire*, to come. One may suspect that the modern interpretation of the term *adventurer* alludes to the risks and encounters that befell medieval merchants more often than they might have wished. Still, the word *adventurer* perhaps continues to capture the meaning quite effectively, as it is an individual willing to embark on adventure in pursuit of economic goals.

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