INNOVATION AND ENTREPRENEURSHIP

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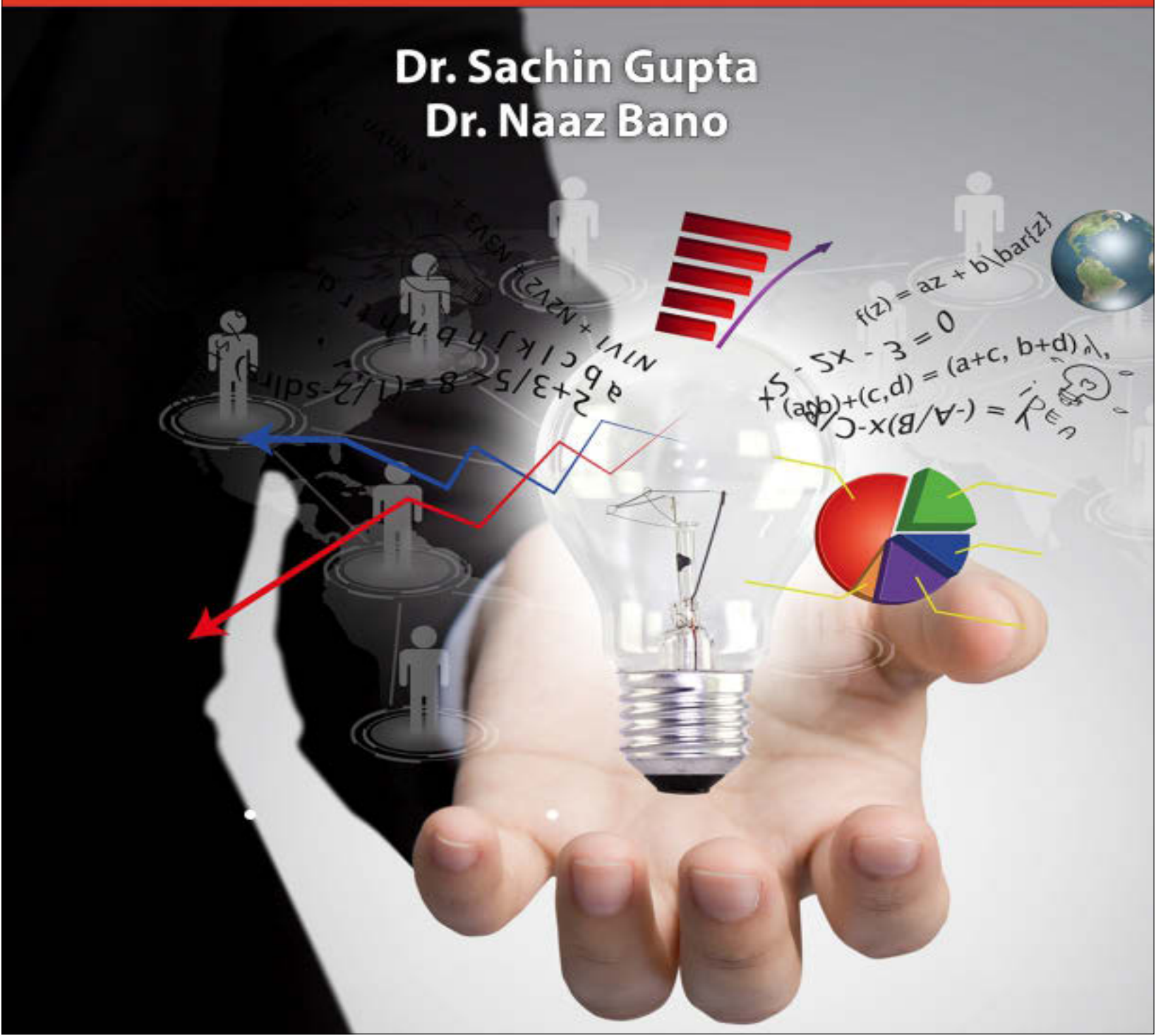

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CHAPTER 1

SYSTEMATIC ENTREPRENEURSHIP: AN EXPLORATION OF THE KEY PRINCIPLES, PROCESSES AND PRACTICES FOR BUILDING SUCCESSFUL VENTURES

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About 1800, the French economist J. B. Say said, "The entrepreneur moves economic resources out of a lower and into a higher productivity and bigger yield sector." Say's definition, however, does not identify this "entrepreneur" for us. The meanings of "entrepreneur" and "entrepreneurship" have been completely unclear since Say first used the phrase, some two centuries ago.For instance, starting one's own, brand-new, modest firm is a common definition of an entrepreneur in the United States. The "Entrepreneurship" courses that have recently gained popularity in US business schools are, in many instances, merely linear successors of the small company startup course that was provided thirty years ago[1].

But are they business owners? All they do is repeat what has been done before numerous times. They take a chance on the rising popularity of dining out in their community, but they don't produce any new customer demands or satisfactions. They are definitely not entrepreneurs when seen from this angle, despite the fact that their business is very new.Nevertheless, entrepreneurship was McDonald's. Of course, it did not create anything. The finished product was comparable to what any respectable American restaurant has produced in the past. But, by using management theories and methods such as asking, standardizing the "product," creating processes and tools, and constructing training on the analysis of the task to be done.

By establishing the criteria it demanded, McDonald's significantly improved resource output while also creating a new market and a new client. This is business ownership. A growing foundry that was established a few years ago by a husband and wife team in the Midwest of the United States to heat treat ferrous castings to high-performance specifications for instance, the axles for the enormous bulldozers used to clear the land and dig the ditches for a natural gas pipeline across Alaska is equally entrepreneurial[2].

The science required is widely understood; in fact, there isn't anything the firm does that hasn't been done before. But first, the founders organized the technical data; nowadays, they may enter the performance requirements into their computer and instantly print out the necessary course of action.

The creators also formalized the procedure. Few orders consist of more than six parts with identical dimensions, metallic composition, weight, and performance requirements. Nevertheless, rather of producing the castings in batches, a flow process is used, using computer-controlled equipment and self-adjusting furnaces.

Prior to the opening of this new foundry, precision castings of this kind had a rejection rate of 30 to 40 percent; now, 90 percent or more are perfect when they leave the line. Even while the Midwestern foundry pays full American union salaries and benefits, the expenses are still less than two-thirds of those of the lowest rival (a Korean shipyard). The fact that this firm is young and yet tiny is not what makes it "entrepreneurial" (though growing rapidly). The understanding that castings of this kind are unique and different, that there is a sizable market for them, and that technology, particularly computer technology, now makes it feasible for an art form to be transformed into a scientific procedure. It's true that all startup small enterprises have a lot in common. But, in order to be considered entrepreneurial, a business must possess unique qualities in addition to being young and tiny. In fact, entrepreneurs make only a small portion of new enterprises. They alter or transform values; they produce something fresh and novel[3].

Also, a business does not need to be start-up or tiny to be an entrepreneur. Indeed, even huge, established businesses engage in entrepreneurship. The General Electric Corporation (G.E.), one of the largest corporations in the world with a history spanning more than a century, has a long history of creating new entrepreneurial firms from nothing and establishing them as significant enterprises. And G.E. has expanded beyond industrial entrepreneurship. The disruption that is altering the US financial system and is now quickly spreading to Great Britain and Western Europe was largely caused by its lending arm, G.E. Credit Corporation. When G.E. Credit realized that commercial paper might be used to fund industries, it broke through the financial world's Maginot Line in the 1960s. This ended the banks' historical monopoly on business financing.

The very large British retailer Marks and Spencer has arguably had a greater impact on the British economy and even on British society than any other change agent in Britain, and perhaps even more than government or laws. Over the past fifty years, Marks and Spencer has been more innovative and entrepreneurial than any other company in Western Europe. Likewise, G.E. and Marks & Spencer share many characteristics with big, well-established companies that are utterly lacking in entrepreneurial spirit. It's not only their size or growth that defines them as "entrepreneurial," but rather a set of distinct traits. Last but not least, entrepreneurship is not tied to only economic institutions.

The history of the contemporary university, particularly the modern American university, is the best source material for a history of entrepreneurship. Wilhelm von Humboldt, a German diplomat and civil servant, is credited with creating the modern university as we know it. In 1809, he conceived of and established the University of Berlin with two distinct goals in mind: to wrest intellectual and scientific leadership from the French and give it to the Germans; and to harness the energies released by the French Revolution and use them against the French themselves, particularly Napoleon. By 1870, when the German university had reached its zenith, 60 years later, the United States adopted Humboldt's notion of the university as a force for change. The ancient "colleges" from the colonial era there were senescent by the conclusion of the Civil War.

Even though the population had almost quadrupled, there were only about half as many college students in the United States in 1870 as there were in 1830. But, throughout the course of the

next thirty years, a vast array of American university presidents* designed and established a brand-new "American university." Read pages 150–152 of my book Management: Duties, Responsibilities, Practices (New York: Harper & Row, 1973) for the chapter on The American University.

New "private" and "metropolitan" universities were created after World War II by a new generation of American academic entrepreneurs. Examples include Pace University, Fairleigh Dickinson, and the New York Institute of Technology in the New York region, Northeastern in Boston, Santa Clara and Golden Gate on the West Coast, and others. Throughout the last thirty years, they have contributed significantly to the expansion of the higher education industry in America. The majority of these new schools seem to have similar curricula to the more established ones[4].

However, they were purposefully created for a new and distinct "market"—for adults rather than teenagers just out of high school, for students from big cities who commute to university at all hours of the day and night rather than for those who live on campus and attend class full-time, five days a week from nine to five, and for students from extremely diverse—indeed, heterogeneous—backgrounds rather than for the "college kid" of the American tradition. They were a reaction to a significant change in the market, a change in the status of a college degree from one associated with the "upper class" to one associated with the "middle class," and a significant change in what "going to college" meant.

The development of the "community hospital" in various forms in nineteenth-century America, the establishment of the great specializedcenters of the early twentieth century, such as the Mayo Clinic or the Menninger Foundation, the emergence of the hospital as a health-care center in the post-World War II era all of these events could serve as the basis for a casebook on entrepreneurship. And right now, new business owners are hard at work transforming hospitals once more into specialized "treatment centers" like ambulatory surgical clinics, standalone maternity facilities, or psychiatric facilities where the focus is instead on meeting specialized "needs" rather than the patient's needs as it is in traditional hospitals.

These service organizations become entrepreneurial via systematic entrepreneurship, which is something unique and particular. Germans associate entrepreneurship with power and property, which is even more deceptive than the way English people associate it with the new, little enterprise. The individual who owns and operates a company is known as the (literally, "entrepreneur" in German; "owner-manager" in English). Also, the term is largely used to differentiate between the "bosses," who also owns the company, and "professional manager" as well as "hired hands" in general[5].

The entrepreneurial bank created in 1857 by the Brothers Pereire in their Credit Mobilier, perfected in 1870 across the Rhine by Georg Siemens in his Deutsche Bank, and brought to New York around the same time by the young J. P. Morgan were the first attempts to develop systematic entrepreneurship, but they did not aim at ownership. The job of the banker as an entrepreneur was to get other people's money moving so it could be invested in things that would produce more and yield more. The former bankers, like the Rothschilds, acquired ownership.

Every time they constructed a railroad, they paid for it themselves. In contrast, the business-minded banker had little interest in becoming an owner. He got his money by reselling the public shares of the businesses he had invested in while they were young. He also borrowed from the common population to fund his businesses.

Entrepreneurs aren't investors either, despite the fact that all economic (and the majority of noneconomic) activities need cash. They are also not investors. Of certainly, they face risks, but so do all people who are involved in economic activity. The commitment of current resources to future expectations and by extension, to uncertainty and risk is the core of economic activity. The entrepreneur is not an employer either; instead, they might operate alone and solely for themselves and do so often[6].

Hence, entrepreneurship is a distinctive characteristic of both individuals and institutions. It is not a personality attribute; in thirty years, I have seen individuals of the widest range of temperaments and dispositions, Entrepreneurship in the Service Institution, but also 25 Management Tasks, Duties, Practices. The use of innovation works effectively in business difficulties. Certainty-seekers are unlikely to create successful business owners. Yet, such individuals are unlikely to succeed in a variety of other endeavors as well, including politics, leadership posts in the armed forces, and roles as ocean liner captains. In all of these endeavors, judgments must be taken, and uncertainty is a fundamental part of every decision. Nonetheless, anybody who is capable of making decisions may learn how to be an entrepreneur and act in an entrepreneurial manner. So, rather than being a personality characteristic, entrepreneurship is a behavior. Yet rather than being based on intuition, its basis is in idea and theory.

Even if the practitioners themselves are ignorant of it, every practice is based on theory. The foundation of entrepreneurship is an economic and social idea. According to the view, change is both natural and beneficial. And it believes that changing things rather than improving on what is currently being done is the main challenge facing society, particularly the economy. Essentially, this is what Say meant when he first invented the word "entrepreneur" almost two hundred years ago. The entrepreneur upheaved and disorganized, according to the manifesto's stated goals. His job is "creative destruction," as Joseph Schumpeter put it.

Adam Smith was admired by Say. He diligently promoted Smith's ideas and programmed throughout his life by translating Smith's Wealth of Nations (1776) into French. But, his unique contribution to economic philosophy, the idea of the entrepreneur and of entrepreneurship, is separate from and even incompatible with classical economics. Classical economics and current mainstream economic theory, such as that of the Keynesians, the Friedmanites, and the Supply-siders, both seek to maximize what currently exists. It emphasizes making the most of already available resources and seeks to achieve balance. The entrepreneur is relegated to the mysterious world of "external forces," which includes war, disease, government, politics, weather, and technology. It is unable to manage the entrepreneur.

Of course, the classic economist does not dispute the existence or significance of these exogenous influences, independent of school or "ism". But, they are not a part of his reality and are not taken into consideration by his model, equations, or forecasts. Even while Karl Marx had

the best understanding, citation of technology he was the pioneer and remains one of the greatest historians of the field he was unable to include entrepreneurship into his economics or his philosophy. Marx believed that all economic change outside of the optimization of current resources, or the creation of equilibrium, resulted from changes in the connections between property and power, or "politics," which means that it occurred outside the economic system itself.

The first significant economist to refer back to Say was Joseph Schumpeter. Schumpeter departed from conventional economics far more drastically in his masterpiece Eine Theory der (The Theory of Economic Dynamics), published in 1911, than John Maynard Keynes would accomplish twenty years later. Instead of equilibrium and optimization, he proposed that dynamic disequilibrium caused by innovative entrepreneurs is the "typical" of a healthy economy and the key tenet of both economic theory and economic practice[7].Say was mostly focused on the world of business. Yet according to his concept, the resources must simply be "economic." These resources may be used for purposes that are not always economically motivated. Normal definitions of "economic" exclude education, and economic standards are hardly the best way to assess the "return" of education (though no one is convinced what alternative standards may apply). Yet, there are, of course, financial resources for schooling.

In actuality, they are the same as those used for the most blatantly commercial endeavors, such the production of soap for sale. In fact, all human social activities need the same "economic" resources: labour, management, and time. Physical resources include land, seed corn, copper, classrooms, and hospital beds. Economic resources include capital, which is money set aside from present use for future aspirations. So, despite the fact that the word originates in the economic sector, entrepreneurship is by no means exclusive to it. It applies to all human actions, except those that may be classified as "existential" as opposed to "social." Yet as we now know, regardless of the industry, entrepreneurship is much the same. The entrepreneur in the area of education and the entrepreneur in the field of health care both have been rich fields do essentially the same things, use essentially the same tools, and run into essentially the same issues as the entrepreneur in the field of business or the field of labor union. Entrepreneurship and entrepreneurship: The entrepreneur constantly monitors for change, reacts to it, and seizes the opportunity it presents.

It's a frequent misconception that starting a business is very dangerous. Moreover, the fatality rate is high and the likelihood of success or even survival seems to be rather low in such highly visible fields of innovation as high tech for example, microcomputers or biogenetics. Why, therefore, is this the case? By definition, entrepreneurs move resources from low-productivity and low-yield regions to high-productivity and high-yield ones. Of course, there is a chance they won't be successful. Yet, if they are even modestly effective, the rewards should be more than sufficient to balance out any potential risk. Thus, one should anticipate that entrepreneurship will be far less dangerous than optimization. Certainly, nothing could be more dangerous than maximizing resources in fields where innovation is the right and lucrative option, i.e., where there are existing prospects for innovation. The least dangerous path, as opposed to the most risky, should be entrepreneurship, according to theory. The widespread misconception that

entrepreneurship and innovation are risky endeavors is, in reality, debunked by the large number of entrepreneurial businesses whose success rates are so high[8].

For instance, Bell Lab, the creative division of the Bell Telephone System, is located in the United States. Bell Lab produced winner after winner for more than 70 years, starting with the design of the first automatic switchboard around 1911 and continuing with the design of the optical fiber cable around 1980, including the invention of the transistor and semiconductor as well as the foundational theoretical and engineering work on the computer. The Bell Lab track record suggests that innovation and entrepreneurship may be low-risk endeavors even in the high-tech sector.

In a rapidly evolving high-tech industry like computers and in rivalry with the "old pros" in electricity and electronics, IBM hasn't seen any significant setbacks to yet. The most innovative of the world's leading retailers, the British department store giant Marks & Spencer, hasn't either in a far more mundane sector. Procter & Gamble, the biggest manufacturer of branded and packaged consumer products in the world, has a similarly stellar track record of successful inventions. Moreover, a "middletech" business, 3M, based in St. Paul, Minnesota, has produced around 28

Four out of every five of Systematic Entrepreneurship's ventures 100 new enterprises or significant product lines in the last 60 years have been profitable. This is only a tiny selection of the businesspeople who innovate in low-risk ways. There are undoubtedly far too many of them to be a coincidence, an act of the gods, an accident, or sheer chance in the case of low-risk business[9], [10].

However, there are enough lone entrepreneurs out there whose success rate in launching new businesses is so high as to refute the notion that entrepreneurship entails a large degree of risk. Since so few "entrepreneurs" really know what they are doing, entrepreneurship is "risky" in large part. They lack the approach. They transgress simple, accepted norms. This is especially true for high-tech business owners.

High-tech entrepreneurship and innovation are undoubtedly harder and riskier by nature than innovations based on economics and market structure, demography, or even something as apparently ethereal and intangible as Weltanschauung perceptions and moods as will be described. Yet, Bell Lab and IBM show that even high-tech entrepreneurship need not be "highrisk". But it does need to be methodical. It must be controlled. Above all, it must be founded on deliberate creativity[11], [12].

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CHAPTER 2

UNLEASHING THE POWER OF PURPOSEFUL INNOVATION: A FRAMEWORK FOR DRIVING SUSTAINABLE GROWTH

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Businesses innovate. The particular tool of entrepreneurship is innovation. This action gives resources a new ability to produce riches. Innovation does in fact produce resources. There is no such thing as a "resource" until man gives anything in nature an economic use, at which point it becomes a resource. Every plant is a weed until that time, and every mineral is simply another rock. Mineral oil pouring from the earth and bauxite, the ore of aluminum, weren't considered resources until little over a century ago. These were nuisances; both leave the land unproductive. The penicillin mold was an annoyance, not a useful thing. The bacteriologists went to considerable measures to prevent it from contaminating their bacterial cultures. The penicillin mould then turned out to be a useful resource when a London physician named Alexander Fleming determined in the 1920s that this "bug" was precisely the bacterial killer bacteriologists had been searching for[1].

The term "purchasing power" refers to the most valuable resource in an economy. But, the innovative entrepreneur is the one who created buying power. Early in the nineteenth century, the American farmer had almost minimal buying power, making it impossible for him to purchase agricultural equipment. Many harvesting equipment options were available, but no matter how much the farmer desired them, he was unable to afford them. Later Cyrus McCormick, one of the several harvesting machine innovators, created installment purchasing. As a result, the farmer was able to purchase a harvesting machine using future revenues as opposed to previous savings, giving him "buying power" to do so.

The concept of transferring a truck body off its wheels and onto a cargo vessel did not entail any new technology. This "invention," the container, really grew out of a new understanding of the "cargo vessel" as a materials-handling equipment rather than a "ship," which meant that the most important thing was to minimize the amount of time in port. Nonetheless, this unremarkable invention probably saved shipping while also nearly quadrupling the productivity of the oceangoing cargo. Without it, the massive rise in global commerce over the last forty years the greatest growth in any significant economic activity ever observed is improbable[2].

More so than the widespread belief in the benefits of education, the methodical preparation of teachers in schools of education, or pedagogical theory, it was that humble invention, the textbook, that really made universal schooling feasible. (The renowned Czech educational reformer Johann Amos Comenius, who created and used the first Latin primers in the middle of the eighteenth century, is said to have invented the textbook.) Without the textbook, even an

excellent instructor can only instruct one or two pupils at once; yet, with it, even a very ineffective teacher may impart some knowledge to thirty or thirty-five students.

These examples demonstrate that innovation need not be technical or even a "thing" in the traditional sense. Few technological advancements can match the social inventions like the newspaper or insurance in terms of effect. The use of installment payments alters economies literally. No matter where it is implemented, it shifts the economy from being supply-driven to being demand-driven, regardless of how productive the economy is. This explains why any Marxist government that comes to power immediately bans installment buying, as the Communists did in 1948 in Czechoslovakia and again in 1959 in Cuba. In comparison to many medical breakthroughs, the hospital, a social invention of the Enlightenment of the eighteenth century, has had a bigger influence on health care. The invention of this century is management, or the "useful knowledge" that allows man to make productive individuals with various abilities and expertise working together in an "organization" for the first time. Modern civilization has been transformed into something entirely new something, incidentally[3].

August Borsig is credited as the first person to construct steam locomotives in Germany in books on economic history. But unquestionably far more significant was his invention of the German factory organisation system, which still serves as the cornerstone of Germany's economic might, despite fierce resistance from trade guilds, educators, and government officials. Borsig is credited with creating both the Lehrling System (apprenticeship system), which combines practical training (Lehre) on the job with schooling (Ausbildung) in the classroom, and the Meister (Master), the highly skilled and highly respected senior worker who runs the shop with considerable autonomy. Yet unlike other technologies, Machiavelli's development of modern government in The Prince (1513) and Jean Bodin's creation of the modern national state sixty years later both had a more enduring influence.

Despite successfully defeating China and then Russia in 1894 and 1905, respectively; Pearl Harbor; and her sudden emergence as an economic superpower and the toughest competitor in the world market of the 1970s and 1980s, Japan has consistently been underrated by westerners since she opened her doors to the modern world in 1867. The widespread notion that innovation has to do with objects and is founded on science or technology is a significant factor, if not the main one. Moreover, it has long been believed that the Japanese are copycats rather than creators, both in Japan and the West. Since, generally speaking, the Japanese have not created notable technological or scientific advancements. The foundation of their success is social innovation[4].

To avoid the fates of India and nineteenth-century China, both of which were invaded, colonised, and "westernised" by the West, the Japanese hesitantly opened their nation to the world during the Meiji Restoration of 1867. The major goal was to keep the West at away using Western weaponry but being Japanese, in true Judo form. This meant that compared to telegraph or steam trains, social innovation was significantly more important. Also, social innovation has played a crucial role in the creation of institutions like schools and universities. Building trains and telegraphs was far easier than developing services, banks, and labour relations. A locomotive that can draw a train from London to Liverpool can also pull a train from Tokyo to Osaka without

any modifications. The social structures, however, had to be both distinctly "Japanese" and "contemporary" at the same time. Although serving a "Western" and highly technology economy, they had to be managed by Japanese. Importing technology can be done affordably and with little danger to cultural diversity. Institutions, on the other hand, need cultural roots to develop and flourish. With astonishing success, the Japanese decided a century ago to focus their efforts on social improvements while also copying, importing, and adapting technological advancements. In fact, they could still benefit from this strategy. For what is sometimes mockingly referred to as "creative mimicry" is really a completely legitimate and often highly effective business technique, as will be covered. It could be wise not to underestimate the Japanese, even if they now need to learn to innovate technology independently rather than just copying, importing, and adapting it. In and of itself, scientific research is a relatively modern "social invention." And the Japanese have always shown a remarkable aptitude for such invention whenever they have had to do so in the past. They have excelled in their understanding of entrepreneurial tactics, above all[5].

Hence, rather than being a technical phrase, "innovation" is an economic or social term. It may be characterized as altering the yield of resources, as J. B. Say put it. Instead, as a contemporary economist would want to do, it may be described in terms of demand rather than supply, i.e., as altering the value and pleasure that consumers get from resources. I would contend that rather than the theoretical model, the individual instance determines which of the two is more appropriate. The simplest way to define and assess the transition from the integrated steel mill to the "mini-mill," which begins with steel scrap rather than iron ore and finishes with a single product (for example, beams and rods rather than raw steel that then has to be manufactured), is in terms of supply. While the expenses are much lower, the final product, the final uses, and the consumers are all the same. And the container fulfils the same supply specification most likely. Yet even if they are just as "technical," if not more so, the audiocassette or videocassette are better characterized or examined in terms of the customer.We are still unable to create an innovation theory. Yet, we already have sufficient knowledge to indicate when, when, and how one should systematically search for new possibilities, as well as how one should assess the likelihood of success or the dangers of failure. Since it is currently just in outlines, we have enough knowledge to build the practice of innovation[6].

For technology historians, the idea that the "invention of innovation" was one of the nineteenth century's greatest accomplishments has nearly become cliché. Invention remained a mystery until about 1880; early nineteenth-century writings often refer to the "spark of brilliance." The inventor himself was a grotesque, half-romantic character working alone in a garret. By 1914, when World War I started, "innovation" had changed to "research," a methodical, deliberate activity that was planned and arranged with a high degree of predictability about both the intended outcomes and the likelihood that they would be realized.

Successful businesspeople start working right away instead of waiting for "the Muse to kiss them" and give them a "brilliant idea". They don't search for the "biggie," the invention that will "revolutionize the industry," build a "billion-dollar firm," or "make one wealthy overnight," in the aggregate. Entrepreneurs who go out with the expectation of quickly becoming wealthy are

almost always doomed to failure. They virtually always make poor decisions. A seemingly significant breakthrough could only be technical brilliance, whereas less significant innovations like McDonald's, for example might grow into enormously successful companies. The same holds true for advancements in non-commercial public services. Whatever their personal motivations may be whether it is money, power, curiosity, or the desire for fame and recognition successful entrepreneurs make an effort to provide value and to contribute. Even yet, successful businesspeople have lofty goals. They are not satisfied with only altering or enhancing what presently exists. They strive to transform "materials" into "resources," to integrate already-existing resources in new and more effective ways, and to produce new and distinct values and satisfactions.

The Seven Sources and purposeful innovation are two distinct concepts. Hence, systematic innovation entails a deliberate and methodical search for changes as well as a methodical evaluation of the potential for economic or social innovation that these changes may provide. Often, they are alterations that have already taken place or are still being made. The vast majority of effective inventions take advantage of change. It's true that certain technological advancements, like the aircraft built by the Wright Brothers, are significant changes in and of themselves. Nonetheless, they are comparatively rare cases[7].

The most common and pragmatic inventions take advantage of change. Because of this, the study of innovation is a diagnostic discipline: a methodical investigation of the areas of change that often provide business prospects. Innovation is the knowledge basis of entrepreneurship. Monitoring seven sources for creative possibility is precisely what systematic innovation entails. The first four sources are found inside the organization, whether it be a company, a governmental institution, a business sector, an industry, or a service sector.

So, they are mostly visible to those working in that industry or service area. These essentially are symptoms. Nonetheless, they are very accurate predictors of changes that have already occurred or that are easily capable of occurring. These four areas of origin are: The unexpected the unexpected success, failure, or outside event; the incongruity between reality as it actually is and reality as it is assumed to be or as it "ought to be"; Innovation based on process need; and Changes in industry structure or market structure that catch everyone off guard. The second group of three sources for inventive potential concerns developments outside the company or sector: Changes in perception, emotion, and meaning; demographics (population shifts); and new information, both scientific and nonscientific. There is a lot of overlap between these seven potential sources of innovation, and the distinctions between them are hazy. These may be compared to seven windows on several sides[8].

There are certain details shown in each window that are likewise visible from the windows on each side of it. Nonetheless, each offers a distinctive and distinctive vista from its center. Each of the seven sources has to be analyzed separately since they each have unique traits. Yet, no region is fundamentally more significant or fruitful than the others. Both the large application of new information after a substantial scientific advance and the examination of change's symptoms, such as the surprising success of what was thought to be a minor modification in product or price, are likely to result in major innovations[9].

Yet, it is not random how these sources will be addressed in sequence. Their dependability and predictability are presented in declining order. Thus, contrary to popular assumption, effective innovations are not always the result of new information, particularly new scientific knowledge. Despite its prominence, glitz, and significance, science-based innovation is actually the least dependable and predictable one. On the other hand, the routine and unglamorous investigation of such underlying changes' signs as unexpected success or failure carries very little risk and uncertainty. The lead time between the beginning of an initiative and its quantifiable outcomes, whether success or failure, is often the shortest for the innovations that arise from it[10]–[12].

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CHAPTER 3

THE UNEXPECTED SUCCESS: EXPLORING THE FACTORS AND STRATEGIES BEHIND SURPRISING ACHIEVEMENTS IN BUSINESS, SPORTS, AND OTHER FIELDS

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The unexpected success is the only sector that provides as many prospects for effective innovation. Innovative prospects are never less difficult to pursue and less hazardous to pursue than they are. But, the unanticipated success is usually entirely ignored; what's more, managements often openly disapprove of it. R. H. Macy, the head of New York's biggest department store, told me more than 30 years ago that "we don't know how to halt the development of appliance sales."The chairman said, "On the contrary, profit margins are greater than on fashion products; there are no returns, and there is essentially no theft." No, no, was the response. "Instead of selling appliances largely to customers who entered the store to purchase clothing, we now often sell clothing to customers who enter the store to purchase appliances. Yet in this kind of shop, fashion producing 70% of sales is reasonable and good, the chairman added. Appliance sales currently make up three-quarters of all sales due to their rapid growth. That's unusual, too. To restore the normal ratio, we've done all we know to make fashion expand, but nothing has succeeded. The only thing left to do is to reduce appliance sales to their proper level[1].

After this incident, Macy's New York carried on drifting for over twenty years. There were several justifications offered for Macy's failure to take advantage of its dominating position in the New York retail industry, including the decline of the inner city, the subpar economics of a store that was allegedly "too enormous," and many more. Indeed, despite inner-city degradation, high labour expenses, and massive size, Macy's quickly started to profit again after new management took over after 1970, changed the focus, and embraced the significance of appliances to sales.

As Macy's rejected the unexpected success, Bloomingdale's, another New York-based retailer, leveraged the same unexpected success to move up to the number two slot in the New York market. At best a poor number four, Bloomingdale's had been even more of a clothing retailer than Macy's. Yet, as appliance sales started to increase in the early 1950s, Bloomingdale's seized the chance. It examined what was happening after realizing something unexpected was occurring. The Housewares Department was then used to create a new position in the market. In order to target a new client, of whose advent the surge in appliance sales was simply a sign, it also refocused its fashion and clothing sales. In terms of volume, Macy's is the top store in New York. The "sophisticated New York shop," however, is now Bloomingdale's. And the shops that competed for this distinction thirty years ago the shops that, at the time, were strong number twos, the pioneers of 1950s fashion, like Best have vanished [2].

It will be said that the Macy's narrative is excessive. Yet the chairman's awareness of his actions was the only peculiar feature about it.Too many managers behave in the same foolish manner as Macy's, despite being unaware of their mistake. The unexpected triumph is never easy for management to accept. It requires tenacity, clear guidelines, a readiness to consider reality, and the humility to admit when one is mistaken. Since we all have a tendency to think that anything that has lasted for a while must be "normal" and continue "forever," it may be challenging for management to embrace unexpected success. Hence, everything that deviates from what we have grown to accept as a natural rule is disregarded as being unsound, harmful, and plainly aberrant. Its steelworks were quickly becoming out of date and would need massive investments to bring them up to date. It also understood that it was unable to get the required funds. The answer was a brand-new, more compact "mini-mill"[3].

Such a "mini-mill" was obtained almost by chance. It immediately started to expand quickly and bring in money and profits. Thus, a few of the younger individuals in the steel industry suggested using the existing investment cash to buy more "minimills" and construct new ones. The "mini-mills" would then provide the steel corporation with several million tonnes of steel capacity within a few years based on contemporary technology, affordable labour, and targeted markets. The initiative was blocked angrily by top management; as a result, all the guys involved became "ex-employees" within a short period of time. Top management stated that "the integrated steelmaking process is the only correct one.

"Anything else is cheating; it's a trend, it's unhealthy, and it won't last." Needless to say, ten years later, "mini-mills" were the only segments of the American steel industry that were still strong, expanding, and somewhat successful. Anything other than "big steel" is strange and alien, even dangerous, to a steelmaker who has dedicated his entire life to perfecting the integrated steelmaking process, who feels at home in the large steel mill, and who may even be the son of a steelworker (as many American steel company executives have). To see one's finest opportunity in the "enemy" requires effort.

People in top management have often grown up in one function or one area in the majority of enterprises, whether small or big, public-service institution or commercial. They feel most at ease here, according to them. For instance, the personnel vice-president was the only member of high management when I met with R. H. Macy's chairman who had not begun his career as a fashion buyer and worked exclusively in the fashion division. These folks believed that other people dealt with appliances[4].

Success that was unexpected may be grating. Imagine the business that has spent a lot of time and effort updating and improving an outdated product that has served as the business's "flagship" for many years and is a symbol of "quality." A revision of an outdated, "low-quality" product that everyone in the organization knows is completely useless is implemented at the same time, but with much reluctance. Just one of the top salespeople for the business is responsible for it. But, nobody anticipates it selling; in fact, nobody wants it to sell. The market is then taken by this "dog," who even steals the sales that were predicted and planned for the "prestige" and "quality" line. It makes sense why everyone is shocked and thinks the success is a "cuckoo in the nest" (a term I have heard more than once).

Everyone is likely to respond just as R. H. Macy's chairman did when he saw the unwelcome and loathed appliances overtaking his cherished garments, on which he had personally focused his time and efforts throughout his working life.The chairman of the major steel business is cited as stating, "If the mini-mills were an opportunity, we definitely would have spotted it ourselves." when he rejected the idea for the mini-mills. While management is compensated for their judgment, they are not hired to have perfect judgment. In actuality, they are being compensated to acknowledge their errors and make amends, particularly when doing so presents an opportunity. But, this is by no means typical[5]. Even though a Swiss pharmaceutical firm now leads the world in veterinary medications, it has never really created a veterinary treatment. Yet, the businesses that created these medications declined to cater to the veterinary industry. Naturally, the drugs mostly antibiotics were created to address illnesses in humans.

The original makers were not happy when veterinarians started ordering them after learning that they were as beneficial for animals. They refused to provide the veterinarians in some situations, and in many others, they did not appreciate having to repackage, reformulate, or otherwise handle the medications for use in animals. About 1953, the medical director of a major pharmaceutical corporation objected, claiming that using a novel antibiotic to treat animals was a "misuse of a noble drug." As a result, when the Swiss contacted this firm and many others, they were able to easily and cheaply get permits for veterinary usage. Several of the producers were eager to get rid of the humiliating success. Since then, the price of human drugs has been under pressure, and regulatory bodies have increased their scrutiny. Veterinary drugs are now the pharmaceutical industry's most lucrative subsegment as a result. Nevertheless, these gains are not received by the businesses who originally produced the chemicals.

Nobody is interested in it. Because no one takes advantage of it, the competition will unavoidably take advantage of it and profit from it. An established hospital vendor unveiled a brand-new range of equipment for biological and clinical examinations. The success of the new items was impressive. Soon orders began to pour in from businesses and academic labs. Nobody knew about them, nobody noticed them, and nobody understood that the corporation had manufactured items for markets other than those for which they were originally intended by sheer accident. No salesperson was sent to make cold calls to these new clients, and no service personnel was organized. Five to eight years later, these new markets were controlled by another business. The amount of revenue these marketplaces generated also allowed the newcomer to quickly infiltrate the hospital market by providing cheaper pricing and superior services to the established market leader[6].

Our current reporting methods often do not mention the unanticipated success, much less shout for management's notice, which is one reason for this blindness to it. Nearly every business, as well as every organization providing public services, has a monthly or quarterly report. The first page highlights the issues and shortcomings in the areas where performance falls short of expectations. So, everyone concentrates on the issues during the management team and board of directors' monthly meetings. Nobody even considers the areas where the business has performed better than anticipated. Also, the data won't often reflect the unanticipated success if it is

qualitative rather than quantitative, as was the case with the hospital instruments stated above that opened up new significant markets outside of the business's regular ones.

Analysis is necessary to take advantage of the chance for innovation presented by unexpected success. Unanticipated success is a sign. Nevertheless, a sign of what? It's possible that the underlying phenomena is nothing more than a restriction on our own perception, expertise, and comprehension. The fact that pharmaceutical companies, for example, disregarded the unexpected success of their new drugs in the animal market was a sign of their ignorance of the scale and significance of livestock raising globally, as well as their blindness to the sharp rise in demand for animal proteins after World War II and to the significant advancements in knowledge, complexity, and management skills among farmers worldwide[7].

The staff at Bloomingdale's concluded that the appliances' surprising success at R. H. Macy's was a sign of a fundamental shift in the attitudes, expectations, and values of a sizable portion of customers. Before World War II, Americans made their purchases at department stores mostly according to their social standing, or income level. After World War II, the market began to rapidly divide itself into "lifestyle" segments. The first large department store to see this, take advantage of it, and create a new retail image was Bloomingdale's, particularly on the East Coast.

A symptom of the disappearance of distinctions between the various users of scientific instruments, which for almost a century had created sharply different markets, with different end uses, specifications, and expectations, was the unexpected success of laboratory instruments designed for the hospital in industrial and university laboratories. It wasn't simply that a product line had applications that weren't initially intended something the corporation was unaware of. The company's specialized market niche in the hospital industry came to an end as a result. As a result, the company that had successfully defined itself as a designer, manufacturer, and marketer of hospital laboratory equipment for thirty or forty years was eventually forced to reposition itself as a manufacturer of laboratory instruments and to develop capabilities to design, manufacture, distribute, and provide services far outside of its original field. Yet at that time, a significant portion of the market had been permanently gone.

DuPont, the greatest chemical corporation in the world, and IBM, the titan of the computer industry, both attribute their dominance to their readiness to seize the unexpected success as an inventive opportunity. For 130 years, DuPont has limited its business to producing explosives and weapons. Then, in the middle of the 1920s, it formed its first research projects in various fields, one of which being the recently developed discipline of polymer chemistry, which the Germans had developed during World War I. 42 For several[8].

There were no findings at all in the unexpected years. Later, in 1928, a helper accidentally left a burner on while they were away. The responsible scientist, Wallace H. Carothers, discovered that the substance in the kettle had solidified into threads on Monday morning. DuPont had to wait another 10 years before learning how to purposely produce nylon. Yet, the story's main point is that, much earlier, the identical event had repeatedly happened with the same outcomes in the labs of the major German chemical corporations. Of course, the Germans were searching for a polymerized fiber, and 10 years prior to DuPont developing Nylon, they might have acquired it

as well as global dominance in the chemical business. But, as the experiment was not intended, the findings were disregarded, the fibers that were unintentionally created were poured away, and the experiment was restarted[9].

The history of IBM demonstrates what may happen when unexpected success is recognized. For IBM, the ability to capitalize on unanticipated success not just once, but twice, is mainly responsible. IBM almost failed in the start of the 1930s. It had used all of its available funds to create the first bank-specific electro-mechanical accounting machine. Yet during the early 1930s Depression, US banks refrained from making new equipment purchases. The machines had to be placed in storage, but IBM continued to produce them since it had a policy of not laying off employees.

The founder of IBM, Thomas Watson, Sr., allegedly found himself seated next to a woman at a dinner gathering while the company was at its lowest point. "Are you the Mr. Watson of IBM?" she asked when she learned his name. Why won't your sales manager let me see your gadget in action? What a woman would like from an accounting device She informed Thomas Watson that she was the director of the New York Public Library, something he could not possible have guessed and which did not much assist him since, as it turned out, he had never been inside a public library. Yet when its doors opened the next morning, he was there[10]. Two hours later, Watson left with enough money from the order to pay the bills for the next month. We acquire payment in advance before we deliver, he said, always with a grin, "I developed a new policy on the spot." IBM had one of the first computers 15 years later. The IBM computer, like other early American computers, was exclusively intended for use in science. Watson's interest in astronomy is one of the main reasons IBM entered the computer industry.

The moon phases of the past, present, and future could all be calculated by IBM's computer, which was displayed in the company's Madison Avenue exhibit window and attracted massive crowds. But soon companies started purchasing this "scientific wonder" for the most banal uses, including payroll. Univac didn't really want to "demean" its scientific marvel by serving business, even though it possessed the most sophisticated computer and the one most suited for commercial needs. Yet, IBM reacted right away despite being just as shocked by the demand for computers from businesses. In fact, it was prepared to forgo its own computer design, which wasn't especially suited for accounting, in favor of using what its adversary and rival (Univac) had created. Even though its own computers were technically inferior to those made by Univac for another decade, IBM had taken the lead in the computer business within four years. IBM was ready to accommodate business and to do it on its terms, for as by providing business-specific programming training[11].

In a similar vein, Matsushita, the leading electronic manufacturer in Japan (also known by the brand names Panasonic and National), owes much of its success to its readiness to take risks. Early in the 1950s, Matsushita was a very modest and unremarkable business, outclassed in every way by older and more established titans like Toshiba or Hitachi. Like every other Japanese company at the time, Matsushita "understood" that "television would not develop rapidly in Japan." The chairman of Toshiba had said, "Japan is simply too impoverished to afford such a luxury," during a conference in New York in 1954 or 1955. But, Matsushita was wise

enough to see that it's possible the Japanese farmers were unaware that they were too impoverished to own a television.

They were aware that television gave them access to a vast world for the first time. People were willing to pay for televisions despite not being able to afford them. At the time, Toshiba and Hitachi produced superior sets, but they mainly displayed them in Tokyo's Ginza and in department shops in large cities, making it very evident that farmers were not really welcome in such opulent settings. Nobody had ever done it in Japan before, but Matsushita went to the farmers and sold its TVs door to door for prices higher than cotton trousers or aprons. Of course, relying on accidents or waiting for the woman at the dinner table to suddenly exhibit interest in one's ostensibly failed product is insufficient. It's important to structure the search. Making sure the unexpected is recognized and, in fact, that it cries out for attention, should come first. It has to be carefully highlighted in the data management studies and acquisitions.

Nevertheless, management must also understand what requirements the unexpected success places on them. Again, an illustration would help to better convey this. Early in the 1950s, a major institution on the east coast of the United States began an evening "continuing education" programmed for adults, where people with a high school diploma may do the regular undergraduate coursework leading to an undergraduate degree[12]. Nobody on the faculty really cherished the initiative. The only reason it was provided at all was because a tiny number of returning World War II veterans were screaming for a chance to receive the credits they still needed since they had been compelled to work before finishing their bachelor degrees. To everyone's amazement, however, the programmed turned out to be very successful, receiving a flood of applications from competent students. Also, programmed participants did better than typical undergraduates. This led to a problem, ultimately. The institution would have needed to create a sizable first-rate faculty in order to capitalize on the unexpected success.

But, this would have compromised its core initiatives and, at the very least, distracted the institution from what it viewed as its primary goal the instruction of students. The other option was to terminate the new initiative. Both options would have been wise choices. The university made the decision to fill the programmed with temporary, inexpensive teachers, the majority of whom were teaching assistants pursuing their own graduate degrees. Because of this, the programmed was dismantled within a few years. What's worse, however, is that it also severely harmed its own image.

It is essential to take innovation seriously. Instead than being staffed with everyone we can find, it requires the most competent individuals. In proportion to the scale of the opportunity, management must take it seriously and provide assistance. Also, the potential is substantial. Contrary to accomplishments, failures cannot be ignored and are almost never overlooked. But, they are seldom recognized as signs of an opportunity. Of course, many failures are just errors that were made as a consequence of ineptitude in planning or execution, avarice, foolishness, or mindless bandwagon-climbing. But, when something fails despite being well planned, conceived, and carried out, it often portends underlying change and, with it, opportunity. A product or service's design, marketing approach, or underlying assumptions may no longer be valid. Maybe consumers are now buying the same "item" but a totally different "value," since

their views and values have shifted. Instead, it's possible that what was once just one market or one end use is now dividing into two or more, with each requiring a very different product. This kind of shift presents a chance for creativity.

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CHAPTER 4

SOURCE: INCONGRUITIES - HARNESSING CONTRADICTIONS AND INCONSISTENCIES TO DRIVE INNOVATION AND PROBLEM-SOLVING

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A difference or dissonance between what is and what "ought" to be, or between what is and what everyone believes it to be, is called an incongruity. We often do not comprehend the cause of things because cannot understand it. Nonetheless, an anomaly is a sign of a chance for innovation. It suggests an underlying "fault," in the terms of the geologists. A flaw like that provides an opportunity for innovation. It produces an unstable environment where relatively small movements of huge populations may lead to a reorganization of the social or economic system.

Nevertheless, inconsistencies seldom show up in the statistics or reports that executives receive and pay attention to. Rather than being quantifiable, they are qualitative. Incongruity is a sign of change, either change that has already happened or change that may be forced to occur, like the unexpected occurrence, whether it is successful or unsuccessful. The changes that underpin incongruity are changes inside an industry, a market, or a process, much as the changes that underlie the unexpected occurrence. Those that work in or are nearby the industry, market, or process may thus easily see the incongruity since it is there in front of their faces. Nonetheless, it is often disregarded by the insiders who tend to take it for granted, saying things like "This is how it's always been" even if this may be a fairly recent development[1].

There are various types of incongruity, including those between the economic realities of an industry (or of a public-service area) and the assumptions about those realities, those between the reality of an industry (or of a public-service area) and the efforts of that industry (or that public-service area), and others. A product or service should have improved economic performance if demand for it is increasing continuously. Becoming successful in a market with continually increasing demand ought to be simple. It is moved by the tide. Such an industry's lack of profitability and outcomes indicates an incongruity between economic realities.

These discrepancies often take the form of macro-phenomena that affect a whole industry or area of services. But, the most significant chances for innovation often go to the tiny, laser-focused new businesses, processes, or services. And often, the innovator who takes advantage of this incongruity may anticipate being left alone for a considerable amount of time before the established companies or suppliers become aware that they face new and serious competition[2].

Since they are so preoccupied attempting to close the gap between increasing demand and lagging outcomes, they seldom even notice when someone is doing differently doing something

that creates results and takes advantage of the increasing need. Sometimes we can make sense of what is happening. But, there are situations when it is tough to understand why more demand does not translate into improved performance. Hence, the innovator need not constantly attempt to comprehend why anything does not function as it ought to. What would take advantage of this incongruity, he should inquire instead? What would make it an opportunity, then? What is possible? Economic realities that don't match up is a call to action. Even though the issue is difficult to solve, there are occasions when the solution is rather evident. Yet sometimes, despite having a complete understanding of the issue, we are unable to resolve it. A notable example of an invention that effectively took use of incongruity is the steel "mini-mill". After the conclusion of World War I, industrialized nations' huge, integrated steel mills have only prospered during times of war for more than fifty years. Nevertheless, at least until 1973, the demand for steel seemed to be increasing continuously.

This contradiction's cause has long been understood. At an integrated steel plant, the bare minimum new unit required to meet increased demand requires a considerable investment and significantly increases capacity. Hence, any extension to an existing steel mill is likely to run for a considerable number of years at a low utilization rate, until demand which usually increases in slow, gradual stages outside of times of war reaches the new capacity level. Yet refusing to grow while demand gradually increases risks permanently losing market share. No business could afford to take that chance. So, the industry can only be profitable for a limited period of time: between the start of everyone's new capacity construction and the start of all of this new capacity[3].

However, it has long been recognized that the steelmaking method developed in the 1870s is essentially unprofitable. It attempts to break the rules of physics, which implies breaking the rules of economics. Even when working against the principles of gravity and inertia, nothing in physics involves more effort than creating temperatures, whether hot or cold. In the integrated steel process, very high temperatures are produced four times before being quenched one more. It had been obvious for a long time that the first process innovation that would address these inherent flaws would result in much cheaper costs. The "mini-mill" achieves just this. The smallest economically viable size of a mini-mill generates sales of over $100 million, thus it is hardly a "tiny" operation. Yet, it is still just a fraction of an integrated steel mill's minimum economic size roughly one-sixth to one-tenth.

Hence, a mini-mill may be constructed to inexpensively produce a relatively tiny extra increment of steel for which a market already exists. The mini-mill only produces heat once; it does not put it to rest; instead, it utilizes it for the remainder of the operation. Instead of using iron ore as a starting point, it begins with steel scrap and focuses on a single end product, such as sheets, beams, or rods. Also, although the integrated steel mill requires a lot of personnel, the mini-mill may be automated. As a result, its costs are much lower than those of the conventional steel process[4].

Every step of the way, governments, labor organizations, and integrated steel firms have fought against the mini-mill. Yet the trend remains steady. The innovation process is advancing. Although the huge, integrated steel mills will be in permanent decline by the year 2000, mini-

mills are anticipated to produce 50% or more of the steel used in the United States. There is, however, a catch, and it's a big one. In the paper sector, there is a comparable discrepancy between the economic realities of demand and process. Only in this instance, we are unsure of how to transform it into an opportunity for creativity. The paper sector has not been doing well despite the continual efforts of the governments of all industrialized and the majority of emerging nations to raise the demand for paper possibly the one goal on which the governments of all countries agree. There are always three years of "record profits" and then five years of "over capacity" and losses. Nevertheless, there is currently no equivalent "mini-mill" method for paper.

It has been known for 80 or 90 years that wood fiber is a monomer, therefore finding a plasticizer to turn it into a polymer shouldn't be too difficult. By doing this, the fundamentally inefficient and wasteful mechanical method of creating paper would be changed to the naturally efficient chemical process. In fact, the rayon method, which goes back to the 1880s, accomplished this goal of creating textile fibers from wood pulp over a century ago. Yet, despite millions being spent on research, no one has yet discovered a method to make paper in that manner[5].

These scenarios serve as examples of incongruities where an inventive solution must be clearly characterized. It must be practical using already available, well-known technology and readily accessible resources. Of course, it demands challenging development effort. Yet, if extensive investigation and fresh expertise are still required, the opportunity is not yet "ripe" for the entrepreneur. The invention that effectively takes advantage of a discrepancy between economic realities must be "obvious" rather than spectacular, simple rather than sophisticated. There are significant discrepancies in economic reality in public service sectors as well.

One example is health care in wealthy nations. As recently as 1929, health care comprised a negligible fraction of national spending across all industrialized nations, accounting for much less than 1% of the GDP or of consumer spending. Now, 50 years later, the share of the gross national product that goes to health care, namely hospitals, ranges from 7 to 11 percent in all industrialized nations. Contradictions instead of up. Prices have increased far more quickly than services—possibly three or four times as quickly. During the next thirty years, the number of elderly people in all industrialized nations will steadily increase, driving up demand. Costs will also increase, and these expenditures are directly related to the population's age.

We don't fully comprehend the phenomena. Yet effective ideas that are straightforward, concentrated, and aimed at certain goals have evolved in the United States and Great Britain. Just because the two nations' respective systems are so drastically different, these inventions are remarkably distinct. Yet, each takes advantage of a particular systemic weakness in its nation and turns it into a business opportunity[6].

Private health insurance, which has quickly emerged as the most popular and fastest-growing employee perk, is considered to be a "radical innovation" in Britain. It only gives policyholders the ability to skip the line and be examined by a doctor right away if they require "elective surgery," saving them time. † Because the British system has made an effort to contain the cost

of healthcare by "triaging," which, in practice, reserves immediate attention and treatment to routine illnesses on the one hand and to "life-threatening" illnesses on the other, but puts everything else, especially elective surgery, on hold with waiting periods now reaching years (e.g., for replacing a hip destroyed by arthritis). Nevertheless, those with health insurance have surgery straight soon.

Unlike Great Britain, the United States has so far made an effort to meet all healthcare requests, regardless of cost. Hospital expenses in America have skyrocketed as a consequence. This opened up a new, creative opportunity: to "unbundle," or relocate from hospitals into other facilities, a variety of services that don't need expensive hospital infrastructure like a body scanner or cobalt X-Ray to treat cancer, a highly automated and instrumented medical laboratory, or physical therapy. These creative comments are all brief and precise:

Standalone "ambulatory" surgical facility for surgery that does not need a hospital stay and post-operative care; a freestanding maternity center that essentially provides hotel accommodations for the mother and new baby; This is made abundantly evident in the finest analysis of the healthcare issue to date, which is also the only one to examine health care across national borders in all industrialize nations. Surgery for conditions that respond to surgery and that, although not "life-threatening," will not get better without it. Examples include cataract surgery, hip replacements, general orthopedics surgery, or uterine prolapse a facility for the diagnosis and referral of mental health issues, equivalent facilities for elderly patients, etc[7].

The hospital is still necessary, despite these modern amenities. They effectively drive the American hospital towards the same function that the British have given their hospitals: that of a location for serious illnesses, life-threatening crises, and intense and acute medical treatment. Yet, these innovations, which, as in Britain, are predominantly represented in profit-making "companies," turn the discrepancy between the economic realities of expanding healthcare demand and declining healthcare performance into a creative opportunity.

These are "large" examples drawn from significant businesses and government entities. Yet it's this feature that makes things approachable, discernible, and comprehensible. Above all, these instances highlight why the discrepancy between economic realities presents such tremendous opportunity for innovation. Those who work in these fields or for the government are aware of the fundamental problems. Yet they feel practically compelled to disregard them in favor of mending here, making improvements there, putting out this fire, or sealing that crack. As a result, they are unable to consider the idea seriously, much less attempt to compete with it. Often, they don't even realize it until it threatens their business or service, at which point it is already irreversible.

Every time a group of individuals working in a field or providing a service misunderstand reality and thus form false assumptions about it, their efforts are misdirected. They will focus on the region where there are no results. Then, there is an apparent discrepancy between reality and behavior, which presents yet another chance for successful invention to whomever can recognise and take advantage of it. The oceangoing general cargo vessel, a stalwart of global commerce,

serves as a straightforward illustration. The ocean-going ship was thought to be on its last legs 35 years ago, in the early 1950s. The average prediction was for a temperature[8].

Source: Air freight has replaced oddities, with the exception of big goods. Prices of maritime freight were increasing quickly, and as one port after another got severely crowded, it took longer and longer to have goods transported by freighter. As a result, there was more material piling up at the docks waiting to be loaded since the boats couldn't get to the pier, which led to an increase in theft. The primary cause was that the shipping sector had spent a long time focusing its resources ineffectively. It had made an effort to create speedier ships with a smaller crew and less fuel-intensive designs. A ship, however, is capital equipment, and the highest expense for any capital equipment is the cost of not operating, during which time interest must be paid while the equipment is idle. Everyone in the business was aware that a ship's primary expenditure is interest on the investment. Yet, the industry continued to focus its attention on expenses that were already relatively low the costs of the ship when operating at sea.

The answer was easy: Separate loading from storage. So that all that has to be done is to put on and take off pre-loaded freight, execute the loading on land where there is sufficient room and where it can be done before the ship enters port. In other words, pay more attention to the expenses associated with not working than with doing so. The roll-on, roll-off ship and the container ship were the solution[9].

During the last thirty years, freighter traffic has multiplied up to five times. Expenses have decreased by 60% overall. In many situations, port time has been reduced by 75 percent, along with congestion and theft. The discrepancy between reality as seen and reality as experienced often manifests. But, it is extremely likely that efforts are being misdirected anytime significant, focused efforts fail to improve things instead making them worse where faster ships merely lead to increased port congestion and longer delivery delays. Refocusing on where the outcomes are most likely can provide significant results quickly and effortlessly. It's true that the discrepancy between what is seen and what is real seldom calls for "heroic" inventions. Adapting to the ocean-going 63 took minimal effort to decouple the loading of freight from the stowing thereof. A complete industry or service sector is generally characterized by the discrepancy between reality as perceived and reality as experienced. But, the answer must once again be concise, clear, and very detailed.

I used the instance of Japanese television as an example of an unexpected success. Also, it serves as a fantastic illustration of the discrepancy between real and perceived client values and expectations. The poor in the United States and Europe had already demonstrated that TV satisfies expectations that have little to do with traditional economics long before the Japanese industrialist claimed to his American audience that the poor in his country would not buy a TV set because they could not afford it. Yet this really clever Japanese man just did not understand that the TV set is not merely a "thing" for consumers, particularly impoverished customers. It stands for opening up to a new universe and maybe a brand-new way of life.

When he declared, "Russians would never wish to own vehicles; inexpensive taxis make far more sense," during a 1956 visit to the United States, Khrushchev could not have imagined that

the automobile is not a "thing." Any adolescent might have explained to him that "wheels" represent more than just movement; they also symbolise freedom, power, and passion. Yet Khrushchev's misunderstanding led to one of the craziest business opportunities: the paucity of cars in Russia gave rise to the largest and liveliest illegal market. These, it will be argued, are once again "cosmic" examples that are of little value to businesspeople or executives at hospitals, universities, or trade associations. Yet these are illustrations of a widespread phenomenon[10].

The instance that follows is distinct, albeit unquestionably operationally significant in its own unique "cosmic" sense. During the last several years, a securities business with offices in a Midwestern city's suburb has been one of the fastest-growing American financial firms. There are now 2000 branch offices. There are oddities everywhere in the US. It also owes its development and success to having taken advantage of an oddity.

The major financial firms, such as Merrill Lynch, Dean Witter, and E. F. Hutton, presumptively have the same ideals as their clients. To them, the idea that individuals invest in order to get wealthy is apparent, if not basic. After all, this is what drives the New York Stock Exchange's participants and defines what they mean by "success." This notion is accurate, but only for a small portion of the investing public certainly not the majority. Not "money people," they are not.

They are aware that in order to "become wealthy" by investing, one must devote their complete attention to handling money and have a solid understanding of it. But, the local professionals, small company owners, and large farmers lack both of these things since they are too busy making money to have the time to manage it[11].

The securities company in the Midwest takes advantage of this contradiction. It seems identical to any other securities business from the outside. The company participates on the New York Stock Exchange. Nonetheless, only a very tiny proportion of its business roughly one-eighth is related to the stock exchange. It avoids the commodities futures, options, and other products that the major trading companies on Wall Street actively promote in favor of what it refers to as "the educated investor." It does not guarantee that its clients will become wealthy, which is a true novelty among American financial service firms.

Even trading customers are not wanted. The successful professional, the considerable farmer, or the small-town businessman are examples of people who tend to make more money than they spend, but the company is less interested in these people because of their high salaries than because of their moderate spending patterns. Then it plays on their psychological need to keep their money safe. What this company offers is the option to keep one's money intact via investments in bonds, equities, real estate trusts, deferred annuities, tax-sheltered partnerships, and other financial products. The "product" the company offers is unique and has never been offered by a Wall Street corporation before: peace of mind. This is what the "wise investor" really perceives as "value." Such clients violate everything the major Wall Street firms regard to be true, thus they are beyond the comprehension of the firms. This prosperous business has recently received a lot of press. Every list of significant and expanding Stock Exchange companies includes it[12].

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CHAPTER 5

PROCESS NEED: A FRAMEWORK FOR IDENTIFYING AND ADDRESSING KEY PROCESS REQUIREMENTS IN ORGANIZATIONS

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Opportunity is the wellspring of creativity has been the leitmotif of the prior chapters. Yet, according to an ancient adage, "Necessity is the mother of innovation." In fact, the demand for innovation is examined in this chapter as a huge potential for innovation. The requirement we'll talk about as a potential source of innovation is fairly particular; I refer to it as a "process need." It is really specific and not at all nebulous or generic. It is a part of the way a company, an industry, or a service operates, much like the unexpected or the incongruities. Some process-based innovations take use of oddities, while others focus on demography. In fact, unlike the other drivers of innovation, process need does not begin with an external or internal environmental event. The task at hand is where it all begins. Instead of being situation-focused, it is task-focused. It enhances an already-existing procedure, replaces a weak link, and restructures an outdated procedure in light of recently discovered information[1].

It sometimes completes the "missing link" in a process, making it conceivable. Everyone in the company is constantly aware of the requirement when an innovation is based on a process need. But, seldom does anybody take action. But, as soon as the invention is introduced, it is seen as "obvious" and quickly becomes "standard." The enzyme that dissolves a ligament during cataract surgery was a textbook curiosity until William Connor transformed it into a necessary product. The procedure for removing cataracts was itself a very ancient one. The ideal enzyme has been discovered for many years.

The preservative to keep the enzyme fresh under refrigeration was the invention. No eye surgeon could reasonably fathom working without Connor's compound after that procedure necessity had been met. Linotype was created by Ottmar Mergenthaler in 1885 for use in typesetting. With the growth of literacy, transportation, and communication throughout the previous decades, printed publications of all kinds magazines, newspapers, books had all been expanding at an exponential pace. The printing process's other components had previously undergone all of these changes. For example, paper was being produced on high-speed paper machines, and there were high-speed printing presses.

Only typography had not altered since Gutenberg's day, which was four hundred years ago. It was still laborious, costly, high-skilled work that required several years of apprenticeship. Like Connor, Mergenthaler outlined the requirements: a keyboard that would enable mechanical selection of the appropriate letter from the typefont; a mechanism to assemble and adjust the letters in a line; and by far the most challenging a mechanism to return each letter to its appropriate receptacle for subsequent use. Each of them requires many years of diligent labour and much creativity. None, however, called for the development of new science. Despite fierce

opposition from the traditional craftsman typesetters, Mergenthaler's linotype became the "standard" in less than five years[2].

The requirement for the method was predicated on an incongruity in the process in both of these instances William Connor's enzyme and the linotype machine. Yet, demographics are often a major source of process demand and a chance for process innovation.

A statistician at the Bell Telephone System predicted two curves around fifteen years apart: the curve for population growth in the United States and the curve for the number of workers needed as central-station operators to manage the rising number of incoming calls. According to these predictions, if the manual call-handling method were to be maintained, every American woman between the ages of seventeen and sixty would have to work as a switchboard operator by the years 1925 or 1930. Bell engineers created and launched the first automated switchboard two years later. Similar to the previous example, the current rush into robotics is mostly the product of a process requirement brought on by demography. Much of the information is decades old[3].

Major firms in industrialized nations did not see the need to replace semi-skilled assembly-line workers with machines, notably in Japan and the United States. Technical advantage is not the reason the Japanese are ahead in robots; most of their designs are American. Nonetheless, the Japanese had their "baby bust" four to five years before America and almost 10 years before West Germany. It took the Japanese 10 years to understand that they were experiencing a labor shortage, which is exactly how long it took the Americans or the Germans. Yet, these 10 years began in Japan far earlier than in the United States, and while these words are being written, West Germany is still in the middle of the ten-year period.

Demographic factors also had a significant role in the development of Mergenthaler's linotype. The supply of typesetters, who must complete a six to eight-year apprenticeship, is quickly running short due to the explosion in demand for printed products, and their salaries are rocketing upward. Because of this, printers recognized the "weak link" and were prepared to spend a lot of money on a machine that could replace five pricey artisans with a single, semi-skilled machine operator. The most frequent reasons of a process requirement might be inconsistencies and demography. But, there is another category that is far more challenging and dangerous but often of much greater importance: what is now referred to as programmed research as opposed to the conventional "pure research" of scientists. There is a "weak link," and it is distinct, visible, and strongly felt. Yet, a significant amount of new information must be created to meet the process demand.

Twenty years after its creation, it was well-known all across the globe. There were outstanding photographers in every nation within around twenty years; Mathew Brady's images of the American Civil War remain unparalleled. Every bride was required to have her picture taken by 1860. Even before the Meiji Restoration and at a period when Japan was generally still firmly closed to foreigners and foreign ideas, photography was the first Western technology to penetrate Japan[4].

By 1870, amateur photography had become firmly entrenched. Yet they found it challenging due to the technologies at hand. Heavy and delicate glass plates were needed for photography, and

they had to be transported with great care. It needed a similarly hefty camera, extensive setup prior to taking a photo, complex settings, and so on. This was common knowledge. Certainly, the publications for photography. Yet by the middle of the 1880s, new information had become accessible, enabling George Eastman, the company's inventor, to create a lightweight camera around his cellulose film in lieu of the cumbersome glass plates and make it resistant to even extremely hard handling. Eastman Kodak assumed global primacy in photography within 10 years, a position it still holds today.

To transform a process from a prospective state into actuality, "programmed research" is often required. Once again, the need must be felt and the necessary items must be discernible. Next, new knowledge must be created. Edison served as the model inventor for this form of process-need innovation. Everyone had been aware that there will eventually be an "electric power business" for around twenty years. It had been clearly evident for the past five or six years of that time frame what the "missing link" was: the light bulb. There wouldn't be an electric power business without it. After two years, Edison produced a light bulb after defining the new knowledge required to transform this prospective electric power sector into a real one[5].

Program research, which transforms promise into reality, has taken centre stage in the top industrial research labs, as well as in research for environmental protection, agriculture, health, and military. Program analysis sounds important. For many, it entails "placing a man on the moon" or developing a polio vaccine. Yet its most effective uses are in tiny, well defined tasks; the smaller and more narrowly focused the project, the better. The highway reflector, which reduced the incidence of automotive accidents in Japan by over two-thirds, is really the finest example and maybe the best single example of effective process need-based innovation. Outside of the major cities, Japan has almost no paved roadways as of 1965. Yet when the nation shifted quickly to the vehicle, the government hurriedly paved the roads. Suddenly, cars were capable of and did make rapid progress. But, the roads were still the same ones that the oxcarts of the eleventh century had used; they were barely wide enough for two automobiles to pass, full of blind bends and concealed entrances[6].

Process In addition, there are intersections every few kilometers where half a dozen roads come together at every angle imaginable. Accidents started to occur more often than usual, particularly at night. The opposition parties in Parliament, the press, radio, and television immediately started to scream on the government to "do something." Rebuilding the roads was obviously out of the question, since it would have taken 20 years in any case. A large PR effort to encourage drivers to "drive cautiously" had the same effect that such ads often do: none at all. Tamon Iwasa, a young Japanese man, saw this catastrophe as a creative opportunity. He altered the conventional highway reflector such that the tiny glass beads acting as its mirrors could be changed to reflect approaching vehicles' headlights in any direction onto any direction. Thousands of Iwasa reflectors were quickly installed by the government.

The American people had developed a need for domestic and foreign news as a result of World War I. Everyone was aware of this. Certainly, questions about how to meet this demand were widely discussed in the early post-World War I years' newspapers and journals. Yet the local publication was unable to complete the task. The New York Times was one of several notable

publications that attempted, but none of them were successful. Henry Luce then determined what was needed to fulfil the process demand. It had to be a nationwide newspaper; it couldn't be local since there wouldn't be enough readers or advertisers. And it couldn't be a daily since there wasn't enough news that would engage a sizable audience. These requirements therefore essentially defined how the editorial format would emerge. Time magazine was an instant hit when it debuted as the first news publication in history.

For instance, we have known for many centuries that mathematics is a difficult subject in school. Just a tiny percentage of students certainly no more than one-fifth seem to struggle with arithmetic and find it easy to learn. The others never really pick it up. Of course, it is feasible to practise a much higher proportion to pass math exams. The Japanese do this by placing a strong focus on the topic. Yet it does not imply that math is taught to Japanese kids. They pick up test-taking strategies and then promptly lose those math skills. By the time they are in their late 20s, ten years later, Japanese students do as badly on mathematics exams as do Western students[7].

There is always a brilliant math teacher in each age who finds a way to help even the least bright students learn, or at the very least learn far more effectively. But, no one has ever been able to duplicate what this one individual accomplishes. While the need is obvious, we do not fully comprehend the issue. Is it a deficiency in innate ability? Are we using the incorrect techniques, perhaps? Exist psychiatric and emotional issues? Nobody has the solution. And without comprehending the issue, we have been unable to come up with any solutions. Even if we comprehend a procedure, we could lack the skills necessary to do the task. Finding a method to make paper that is less wasteful and uneconomical than the current one was discussed in the chapter that came before it. Capable individuals have been working on the issue for a century. We are aware that the polymerization of the lignin molecule is required. We have polymerized a lot of comparable compounds, so it should be simple.

But, after a century of diligent labor by skilled individuals, we lack the expertise to accomplish it. Just "Let's try something different" will do. The solution must match how people like to and actually do the task. The complex mechanics of the early photography process had little psychological impact on amateur photographers. They just cared about taking a good shot as quickly as possible. So, they were open to a method that eliminated the effort and talent involved in capturing images. The same is true for eye surgeons, who merely want a simple, orderly, painless procedure. Hence, an enzyme that provided this for them met their needs and values. This invention, however, seems to not quite meet the bill and has not been well received despite being founded on a clear and significant process requirement.

Over many years, the amount of information needed by various professions, including attorneys, accountants, engineers, and doctors, has increased considerably more quickly than our ability to access it. Professionals have been griping that they must spend an increasing amount of time looking for material in the legal library, in manuals and textbooks, in loose-leaf services, and so on. So, one would anticipate a "databank" to be a huge success right away. Using a computer software and a display terminal, it provides the professionals with instant information: court judgments for the attorneys, tax decisions for the accountants, and medicine and poison information for the doctors.

Yet, these firms have had a very difficult time attracting enough users to turn a profit. It has taken more than 10 years and significant financial resources in certain situations, such with the legal service Lexis, to attract subscribers. Very likely, the databank's ease of use is the cause. Professionals take great pleasure in their "memory," or their capacity to either recall or locate the knowledge they want. "You have to remember the court judgments you need and where to obtain them," is still the admonition the beginning lawyer receives from the elders. So, the databank goes against the basic ideals of the professional, notwithstanding how useful it is for the job and how much time and money it saves. "What would you need me for if it can be looked up?" an eminent physician once said when asked by one of his patients why he did not use the service that would give him the information to check and confirm his diagnosis, and then decide which alternative method of treatment might be the best in a given case.

Systematically looking for innovation opportunities based on process needs is possible. Edison contributed to electronics and electricity in this way. Henry Luce carried out this while still a Yale student. What William Connor accomplished was this. In reality, the location is conducive to careful investigation and study. Nevertheless, once a process requirement has been identified, it must be evaluated using the five fundamental criteria listed above. The procedure must then be evaluated against the three constraints as a final step. Do we comprehend what is required? Does the information already exist or can it be acquired using "state of the art" technology? Does the solution adhere to the standards and values of the target users, or does it go against them?

Large companies have not yet come to terms with the fact that their rival exists, much less that it is profitable. There is always some degree of intellectual haughtiness, rigidity, and dogmatism lurking behind the discrepancy between reality as experienced and reality as perceived. The Japanese manufacturer effectively said, "I know what impoverished people can afford, not they. Every decent Marxist realises that people act in accordance with economic reason, as Khrushchev said. They are left alone and unbothered, which explains why innovators may take advantage of the incongruity so quickly.

The discrepancy between what is seen and what is real may be the most frequent of all contradictions. Almost usually, producers and suppliers are unaware of what the client really purchases. They must make the supposition that what the manufacturer and supplier deem to be of "value" is also of "value" to the client. All work must be taken seriously and sincerely believed in for it to be completed successfully. Cosmetic manufacturers must have faith in their products; else, they will produce subpar goods and will lose their clients. Health care must be seen as an absolute good by those who operate hospitals; else, patient and medical care would quickly erode. But, no consumer ever considers what the maker or supplier provides as something they are purchasing. Their standards and principles are always different.

Producers and suppliers often respond by whining that buyers are "irrational" or "unwilling to pay for quality." When such a complaint is made, it is reasonable to presume that the manufacturer or supplier's true values and expectations are at odds with the actual values and expectations of the clients and consumers. Hence there is a strong reason to search for an innovation opportunity that is extremely focused and has a high likelihood of success. Around 25 years ago, in the late 1950s, a pharmaceutical firm salesperson made the decision to start his own

business. Thus, he searched for an anomaly in a procedure used in medicine. He almost quickly discovered one. The procedure to remove a senile cataract from the eye is among the most popular surgical procedures.

Throughout the years, the process had been honed, routinized, and instrumented to the point that it was performed with complete control and in time with a dance that had been meticulously practiced. The eye surgeon had to cut a ligament, bind blood vessels, and risk bleeding at one point in the procedure, endangering the eye in the process. This was out of character and rhythm for the surgeon. That was not particularly tough, and more than 99 percent of surgeries were completed satisfactorily. Yet the surgeons were really troubled about it. That caused them to alter their rhythm and made them feel anxious. No matter how many times they had performed the treatment, eye doctors always feared this one, brief procedure.

William Connor, a salesperson for a pharmaceutical business, learned without doing any investigation that an enzyme had been discovered in the 1890s that dissolves this specific ligament fairly instantly. Yet, no one had ever been able to retain this enzyme under refrigeration for more than a few hours back then, sixty years ago. Yet preservation methods have advanced significantly since 1890. Hence, after a few months of trial and error, Connor was able to develop a preservative that offers the enzyme a long shelf life without reducing its strength. Every ophthalmologist in the world was utilizing Connor's unique substance within a few years. Twenty years later, he sold Alcon Labs to a huge international corporation for a very substantial sum of money.

Another eye-opening example: O. M. Scott & Co. is the top American manufacturer of goods for maintaining lawns, including grass seed, fertilizer, insecticides, and other related items. While it is now a division of a major corporation (ITT), it first rose to prominence as a tiny independent business competing against companies many times its size, such as Sears, Roebuck, and Dow Chemicals. While its goods are excellent, so are those of the rivals.

The Spreader, a tiny, lightweight wheelbarrow with holes that can be adjusted to let the right amounts of Scott's goods run through in an equal flow, is its key piece of machinery. All lawn care products make the claim to be "scientific" and are created based on thorough testing. All specify in minute detail how much of the substance should be applied according on the soil's characteristics and the temperature. All make an effort to convince the buyer that lawn care is "precise," "managed," if not "scientific." Yet prior to the Scott Spreader, no manufacturer of lawn care products provided the consumer with a means of managing the procedure. Moreover, the lack of such a tool caused the process' internal inconsistency, upsetting and frustrating consumers.

Do "intuition" and chance play any role in the discovery of such internal incongruity inside a process? It is reported that William Connor began by interviewing surgeons about their unease with certain aspects of their employment. O. M. Scott expanded from a small regional seed merchant to a moderately large national corporation by asking its dealers and consumers what they thought the market was lacking in terms of items. The Spreader was then the focal point of its whole product range.

It's not a very subtle issue when a process, its rhythm, or its logic, are inconsistent. That is always known to the users. Every eye surgeon commented about how uncomfortable it was to have to cut the eye muscle. Every hardware store employee was aware of his yard customers' annoyance and discussed it. But what was missing was a listener, someone who took seriously what everyone says: that the goal of a product or service is to gratify the consumer. Using incongruity as a chance for creativity becomes very simple and extremely effective if this principle is embraced and put into practice.

There is, however, a significant drawback. Often, only those who work in a certain business or service may access the incongruity. That is not something that a stranger is likely to notice, comprehend, and so be able to take advantage. My first position was as a trainee at a venerable export business that had been supplying British India with hardware for more than a century. For years, a low-cost padlock had been its top seller; each month, it sent whole shiploads of the product. The padlock was weak, and a pin worked to unlock it with ease. Throughout the 1920s, when earnings rose in India, padlock sales didn't rise but rather started to fall fairly quickly. After that, my boss did the logical thing: he rebuilt the padlock to make it "higher quality" by giving it a stronger lock. The quality was significantly improved at a little additional expense. The enhanced padlock, however, proved to be unmarketable. The company entered liquidation four years later, with the fall of its Indian padlock business playing a significant role in its demise.

A very tiny rival of my company in the Indian export market, who was previously barely able to exist and was less than one-tenth the size of my organization, recognized that this unexpected failure was a sign. The Unexpected of Fundamental Change. No robber would have ventured to pick a padlock since, for the vast majority of Indians, the peasants in the countryside, it was (and, for all I know, still is) a mystical sign. The key vanished often and was never used. Hence, receiving the enhanced padlock that my firm had worked so hard to perfect without incurring extra costs was a tragedy rather than a benefit.

Yet, a tiny but expanding middle-class minority in the cities need a genuine lock. The key factor contributing to the previous lock's decline in popularity and market share was that it wasn't robust enough for their demands. Yet the revised product was still insufficient for them. The competitor of my employer divided the padlock into two distinct products: one without a lock or key, with just a trigger release, selling for one-third less than the previous model but with double the profit margin; and the other, with a solid lock and three keys, costing twice as much but with a much higher profit margin. Both lines started selling right away. The rival company had overtaken all other European hardware exporters to India in only two years. Until World War II completely ended European exports to India, he held onto this job for eleven years.

Some may call it a charming story from the era of the horse and carriage. Indeed, in the era of computers, market research, and MBAs from business schools, we have advanced in sophistication. But here's another instance from a highly "advanced" sector, fifty years later. Yet, it imparts the exact same message. The 1973–1974 recession struck just as the first cohorts of the "baby boom" were approaching their mid-twentiesthat is, the age to start families and purchase their first home. Particularly in housing costs, which climbed considerably more quickly than

other prices, inflation was on the rise. Mortgage interest rates were also soaring at the same period. As a result, American mass builders started to create and market what they dubbed a "basic home," which was more affordable, simpler, and smaller than the house that had been the norm.

The "basic house" was a resounding flop despite being such "excellent value" and being well within the capabilities of the first-time homeowner. By providing low-interest financing with lengthy payback periods, as well as by cutting costs, the builders attempted to save it. Yet, nobody purchased the "basic dwelling."

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CHAPTER 6

EXPLORING INDUSTRY AND MARKET STRUCTURES: AN ANALYSIS OF THE KEY DRIVERS, CHALLENGES, AND IMPLICATIONS FOR BUSINESS STRATEGY AND PERFORMANCE

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Market and industry structures may sometimes survive for a very long period and seem to be entirely stable. For instance, the Pittsburgh-based company still dominates the global aluminum business after a century. Original patents were owned by the Aluminum Corporation of America and its Canadian descendant, Alcan of Montreal. Since the 1920s, there has only been one significant entrant to the global cigarette market: the South African Rembrandt group. Yet just two newcomers Philips in Holland and Hitachi in Japan have become the top producers of electrical equipment worldwide in the last century.

In the early 1920s, when Sears, Roebuck started to transition from mail order into retail shops, and the mid-1960s, when an old dime-store chain, Kresge, founded the K-Mart discount stores, no significant new retail chain appeared in the United States for 40 years. Moreover, market and industrial systems seem so solid that those who work in them are prone to believe that they were predetermined, belong to the natural order, and will last forever. Market and industrial frameworks are really fairly fragile. They frequently fall apart quickly with only a little touch. Every professional in the field has to take action when this occurs. Doing business as usual nearly always results in catastrophe and may even lead to a company's demise. The firm will, at the absolute least, lose its status as a leader, and once lost, such leadership is nearly never recovered. Yet another significant potential for innovation is a shift in the market or industry structure[1].

A change in an industry's structure necessitates entrepreneurial behavior on the part of every participant. It necessitates that everyone re-examine their own businesses. And to that query, each member will have to provide a unique but most importantly fresh response. Early in this century, the automotive industry had such rapid growth that its markets underwent significant transformation. This adjustment elicited four diverse reactions, all of which were fruitful. Up until 1900, the early industry had mostly served as a supplier of a luxury good for the extremely wealthy. But, at that time, it had outgrown this little market and was expanding at a pace that was doubling the industry's sales volume every three years. Yet, all of the current businesses continued to focus on the "carriage trade."

The 1904-founded British business Rolls-Royce was one answer to this. In response to the founders' realisation that vehicles were becoming "common," as described in an early Rolls-Royce prospectus, they set out to design and market a car with "the cachet of royalty." They

purposefully reverted to previous, already antiquated manufacturing techniques in which each automobile was manually machined by a qualified technician and put together using hand tools. After that, they made a guarantee that the automobile would last forever. It was designed to be operated by a qualified driver who had received training from Rolls-Royce. They only allowed authorized consumers to purchase from them, particularly titled ones. They priced the Rolls-Royce as much as a small boat, which is about forty times the yearly salary of an accomplished mechanic or successful businessman, in order to ensure that no "riff-raff" purchased their automobile[2].

A few years later, in Detroit, the young Henry Ford saw that the market structure was shifting and that cars were no longer only the preserve of the wealthy. In response, he created an automobile that could be completely mass-produced, mostly by semiskilled workers, and that the owner could also drive and maintain. Contrary to popular belief, the 1908 Model T was not "cheap"; in fact, it cost a little bit more than the American expert mechanic, who at the time had the highest salary in the world, made in a complete year. The least expensive new automobile now available on the US market costs nearly 10 times what an unskilled assembly-line worker makes in salary and benefits in a single year. The Model T, however, was far less expensive than the cheapest car available at the time and was also much simpler to operate and maintain.William Crapo Durant, another American, viewed the shift in market structure as a chance to assemble a professionally run major vehicle corporation that would satiate all parts of what he anticipated would be a sizable "universal" market. He established General Motors in 1905, started purchasing already-established automakers, and combined them into a big, cutting-edge corporation. The young Italian Giovanni Agnelli had predicted that the vehicle will be used by the military, particularly as a staff car for officers, a few years earlier, in 1899. At Turin, he established FIAT, which in a short period of time rose to become the top provider of staff vehicles to the military of Italy, Russia, and Austria-Hungary. Between 1960 and 1980, market structures in the global car industry underwent yet another transformation.

The car industry had been dominated by national suppliers in national markets for forty years after World War I. Fiats, a few Alfa Romeos, and a few Lancias were the only vehicles seen on Italian roads and parking lots; outside of Italy, these brands were rather uncommon. There were Renaults, Peugeots, and Citroens in France; Mercedes, Opels, and German Fords in Germany; and GM vehicles, Fords, and Chryslers in the United States. The car business suddenly became a "global" industry about 1960[3]. Several businesses responded in very different ways. The Japanese, who had previously been the most reclusive and had scarcely exported their automobiles, made the decision to start doing so. In the late 1960s, their first foray into the US market was a disaster. Regrouping, they reconsidered their strategy and decided to provide a smaller, more fuel-efficient American-style automobile with American comfort and performance features. They also tightened up their quality control procedures and, most importantly, improved their customer service. And when they were given a second shot during the 1979 oil crisis, they nailed it. Ford Motor Company also made the decision to pursue a "global" strategy via a "European" approach.

Ford had established itself as a serious competitor for the top slot in Europe 10 years later, in the middle of the 1970s. Fiat made the decision to expand outside Italy and become a truly European firm, striving to hold a solid second-place position in each significant European nation while maintaining its dominance in Italy. General Motors first chose to stay in the United States and maintain its customary 50 percent market share, but in a manner that would allow it to receive around 70 percent of all earnings from car sales in North America.

America. It was successful. Ten years later, in the middle of the 1970s, GM changed course and chose to compete with Ford and Fiat for market supremacy in Europe. This time, it was successful. It seems that GM ultimately made the decision to become worldwide in the years 1983–1984 by joining up with many Japanese businesses, starting with two smaller ones and concluding with Toyota. And Mercedes in West Germany opted on yet another worldwide approach where it confined itself to certain markets, such as premium automobiles, taxis, and buses[4].

All of these tactics mostly succeeded. It is difficult to determine whether one performed better than the other. But, the businesses that avoided making difficult decisions or refused to acknowledge that much was going on did poorly. Only because their separate governments won't let them fail will they continue to exist. Of course, Chrysler is a prime example. Everyone in the sector was aware of what was going on, even the Chrysler employees. Yet instead of choosing, they dodged. Chrysler may have adopted a "American" approach and concentrated all of its efforts on bolstering its position inside the United States, which is still the biggest vehicle market in the world. Perhaps it may have merged with a powerful European company with the intention of capturing third place in the two most significant vehicle markets in the world: the US and Europe.

Mercedes is reported to have shown considerable interest, but Chrysler did not. Instead, Chrysler wasted its money on unreal things. It bought beaten "also-rans" across Europe to give the impression that it was international. This, however, depleted Chrysler's resources and left it with none left over for the investment required to give Chrysler a chance in the US market, providing Chrysler no further strength. After the oil crisis of 1979, when it was time to make a decision, Chrysler had nothing in Europe and not much more in the United States. It was only rescued by the US government.

The situation is not much different for British Leyland, which was once the biggest automaker in Britain and was a serious contender to dominate Europe, or for Peugeot, a sizable automaker in France. Both resisted acknowledging that a choice had to be made. They quickly lost both market share and profitability as a consequence. Chrysler, British Leyland, and Peugeot are now all very little companies. The most intriguing and significant instances, however, come from relatively smaller businesses. Whether big or little, every automaker in the world has had to take action to avoid becoming extinct. Volvo, BMW, and Porsche were three tiny, somewhat marginal businesses that recognised this as a significant potential for innovation[5].

When the market for automobiles abruptly altered about 1960, informed bets greatly favoured these three firms' demise during the ensuing "shakeout." Instead, all three of them have

prospered and established market segments in which they are the market leaders. They did this by using a creative approach that inadvertently transformed them into new enterprises. In 1965, Volvo was a tiny, unprofitable company. It did suffer significant financial losses for a few of crucial years. Volvo, though, started to kind of remake itself. It developed became an aggressive global marketer particularly potent in the United States of what can be referred to as the "sensible" car: not very opulent, not particularly inexpensive, not at all stylish, but solid and exuding common sense and "better value." Volvo has positioned itself as the vehicle for businesspeople who appreciate being recognized for their "excellent judgment" rather than needing to show off their prosperity via the vehicle they drive.

BMW, which was at least as marginal in 1960, has had comparable success, particularly in nations like Italy and France. It has been advertised as the vehicle for "young corners," or those who want to seem youthful but have already achieved significant success in their careers. These individuals want to show that they "know the difference" and are prepared to pay for it. Unapologetically a premium vehicle for the wealthy, BMW appeals to individuals who desire to look "no establishment." In contrast to Mercedes and Cadillac, which are driven by business and government leaders, BMW is very manly and calls itself the "ultimate driving machine"[6].

Ultimately, Porsche (initially a Volkswagen with additional style) rebranded itself as the sports car, the one and only vehicle for individuals who continue to seek thrill rather than transportation in a vehicle. Yet, the smaller automakers that chose to stick with their tried-and-true methods and present themselves unchanged in what is essentially a new industry have suffered the consequences. For instance, the British MG was the pinnacle of sports cars thirty years ago, much as the Porsche is now. It is now practically extinct. What about Citroen? Thirty years ago, the automobile had 80 horsepower, robust structure, and solid new engineering.

Industry and Market Structures as a Source reliable in the middle class. It would have seemed that Citroen was well-suited for the market niche that Volvo has occupied. Citroen lacks both a product and a strategy since it did not thoroughly consider its business and innovate. Unusual opportunities are presented by a shift in the industrial structure, and they are both very apparent and relatively foreseeable to outsiders. Nevertheless, insiders largely see these same developments as dangers. So, outsiders who innovate may quickly and with little risk become a big force in a key sector or business.

Three young guys met practically by chance in New York City in the late 1950s. Each of them was employed by financial organizations, mostly Wall Street firms. On one issue, they came to an understanding: the securities industry, which had not altered since the Great Depression 20 years earlier, was about to undergo a fast structural shift. They came to the conclusion that this transition had to provide chances. So they conducted a thorough analysis of the financial markets and industry to identify opportunities for newcomers with little in the way of connections or funds. As a consequence, Donaldson, Lufkin & Jenrette was founded. It began in 1959, and five years later, it had established itself as a significant power on Wall Street[7].

The pension fund managers were a brand-new consumer segment that these three young men quickly discovered. These new consumers didn't have any special requirements, but they did

want something distinctive. And no current company had set up shop to provide it to them. A brokerage company was established by Donaldson, Lufkin & Jenrette to concentrate on these new clients and provide them with the "research" they required. About the same time, another young person working in the securities industry also became aware of the structural changes taking place in the sector and how they may provide a chance for him to start his own unique securities company. The previously described "clever investor" was the opportunity he discovered. On this, he later created a large and still-expanding company.

The American health care system's organizational structure started to rapidly alter in the early to mid-1960s. Three young individuals, the oldest not nearly thirty, who were then serving as junior managers at a big hospital in the Midwest, believed that this presented them with the chance to launch their own creative company. They came to the conclusion that hospitals will need more and more knowledge to manage housekeeping services including cooking, laundry, maintenance, and so on. They organized the tasks that needed to be done. Next, they made contracts available to hospitals, under which their new company would send in its own qualified personnel to manage these services, with a fee deducted from the savings that would follow. This business billed over a billion dollars in services twenty years later.

The third example is the long-distance telephone market in America, where discounters like MCI and Sprint operate. They were complete outsiders; for instance, Sprint was founded by the Southern Pacific, a railroad. These intruders started searching for the weak spot in Bell System's defenses. They discovered it in the long-distance service pricing scheme. Prior to World War II, long-distance calls were a luxury reserved for the government and major corporations, or for emergencies like a family death. After World War Two, they were widely used. They did in fact become the area of telecommunications that was growing. Yet, the Bell System persisted in pricing long-distance as a luxury, much beyond costs, with the proceeds being used to subsidies local service, despite criticism from the regulatory bodies for the several states that oversee telephone rates. Yet to make up for it, the Bell System offered significant discounts to big long-distance customers[8].

By 1970, long-distance service revenues had caught up to and were quickly surpassing local service revenues. Yet, the original pricing structure was preserved. And it was this that the outsiders abused. They shared the savings with smaller customers by signing up for the volume service at the discount and then selling it to them. As a result, they made a considerable profit and could provide their customers long-distance service at a much reduced price. The amount of calls handled by long-distance discounters in the early 1980s, ten years after the discounters' founding, exceeded that of the whole Bell System. If it weren't for the fact that each of the inventors in question was aware that the market offered a significant possibility for innovation, these stories would simply be anecdotes. Each person felt relatively certain that an invention will be successful and do so with little risk. How are they so certain?

Among these signs, an industry's quick expansion stands out as the most trustworthy and visible. This is essentially what all of the aforementioned instances as well as the ones from the car industry have in common. It is quite likely that an industry's structure will alter dramatically when it expands significantly faster than the economy or population at the absolute latest, by the

time it has doubled in size. Nobody wants to change the techniques that are now working so well. But they are ageing. But, neither Bell Telephone nor Citroen's employees were prepared to accept this, which is why "outsiders," "newcomers," or former "second-raters" were able to outperform them in their respective industries[9].

It's conceivable that the way a sector that is expanding quickly sees and serves its market will no longer be suitable by the time the sector's volume has doubled. Namely, the market is no longer defined or segmented in ways that reflect reality, but rather, that reflect history. Reports and statistics still continue to reflect the conventional market outlook. This explains why Donaldson, Luflun & Jenrette and the Midwest-based brokerage firm known as the "intelligent investor" were both successful innovators. The pension funds were too new to be recognized by the existing financial services firms, and the "intelligent investor" did not conform to the Wall Street caricature, thus he was not effectively served. But, the hospital management tale also illustrates how conventional aggregates fall short following a time of fast expansion. The "paramedics," or hospital professions like X-ray, pathology, the medical lab, therapists of various types, and so forth, flourished in the years after World War II. They were seldom present before to World War Two. Also, running a hospital became a career in itself. When hospital staff, particularly the low-paid ones, started to organize, the conventional "housekeeping" services that had previously dominated hospital operations gradually became a challenge for the administrator, proving to be more complex and expensive[10].

Another example of structural change brought on by fast expansion is the instance of the book chains mentioned previously (in Chapter 3). The conventional American bookshops and publishers were unaware that traditional readers and new clients, known as "shoppers," were both growing concurrently. These new clients were simply not noticed by the conventional bookshop, which never made an effort to assist them. Yet, there is also a propensity for complacency and, more importantly, for trying to "skim the cream" as a sector expands rapidly. The Bell System handled long-distance calls in a similar manner. The only outcome is to encourage competitiveness. Museums were regarded as "upper-class" before World War II. Following World War II, visiting museums became a middle-class habit, and new museums were established in city after city. Art collecting was a pastime of a select few very wealthy individuals prior to World War Two. After World War II, the practise of collecting art of all types grew more and more widespread, with thousands of people including those with quite little financial resources getting involved.

One young person who was employed at a museum viewed this as a chance for innovation. In fact, he discovered it in insurance, which was the last place he anticipated to find it. He made a name for himself as an insurance agent who insured both museums and collectors, with a focus on art. Due to his experience in the field of art, underwriters at the big insurance firms who had previously been unwilling to cover art collections were prepared to take the chance at rates that were up to 70% less than those previously charged. 3. The convergence of technologies that were previously thought to be clearly different will also inevitably cause abrupt changes in industry structure. This young guy now owns a sizable insurance brokerage company.

The private branch exchange (PBX), which serves as the switchboard for offices and other big telephone customers, is one instance. Fundamentally, Bell Laboratories, the research division of the Bell System, has carried out all of the scientific and technological work on this in the United States. Yet a few entrants, like ROLM Company, have mostly benefited. Two distinct technologies computer technology and telephone technology converge in the new PBX. The PBX may be seen as a computer that is used in communications or as a computer that is utilised in communications[11].

Industry and Market Structures have always been computer pioneers, thus they are more than capable of managing this. Bell System, on the other hand, saw the computer as something entirely separate and distant from the market and the consumer. It never promoted the computer-type PBX, despite designing and introducing it. As a consequence, a complete outsider has emerged as a formidable rival. In actuality, ROLM, formed by four young engineers, was only accidentally drawn into the telephone industry while developing a miniature computer for fighter planes. Despite being the top in terms of technological ability, the Bell System now holds less than one-third of that market.

If an industry's business practices are evolving quickly, it may be time to make fundamental structural changes. The vast majority of American doctors ran their own practices thirty years ago. Only 60% of people were doing this in 1980. Currently, 40% of practitioners (and 75% of those under 40) work in groups, either as partners in a partnership or as staff members of a hospital or a health maintenance organization. A few individuals who caught wind of what was occurring in the early 1970s saw that it presented an opportunity for creativity. A service provider may design the group's workspace, advise the doctors on the equipment they need, and either run the group practise for them or provide managers with management training.

If a single, extremely big manufacturer or supplier, or a small number of suppliers, dominate the industry and its markets, innovations that take advantage of changes in industry structure are especially effective. Even if there isn't a real monopoly, these powerful manufacturers and suppliers who have enjoyed years of success and lack of competitiontend to be conceited. They first disregard the newbie as unimportant and in fact unprofessional. But, even as the newcomer steals a greater and larger portion of their company, they struggle to organize themselves for resistance. The Bell System took nearly 10 years to react to both the long-distance discounters' and the PBX makers' challenge[12].

Yet, the US aspirin manufacturers were as slow to react when Tylenol and Datril, the first "non-aspirin aspirins," initially arrived. Once again, based mostly on quick development, the innovators saw an opportunity due to an upcoming shift in industry structure. After all, medical literature was replete with references to the risks and restrictions associated with aspirin. Nonetheless, the entrants had the market to themselves for the first five or eight years. In a similar vein, the USPS waited several years to respond to innovators who were stealing ever-larger portions of the most lucrative services. Ordinary parcel post was eliminated first by United Parcel Service, followed by the even more lucrative delivery of urgent or high-value goods and mails by Emery Air Freight and Federal Express. The Postal Service's fast expansion was what

made it so susceptible. Volume increased so quickly that it ignored what seemed to be minor categories, thereby giving the innovators an open welcome.

The manufacturers or suppliers that are today's industry leaders will be discovered to be ignoring the fastest-growing market segments time and time again when market or industry structure changes. They will continue using methods that are quickly becoming ineffective and out of date. Seldom do the new growth prospects align with how the sector has "always" defined, structured, and handled the market. So, there is a strong likelihood that the inventor in this field will be left alone. For a while, the established companies or services in the industry will continue to thrive by catering to the established market in the same manner. They are inclined to regard the new obstacle with disdain or ignore it entirely, paying it little mind. But, there is a crucial qualification. It is very important to make this area's innovation straightforward. Complex inventions don't succeed. Here's an example of the most clever business move I've ever heard of and one of the most abject disasters.

Volkswagen was the catalyst for the shift that turned the vehicle industry into a worldwide market about 1960. Since the Model T forty years before, the VW Beetle was the first vehicle to gain true global acclaim. It was as commonplace in the US as it was in its country of origin, Germany, and it was just as well-known in Tanganyika as it was in the Solomon Islands. VW, however, blew the chance it had created for itself, partly because it was too shrewd. Ten years after entering the global market, in 1970, the Beetle was losing popularity in Europe. The Beetle nonetheless did rather well in sales in the United States, which was its second-best market. Brazil, the third-largest market for the Beetle, also seemed to have significant development potential. It was obvious that a different approach was required.

The successor to the Beetle, which the German factories would also provide to the American market, was the new model that the chief executive officer of VW advocated transferring the German plants totally to. But, the ongoing demand for Beetles in the United States would be met from Brazil, giving Volkswagen do Brasil the necessary capacity to expand its facilities and preserve the Beetle's dominance in the expanding Brazilian market for a further 10 years. However, crucial components like engines and transmissions for all cars sold in North America would still be made in Germany, with the finished car for the North American market then being assembled in the United States. This was done to reassure American customers of the "German quality" that was one of the Beetle's main selling points.

In a sense, this was the first really global approach, with distinct components to be produced in several nations and assembled in various locations in accordance with the requirements of various markets. That would have been the best course of action and a very inventive one as well, had it succeeded. German labor unions were chiefly responsible for its demise. They said, "We won't stand for it. Beetle assembly in the US implies exporting German jobs." Even though the crucial components will still be "produced in Germany," the US dealers were skeptical of a vehicle that was "manufactured in Brazil." VW was forced to abandon its excellent idea.

As a consequence, VW lost its second largest market, the United States. When tiny vehicles became popular following the toppling of the Shah of Iran and the second petroleum crisis, VW

should have dominated the market rather than the Japanese. Only the Germans were lacking in goods. Yet VW do Brasil ran into problems when, a few years later, Brazil had a terrible economic crisis and car sales fell. The capacity it had to construct there throughout the 1970s lacked any export clients.

The particular reasons why Volkswagen's excellent plan failed, thus jeopardising the company's long-term viability, are not as important. The lesson of the tale is that a novel approach that seems "smart" always falls short, especially when it attempts to take advantage of an opening brought about by a shift in the way an industry is structured. Hence, the only approach with a possibility of success is the straightforward, precise one.

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CHAPTER 7

THE CHANGING FACE OF DEMOGRAPHICS: IMPLICATIONS FOR BUSINESS, SOCIETY, AND PUBLIC POLICY

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The sources of inventive potential mentioned so far through the unexpected, incongruities, changes in market and industry structure, and process needs manifest themselves inside a firm, an industry, or a market. These might be signs of changes occurring outside, in the society, the economy, and knowledge. The remaining opportunities for innovation come from: Demographics; Modifications in perspective, meaning, and mood; External knowledge is new knowledge. These are modifications to the intellectual, political, philosophical, and social environment. Demographics, which are defined as changes in population number, age structure, composition, employment, educational attainment, and income, are the most obvious of all external changes. These are very clear[1].

They also have lead times that are predictable and almost definite. Each member of the American labor force in 2000 is still alive at this point, even if they are not necessarily residents of the country; for instance, a large portion of American employees in fifteen years may already be children living in a Mexican hamlet. In the industrialized nations, everyone who will be of retirement age in 2030 is currently employed, and most of them are in the occupational group they will remain in until they retire or pass away. And over the next forty years, the professional trajectories of those who are now in their early or mid-20s will be substantially influenced by their educational backgrounds.

What will be purchased, by whom, and in what amounts will be greatly influenced by demographics. For instance, American teens purchase a lot of inexpensive pairs of shoes each year; they priorities style above quality, and their budgets are little. Ten years later, the same individuals will purchase far fewer pairs of shoes annually a sixth as many as they did when they were seventeen but they will purchase them mostly for comfort and longevity rather than fashion. The core travel and holiday market in industrialized nations is made up of persons in their sixties and seventies, or those who have just entered early retirement. The same folks are still paying for long-term and costly medical care, nursing homes, and retirement communities 10 years later.

Families with two earners often spend more than they have time for. Ten to twenty years after receiving significant education in their early years, particularly professional or technical education, those who have done so will become clients for advanced professional training. Nonetheless, those with substantial education are also accessible, mostly for knowledge worker positions. The industrially developed nations of the West and Japan would have had to automate

even without competition from low-wage nations with enormous surpluses of young people trained only for unskilled or semi-skilled manual jobs the surge of young people in Third World countries as a result of the decline in infant mortality after 1955. By 2010, conventional manual blue-collar employment in manufacturing in industrialized nations cannot be more than one-third or less of what it was in 1970, according to demographics alone, the combined impacts of the "educational boom" and the dramatic decline in birth rates. (But, due to automation, manufacturing output may be three to four times higher now.

All of this should be so evident that no one has to be reminded of the significance of demography, one would assume. Politicians, businesspeople, and economists have all long recognized the crucial significance of population dynamics, trends, and migrations. But, they also thought that they were exempt from having to consider demography while making daily choices. It was traditionally believed that population changes whether in birth or death rates, educational attainment, the makeup and participation of the labor force, or the location and migration of people occurred so slowly and over such extensive time periods as to be of little practical importance. Significant population disasters, like the Black Plague in Europe in the fourteenth century, were acknowledged to have direct effects on the economy and society. But, other than these "secular" changes, demographic shifts were of interest to historians and statisticians rather than to businessmen or administrators[2].

This was a risky mistake all along. The vast migration from Europe to the Americas in the nineteenth century both north and south as well as to Australia and New Zealand completely altered the world's economic and political landscape. It produced a large number of business possibilities. It rendered obsolete the geopolitical theories that had long served as the foundation of European politics and military tactics. Nevertheless that happened in only fifty years, from the middle of the 1860s to 1914. Anybody who ignored it was certain to fall behind quickly. For instance, the House of Rothschild dominated global finance up until 1860. Yet, the Rothschilds were unable to comprehend the significance of the transatlantic exodus; they believed that only "riff-raff" would leave Europe. The Rothschilds thus lost their prominence after 1870. They were now just wealthy people. J. P. Morgan assumed control. His "secret" was being able to see the transatlantic movement at its inception, comprehend its importance right away, and seize the opportunity by locating a global bank in New York rather than Europe and using it to finance the American businesses that immigrant labor was enabling. The transition from rural, agricultural cultures to big-city civilizations in both Western Europe and the eastern United States took just thirty years, from 1830 to 1860.

In past periods, demographic shifts often occurred just as quickly, abruptly, and with a similar degree of effect. It is a fallacy that historically, population changes were gradual. Or maybe it should be said that historically, stationary populations residing in one area for extended periods of time have been the exception rather than the norm. The fundamental premise for our age must be that people are innately unstable and vulnerable to abrupt, drastic changes and that they are the first environmental aspect that a decision-maker, whether a businessperson or a politician, examines and considers. The ageing of the population in wealthy nations on the 90th percentile

and above will be one of the most important challenges this century for both local and international affairs, for example[3].

On the one hand, demographics; on the other, the tidal surge of young people in the Third World. Despite the causes, civilizations in the twenty-first century, both established and developing, have evolved a propensity for very quick and severe demographic shifts that happen without notice. The nation's population will reach a high of around 140 million people in 1943 or 1944, according to all of the leading American population specialists gathered by Franklin D. Roosevelt in 1938, before gradually declining. With a minimum of immigration, there are now 240 million people living in the United States. Because the United States started a "baby boom" in 1949 that generated historically big families for twelve years before abruptly transitioning into a "baby crash" in 1960 that resulted in historically tiny families. There was no sign of a "baby boom" in 1938, thus the demographers at the time weren't stupid or inept. Twenty years later, John F. Kennedy, another American president, gathered a team of distinguished professionals to construct his "Alliance for Progress" assistance and development initiative for Latin America. The remarkable decline in infant mortality that, within another fifteen years, completely altered Latin America's culture and economy, was not noticed by any specialists in 1961. Also, without exception, the experts all presupposed a rural Latin America. They, too, were neither stupid nor inept. Yet, the urbanization of society and decline in infant mortality in South America had only just started.

The most seasoned labor force analysts in the United States continued to unquestioningly assume that the involvement of women will continue to fall as it had done for many years in 1972 and 1973. The "baby boomers" were concerned (inadvertently, it turned out) about where all the employment for the young guys would come from when they entered the workforce in unprecedented numbers. Young women were not meant to require work, therefore no one inquired as to where they would come from. Ten years later, American women under fifty had the highest-ever participation percentage in the work force at 64%. Also, there aren't much differences in this group's labor force involvement between married and single women, or between those who have kids and those who don't[4].

These changes don't just happen in an instant. They often remain enigmatic and resist explanation. In hindsight, one can explain the decline in infant mortality in the Third World. There was a confluence that led to it as well as of ancient technologies, such as the public health nurse, the toilet under the well, immunization, and the wire screen outside the window. Nonetheless, it was completely unforeseen. And how do the "baby bust" and "baby boom" fit together? What causes the dramatic surge in female employment among Americans and European women as well, but with a little delay?

Despite having significant lead periods before having an influence and lead times that are also foreseeable, demographic trends in this century may be essentially unexpected. Until newborn infants attend kindergarten and need classrooms, playgrounds, and instructors, it will be five years. It will take those fifteen years to establish themselves as significant clients, and it will take those nineteen to twenty years to enter the workforce as adults. As soon as infant mortality started to decline, populations in South America started to expand very quickly. Yet, the

newborns that survived did not enter school for five or six years, nor did they become teenagers searching for employment until fifteen or sixteen years. Also, it typically takes fifteen years at least ten for any change in educational attainment to be reflected in the work forces makeup and skill set. In fact, the very fact that decision-makers be they businesspeople, employees of the public sector, or decision-makers in charge of governmental policy ignore demography is what makes it such a lucrative potential for the entrepreneur. They continue to hold on to the belief that demographics don't change or don't change very quickly. In fact, they deny even the most obvious signs of a demographic shift. Here are a few instances that are pretty common.

By 1970, it was obvious that for at least 10 or fifteen years, the number of students in American schools would be 25 to 30 percent fewer than it had been in the 1960s. As students starting kindergarten in 1970 must have been born no later than 1965, the "baby bust" had already been irreversibly entrenched by that point. But, this was categorically rejected by the schools of education at American colleges. The number of youngsters who are old enough to attend school must increase every year was seen as a natural rule in their eyes. They increased their recruitment efforts as a result, which resulted in significant graduate unemployment a few years later, severe wage pressure on instructors, and widespread school closings[5].

Twenty-five years later, or by the middle of the 1970s, American demographics students. The number was easily calculated by adding two demographic developments that had already occurred: the rise in birthrate and the rise in the proportion of young people attending college. The prognosis was entirely accurate. Yet almost every reputable institution dismissed it. I anticipated that the retirement age in the United States would need to be increased to seventy or removed entirely within 10 years after looking at the age statistics in 1976, twenty years later.

The shift occurred even more quickly: retiring before the age of 70 was implemented throughout the nation in 1978, and California repealed mandatory retirement at any age a year later, in 1977. The demographic data that nearly guaranteed this forecast was well-known and widely available. But, the majority of so-called specialists, including government economists, labor-union economists, corporate economists, and statisticians, disregarded the prediction as completely illogical. It was almost universally agreed upon that "it will never happen".

The obligatory retirement age was first suggested to be lowered to sixty or lower by the labour unions at the time. The opportunity for the entrepreneur arises from the experts' hesitation or inability to accept demographic facts that differ from what they presume to be true. Lead times are understood. The actual events have already taken place. Yet nobody acknowledges them as opportunities, much alone as realities. So, people who reject common thinking and embrace the facts—indeed, those who deliberately seek them out can anticipate being left alone for a considerable amount of time.

The majority of the major American colleges scoffed at my prediction of 10 to 12 million college students by the 1970s. Yet, Pace University in New York and Golden Gate University in San Francisco were among the enterprising colleges that took it seriously. They first shared the same level of disbelief, but after checking the forecast they realized it was accurate and, in fact, the only logical projection. The conventional institutions, particularly the "prestige" ones, did little

in contrast to how The Practice of Innovation arranged themselves for the increasing student enrolment. Because of this, twenty years later these brazen newcomers had the students, and even when the "baby bust" caused enrollments to decline nationally, they continued to expand.

Melville, a modest and unremarkable shoe business, was one American merchant to welcome the "baby boom" at the time. Melville focused on this new market in the early 1960s, just as the first cohorts of the "baby boom" began to enter adolescence. It spawned novel and distinctive boutiques designed especially for youngsters. It updated the look of its products. It targeted sixteen and seventeen-year-olds with advertisements and promotions. Also, it had apparel for youths, both male and female, in addition to shoes[6].

As a consequence, Melville turned become one of the nation's fastest-growing and most successful stores. Ten years later, other stores caught on and started to target adolescents, just as the demographic center of gravity started to veer towards "young adults," or those between the ages of twenty and twenty-five. By that point, Melville had already shifted its own attention to the newly dominating age group. In 1961, President Kennedy assembled a group of experts on Latin America to advise him on the Alliance for Progress, but they failed to recognize the region's urbanization. But, one company, the American retail giant Sears, Roebuck, had anticipated it many years before. They did it without the use of statistics, instead going out and observing the public in cities like Bogotá, Lima, So Paulo, and Bogotá. Because to this, Sears started to construct American-style department stores in significant Latin American cities in the middle of the 1950s. These shops were created for a new urban middle class that, although not "wealthy," was a member of the money economy and had middle-class ambitions. Over a few years, Sears rose to become the top retailer in South America[7].

Here are two more instances of creatively using demographics to create a workforce that is very productive. The rise of young, highly educated, and very driven women in the workforce is partly responsible for Citibank of New York's development. As recently as 1980, the majority of large American businesses saw these women as a "problem," and many still do. Almost alone among major employers, Citibank saw an opportunity in them. In the 1970s, it actively sought them out, trained them, and sent them as loan officers around the nation. Demographics bank is the source. At the same time, a few savings and loan associations an industry not known for creativity or risk-taking—found that older married women who had previously left the workforce while their children were little and returned as permanent part-timers made excellent employees. Part-timers are "temporary," as "everyone understood," and women who have left the labor field once may never rejoin it; these were perfectly reasonable norms in bygone times. But, changing demographics rendered them unnecessary. The savings and loan organizations, notably in California, have benefited much from the readiness to accept this truth. This willingness, again, did not result from reading data but from getting out and looking.

The rise of several young people in Europe and the United States who are wealthy and educated yet only one generation removed from working-class roots is the direct cause of Club Mediterranée's success in the travel and resort industry. They are eager to have someone with the know-how to plan their vacations, their travel, and their fun, but they are still quite unsure of themselves and still lacking in self-confidence as tourists. Despite this, they are not particularly

at ease around either their working-class parents or older, middle-class individuals. They are therefore the ideal target market for a modernized and "exotic" variation of the classic hangout for teenagers.

Nonetheless, the absolute population is the least important figure. For example, the distribution of ages is significantly more significant. The majority of non-Communist industrialized nations had a fast growth in the number of young people throughout the 1960s; the noteworthy exception was Great Britain, where the "baby boom" was short-lived. The 1980s and 1990s will see a decline in the number of young people, a steady rise in the number of persons in their early middle years (up to age 40), and a very quick rise in the number of the elderly (seventy and over). What chances do these new advancements present? What are the needs, desires, and expectations of these distinct age groups in terms of values and expectations?

The number of 18 and 19-year-olds who continue their education after secondary school will rise enough to make up for the decrease in the overall population. However, as the percentage of people in their mid-thirties and forties who have a college degree earlier rises, there will be a sizable population of highly educated individuals who want to pursue advanced professional training or retrain in a variety of fields, including medicine, law, architecture, engineering, management, and education. What do these individuals seek? What are they lacking? Why can't they pay? What must the conventional university do to attract and satisfy such a diverse group of students? Finally, what are the needs, values, and priorities of the elderly? Is there really just one "older group," or are there really a number of them, each with its own goals, wants, and desires?

Changes in the center of population gravity, or the age group that at any one moment makes up both the biggest and the fastest-growing age cohort in the population, are particularly significant in age distribution and have the greatest predictive value. The center of population gravity in the United States reached its greatest point in history near the conclusion of the Eisenhower administration, in the late 1950s. Yet a drastic change was inevitable within a few years. The "baby boom" would cause a rapid decline in the center of American population gravity by 1965, bringing it to its lowest level since the early years of the Republic, somewhere between sixteen and seventeen[8].

Anybody who took demography seriously and examined the data might have anticipated that there would be a significant shift in attitudes and beliefs. The "youth revolt" of the 1960s was mostly a refocusing of attention on behaviors that have always been characteristic of adolescents. In the past, when the majority of the population was in their late 20s or early 30s, which are known for being quite conservative, teenage behavior was brushed off as "Boys will be boys" and "Girls will be girls". That all of a sudden became the standard conduct in the 1960s.

Yet, by the time everyone began talking about a "permanent change in values" or a "greening of America," the age pendulum had already drastically swung back. The "baby bust's" early repercussions could already be seen in 1969, and not only in numbers. The final year when people between the ages of sixteen and seventeen would make up the bulk of the population would be 1974 or 1975. Following then, the center would rise quickly, reaching the high twenties once again by the start of the 1980s. A change in what would be 96 would follow this transition.

Demographics deemed to be "representative" of behavior. Of course, the teens would still act like teenagers. Yet once again, it would be discounted as the typical conduct of teens rather than a reflection of the societal values and norms. Thus, one could predict with a high degree of certainty, for example, that by the mid-1970s, college campuses would stop being "activist" and "rebellious," and college students would once again be concerned with grades and jobs. However, one could also predict with a high degree of certainty that the vast majority of the 1968 "dropouts" would have transformed into "upward mobile professionals" by then, who were concerned with careers, advancement, tax shelters, and stock options. Segmenting based on educational level may be as critical, if not more so for certain objectives (e.g., selling encyclopedias, continuing professional education, but also vacation travel). Then there is occupational fragmentation and labor force participation. The distribution of income, particularly the distribution of disposable and discretionary income, comes last. What happens, for example, to the family with two earners' inclination to save money?

In reality, most of the solutions are accessible. They make up market research material. All that is required is the curiosity to inquire. Yet there's more at stake than just studying numbers. Indeed, statistics serve as a good place to start. These were what prompted Melville to inquire about the chances presented by the increase in teens for a fashion shop or what prompted Sears, Roebuck's senior management to consider South America as a prospective market. But after that, the executives of these businesses or the deans of large, urban institutions like Pace in New York and Golden Gate in San Francisco went outside to see and listen[9].

Sears, Roebuck really made the decision to enter South America in this manner. Robert E. Wood, the chairman of Sears, learned in the early 1950s that Mexico City and So Paulo would surpass all American cities in population by 1975. He was so interested by this that he travelled to see the biggest cities in South America for himself. He spent a week exploring each of them Mexico City, Guadalajara, Bogota, Lima, Santiago, Rio, and So Paulo looking at shops (he was horrified by what he found), observing traffic patterns, and taking in the local culture. He then understood who to target as consumers, how to design the shops, where to locate them, and what goods to supply them with package tours, before they constructed their first resort, spoke with and listened to them. Similarly, the two young men who transformed Melville Shoe from a dowdy, unremarkable shoe business (one of many) into the fastest-growing popular fashion store in America spent weeks and months in shopping malls observing and learning about their patrons' ideals.

They looked at how young people shopped, the types of environments they preferred (do adolescent boys and girls prefer different shoe shops or do they prefer to buy in the same location?, and what they saw as the "worth" of the goods they purchased. So, the potential to innovate is both extremely productive and very reliable for people who are actually eager to go into the field, look, and listen.There is no distinction between "The glass is half full" and "The glass is half empty" in mathematics. The implications of these two sentences, however, are completely different, as is their meaning. If the popular consensus shifts from seeing the glass as "half full" to

These are some examples of these shifts in vision and the creative possibilities they created in several fields, including business, politics, education, and others. According to all available data, the health of Americans has improved and advanced in ways never before seen during the last twenty years, or since the early 1960s. All measures of physical health and functioning have been improving at a decent pace, regardless of whether we focus on death rates for newborn infants or survival rates for the very elderly, the incidence of malignancies other than lung cancer or cure rates for cancer, etc.[10].

And yet, a general sense of hypochondria permeates the country. Never before have people been so afraid and concerned about their health. All of a sudden, everything appears to be a source of heart disease, cancer, or early memory loss. Clearly, the glass is "half empty." Instead of the significant advancements in health and functionality, we now see that we have made no progress towards immortality and that we are as distant from it as ever. In fact, it might be claimed that the intense concern for health and fitness, as well as the fixation with becoming old, losing fitness, and deteriorating into long-term disease or senility, are the same reasons why there has been a true decline in American health over the last 20 years.

Even little advancements in the country's health were seen as significant leaps forward twenty-five years ago. Even significant advancements are now seldom noticed. Whatever the reasons for this shift in perspective, it has produced significant potential for innovation. It opened up a market for new health periodicals, such American Health, which in only two years gained a million readers. It gave many new and creative companies the chance to capitalize on consumers' concern that conventional meals may cause irreversible harm.

One of the "flower children" of the late 1960s began Celestial Seasonings, a company in Boulder, Colorado, by gathering herbs in the mountains, bottling them, and selling them on the street. After fifteen years, Celestial Seasonings, which had annual sales of several hundred million dollars, was sold to a significant food-processing firm for more than $20 million. And there are chains of natural food shops that are very lucrative. Jogging equipment has also become major business, and in 1983, an indoor exercise equipment manufacturer was the fastest-growing new firm in the United States.

In the past, class and economic levels had a significant role in how people were fed. Rich folks "dined," whereas commoners "ate." Throughout the past 20 years, this view has shifted. The same individuals now "eat" and "dine." One tendency is towards "feeding," which refers to ingesting food in the quickest and most straightforward manner possible, such as convenience meals, TV dinners, McDonald's hamburgers, Kentucky Fried Chicken, etc. Nonetheless, many of the same customers are now accomplished chefs. Gourmet cookbooks have become best-sellers on the mainstream market, and brand-new chains of gourmet food shops have arisen. Gourmet cookery TV shows are very well-liked and get great ratings[11].

Lastly, while conducting 90% of their business in "feeding" foods, conventional supermarkets have built "gourmet boutiques," which are often far more lucrative than their typical processed-food business. By no means is this new view exclusive to Americans. We eat six days a week, but one day a week we prefer to really dine, a young female doctor recently told me in West

Germany. In the past, "essen" was the daily activity of the common man, while "speisen" was the daily activity of the elite, the wealthy, and the nobility.

If someone in the Bush administration or at the start of the Kennedy administration had forecast the advancements that black Americans would make over the following ten or fifteen years, they would have been scoffed at as unrealistic dreamers, if not mad. It would have been unfathomably optimistic to even forecast half the improvements for American blacks over those ten or fifteen years. Never in recorded history has the standing of a social group changed more dramatically in less time. Black students' engagement in post-secondary education at the beginning of those years was around one-fifth that of white students. By the early 1970s, it was higher than many white ethnic groups and on par with that of whites. Employment, salaries, and particularly entry into professional and management jobs all increased at the same pace. Anybody given a head start twelve or fifteen years ago would have believed that the "black issue" in America had been resolved, or was at the very least well on its way to resolution.

However a sizable portion of the black community in America today, in the middle of the 1980s, believes that the glass is still "half empty" rather than "half full." For a sizeable portion of American blacks, dissatisfaction, resentment, and alienation have grown rather than lessened. They focus on the failure of the remaining one-third of black people to progress rather than the accomplishments of the two-thirds of black people who have advanced economically and socially into the middle class.

They observe that progress has been gradual and that there is still much work to be done, not how quickly things have been progressing. The trade unions, the Jewish community, or academia the traditional friends of the American blacks and the liberal whites see the developments. The glass is now "half full," they notice. Hence, there is now a fundamental divide between the liberal organizations and the black community, which only serves to reinforce the black community's belief that the situation is "half empty."

But, the white liberal has come to believe that black people are no longer "deficient," no longer deserving of special treatment like reverse discrimination, and no longer requiring special accommodations and priority in employment, promotions, and other areas. The Reverend Jesse Jackson, a new breed of black leader, was given the chance as a result. A black man could only become the leader of his community historically for almost a century from Booker T. Washington at the turn of the century through Walter White during the New Deal era to Martin Luther King Jr. during the administrations of John Kennedy and Lyndon Johnson by demonstrating his capacity to win the support of white people[12].

That was the only way to amass sufficient political clout to secure meaningful advancements for black Americans. Jesse Jackson recognized that the perception shift that has separated American blacks from their former allies and comrades in arms, white liberals, is a creative opportunity to develop a completely different type of black leadership, one based on vocal hostility to the white liberals and even outright attack on them. It would have been political death for Jackson to have sounded as anti-liberal, anti-union, and anti-Jewish as he has. It quickly elevated Jackson to the position of unchallenged leader of the black community in America in the early weeks of 1984.

In actuality, there is nothing more ludicrous. Female stars of the first magnitude dominated the America of the 1930s and 1940s. Eleanor Roosevelt was the first American President's wife to carve out for herself a significant position as a conscience, a voice for morality and compassion that no American man in history has ever matched. Frances Perkins, a close friend of hers, served as Secretary of Labor in President Roosevelt's cabinet and was the strongest and most capable woman in the whole government. As personnel vice-president of R. H. Macy, the largest retailer in the nation at the time, Anna Rosenberg was the first woman to hold a senior executive position in a very large company.

Later, during the Korean War, she rose to become the Assistant Secretary of Defense for manpower and the "boss" of the generals. Several powerful, well-known women served as presidents of universities and colleges; each was a recognised national figure. Clare Booth Luce and Lillian Heliman, two of the top writers, were both female; Luce later rose to prominence in politics as a Connecticut representative to Congress and ambassador to Italy. The effort of a woman led to the period's most widely reported medical advancement. The "blue baby" operation, pioneered by Helen Taussig, was the first successful surgery on a live heart.

It rescued numerous children throughout the globe and helped usher in the age of cardiac surgery, which later gave rise to the heart transplant and the by-pass procedure. Then came Marian Anderson, a black singer who was the first black person to enter every American living room via radio. She touched the hearts and consciences of millions of Americans in a way that no other black person had done before her and that no other black person would do again until Martin Luther King, Jr., a quarter century later. One could go on and on with the list. They did not consider themselves "role models," nevertheless. They saw themselves as people rather than as ladies. Instead of seeing themselves as "representative," they saw themselves as extraordinary will leave it to future historians to explain how and why the transition took place. Nevertheless, when it occurred around 1970, these outstanding female leaders effectively lost their humanity in the eyes of their feminist successors. The woman who is not employed or who does not have a job that is seen as "masculine" historically is now viewed as an outlier and the exception.

A few corporations, like Citibank, saw this as an opportunity. The same businesses, such as department shops, advertising agency, magazine or book publishers, where women had long been regarded as professionals and executives, did not perceive it at all. Today, there are actually fewer women in prominent positions at these traditional employers of professional and management women than there were thirty or forty years ago. The extreme machismo of Citibank, in contrast, may have contributed to its realization that something had changed. It recognized a significant potential to attract and retain highly talented, ambitious, and striving women in the new view that women had of themselves. And it could do so without opposition from the conventional professional women's recruiters. As we've seen, innovators often have the field to themselves for a considerable amount of time when they take advantage of a shift in perspective.

A instance from the early 1950s, which is considerably older, demonstrates a similar use of a shift in perspective. By 1950, the majority of Americans started identifying as "middle class," practically independent of their level of income or line of work. Evidently, People' perceptions of

their own social standing had shifted. So what does the modification imply? William Benton, a former advertising executive who subsequently became a senator from Connecticut, went out and inquired about what the term "middle class" meant to different individuals. The findings were clear: being "middle class," as opposed to being "working class," entails having faith in one's children's capacity to succeed via academic achievement. Benton then acquired the Encyclopedia Britannica firm and began selling the Encyclopedia to parents whose kids were the first generation in the family to graduate from high school, mostly via high school teachers.

In essence, the marketer argued, "Your kid needs the Encyclopedia Britannica to succeed in school." Benton revived the business that was on the verge of failure in less than three years. Ten years later, the business started using the exact same technique in Japan for the same good reasons and with the same degree of success. Sudden success or failure is often a sign of a shift in perspective and significance. The story of the Thunderbird's resurrection from the ashes of the Edsel was related. As the Ford Motor Corporation looked for an explanation for the Edsel's failure, it discovered a shift in perspective. Customers now saw the automotive industry as being split by "lifestyles" rather than by economic groups, as it had been just a few short years previously.

Their intent does. From "The glass is half full" to "The glass is half empty," the connotation has altered. The meaning shifts from thinking of oneself as "working-class" and so having been destined for one's "station in life," to thinking of oneself as "middle-class" and thus having considerable control over one's social standing and economic chances. This shift could occur suddenly. Most Americans probably did not need much more than ten years to transition from calling themselves "working-class" to calling themselves "middle-class."

Such adjustments may not necessarily be dictated by economics; in fact, they may not matter. Great Britain is a more equitable nation than the US when it comes to income distribution. Although though at least two-thirds of British citizens earn more than the "working-class" average and almost half are above the "lower middle class," about 70 percent of the country's population still considers itself to be of that class. Mood, not facts, decides whether the glass is "half full" or "half empty". It is the product of what can be referred to as "existential" experiences.

The unhealed scars of ages past have as much to do with why American blacks believe "The glass is half empty" as anything in contemporary American culture. The gap between "church" and "chapel" that existed in the nineteenth century is still mainly to blame for the fact that the majority of English people identify as "working-class." Perhaps more than anything in the health statistics, the American health hypochondria embodies American ideals like the cult of youth.Alterations to The perception phenomena doesn't matter. That is still true. It often cannot be defined, or if it is, it will be too late to offer as a chance for innovation. Yet it is neither mysterious nor ethereal. It can be defined, tested, and most importantly, used since it is tangible. Administrators and executives acknowledge the power of perception-based innovation. Yet they often avoid it because it is "not practicable."

People see the perception-based inventor as eccentric or just a nutcase. But, there is nothing strange about Celestial Seasonings, the Ford Thunderbird, or the Encyclopedia Britannica. Of course, effective innovators in any discipline often work in or near their respective fields of innovation. Yet their awareness of potential is the one thing that distinguishes them. A young guy who worked as the culinary editor of an airline magazine before starting one of the top gourmet publications today. He noticed the shift in perspective when he read three conflicting reports in the same Sunday newspaper edition. The first claimed that within a few years, prepared meals like frozen dinners, TV dinners, and Kentucky Fried Chicken will make up more than 75 percent of all meals eaten in the United States. The second said that one of the most popular television programmed was one about gourmet cookery. And the third was when a gourmet cookbook shot to the top of the bestseller lists in its paperback edition, or edition for the general public. He questioned, "What's going on here?" in response to these seeming discrepancies. A year later, he launched a gourmet publication that was quite distinct from any that had previously been available.

When its college recruiters reported that they were unable to follow instructions to hire the top male business school students in finance and marketing, Citibank became aware of the opportunity presented by women's entry into the workforce. They reported that more and more women were pursuing these fields as top students. At that time, college recruiters told their managements the same tale in many other businesses, including quite a few banks. Most of them received the advice to "just strive harder to obtain the top-flight 105" in return.

Yet, each of these cases also demonstrates the time issue that is a major barrier to perception-based innovation. Ford may have lost the "lifestyle" market to GM's Pontiac if it had delayed just one year after the Edsel debacle. The smartest and most ambitious young women looking to pursue careers in business would not have chosen Citibank as their preferred employer if it had not been the first company to hire female MBAs. But, nothing is more risky than jumping the gun and taking advantage of a shift in perspective. First off, a lot of things that seem to be shifts in perception are really passing trends.

They disappear after a year or two. Yet it's not always clear which trends are fads and which represent real change. The trend of youngsters playing video games was passing. Businesses that, like Atari, recognized a shift in perspective in them endured for one or two years before failing. Yet, the decision by their dads to purchase personal computers marked a significant shift. Moreover, it is very hard to foresee what the effects of such a shift in perspective will be. The effects of the student uprisings in France, Japan, West Germany, and the United States are an excellent illustration. Everyone was certain that they would have long-lasting and significant effects in the late 1960s. What are they, though? In terms of the universities, the student uprisings seem to have had no lasting effect at all. And who would have imagined that the disobedient college students of 1968 would develop into the "Yuppies" the young, upwardly mobile professionals who were ultra-materialistic, job aware, and angling for their next promotion to whom Senator Hart appealed in the 1984 American primaries? The only change is that the media focus on them now even though there are really considerably less "dropouts" around than there used to be. Can the student uprising be used to explain the rise of gays and

lesbians in the public eye? Neither the students themselves in 1968 nor any observers or commentators of the time could have possible foreseen these outcomes. Yet, timing is crucial is ineffective at taking advantage of shifts in perception. There must be a first. Yet, since it is difficult to predict whether a shift in perception will be temporary or long-lasting, as well as what the actual effects will be, perception-based innovation must begin small and be extremely focused.

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CHAPTER 8

UNCOVERING NOVEL INSIGHTS: A STUDY ON THE ACQUISITION AND INTEGRATION OF NEW KNOWLEDGE IN COMPLEX SYSTEMS

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It receives media coverage. It receives payment. When people speak about innovation, they often mean this. Of course, not all breakthroughs based on information are significant. Some are really unimportant. But among Knowledge-based inventions are among the most revolutionary. Yet the information isn't always specialized or technical. Knowledge-based social innovations may have an effect that is at least as big. The fundamental qualities of knowledge-based innovation stand out from all other innovations, including their time horizon, fatality rate, predictability, and the difficulties they provide to the entrepreneur. Yet like other "superstars," knowledge-based innovation is volatile, fickle, and hard to control.

Among all advances, knowledge-based innovation has the longest lead time. First of all, it takes a while for new information to apply to technology once it initially appears. Before the new technology is translated into marketable goods, procedures, or services, there is still another lengthy interval[1]. The scientist Paul Ehrlich established the hypothesis of chemotherapy, the management of pathogenic germs by chemical substances, between 1907 and 1910. For the treatment of syphilis, he created Silverman, the first antibacterial medication. Ehrlich's chemotherapy is used with the sulfa medicines to manage a variety.After 1936, twenty-five years later, a wide range of bacterial infections entered the market. In 1897, Rudolph Diesel created the engine that bears his name. At instantly, everyone recognized how significant of an invention it was. Yet, there weren't many real-world uses for many years. Charles Kettering, an American, completely revamped Diesel's engine in 1935, making it suitable for use as the propulsion system in a range of ships, locomotives, trucks, buses, and passenger automobiles.

The computer was made feasible by the convergence of many fields of knowledge. The binary theorem, a mathematical principle that dates back to the seventeenth century and allows all numbers to be stated using just two integers one and zero was the first. In the early part of the nineteenth century, Charles Babbage used it to a calculator. Hermann Hollerith created the punch card in 1890, building on a French inventor from the early nineteenth century named J-M. Jacquard. The punch card allows for the transformation of integers into "instructions." Electronics were made possible by Lee de Forest, an American who developed the audio tube in 1906. Later, between 1910 and 1913, Bertrand Russell and Alfred North Whitehead developed symbolic logic, allowing us to describe all logical notions as numbers in their Principia Mathematica book. Ultimately, during World War I, the ideas of feedback and programming were established, mainly for antiaircraft gunnery. In other words, by 1918, all the information required to create the computer was accessible. In 1946, the first computer was put into use.

The term "automation" was first used in 1951 by a manufacturing executive at Ford Motor Company, who also elaborated on the extensive production process that automation would need. For twenty-five years, "robotics" and manufacturing automation have been hot topics, yet nothing has really changed.

Robots weren't put into Nissan and Toyota's factories in Japan until 1978. General Electric constructed a factory for automated locomotives in Erie, Pennsylvania, towards the beginning of the 1980s. Afterwards, General Motors started automating a number of its accessory and engine factories. Volkswagen started using its "Hall 54" as a production plant from the beginning of 1985[2].

The design of what Buckminster Fuller termed the "Dymaxion House," a name he selected because he liked the way it sounded, was based on the mathematics of topology. Fuller, who went by the moniker "geometer," was a mathematician, philosopher, and part-time geometer. The most living space possible is combined with the lowest surface area feasible, according to New Knowledge. As a result, it has excellent acoustics, ideal insulation, and ideal heating and cooling. It can also be constructed using lightweight materials, with the least amount of suspension and foundation needed, and it can yet survive the worst storm and an earthquake.

A Dymaxion House was built by Fuller on the grounds of a tiny New England college about 1940. And it remained there. Few Dymaxion Houses have been constructed; it would seem that Americans dislike living in circular residences. But, about 1965, Dymaxion buildings started to be erected in the Arctic and Antarctic, where traditional structures are unsuitable, costly, and challenging to construct. Since then, they have been utilised more and more for big buildings like auditoriums, concert tents, sports stadiums, and so on.

This lead period can only be shortened by severe external crises. Radio would have been possible almost immediately after the 1906 invention of De Forest's audion tube, but it wouldn't have been available until the late 1930s or so if World War I hadn't compelled governments, especially the American government, to push the development of wireless sound transmission. The only wireless telegraphy available was limited to dots and dashes, and field telephones linked by cables were just too unstable. So, barely fifteen years after the development of the knowledge on which it is founded, radio entered the market at the beginning of the 1920s. Similar to the development of penicillin, World War II probably would not have occurred until the 1950s or later. Around the middle of the 20th century, Alexander Fleming discovered the bacterial-killing mould penicillium. Ten years later, English scientist Howard Florey started working on it. Yet, it was World War II that compelled the development of penicillin early on.

The British government supported Florey's research because it was necessary to have an effective medication to combat infections. English troops were made accessible to him as test subjects wherever they fought. If Bell Lab researchers hadn't discovered the transistor in 1947, the computer would have likely had to wait. The US government pushed computer development and invested significant manpower and financial resources in the field as a result of World War II. By no means is the lengthy lead time for knowledge-based inventions restricted to science or technology. That also holds true for inventions based on non-technological and non-scientific

understanding. The comte de Saint-Simon created the entrepreneurial bank theory, which advocates the deliberate use of money to produce economic benefit immediately after the Napoleonic Wars, development. At that time, bankers were moneylenders who made loans in exchange for "security" (like a prince's taxing authority). The job of Saint-banker Simon's was to "invest," or develop new capabilities for generating riches. Saint-Simon had enormous impact during his lifetime, and following his death in 1826, a cult of personality sprang up around him and his beliefs. But it wasn't until the brothers Jacob and Isaac Pereire, two of his students, founded the Credit Mobilier in 1852 that the modern concept of finance capitalism was introduced.

Similar to how many of the components required for what we now refer to as management were accessible immediately after World War I. In fact, the first International Management Congress was organised in Prague in 1923 by Thomas Masaryk, the country's founder and first president, and Herbert Hoover, who would soon become president of the United States. A few significant corporations started to restructure themselves around the new management ideas around the same period, most notably DuPont and General Motors in the United States.

A few "true believers," particularly an Englishman named Lyndall Urwick, who founded the first management consulting business that still carries his name, started to write about management in the next ten years. Nevertheless, management did not become a discipline available to managers everywhere until my books Idea of the Corporation (1946) and Practice of Management (1954) were released. Prior to it, each "management" student or practitioner concentrated on a different topic; Urwick on organization, others on the management of people, etc. It was formalized, arranged, and systematized in my publications. Management quickly expanded to a global force.

Regarding learning theory, we still have a comparable lead time today. In 1890, Wilhelm Wundt in Germany and William James in the United States started the scientific study of learning. B. F. Skinner and Jerome Bruner, two Americans who worked at Harvard after World War II and had specialised in behaviour and cognition, respectively, formulated and tested the fundamental ideas of learning. But it is only now that learning theory is starting to influence our classrooms. Maybe it is now time for a businessperson to open schools that are based on what we now know about learning rather than on the fables that have been passed down through the years[3].

In other words, it takes between 25 and 35 years for knowledge to transform into usable technology and start to become acceptable on the market. Over documented history, not much has changed about this. It is commonly held that scientific advancements translate into technology, goods, and processes now more quickly than ever before. Yet much of this is a lie. A Franciscan friar from England named Roger Bacon demonstrated how eyeglasses may be used to correct refractive errors in the eye about the year 1250. Galen, a famous medical expert, had "proved decisively" that it could not be done, according to the "infallible" authority of the Middle Ages. This contradicted what everyone understood at the time. In the wilds of northern Yorkshire, Roger Bacon made his home and carried out his business at the farthest reaches of civilization. Yet, a painting painted thirty years later at the Palace of the Popes in Avignon where it is still visible depicts old cardinals using reading spectacles, and miniatures painted ten years

later in the Sultan's Palace in Cairo depict senior courtiers wearing glasses as well. About the year 1000, Benedictine monks in northern Europe invented the mill race, the first real "automation," to grind grain. By thirty years, it had spread across all of Europe. Within thirty years of the West discovering Chinese printing, Gutenberg created moveable type and the woodcut.

Knowledge seems to have an intrinsic lead time before it is transformed into innovation that is knowledge-based. Why is unknown to us. The fact that new scientific theories are given the same lead time, however, may not be a complete coincidence. It takes around thirty years for a new scientific theory to become a new paradigm a new assertion that scientists pay attention to and utilise in their own work as shown by Thomas Kuhn in his seminal book The Structure of Scientific Revolutions (1962).

The second, and most distinctive, feature of knowledge-based breakthroughs is that they virtually never depend on a single component but rather on the synthesis of numerous diverse types of information, not all of which are scientific or technical. The hybridization of crops and animals is one of the knowledge-based breakthroughs of this century that has had the most positive impact on mankind. It makes it feasible for the world to feed a lot more people than was previously considered imaginable. Hybrid corn was the first new seed to be successful. Henry C. The only person to occupy this position who, in the opinion of many, should be known for anything other than distributing money was Wallace, the editor of a farm newspaper in Iowa who subsequently served as the United States Secretary of Agriculture under Harding and Coolidge. The two knowledge roots of hybrid corn.

One was William J. Beal's work, a Michigan plant breeder who, in 1880, found hybrid vigour. The other was Dutch researcher Hugo de Vries' rediscovery of Mendel's genetics. The two males were unfamiliar with one another. Both in terms of aim and substance, their work was completely different. Yet creating hybrid corn required a concerted effort[4]. Two knowledge roots were also included in the Wright Brothers' aircraft. One was the gasoline engine, created in the middle of the 1880s to power Karl Benz's and Gottfried Daimler's respective first vehicles. The other was mathematical and was established mostly via experiments with gliders: aerodynamics. Each was created in a very independent manner. The aircraft was only made feasible when the two came together.

As previously said, the creation of the computer needed the fusion of at least five diverse fields of knowledge: the notions of programmed and feedback, a new logic, the audio tube, the binary theorem, and key mathematical discoveries. No computer could have been constructed before all these were accessible. The English scientist Charles Babbage is sometimes referred to as the "father of the computer." It is said that Babbage's inability to get the necessary metals and electricity during his lifetime was the sole thing preventing him from creating a computer. This, however, is a misconception. Even with the right resources, Babbage could only have created the mechanical calculator we now refer to as a cash register. Babbage could only envisage a computer since he lacked the logic, the design idea of the punch card, the notion of a programmed, and the concept of feedback.

In 1852, the Brothers Pereire established the first business bank. They only had one knowledge base, while the entrepreneurial bank requires two, hence it collapsed after a few years. They had a novel finance philosophy that made them successful venture investors. Yet, they lacked the systematic understanding of banking that the British were developing over the Channel at the same time and codifying in Walter Bagehot's masterpiece, Lombard Street successfully continued where the Brothers Pereire had left off by incorporating banking expertise into the idea of venture capital. First was J. P. Morgan, a London-trained financier who likewise meticulously researched the Pereires' Crédit Mobilier. In 1865, he established the most prosperous business bank of the nineteenth century in New York.

Georg Siemens, a young German who lived across the Rhine, was the second. He established what he termed the "Universal Bank," which was a financial institution that included both a deposit-taking bank based on the British model and an entrepreneurial bank based on the Pereires' concept. Another young man, Shibusawa Eichii, one of the first Japanese to travel to Europe and study banking firsthand, spent time in Paris and London's Lombard Street, and later established a Japanese equivalent of the Universal Bank in a remote area of Tokyo. Shibusawa Eichii is credited with helping to establish the modern Japanese economy. The biggest banks in each of their respective nations are still the Deutsche Bank of Siemens and the Daichi Bank of Shibusawa.

James Gordon Bennett, the founder of the New York Herald and the first person to envision the contemporary newspaper, was an American. Bennett was aware of the issues in full: A newspaper needed to make enough money to support editorial independence while also being affordable for wide distribution. The majority of American and almost all European newspapers of his day made their money by ceding their independence to political factions, or by acting as their lackeys and hired propagandists. Maybe they were "written by gentlemen for gentlemen," like the great aristocrat of the day, The Times of London, but so costly that only a select elite could buy them[5].

Bennett used the telegraph and high-speed printing, the two technical knowledge bases on which a contemporary newspaper is built, to great effect. They made it possible for him to create a paper for a lot less money than usual. Despite the fact that high-speed typesetting was not created until after his passing, he was aware of the necessity for it. He also recognised popular literacy as one of the two nonscientific grounds, enabling wide distribution of a low-cost newspaper. But, he missed the fifth basis, which is mass advertising, which provides the funding necessary for editorial independence. Bennett was the first of the press lords and had phenomenal success individually. Yet neither financial stability nor leadership were gained by his journal. Only two decades later, in the vicinity of 1890, did three persons who understood and used advertising succeed in achieving these objectives.

York, William Randolph Hearst, who created the modern newspaper network, and Adolph Ochs, who revived the dormant New York Times and turned it into the nation's top publication. The development of plastics, starting with Nylon, also depended on the fusion of many distinct new scientific discoveries, each of which first appeared about 1910. Leo Baekeland, a Belgian working in New York, refined organic chemistry, which was started by the Germans. Other

examples include X-ray diffraction, which led to a knowledge of crystal structure. The German government was ready to make a significant investment in polymerization research to find a rubber alternative due to the strain of World War 1 shortages. Nylon wasn't ready for the market for another twenty years, however.

Knowledge-based innovation is premature and will not succeed until all necessary knowledges can be delivered. Most of the time, innovation doesn't happen until these many aspects are already recognised, accessible, and being used elsewhere. This applied to the 1865–1875 Universal Bank. After World War Two, the computer was an example. Occasionally the inventor is able to see the components that are lacking and then go about creating them. Modern advertising was primarily developed by William Randolph Hearst, Adolph Ochs, and Joseph Pulitzer. This led to the fusion of information and advertising in "mass communications," which is what we now refer to as media. The Wright Brothers recognized the gaps in knowledge—mostly in mathematics—and went on to fill them by creating a wind tunnel and putting mathematical hypotheses to the test. Yet, a knowledge-based invention won't take off until all the knowledge's required for it have been combined. It will stay an unborn child.

For instance, Samuel Langley was a considerably better schooled scientist than the Wright Brothers and was predicted by his contemporaries to be the creator of the aircraft. He also had access to all of the nation's scientific resources as secretary of the Smithsonian in Washington, which at the time was the country's premier scientific organisation. But Langley opted to overlook the gasoline engine, even though it existed at the time of his period. He was a supporter of the steam engine. Because of the weight of the steam engine, his aircraft was able to take off, but it was too heavy to support even a little load, much alone a pilot. To create the aircraft, mathematics and the internal combustion engine have to come together[6].

In fact, the lead time for a knowledge-based innovation often does not even start until all the knowledge's converge. Knowledge-based innovation has special needs because of its nature. And they are distinct from those that apply to any other sort of innovation. Knowledge-based innovation first and foremost requires comprehensive examination of all relevant aspects, including knowledge itself as well as social, economic, and perceptual factors. In order for the entrepreneur to decide whether these missing elements can be produced, as the Wright Brothers did with regard to the missing mathematics, or whether the innovation would be better off being postponed as it is not yet feasible, the analysis must identify the factors that are not yet available.

The Wright Brothers are the epitome of the approach. They carefully considered what information was required to construct an aircraft for manned, powered flight. After they acquired the mathematics required to build ailerons, shape the wings, and so on, they started about developing the bits of knowledge that were required, testing the information first theoretically, then in the wind tunnel, and last in real flight trials. For innovation based on non-technical knowledge, the same approach is required. When Shibusawa in Japan published his studies, neither J. P. Morgan nor Georg Siemens did. We thus know that he carefully considered the information that was already accessible and the knowledge that was required before deciding to forego a wonderful government career and launch a bank. Similar to this, Joseph Pulitzer thoroughly considered the information required to establish what would eventually become the

first modern newspaper and came to the conclusion that advertising needed to be developed and could be produced.

If I may add a personal remark, in the early 1940s, a similar study became the basis of my own success as an inventor in the management sector. Several of the necessary pieces of knowledge were already in existence, such as organization theory and a sizable amount of information on worker and work-related management. These compositions were dispersed over different disciplines. It then determined which essential knowledge's were lacking, including the purpose of a firm, any understanding of the duties and organizational structure of top management, what we now refer to [7]as "business policy" and "strategy," goals, etc. I determined that all of the knowledge's that were lacking could be provided. Yet, I would not have known what they were or that they were absent without such study.

Failing to conduct such an examination is almost a recipe for catastrophe. Either knowledge-based innovation is not accomplished, as was the case with Samuel Langley, or it is. Instead the inventor just succeeds in providing opportunities for someone else and loses the benefits of his idea. The British people's inability to benefit from their own knowledge-based advances is particularly revealing. Penicillin was discovered and developed by the Brits, but it was adopted by the Americans. The British scientists executed their technical plan flawlessly. They introduced the appropriate materials and applications. Yet, they overlooked the importance of manufacturing capability while identifying crucial knowledge factors. They could have learned the requisite fermentation technology skills, but they made no attempt. As a consequence, a modest American business named Pfizer began working on expanding its understanding of fermentation and rose to become the world's top producer of penicillin.

Similar to this, the first passenger jet aircraft was created, constructed, and manufactured by the Brits. De Havilland, a British corporation, did not, however, do the necessary analysis and, as a result, failed to recognize two crucial elements. One was configuration, or getting the aircraft to have the correct size and payload for the routes where it would benefit an airline most[8]. The other was as uninteresting: how to pay for the airlines' acquisition of such a costly jet. Due to de Havilland's inability to do the study, the jet aircraft was taken up by Boeing and Douglas, two American businesses. De Havilland has also vanished decades ago. Even though such examination would seem to be rather apparent, the scientific or technological inventor seldom does it. Since they believe they already know, scientists and technologists are unwilling to do these assessments exactly. This explains why the father or at least godfather of so many outstanding knowledge-based breakthroughs has been a layperson rather than a scientist or a technician. The (American) General Electric Corporation was mostly the idea of a businessman in the finance industry.

He came up with the plan that helped G.E. become the world's top provider of huge steam turbines and, as a result, the top supplier to electric power companies. Similar to this, Thomas Watson Sr. and his son Thomas Watson Jr., both laymen, helped IBM become the industry leader in computers. At DuPont, businesspeople on the executive committee, not the scientist who created the technology, conducted the analysis of what was required to make the knowledge-based invention of Nylon effective and successful. Under the direction of marketing

professionals who were aware of what the airlines and the general public required, Boeing rose to become the world's top manufacturer of jet aircraft[9].

But this is not a natural law. Most of the time, it comes down to willpower and self-control. There have been plenty of scientists and technologists Edison is a good example who forced themselves to think through what their knowledge-based innovation required. The second requirement of knowledge-based innovation is a clear focus on the strategic position. It cannot be introduced tentatively.

The fact that the introduction of the innovation creates excitement, and attracts a host of others, means that the innovator has to be right the first time. He is unlikely to get a second chance. In all the other innovations discussed so far, the innovator, once he has been successful with his innovation, can expect to be left alone for quite some time. This is not true of knowledge-based innovation. Here the innovators almost immediately have far more company than they want.

There are basically only three major focuses for knowledge-based innovation. First, there is the focus Edwin Land took with Polaroid: To develop a complete system that would then dominate the field. This is exactly what IBM did in its early years when it chose not to sell computers but to lease them to its customers. It supplied them with such software as was available, with programming, with instruction in computer language for programmers, with instruction in computer use for a customer's executives, and with service. This was also what G.E. did when it established itself as the leader in the knowledge-based invention of huge steam turbines in the early years of this century.

The second distinct emphasis is a market focus. Knowledge-based innovation might aim at developing the market for its goods. DuPont used this principle to Nylon. It did not "sell" nylon; instead, it helped to develop markets for nylon-based women's hosiery and undergarments, car tires, and other products manufacturers to produce the goods for which DuPont had already generated demand and, in essence, sold them. Similar to steel, aluminum started to develop a market for pots and pans, rods, and other aluminum extrusions as soon as Charles M. Hall invented the aluminum reduction method in 1888. The aluminum corporation really invested in producing and marketing these finished goods. It established the market, which served to deter (if not completely exclude) new rivals[10].

Possessing a strategic position and focusing on a crucial function is the third goal. What role would provide the knowledge inventor the ability to be essentially impervious to the tremendous convolutions of a knowledge-based business in its early stages? The early advantage in penicillin that Pfizer in the United States obtained and has since maintained was the result of carefully considering this and opting to focus on perfecting the fermentation process. Boeing gained the market share in passenger jets it has had ever since by concentrating on marketing and mastering the demands of airlines and the general public in terms of configuration and financing. In addition, despite the current turmoil in the computer business, a small number of top semiconductor makers are able to retain their dominance almost regardless of what happens to other computer manufacturers individually. One example is Intel.

Individual knowledge-based innovators may sometimes choose between various options within the same sector. For instance, Dow Chemical, DuPont's closest American rival, strives to take a leading position in each market category where DuPont has decided to build markets. J. P. Morgan chose the key function strategy 100 years ago. In addition, in a nation with a lack of cash, he created his bank as the conduit for European investment capital in American industry. Georg Siemens in Germany and Shibusawa Eichii in Japan both opted for the systems approach at the same time[11]–[13].

Edison's achievement serves as an example of the potency of having a focused goal. Not only Edison recognized the innovations needed to create a light bulb; others did as well. Joseph Swan, an English scientist, also achieved this. Swan and Edison both created their light bulbs at the same period. Swan's bulb was better in terms of technology to the point where Edison acquired the Swan patents and employed them in his own light bulb factory. Edison, however, considered more than just the technical needs.

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CHAPTER 9

ILLUMINATING THE INNOVATION PROCESS: EXPLORING THE FACTORS THAT CONTRIBUTE TO GENERATING AND IMPLEMENTING BRIGHT IDEAS

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Bright idea-based innovations likely outweigh all other categories combined. For instance, seven or eight out of ten patents fall within this category. The majority of new enterprises portrayed in literature on entrepreneurship and entrepreneurships are constructed. The ballpoint pen, the aerosol spray can, the tab to open soft drink or beer cans, and many more inventions are examples of "brilliant ideas" in everyday life. And what is referred to as research in many industries is to discover and capitalize on innovative ideas, whether they be for a better running shoe, a new taste for breakfast cereals or soft drinks, or yet another non-scorching clothes iron.

Yet the riskiest and least productive source of creative potential is brilliant ideas. The rate of casualties is really high. Hardly one in a hundred patents for an invention of this kind generates enough revenue to cover the expenditures of research and development as well as patent fees. Just a far smaller percentage possibly as few as one in 500 makes any money above their out-of-pocket expenses[1]. Moreover, no one is aware of which innovations based on original ideas are likely to succeed and which are more likely to fail. For example, why did the aerosol can succeed? And why did a dozen or more other, like devices that aimed to deliver particles uniformly fail miserably? Why do most of the many universal wrenches vanish yet just one sells? Why did the zipper become popular despite its propensity to clog and essentially replace buttons? After all, a broken zipper on a dress, jacket, or pair of pants may be quite unflattering.

There have been unsuccessful attempts to increase the predictability of discoveries based on original thinking. It has also been fruitless to pinpoint the characteristics, actions, or habits of great innovators. An ancient saying goes, "Successful innovators keep on innovating. They use probability. Nevertheless, this conviction that you may succeed if you keep trying out innovative ideas is no more sensible than the widely held misconception that all you need to do in Las Vegas to win the jackpot is to keep pressing the lever.

Unfortunately, the system is set up such that the house wins 70% of the time. You lose more frequently the more pulls you make. The notion that perseverance in pursuing the "great idea" pays off has no factual support whatsoever, just as there is no proof of any "method" to beat the slots. Some famous innovators, like the one who came up with the zipper or the ballpoint pen, only had one really spectacular invention before giving up. However, there are many innovators who have forty patents to their name but have not been successful. Of course, innovators become better with experience. But only if they use the proper methodology, i.e., if they base their work

on a thorough examination of the opportunities for innovation[2].Both the unpredictable nature and the high casualty rate have quite clear-cut causes. Brilliant concepts are hazy and illusive. I doubt that anybody other than the creator of the zipper ever considered that hooks and eyes or buttons were insufficient for fastening garments, or that anyone other than the ballpoint pen creator could have identified what, if anything, the fountain pen of the nineteenth century lacked. What need was met by the electric toothbrush, one of the 1960s's commercial successes? After all, it still has to be held in the hand.

Even if the need can be identified, the answer is sometimes impossible to pinpoint. It wasn't so hard to imagine that those stuck in their automobiles in a traffic congestion might appreciate some entertainment. So why did the far more costly vehicle radio succeed in the market while the compact TV set Sony produced about 1965 to fill this demand failed? It is simple to respond to this in hindsight.

But was there any way it might have been addressed beforehand? So, the business owner would be wise to forego innovations based on brilliant ideas, notwithstanding how alluring the success tales may be. In spite of the fact that someone wins a jackpot on a Las Vegas slot machine every week, the most a single player can hope for is to keep their losses to a minimum. Entrepreneurs who are methodical and deliberate study the seven sources[3].

There is enough in these areas to keep any one entrepreneur, entrepreneurial enterprise, or institution of public service busy. There is really far more than anybody could reasonably take in. All that can be done for innovators with bold ideas is to advise them on what to do in the unlikely event that their breakthrough succeeds. Then a new venture's regulations will apply. And of course, this explains why so much entrepreneurship literature focuses on launching and managing a new business rather than on invention itself.

Yet innovation based on a clever concept cannot be dismissed carelessly in a free-market economy. The vast majority of times, individual invention of this sort fails because it is unpredictable, cannot be managed or systematized, and cannot be organized. And many, many things are inconsequential right from the bat. New wig stands, can openers, and belt buckles consistently get more patent requests than any other invention. And there is usually at least one foot warmer that can also be used as a dish towel in any list of new patents. Yet since there are so many of these brilliant ideas being developed, even a small portion of them succeeding is a significant source of new companies, employment, and performance capabilities for the economy.

The bright-idea invention belongs in the appendix in terms of innovation theory and practice. Yet it deserves appreciation and praise. It stands for the initiative, aspiration, and inventiveness that society requires. Maybe there is nothing that society can do to encourage this kind of creativity. One cannot advocate for what they do not comprehend. Yet, society should at least refrain from discouraging, punishing, or making such breakthroughs difficult. When seen from this angle, the current tendency in industrialiser nations particularly in the United States to discourage those who want to innovate by discouraging patents as "anticompetitive" and hiking patent costs, for example, is shortsighted and harmful[4].

He considered where to concentrate. Before he even started working on the technical aspects of the glass envelope, the vacuum, the closure, and the glowing fiber, he had already made up his mind about the "system" he would use to operate his light bulb business. His light bulb was created to fit the needs of an electric power company, for which he had arranged financing, the right to run wires to supply power to his light bulb customers, and the distribution network. Scientist Swan created a product; inventor Thomas Edison created an industry. Due of Edison's ability to sell and install electricity, Swan could continue to consider potential customers for his technological advancement.

All three of the ones mentioned above are very dangerous. But, it is considerably riskier to not settle on a definite focus, let alone to try to be in between or to attempt more than one focus. That could turn out to be deadly. The knowledge-based inventor must also understand and put into practice entrepreneurial management, particularly if their idea is based on scientific or technical expertise. In fact, knowledge-based innovation requires entrepreneurial management more than any other sort of innovation. Because of its significant risks, it places a far greater value on management and financial foresight as well as being market-focused and market-driven. Yet innovation that is knowledge-based, and particularly high-tech, often has little entrepreneurial management[5].

The knowledge-based, and particularly the high-tech, entrepreneurs themselves are largely to blame for the high fatality rate of the business. They often have a low opinion of anything that is not "advanced knowledge," and they are especially dismissive of anybody who is not an expert in their own field. They often mistakenly define "quality" as something that is technically advanced rather than something that adds value for the consumer due to their obsession with their own technology. They are still mostly nineteenth-century innovators in this regard rather than modern businesspeople.

In reality, there are enough businesses operating today to demonstrate how, with careful entrepreneurial management, the risk associated with knowledge-based innovation, particularly high tech, can be greatly reduced. The Swiss pharmaceutical business Hoffmann-LaRoche is one such; others include Hewlett-Packard and Intel. Due to the significant inherent risks associated with knowledge-based innovation, entrepreneurial management is both essential and very successful.

Knowledge-based innovation nonetheless faces certain dangers and, worse, an inherent unpredictability, even when it is founded on thorough analysis, endowed with clarity of purpose, and diligently controlled. Long lead periods and convergences, two features of knowledge-based breakthroughs, work together to create this unusual rhythm. There has been a long-standing expectation that an invention would occur, yet it never happens.

Then there comes an abrupt near-explosion, followed by a brief period of intense enthusiasm, intense startup activity, and intense media coverage. Five years later, there is a "shakeout" that few make it through. Werner Siemens in Germany used the electrical theories Michael Faraday had created in 1830 (25 years previously) to construct the first dynamo, which was the forerunner of the first electrical motor. It became an international sensation. The existence of a

"electrical industry" and its importance were afterwards assured. Several researchers and creators started their job. Yet for 22 years, nothing occurred. The elaboration of Faraday's ideas by Maxwell was the knowledge that was lacking[6].

After the light bulb was created by Edison in 1878 and was made accessible, the competition began. In the next five years, all of the main manufacturers of electrical equipment in Europe and America were established. Siemens in Germany acquired the minor electrical equipment maker Schuckert. Based on Edison's invention, the (German) General Electric Corporation, AEG, was established.

What are now G.E. and Westinghouse originated in the United States, Brown Boveri emerged in Switzerland, and ASEA was established in Sweden in 1884. However, these few are the survivors of 100 similar businesses, including American, British, French, German, Italian, Spanish, Dutch, Belgian, Swiss, Austrian, Czech, Hungarian, and others. All of these businesses were eagerly financed by the investors of the day and anticipated becoming "billion-dollar businesses." The first big science fiction boom was sparked by the expansion of the electrical device business, which also made Jules Verne and H. C. Wells international bestsellers.

New Knowledge had already vanished, either going out of business, declaring bankruptcy, or being absorbed by the few survivors. Up to 200 automotive manufacturers operated only in the United States in 1910. Their population had decreased to twenty by the early 1930s and to four by 1960. Thousands of businesses produced radios throughout the 1920s, and many more invested in radio stations. About a dozen radio set manufacturers remained in business by 1935, and three "networks" now controlled transmission[7].

Again, the number of newspapers established between 1880 and 1900 increased dramatically. Indeed, one of the main "growing sectors" at the time was the newspaper industry. Every major nation's newspaper circulation has been progressively declining since World War I. The same is true for banking as well. After the founding families the Morgans, Siemens, and Shibusawas there was an almost rapid rise in the number of new banks in both Europe and the United States. Consolidation began, however, only twenty years later, around 1890. Banks started closing their doors or merging. At the conclusion of World War II, there were very few commercial or private banks in every significant nation that had significance beyond the local level.

Yet in every instance, a business that was founded during the early explosive era has prevailed. Entry into the sector is effectively closed when that time period has passed. Each new knowledge-based industry has a "window" of a few years within which a new enterprise must establish itself. Now, it's widely accepted that that "window" has shrunk. Yet this is just as false as the erroneous notion that there is now much less time between the creation of new knowledge and its translation into technologies, goods, and processes.

Around a hundred railroad firms were founded in England within a few years after George Stephenson's "Rocket" pulling the first train on a commercial railroad in 1830. Railroads were "high-tech" for ten years, and railroad entrepreneurs were "media events." Dickens's work Little Dorrit, which was published in 1855–1857, satirises the speculative fever of the time in a cutting way. This speculative fever was similar to that of Silicon Valley today. But, the "window"

abruptly closed in 1845[8]. Likewise, the industries of electrical equipment, telephone, vehicle, chemical, home appliance, and consumer electronics all followed a similar pattern. The "window" has never been very large or wide open. Yet there's no denying that the "window" is becoming progressively fuller nowadays. The railroad boom of the 1830s was limited to England; afterwards, every nation saw its own local boom that was completely unrelated to the one that had come before in the nation next door. Both the boom for electrical equipment and the vehicle twenty-five years later crossed international borders. Nonetheless, each was restricted to the nations that had advanced industrially at the time.

Yet nowadays, the definition of "industrially developed" covers a lot more ground. As an example, it works in Japan. In Brazil, it occurs. Hong Kong, Taiwan, and Singapore are non-Communist Chinese areas that it may soon include. Nowadays, travel is simple and quick, and communication is nearly immediate. Yet now, many nations possess what just a tiny number of isolated locales had a century ago: vast cadres of skilled workers who are ready to work right away in any field of knowledge-based innovation, particularly in the fields of science and technology.

To start, innovators in both science and technology realize that time is working against them. Time is on the innovator's side in every innovation based on any other source, including the unexpected, incongruities, process necessity, changes in industry structure, demography, or perception changes. Innovation pioneers might expect to be left alone in any other kind of innovation. They may have enough time to fix a mistake if they do. And they might start their new business at different points in time[9].

Not so with innovation that is knowledge-based, and particularly with inventions that are informed by scientific and technical knowledge. Here, admission is only feasible for a brief period of time—the "window" at all. Here, inventors must be correct the first time; there is no second chance. The surroundings are cruel and nasty. And when the "window" closes, the chance is lost for good. Yet, in certain knowledge-based businesses, a second "window" does in fact open about 20–30 years after the first one closes.

Computers' initial "window" ran from around 1949 until 1955. Every single electrical equipment firm in the world entered the computer market at this time, including G.E., Westinghouse, and RCA in the United States; Plessey, Ferranti, and the British General Electric Company in Great Britain; Siemens and AEG in Germany; Philips in Holland; and so on. All of the "biggies" had shamefully abandoned computers by 1970. The field was filled with businesses that either didn't exist at all in 1949 or had been small and marginal: IBM, of course, and the "Seven Dwarfs," the seven smaller computer firms in the United States; ICL, the relic of the computer divisions of the General Electric Company, Plessey, and Ferranti in Great Britain; some shards supported by significant government subsidies in France; and a complete newcomer, Nixdorf, in Germany. By government assistance, Japanese businesses were kept afloat for a very long period.

The development of micro-chips in the late 1970s created a second "window," which resulted in the development of word processors, minicomputers, personal computers, and the merger of switchboards for computers and telephones. Yet, the businesses who had lost in the first round

did not try again in the second. Even those who made it through the first round chose to skip the second one or entered it grudgingly and late. In the field of minicomputers and personal computers, neither Univac nor Control Data, Honeywell nor Burroughs, Fujitsu nor Hitachi assumed primacy.

IBM, the uncontested winner of the first round, stood out as the lone exception. Also, past knowledge-based inventions followed a similar trajectory. Any knowledge-based innovator has a considerably lower probability of surviving since the "window" is much more crowded. There will probably be a lot more applicants during the "window" time. But, after the industries had stabilized and grown, their organizational structure seems to have been relatively constant for at least a century. Of course, the structure of different businesses varies greatly based on factors like technology, startup costs, and simplicity of entrance, as well as factors like whether a product can be exported internationally or is only available locally. Yet at any given moment, every sector has a similar structure: in every market, there are an equal number of large, medium-sized, and small businesses, as well as an equal number of experts[10].

There is only one "market" for each emerging knowledge-based sector, whether it computers or contemporary banking: the global market. So, the number of knowledge-based innovators who will endure as a sector develops and stabilizes will not increase from its historical level. Yet, the number of participants throughout the "window" era has significantly expanded, partly due to the creation of a worldwide market and of global communications. Hence, the casualty rate is substantially greater than it was when the shakeout occurs. And it is inevitable that there will be a shakeout.

As soon as the "window" closes, the "shakeout" begins. Moreover, the majority of businesses founded during the "window" era fail during the shakeout, as seen by the high-tech companies of the past including railways, manufacturers of electrical equipment, and the car industry. Just five or six years after the "window" opened, the shakeout among the microprocessor, minicomputer, and personal computer industries has started as these words are being written. Over 100 businesses operate in this sector in the United States alone now. There won't likely be more than a dozen of any size or importance surviving in 1995, ten years from now.

Yet, it is uncertain which ones will live, which ones will pass away, and which ones will suffer chronic crippling, rendering them incapable of either living or passing away. In actuality, speculating is pointless. Simple size could guarantee survival. Yet, it does not ensure victory in the shakeout, since DuPont would not be the largest and most prosperous chemical business in the world today if Allied Chemical had prevailed. Allied Chemical seemed unstoppable in 1920 when the "window" for the American chemical industry opened, even if only because it had acquired the German chemical patents that the US government had taken during World War I. With the shakeout seven years later, Allied Chemical had devolved into a meagre also-ran. It has never been able to pick up speed again.

Nobody in 1949 could have foreseen the rise of IBM as the dominant computer company, much less the utter failure of such powerful, seasoned leaders as G.E. or Siemens. When automotive stocks were the New York Stock Exchange's favourites in 1910 and 1914, no one could have

imagined that General Motors and Ford would live to see another day and that beloved brands like Packard or Hupmobile would cease to exist. Nobody could have expected that Deutsche Bank would acquire dozens of the old commercial banks in Germany and take over as the nation's top bank during the 1870s and 1880s, the era in which the modern banks were created[11].

It's not difficult to forecast that a given sector will grow to be significant. There is no known instance where an industry that had reached the "window" or explosive phase, as I referred to it, failed to develop into a significant industry. Which certain units within this business will serve as its leaders and hence endure?

This pattern a time of intense exhilaration, coupled with intense speculative ferment, followed by a harsh "shakeout" is especially noticeable in the high-tech sectors. First of all, since these fields are in the spotlight, they get far more attention and funding than fields that are more routine. Also, there are far higher expectations. More individuals than have gotten wealthy via high-tech enterprises have likely built more conventional businesses, including shoe polish or wristwatch firms. Nonetheless, nobody considers shoe polish manufacturers a failure if all they manage to achieve is establish a reliable but little family business. In contrast, high tech is a "high-low game" where a medium hand is unimportant.

High tech, however, also takes a very long period to become lucrative. In 1947–1948, the global computer industry had its start. The industry as a whole didn't achieve break-even until the early 1980s, more than thirty years later. Undoubtedly, a small number of businessespractically all of which were American—started to turn a profit considerably sooner. Moreover, the market leader IBM started to generate a lot of money much early. The horrifying losses suffered by the rest of the industry, such as those incurred by the major worldwide electrical corporations in their futile bids to become computer manufacturers, more than outweighed the profits made by those few successful computer producers. The same phenomenon occurred in every previous "high-tech" boom as well, including the railroad booms in the early nineteenth century, the electrical device and automotive booms between 1880 and 1914, the radio and electric appliance booms in the 1920s, and so on[12].

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CHAPTER 10

INNOVATING WITH PURPOSE: AN EXAMINATION OF THE PRINCIPLES UNDERLYING SUCCESSFUL INNOVATION STRATEGIES

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Every seasoned doctor has seen "miracle cures." People with terminal diseases often experience a surprising recovery; this may happen spontaneously, after seeking the help of religious healers, changing their diets, or by resting during the day and being active all night. Only a bigot would disregard and deny the existence of such therapies the term "unscientific." They're sufficiently genuine. But, no doctor will include miraculous treatments in a textbook or a course intended to be taught to medical students. They cannot be learnt, they cannot be taught, and they cannot be duplicated. They are also quite uncommon; after all, the vast majority of terminal patients actually pass away.

There are other innovations that do not originate from the sources mentioned in the chapters above, inventions that are not created in an organised, deliberate, or systematic way. Some inventors are "kissed by the Muses," and their ideas come about as a result of a "flash of inspiration" rather than via arduous, methodical labour. These improvements, however, cannot be duplicated. They cannot be learnt, nor can they be taught. It is not yet known how to train someone to be a genius. In addition, "flashes of brilliance" are very unusual, in contrast to what the romanticism of creation and creativity would have you believe. Even worse, I am not aware of a single instance of a "flash of inspiration" that resulted in an invention. Those were all still quite clever concepts[1].

Leonardo da Vinci was perhaps the most creative mind to ever live. Every page of his notes is filled with breath-taking ideas, whether they are for a submarine, a chopper, or an automated forge. Nevertheless, none of these could have been made into an invention with the tools and materials available in 1500. In fact, none of them would do it. The society and economy at the time were open to the practise of innovation. Every schoolchild is aware that James Watt was not the "creator" of the steam engine. Technology historians are aware that Thomas Newcomen created the first steam engine in 1712 that was really put to service by pumping water out of an English coal mine. Both guys were structured, methodical, and deliberate inventors.

A process need-based invention, Watt's steam engine in particular is the perfect example of how newly accessible information (how to ream a smooth cylinder) and the design of a "missing link" the condenser were coupled. The receptivity for this innovation had been generated by Newcomen's engine several thousand were by then in use. Yet, neither Watt nor Newcomen can really claim to be the "creator" of the combustion engine, or of what we now refer to as modern technology. Robert Boyle, a renowned Anglo-Irish scientist, accomplished this in a "stroke of brilliance." Only Boyle's engine was unable to function and never could. Boyle drove the piston with an explosion of gunfire, but this clogged the cylinder so badly that it needed to be

disassembled and cleaned after each stroke. Boyle's concept made it possible for Denis Papin, who had helped Boyle construct the gunpowder engine, then Newcomen, and eventually Watt, to create a functional combustion engine. Boyle, the genius, just had one great idea. Instead of the history of technology or innovation, it belongs in the history of ideas.

Everything that can be articulated and presented as the practise of innovation is the deliberate invention produced by analysis, system, and hard labour. But, this is all that needs to be discussed since it undoubtedly includes at least 90% of all useful advances. And just as in every other field, the remarkable performer in innovation will only be successful if they are well rooted in and adept at their specialty. What then are the guiding principles of innovation, which serve as the discipline's rigid foundation? There are several "dos" actions that must be taken. There are also a few "don'ts"actions that need to be avoided.

At certain points in time, the principles of innovation will be more or less significant. For example, innovators in basic industrial processes, such as those searching for the "missing link" in a process like papermaking where there is a visible discrepancy between economic realities, may not give much thought to demographics. By the same token, fresh information may not be particularly useful to someone developing a new social tool to fill a demand brought on by shifting demographics. Yet, it is important to methodically assess and research all sources of inventive potential. Being made aware of them is insufficient. A methodical, coordinated search must be conducted on a regular basis[2].

Both mental and perceptual aspects of innovation. So, going outside to look, ask, and listen becomes the second innovation requirement. This must be emphasized often. Innovative people that are successful employ both sides of their minds. Both numbers and persons are examined. They determine analytically what the innovation must be to take advantage of a situation. Next they go out and observe the clients, the users, to ascertain what their requirements, values, and expectations are.

Values and receptivity may both be sensed. One can tell that a certain strategy won't work given the individuals who must utilize it or their expectations or habits. The question that follows is, "What must this invention represent in order for those who must use it to want to utilize it and find their potential in it?" Otherwise, one runs the risk of implementing the right innovation in the wrong way, as was the case with the leading provider of computer learning programmed for American schools, whose excellent and effective programmed were not used by teachers who were petrified of computers and saw the device as a threat rather than a tool.

For an idea to be successful, it must be clear and concise. It should only do one task; otherwise, it causes confusion. That won't work if it isn't straightforward. Every new object has problems, and if it's intricate, it can't be rectified or corrected. Amazingly basic inventions are the only ones that work. The best compliment an idea can get is when someone says, "This is obvious. Why didn't I consider it before?

Even innovations that generate additional markets and applications should be focused on a single, well-defined usage. It should be focused on a particular need that it meets and a particular outcome that it achieves. Successful inventions begin modestly. They lack ostentation. They

endeavour to carry out a single task. It could be to allow a moving vehicle to draw electricity while travelling over railways, thanks to the invention that made this possible streetcar that runs on electricity. Or it might be something as simple as placing the same number of matches in each matchbox (there used to be fifty), which allowed for the automated filling of matchboxes and granted the Swedish inventors of the concept a global monopoly on matches for over fifty years.

Innovations must be able to start small, needing initially minimal funding, few resources, and a narrow market. Without sufficient time, it would be impossible to make the necessary modifications and alterations to ensure the success of an idea. Innovations seldom go beyond being "nearly correct" at first. Only when the size is small and the resources needed, both in terms of people and money, can the essential improvements be accomplished[3].

A successful invention, however and this is the last "do" strives for leadership. It doesn't necessarily want to grow into a "large company"; in reality, no one can predict whether a certain invention will turn out to be a huge business or a little one. But, if an invention does not start off with a focus on leadership, it is unlikely to be sufficiently inventive and, as a result, unlikely to be able to establish itself. There are many different types of strategies (to be covered in Chapters 16 through 19), from those that seek market or industry domination to those that seek to identify and occupy a tiny "ecological niche" in a process or market. But, all entrepreneurial strategies, or strategies meant to capitalize on innovations, must become leaders in their respective environments. Otherwise, they will just give the opposition a chance to compete.

The first is just to avoid attempting to be smart. Innovations must be managed by regular people, and if they are to grow and become significant at all, by idiots or near-idiots. After all, the one thing that is consistently available in large quantities is incompetence. Anything too clever in execution or design is nearly certain to fall short. Avoid diversifying, splitting off, or attempting to accomplish too many things at once. Naturally, this is the logical extension of the "do": pay attentionthat diverge from a core have a tendency to disperse. They do not develop into inventions; they stay ideas.

Technology or knowledge do not have to be the core. In reality, market knowledge offers a stronger foundation of cohesion in any organization, whether it be a for-profit company or a government entity. Innovative endeavors must, however, be unified at their heart or they risk disintegrating. A coordinated, focused effort is required to support an idea. It also needs that those who implement it understand one another, which again calls for unity and a shared foundation. This is also at danger as a result of variety and fragmentation.

Lastly, avoid attempting to invent for the future. Invent in the here and now! An invention could have long-term effects; it might take 20 years for it to fully mature. As we've seen, it took until the early 1970s 25 years after the first functional models were released—for the computer to start having a significant influence on how business was conducted. Yet, the computer had several specialized modern uses from the start, such as payroll processing, scientific computation, and flight simulators for training pilots[4].

The statement "In 25 years there will be so many really elderly individuals that they will require this" is insufficient. There must be enough elderly individuals in existence for this to matter to

them, one must be able to assert. Of course, time marches on, and there will be many more in twenty-five years. But, if there isn't a direct application in the here and now, an invention is only a "great concept," similar to the sketches in Leonardo da Vinci's notebook. Few of us may hope that our notebooks alone will ensure immortality since very few of us possess Leonardo's brilliance.

Edison was perhaps the first inventor to completely grasp this third caution. About 1860 or 1865, every other electrical inventor of the day started working on what would ultimately become the light bulb. Up until that moment, development on the light bulb was considered to be "of the future," therefore Edison had to wait 10 years for the information to become accessible. Yet, when the information was made available or, to put it another way, when a light bulb might become "the present," Edison assembled his enormous resources and an exceptionally talented team and focused for a few years on that one unique possibility.

Lead periods for innovative prospects might be lengthy. Ten years of research and development activity are by no means unusual or unusually extensive in the field of pharmaceutical research. But there is no business would never consider initiating a research study for something that, even if it is effective, would not immediately translate into a medicine to address existing healthcare needs. It need expertise. It typically calls for a lot of creativity. Clearly, some individuals possess more inventive skill than the rest of us. Moreover, inventors seldom ever work in many fields. Despite his incredible talent for innovation, Edison solely worked in the electrical industry. Moreover, Citibank in New York, a financial pioneer, is unlikely to pursue breakthroughs in retail or healthcare. Like any other kind of labor, creativity requires ability, inventiveness, and a certain mindset. Yet when all is said and done, creativity turns into difficult, meaningful labor that places very high demands on assiduity, perseverance, and devotion. No amount of ability, creativity, or expertise can help if they are absent[5].

Innovators must capitalize on their advantages to prosper. Successful innovators consider a variety of options. Which of these chances, however, best suits me, my organization, and puts to use what we (or I) are strong at and have shown capability for in performance? Innovation is, of course, no different from other activities in this regard. Yet, because of the risks associated with innovation and the premium placed on knowledge and performance capability as a consequence, it could be even more crucial to capitalize on one's capabilities in this area. And just like any other endeavor, creativity requires a "fit" in terms of temperament.

Companies struggle in areas they do not really respect. No pharmaceutical firm, which must be managed by someone with a scientific mindset and a sense of seriousness, has succeeded in something as "frivolous" as lipstick or perfume. The temperament of innovators must also be adapted to the possibility for innovation. They must value it and think it makes sense. If so, they won't be willing to put in the constant, difficult, and tedious labour that effective innovation inevitably demands.

Finally, innovation has an impact on the economy and society, changing how people behave in general, including consumers, teachers, farmers, and eye doctors. Or maybe a procedure has changed that fundamentals of innovation are found in the processes through which humans

create things. Hence, innovation must constantly be connected to the market, market-focused, and even market-driven. A university conference on entrepreneurship a year or two ago when many psychologists talked. They all discussed a "entrepreneurial personality," which was defined by a "propensity for risk-taking," despite the fact that their papers contradicted on every other point.

Then, a well-known and accomplished inventor and entrepreneur was requested to remark on how he turned a process-based breakthrough into a sizable global company in under 25 years. I'm perplexed by your documents, he remarked. I believe I know more successful inventors and business owners than anybody, starting with myself. I have never encountered a "personality with an entrepreneurial streak." Yet the successful people I know all have one thing in common and just one thing they're not "risk-takers."

They make an effort to specify the risks they must assume and to reduce them as much as they can. Without it, none of us would have been successful. As for me, if I had wanted to take risks, I would have entered the real estate or commodities trading industries, or I would have followed my mother's advice and become a professional painter. This matches my own experience. I also know a lot of successful inventors and business owners. They don't have any "propensity for risk-taking," at all[6].

The typical image of innovators resembles a mix between Superman and the Knights of the Round Table and is influenced by both pop psychology and Hollywood. However, the majority of them are not romantic characters in real life and are far more likely to spend hours on a cash-flow estimate than to frantically search for "risks." But so is getting in your vehicle and heading to the store to buy a loaf of bread. By definition, any economic action is "high-risk." Therefore, maintaining the status quo i.e., not innovating is considerably riskier than creating the future. The innovators I know succeed to the degree that they categories and limit risks. They are effective to the degree that they identify and identify and utilize sources of inventive possibility via methodical analysis.

The necessity to continually invest more money in research, technological advancement, and technical services in order to remain competitive is one of the main causes of this. High tech does certainly need to move at an ever-increasing speed to remain still. Of course, this contributes to its allure. Nevertheless, it also implies that very few companies in the sector will have the financial wherewithal to weather even a brief storm when the shakeout occurs. Because of this, high-tech enterprises need financial foresight even more than other new initiatives do. Nevertheless, high-tech new ventures are even less likely to possess financial foresight than new ventures in general.

Entrepreneurial management is the only method for surviving the shakeout. Georg Siemens carefully planned and assembled the first senior management team in history, setting Deutsche Bank apart from other "hot" financial organizations of the day. The fact that DuPont developed the world's first systematic organizational structure, long-term planning, and management information and control system in the early 1920s set it apart from Allied Chemical. In contrast, Allied Chemical was governed arbitrarily by a brilliant egomaniac. But, this is not the whole tale.

Several of the huge corporations that didn't make it through the more recent computer shakeout, like Siemens and GE, are regarded as having excellent management. Yet despite being horrendously handled throughout the shakeout years, the Ford Motor Company managed to survive, if barely[7].

So, entrepreneurial management is undoubtedly a need for survival, while it is not a guarantee. Moreover, only insiders (and maybe not even they) can really determine if a knowledge-based innovator that has expanded quickly for a few boom years is competently managed, as DuPont was, or essentially mismanaged, as Allied Chemical was, at the time of the shakeout. It could already be too late by the time we find out. Knowledge-based innovations must be "ripe" and well-received in order to succeed. Because of its special ability, knowledge-based innovation carries an inherent risk. Innovations take use of a shift that has already taken place. They fulfil a pre-existing demand. Yet with knowledge-based innovation, the transformation is initiated by the invention. It seeks to arouse desire. Also, no one is able to predict in advance whether a user would be open, uninterested, or aggressively resistive.

There are, of course, exceptions. Someone who discovers a cancer cure should not be concerned about "receptivity." Most knowledge-based breakthroughs are risky when it comes to reception. Also, the probabilities are unknown and very strange. No one seems to be aware of the potential for tremendous receptivity.

Yet when everyone is certain that society is truly eagerly anticipating the innovation, there may be little receptivity or even strong rejection. There are many tales of the high and might's obtuseness in the face of a knowledge-based breakthrough. The story about the Prussian monarch who predicted that the railroad would fail because "no one would pay good money to go from Berlin to Potsdam in one hour when he may ride his horse in one day for free" is typical. Yet, the King of Prussia was not the only one who misjudged the public's interest in the railroad; most of the "experts" of the day shared his viewpoint[8].

Yet before the computer came along, not a single "expert" could have predicted that companies would ever need such a device. Yet, the reverse mistake is as often made. While in actuality there is complete indifference or opposition, "everyone knows" that there is a legitimate need or desire. The same authority who, in 1948, could not have imagined that a corporation would ever desire a computer, projected that the computer would "revolutionize the schools" within a decade. This was about 1955. The telephone was invented by Philip Reis, according to the Germans, not Alexander Graham Bell. In fact, Reis created a device in 1861 that was almost capable of transmitting voice and could communicate music. But eventually, completely disillusioned, he quit up. A telephone was not welcomed, there was no enthusiasm for it, and there was no desire for it.

The general opinion was that we can get by with the telegraph. But, when Bell eventually secured a patent for his telephone fifteen years later, there was an instantaneous uproar. Germany was the country where it was at its highest. It's not too difficult to illustrate how receptivity changed over the course of these fifteen years. The American Civil War and the Franco127 war are two important conflicts. The telegraph had clearly not been "good enough" as the Prussian

War had shown. The actual issue, however, is not why receptivity changed. The reason for this is because in 1861, every authority fervently promised astonishment when Reis showed off his apparatus at a scientific conference [9].

Of course, the authorities might also be wrong; in fact, they often are. For example, in 1876–1877, everyone was aware that there was a market for both a light bulb and a telephone, and they were correct. Similar to how Edison relied on the advice of his time's experts when he set out to create the phonograph in the 1880s; once again, the experts were correct in predicting that the new innovation would be well received. Nevertheless, only retrospect can tell us if the experts' assessments of the receptivity for one knowledge-based innovation or another are accurate or inaccurate. Even in retrospect, we may not always understand why a specific knowledge-based innovation finds reception or not. Nobody can explain why phonetic spelling has been so fiercely fought, for example. All agree that no phonetic spelling is a significant barrier to learning to read and write, requires schools to spend an excessive amount of time on the reading skill, and causes an unacceptably high number of reading problems and emotional traumas in children. The study of phonetics dates back at least a century. In the two languages where the issue is most severe, there are ways to create phonetic spelling: any number of phonetic alphabets for English, and the much older, forty-eight-syllable Kana scripts in Japanese.

There are neighboring instances of successful transitions to a phonetic script for both nations. The successful German spelling reform in the middle of the nineteenth century serves as a model for the English, while the similarly successful and much earlier phonetic reform of the Korean script serves as a model for the Japanese. But, neither nation has even the smallest interest in adopting an invention that, in one's opinion, is desperately required, utterly reasonable, and demonstrably secure, manageable, and effective. Why? There are several explanations, but nobody is sure[10].

The risk component cannot be eliminated and cannot even be reduced. Market research is useless since it can't be conducted on nonexistent objects. Opinion research is likely not just ineffective, but also harmful. At least, that's what the "expert opinion" experience on the openness to knowledge-based innovation would suggest. Yet there is no other option. We must take a chance on openness to knowledge-based innovation if we want it. Innovations based on cutting-edge scientific and technological knowledge carry the greatest dangers. They are obviously very high in "hot" technological fields like biotechnology or, at the moment, personal computers. Areas that are hidden from view, however, have far lower hazards, if only because there is more time. The dangers are much smaller in breakthroughs, like social innovations, where the knowledge basis is not science or technology[11].

Yet knowledge-based innovation carries considerable risk by nature. It is the cost we must bear in exchange for its influence and, more importantly, for its power to alter not just the goods and services we use but also how we see the world, our role in it, and ultimately how we perceive ourselves. Incorporating new information as the source of innovation with one of the other sources outlined earlier the unexpected, incongruities, and particularly process need—can significantly lower the risks associated with even high-tech innovation. Receptivity in these regions has either previously been demonstrated or is simply and accurately testable. Moreover,

the knowledge or knowledge's needed to achieve an invention can often be described with great accuracy in these fields as well. This explains why "programmed research" is growing in acceptance. But, even programmed research demands a lot of organization and self-control, and it must be planned and directed. Hence, knowledge-based innovators are subject to extremely high expectations. They vary from those in other fields of innovation as well. They also run distinct dangers; for instance, time is not on their side. But, if the dangers are higher, the possible profits are also higher. The other inventors may become very wealthy[12].

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CHAPTER 11

ENTREPRENEURIAL MANAGEMENT: BALANCING RISK AND REWARD IN THE PURSUIT OF BUSINESS GROWTH

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The fundamentals of entrepreneurship are the same whether the entrepreneur is a huge, established organization or a lone person launching a new business. Whether the entrepreneur is a for-profit or nonprofit public service organization, or even a governmental or non-governmental institution, makes little to no difference. The guidelines are essentially the same, the types of innovation and the places to seek for them are essentially the same for things that work and those that don't. There is a discipline we may name entrepreneurial management in each situation.

But, compared to a lone entrepreneur, an established firm has distinct challenges and is required to acquire new knowledge. To put it too simply, the current company understands how to manage but has to learn how to innovate and be an entrepreneur. The non-business public-service institution also has its own unique set of challenges, educational requirements, and risk factors. And the new business must learn how to create, how to be an entrepreneur, and most importantly, how to manage[1].

A special guide to the practice of entrepreneurship must be created for each of these three: the current firm, the public-service institution, and the new enterprise. What is required of each? What should each keep an eye out for? The conversation may logically begin with the new business, just as the study of medicine could reasonably begin with the foetus and newborn child. Nonetheless, the medical student begins with learning about the adult's anatomy and pathology.

Without developing entrepreneurial skills, today's firms, particularly the major ones, would simply not survive in this era of fast change and innovation. The previous great entrepreneurial era in economic history, the fifty or sixty years that came to an end with the onset of World War I, is completely different from the late twentieth century in this regard. There weren't many large companies operating back then, and even fewer middle-sized ones. Nowadays, many huge organizations have a social obligation as well as a self-interest in learning how to manage themselves for entrepreneurship[2].

In stark contrast to the situation a century ago, innovation's quick destruction of the existing businesses especially the large ones or the innovator's "creative destruction," to use Joseph Schumpeter's famous phrase, poses a real threat to employment, financial stability, social order, and governmental responsibility. Current companies will have to evolve, and change dramatically. Every industrially developed non-Communist country will experience a manufacturing labor force that is one-third of what it is today within twenty-five years; however, manufacturing output should increase three to four times as quickly a development that will

parallel the development of agriculture in the twenty-five years following World War II. Existing firms will need to learn how to survive, and even how to prosper, in order to provide stability and leadership through a change of this size. And they can only do it if they develop their entrepreneurial skills.

The entrepreneurship required often can only come from already established enterprises. It's possible that some of today's titans won't be there in 25 years. But, we now understand that the medium-sized organization is uniquely suited to be a successful innovator and entrepreneur, given that it sets itself up for entrepreneurial management. The strongest potential for entrepreneurial leadership is seen in established businesses, particularly those that are fair size as opposed to tiny. It has the required resources, particularly in terms of human resources. It already has a management team in place and has managerial expertise. It has both the chance and the duty to run an entrepreneurial venture effectively.

The same is true for government-owned and tax-financed public institutions, particularly those performing nonpolitical duties; for hospitals, schools, and universities; for the public services provided by local governments; for community organizations and volunteer groups like the Red Cross, Boy Scouts of America, and Girl Scouts; for churches and church-related organizations; but also for professional and trade associations. A time of fast change renders a good number of the old issues outdated, or at the very least renders ineffective a significant number of the approaches used to address them. In addition, a moment like this offers chances for experimentation, social innovation, and taking on new challenges[3].

Above all, there has been a significant shift in popular image and sentiment (cf. Chapter 8). The "panic" of 1873 ended the laissez-faire era that had started with Adam Smith's Wealth of Nations in 1776 a century previously. Being "modern," "progressive," or "forward-seeing" means turning to the government as the instrument of social change and improvement for a century starting in 1873. For better or worse, that time has passed in all developed non-Communist nations (and possibly in the advanced Communist nations as well).

The nature of the next "progressivism" wave is unknown. We do, however, know that anybody still espousing the "liberal" or "progressive" theology of 1930 or even of 1960, during the Kennedy and Johnson years is a "reactionary," not a progressive. We are unsure about the success or scope of privatization, which is the process of shifting operations back from government control to nongovernmental management (albeit not necessarily management by a corporate firm, as most people have understood the phrase to mean). We do, however, know that no non-Communist developed nation would continue along the path of nationalization and centralized government rule in the hopes, anticipation, or conviction of the old promises. It will only act in this way out of irritation and a feeling of failure. And in this circumstance, public-service organizations have both the chance and the duty to innovate and be entrepreneurial[4].

The practice of entrepreneurship involves making many errors. So, entrepreneurship in the public-service institution requires its own discussion. The new business venture is the last one. As it has been during all significant entrepreneurial eras and is once again now in the emerging entrepreneurial economy of the United States, this will continue to be a key vehicle for

innovation. In fact, there are plenty of new businesses and aspiring entrepreneurs in the United States. Yet, the majority of them, particularly the high-tech ones, have a lot of entrepreneurial management to learn and will need to master it if they are to survive.

In all three areas, there is a significant performance difference between the leaders in entrepreneurship and innovation and the ordinary practitioner. Thankfully, there are enough real-world instances of entrepreneurial success that it is feasible to explain entrepreneurial management in a methodical way that is both practice and theory, both description and prescription little builder decided to have a peek around. He discovered that the young American couple's preferences for their first home had changed. This is no longer the family's permanent residence, as it had been for their grandparents, a place where the couple hopes to spend the rest of their lives or a very long time together. Young couples were buying not one, but two distinct "values" when they bought their first house in the 1970s. They purchased housing for a brief period of time as well as the right to purchase their "actual" home a larger, opulent mansion in a better area with superior schools a few years later.

They would, however, need the equity they had accrued in the first property in order to make the down payment on this far more costly permanent residence. Even though it was all they could afford, the young people were fully aware that the "basic home" was not what they or their peers actually desired. They worried that they would not be able to sale the "basic home" for a fair price, which was a very reasonable concern. The "basic home" would therefore become a significant obstacle to the satisfaction of their genuine housing requirements and wishes rather than an opportunity to purchase the "real house" in the future[5]. The young couple of 1950 had nevertheless considered themselves as "workingclass," by and large. Also, "working-class" individuals in the West do not anticipate major increases in their wages or in their style of life after finishing their apprenticeships and transitioning to full-time employment.

For those in the working class, seniority does not always translate into higher wages (Japan being the main exception). Yet, the "middle class" has historically been able to anticipate consistent income growth until the family head reaches the age of forty-five or forty-eight. Young American adults' reality and self-perception their education, aspirations, and employment had shifted from "working class" to "middle class" between 1950 and 1975. And along with that transition, the young people's first home's significance and "worth" had undergone a significant shift.

Successful innovation was simple to come up with after this was realized all it required was a few weekends spent listening to potential homebuyers. Practically no changes were made to the actual structure of the building; the kitchen was the lone exception. Other than that, the structure was still the "basic house" that the homebuilders had been unable to sell. Nevertheless, it was presented as "your first home" and a "building block towards the house you desire" rather than being given as "your house." This indicated that the young couple was 48 years old.

The "basic house" was shown in The Unexpected beside a model of the same home that had prospective extensions like an extra bathroom, one or two more bedrooms, and a basement

"family area" constructed. The "basic house" had previously been converted to a "permanent residence" thanks to the builder's prior acquisition of the required local permissions[6].

In addition, the builder promised the young couple a certain selling price for their first home, which would be used towards the purchase of a second, larger "permanent" home from his company within five to seven years. "There was almost no danger involved," he said. After all, the demographics were such that they would ensure a constant rise in the demand for "first homes" until the late 1980s or 1990s, when the children of the "baby bust" of 1961 would have reached the age of 25 and will begin starting their own families.

Until this house builder turned failure into innovation, he had only worked in one major city and made a little impact there. Five years later, the company was operating in seven major cities and was either the top-ranked business or a close second in each of them. This creative homebuilder kept expanding even during the catastrophic construction slump of 1981–1982, which resulted in some of the biggest American builders not selling a single new home for an entire season. One reason, according to the company's creator, was something even I had not anticipated when I chose to provide first-time homeowners with a buyback guarantee. It provided us with a consistent supply of well-constructed, still-relatively-new homes that only required minor repairs before being resold at a significant profit to the next generation of first-time homebuyers.

Executives, particularly those in big firms, have a tendency to want extra research and analysis when faced with an unexpected failure. Yet as both the "simple home" and the "padlock" stories demonstrate, this is the incorrect answer. You must walk outside, take a look, and pay attention since the failure was unexpected. Failure must always be seen as a sign of an innovative opportunity and treated accordingly[7]. Both among consumers and in the operations of a supplier, it is crucial to keep an eye out for unforeseen events. For instance, Ray Kroc, the company's creator, was interested in the unexpected success of one of his clients, and this led to the creation of McDonald's. At the time, Kroc sold milkshake equipment to fast food restaurants. He saw that one of his clients, a modest hamburger restaurant in a far-off California hamlet, purchased several times as many milkshake machines as its location required.

The use of innovation and scale could be justified. He looked into it and discovered an elderly guy who had, in a sense, systematized the fast food industry. Based on the unexpected success of the first owner, Kroc purchased his company and turned it into a billion-dollar enterprise. In either scenario, the occurrence is taken seriously as a potential sign of a creative opportunity. You don't simply "analyses" things. One leaves to look into it. Innovation is planned, methodical, and logical effort, and this is the book's major argument. Yet it is both intellectual and perceptual. To be sure, the innovator's observations and lessons must be put through a thorough logical examination. If "intuition" is defined as "what I feel," then it is not good enough and is even useless. As it often means "what I like it to be" as opposed to "what I believe it to be," The analysis must be based on a perception of change, opportunity, new realities, and the discrepancy between what most people still firmly believe to be the reality and what has actually changed into a new reality. This analysis must be rigorous and include requirements for testing, piloting, and evaluating. To achieve this, one must be prepared to admit: "I don't know enough to evaluate, but I'll find out.

The unexpected is such a rich source of creativity precisely because it shakes us out of our preconceived conceptions, assumptions, and certainties. The entrepreneur need not even comprehend the reasons why reality has altered. It was simple to determine what had occurred and why in the two aforementioned circumstances. The majority of the time, we learn what is occurring without any understanding of why. We can still innovate effectively, however[8]. American folklore has made reference to the 1957 Edsel failure by the Ford Motor Company. Even many who had not yet been born when the Edsel collapsed, at least in the United States, were aware of it. Therefore, it is completely false to think that the Edsel was a hasty bet. Very few items have ever been presented, advertised, or created with more attention. The Edsel was meant to be the culmination of the most meticulously planned economic strategy in American history: a ten-year effort in which the Ford Motor Company transformed itself after World War II from on the verge of bankruptcy.

The Unexpected developed into a fierce rival, a potent number two in the United States, and a strong challenger for the top slot in the quickly expanding European market a few years later. In three of the four major American automotive markets the "standard" one with the Ford label, the "lower-middle" one with Mercury, and the "higher" one with the Continental Ford had already effectively restored itself as a fierce rival by 1957.

The only market category left was the upper-middle market, where General Motors, a major competitor of Ford, developed the Buick and the Oldsmobile. In the years after World War II, this "upper-middle" category of the automotive industry had the quickest growth, but Chrysler, the third vehicle manufacturer, lacked a significant entrance in this market, leaving Ford with an open door. Ford went to great efforts to conceptualize and create the Edsel, including the greatest data from market research, the best data on consumer preferences for look and style, and the strictest quality control requirements[9].

The Ford team felt there was something going on that did not fit with the basic assumptions everyone in the automotive industry had been making about customer behavior—and for so long that they had become unquestionable axioms. Since Alfred P. Sloan classified the socioeconomic segmentation of the American market into "low," "lowermiddle," "upper-middle," and "upper" segments in the 1920s and used that knowledge to found the General Motors Company, Ford's decision to venture out and conduct research led to the only real innovation in the American automobile industry. As the Ford employees left, they found that this segmentation was quickly being replaced by another, very different one that we would today refer to as "lifestyle segmentation," or at least it was mirrored by it.

The outcome was the debut of Ford's Thunderbird shortly after the Edsel's failure, the country's most successful automobile since Henry Ford Sr. unveiled his Model T in 1908. Instead of being GM's little brother and a steadfast imitator, the Thunderbird restored Ford's status as a significant manufacturer in its own right. It took place long before any of the events that are often used to explain it, such as the shift in the population's centre of gravity to teens as a consequence of the "baby boom," the astronomical growth of higher education, or the shift in sexual norms. Moreover, we are unsure of what is meant by "lifestyle." It has eluded all efforts at description so far. We just know that something occurred.

But, it is sufficient to transform the unexpected whether it results in success or failure into a chance for efficient and deliberate innovation. Up until now, both surprising achievements and failures inside a corporation or an industry have been highlighted. But, external events that is, occurrences that are not reflected in the data and statistics used by a management to guide its institution are as significant. Actually, they often carry greater weight. These are a few examples of common unexpected outside occurrences and how they might be used as significant catalysts for innovative achievement. As much IBM executives and engineers may have differed, it seems that until far into the 1970s there was complete unanimity inside the business on one point: the future belonged to the centralized "main-frame" computer, with an ever-increasing memory and ever-increasing computing power. Any IBM engineer could make a strong case that everything else is overpriced, overcomplicated, and has too few performance capabilities. IBM thus focused its efforts and resources on preserving its dominance in the main-frame industry.

Then, to everyone's complete amazement, children as young as ten and eleven years old started playing video games about 1975 or 1976. Their dads immediately desired a separate, compact, standalone computer for their workplace or personal use that had far less storage space than even the smallest mainframe. The IBM staff members' worst predictions came true in full. There are many more freestanding machines and their programmed than plug-in "terminals," but they are far more expensive and have much less capacity.So few of them are really compatible with one another, according to The Unexpected that the field as a whole has descended into chaos, with servicing and repairs in disarray. However the clients do not seem to be bothered by this. However, between 1979 and 1984, personal computers in the US market attained an annual sales volume of $15–16 billion, which had taken "mainframes" thirty years to accomplish.

Instead, IBM established task groups that competed with one another to build personal computers for the firm as early as 1977, when personal computer sales globally were still less than $200 million (as opposed to main-frame sales of $7 billion for the same year). As a consequence, in 1980, just as the personal computer industry was about to explode, IBM released its own model. When it came to manufacturing personal computers, three years later, in 1983, IBM had virtually the same level of market dominance as it had with mainframes. Furthermore in 1983, IBM unveiled the "Peanut," a very small "home computer"[10].

What explains that IBM, of all people, viewed this transformation as an opportunity when everyone at IBM was so utterly certain that it couldn't happen and made no sense? is the question I raise whenever I talk about all of this with the IBM staff. And I usually receive the same response: "The development came as a terrible shock to us precisely because we knew that this couldn't happen, and that it would make no sense at all. We came to the realization that everything we'd taken for granted, everything we were so confident of, was suddenly being turned on its head. We then recognized that we needed to arrange ourselves to take advantage of a development we knew couldn't happen, but which still did.

A large part of the reason why the United States has never been a nation that buys books is due to the ubiquity of free public libraries. Everyone anticipated a sharp decline in book sales when TV was introduced in the early 1950s and Americans started spending more and more time in front of the television, especially those who were in their prime reading years, or those who were

in high school and college. Book publishers hurriedly tried to expand into "high-tech media," such as computer programmed or instructive movies, but in most instances they failed miserably. Nonetheless, since the introduction of TV, book sales in the United States have increased rather than decreasing. They have expanded far more quickly than anticipated based on every metric, including household incomes and the overall population.

Nobody is aware of the cause of this. In fact, nobody is really certain of what took place. The ordinary American household still doesn't have many books. So where do all of these books end up? The fact that we don't know the answer to this issue doesn't change the reality that more and more people are purchasing and paying for books. Naturally, the publishers and already-existing bookshops were aware that book sales were surging. Yet, neither took any action. Instead, a few large shops, including department stores in Minneapolis and Los Angeles, took advantage of the unanticipated occurrence. All of these folks had no experience with books, but they were familiar with the retail industry. They created book chain stores that are quite different from any American bookstores from the past. They are essentially supermarkets.

They treat books less like literature and more like "mass merchandising," focusing on the goods that move quickly and bring in the most money per square foot of shelf space. They are situated in high-traffic, high-rent retail complexes, despite the fact that everyone in the book industry has long recognized that a bookstore must be situated in a low-rent area, ideally next to a university. Booksellers have often been "literary types" themselves who seek for candidates who "love books." The operators of the new bookshops formerly sold cosmetics. One of their running jokes is that any salesman who wants to read anything other than the book's price tag is utterly overqualified.

These new bookshop chains have been among the most lucrative and quickly expanding sectors of American retailing for the last ten years, as well as among the fastest-growing new enterprises nationwide. Each of these situations exemplifies true ingenuity. Nevertheless, none of them exemplify diversity. IBM continued to operate in the sector. And the individuals in charge of the chain bookshops have always worked in retail, at malls, or in "boutiques." Exploiting an unplanned external occurrence successfully requires that it match the knowledge and experience of the individual company[11].

This is also true of Japan, which buys twice as many books as the United States does on a per capita basis. The Unforeseen or those who go into mass commerce without retail knowledge have all met with failure. So, the unanticipated external incident could serve as a perfect chance to put previously acquired knowledge to use in a novel way that doesn't alter the essence of the "business we are in." Instead of diversity, it can be extension. Yet, as the aforementioned instances demonstrate, it also calls for product, and often service and distribution channel, innovation.

The second thing to note about these instances is that they all involve major corporations. Naturally, a significant portion of the examples in this book as in any management book must include large corporations. Generally speaking, these are the only ones that are accessible, that can be found in public records, and that are covered in the business pages of newspapers and

magazines. Small-company instances are significantly more difficult to find and often cannot be addressed without breaching confidentiality agreements.

Yet taking use of the unanticipated external occurrence seems to be something that specifically matches the current business, and a very significant one at that. Hardly a few small businesses that I am aware of have successfully taken advantage of an unanticipated outside occurrence, and neither have any other entrepreneurship and innovation students I could speak with. That might be a coincidence. But, it's possible that the huge, established company is more likely to see the "big picture."

The major retailer in the US is used to looking at data that demonstrates where and how people spend their retail money. The huge store is also knowledgeable about sites in shopping centres and how to choose the best ones. Could a smaller business have created four task forces of top-notch designers and engineers to work on new product lines, as IBM did? Smaller high-tech businesses in a sector with fast growth often lack enough of these workers to complete their current tasks.

The inventive field that presents the huge firm with the greatest possibility and the lowest risk may very well be the unanticipated external incident. That may be the field where the huge, well-established company would be most prepared to innovate. That could be the field where knowledge counts the most and where having the capacity to quickly deploy sizable resources makes the most impact.

Nevertheless, as these stories also demonstrate, being large and well-known does not ensure that a business would recognize the unexpected occurrence and properly prepare itself to take advantage of it.

They were all too preoccupied battling IBM to use the personal computer in any of their exploits. Yet none of the traditional, well-established American book chains, like Brentano's in New York, took advantage of the new book market[12]. In other words, the chance is there. That is a significant opportunity that regularly arises. And when it does, it is quite promising, especially for large and established businesses. But, these possibilities call far more than just good fortune or instinct. They require that the business look for innovation, arrange for it, and manage it to take advantage of it.

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CHAPTER 12

THE ENTREPRENEURIAL BUSINESS: FROM START-UP TO SUCCESS - EXPLORING THE KEY DRIVERS AND CHALLENGES

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According to traditional thinking, large corporations do not innovate. This is believable enough. It is true that the modern, significant inventions did not originate from the established, massive companies of the past. The railways did not even attempt to create the car or the truck. Yet, despite Ford and General Motors' and their competitors' attempts (both firms were pioneers in aviation and aerospace), none of the major aircraft and aviation businesses of today originated from vehicle corporations.Parallel to this, when the first modern pharmaceuticals were invented forty years ago, the majority of the firms that are today's pharmaceutical industry titans were tiny or nonexistent. The electrical industry's titans all jumped into computers in the 1950s, including General Electric, Westinghouse, and RCA in the United States, Siemens and Philips on the Continent, and Toshiba in Japan[1].

None of them succeeded. IBM, a business that was hardly middle-sized and most certainly not high-tech forty years ago, now dominates the industry. But, it is a misconception, not even a half-truth that giant organization’s do not innovate and cannot. This is the widely held idea. First of all, there are several outliers, numerous big businesses that have succeeded as inventors and entrepreneurs. In the United States, 3M manufactures highly designed goods for both industrial and consumer sectors, whereas Johnson & Johnson specializes on hygiene and health care. Largest nongovernmental financial institution in the world and in America, Citibank has been a prominent pioneer in several fields of banking and finance for well over a century. One of the greatest chemical businesses in the world, Hoechst, which has been around for more than 125 years, has achieved success as an inventor.

To further complicate matters, there are many large, established companies that have excelled as entrepreneurs and innovators in certain industries while failing miserably in others. The (American) General Electric Corporation was a successful inventor in aviation engines, engineered inorganic polymers, and medical electronics but failed miserably in computers. Yet, RCA was successful in colour television but failing in computers. Certainly, things are not as straightforward as what is believed to be true.

Second, it is untrue that "bigness" prevents innovation and entrepreneurship. One often hears about the "bureaucracy" and "conservatism" of large corporations in talks about entrepreneurship. These both exist, of course, and they seriously impede not just innovation and entrepreneurship but also every other performance. Nonetheless, the evidence is clear that small businesses and public sector organizations are the least inventive and entrepreneurial of all

currently operating businesses[2].There are a lot of extremely large entrepreneurial enterprises already in existence; the list above could have easily been expanded to include 100 corporations from across the globe, and a list of creative public-service organizations would also contain a lot of huge ones. The largest medium-sized corporation, like the American firm with $500 million in revenues in the middle of the 1980s, is possibly the most entrepreneurial of them all. Therefore, any list of entrepreneurial firms would be glaringly devoid of tiny established businesses. Entrepreneurship and innovation are hindered by the operation itself, and particularly by the operation that is now successful, not by its scale. And a large or at least somewhat sized corporation will find it simpler to overcome this challenge than a tiny one. Running anything demands ongoing work and unwavering attention whether it's a manufacturing facility, a technology, a product line, or a distribution system.

This has been surmised for a while. Nevertheless, convincing evidence is now available thanks to Richard E. Cavenaugh and Donald K. Clifford, Jr.'s research of 100 medium-sized "growth" businesses, "Lessons from America's Mid-Sized Growth Firms," published in the McKinsey Quarterly (Autumn 1983). Business of the Entrepreneur. The daily crisis is the only aspect of any operation that can be relied upon. Daily crises must be resolved immediately; they cannot be put off. Also, the current operation necessitates and merits significant importance[3].

As compared to the size and performance of maturity, the fresh always seems so tiny, so weak, and so unpromising. Every genuinely novel object that seems to be large should be avoided. It has a very little chance of success. But, as was previously noted, great innovators begin small and, most importantly, simple. The statement made by so many companies, "In ten years, 90% of our sales will come from things that do not even exist now," is mostly boastful. Existing product adjustments are acceptable, as are variants and even expansions into new markets and end uses, with or without changes. Yet, the lead time for a completely fresh endeavor is often greater. In ten years, successful companies, those who are now offering the appropriate goods or services in the right markets, may expect to generate three-quarters of their income from current products and services, or from their linear offspring. In reality, if today's goods or services don't bring in a steady stream of big money, the company won't be able to make the huge investment in the future that innovation demands.

So, it requires extra work for an established firm to become creative and entrepreneurial. The "natural" response is to devote resources to the ongoing business, to the ongoing crises, and to maximizing what we currently have. The temptation in the current corporate model is to feed today's customers while starving them tomorrow. Of course, it is a fatal temptation. Without innovation, a company would gradually deteriorate and age. And the collapse will happen quickly in a time of rapid change like the one we're in right now, a time of entrepreneurship.

It is very difficult, if not impossible, to turn around a business or an industry once it has begun to look back. Yet the success of the current company really creates a significant barrier to innovation and entrepreneurship. The business's success, which makes it "healthy" rather than being de-generatively afflicted by bureaucracy, red tape, or complacency, is exactly the issue established big and fair-sized firms who are also successful entrepreneurs and inventors. These companies demonstrate that it is possible to go through the current and success-related obstacles.

And it may be dealt with in a manner that benefits both the old and the young, the developed and the developing. Johnson & Johnson, Hoechst, ASEA, 3M, and the 100 middle-sized "growth" firms are examples of major corporations that are successful inventors and entrepreneurs. They obviously know how to do it.

The idea that entrepreneurship and invention are natural, creative, or spontaneous is where common wisdom errs. If innovation and entrepreneurship do not flourish inside a company, then something must be restricting them. So, it is believed that established firms stifle innovation and entrepreneurship since only a small percentage of them are profitable and successful.

Therefore, becoming an entrepreneur is neither “natural” nor "creative." It takes effort. As a result, the proper inference to be drawn from the facts is the opposite of what is usually done. The fact that a sizable percentage of currently operating firms, including a sizable number of fair-sized, enormous, and very big ones, thrive as entrepreneurs and innovators shows that any company may be an entrepreneur or an innovator. Yet, they need to be actively pursued. It takes work, but they can be taught. Entrepreneurial companies see being an entrepreneur as a responsibility. They practice it, they work hard at it, and they are disciplined about it[4].

The first step is to open the company up to innovation and get them to see change as an opportunity rather than a danger. To carry out the hard job of the entrepreneur, it must be organized. In order to foster an entrepreneurial atmosphere, policies and behaviors are required. Second, there must be built-in learning to enhance performance as well as systematic assessment or at the very least evaluation of a company's success as an inventor and entrepreneur. Third, entrepreneurial management calls for unique approaches to organizational structure, planning and controlling, as well as paying out remuneration, providing incentives, and rewarding employees. Fourth, there are certain "don'ts": things to avoid doing while managing an entrepreneurial business. Humans were once referred to be "rerun nova rum cupids" by a Latin poet (greedy for new things).

Executives often wonder, "How can we get over the opposition to innovation in the current organization? The question would still be incorrect even if we knew the solution. The appropriate question is, "How do we get the organization on board with innovation, desire it, go for it, and work for it?" There won't be innovation if the organization views it as something that goes against the grain, as swimming against the river, if not as a heroic feat. Creativity must be inherent in the commonplace, the usual, if not the regular. This need special regulations. First, managers need to be persuaded to embrace innovation rather than cling to the status quo. The company as a whole has to make very clear that innovation is the greatest way to protect and sustain it, and that it is the basis for each manager's success and job security. Second, it's crucial to establish and outline the need of innovation as well as its scope and timeframe[5].

There is only one method to make innovation appealing to managers: a systematic programmed of getting rid of everything that is worn-out, out-of-date, and ineffective, as well as the errors, failures, and effort misdirection’s. Around every three years, the business must put every single process, technology, market, distribution channel, and internal staff activity to the ultimate test. It must inquire: Would we now enter this market, this product, this distribution method, and this

technology? One does not reply, "Let's create another study," if the response is "No." What must we do to cease squandering money on this brand, this industry, this distribution method, and this staff activity?

Yet, one at least sets a cap on future attempts and ensures that valuable human and financial resources are not still being savaged by the past. In any case, doing this is the correct thing to do to keep the organization healthy since every organism must get rid of its waste products in order to avoid poisoning itself. But, if an organization is to be capable of innovation and to be open to it, it is a fundamental prerequisite. Nothing focuses a man's attention more effectively than the knowledge that he will be hanged the next morning, as Dr. Johnson was fond of saying. Knowing that the current product or service will be discontinued in the near future has the capacity to focus a manager's thoughts on innovation. Invention requires a lot of work. It needs diligent labor on the part of skilled, high-performing individuals, the most in-demand resource in any firm. "Nothing demands more heroic efforts than to prevent a body from smelling, and yet nothing is quite so pointless," is an ancient medical proverb. The greatest employees in practically every firm I have seen are working in vain to postpone accepting the inevitable for a little while longer and at enormous expense. Yet the living will be willing no, eager to work on innovation if it is recognized across the company that the dead would be left to bury their dead[6].

A firm must be able to release its top performers for the difficulties of innovation in order to enable it to innovate. It must also have the financial means to invest in innovation. Without organizing itself to let go of previous achievements, failures, and particularly "near-misses," or things that "should have worked," it will be unable to do either. Executives will be encouraged to seek out the new, to support entrepreneurship, and to recognize the necessity to become entrepreneurs themselves if they are aware that it is corporate policy to abandon. It's a type of organizational hygiene, and it's the first step. The second stage, the second strategy required to make an existing firm "greedy for new things," is to face up to the truth that all present goods, services, markets, distributive channels, processes, technologies, have limited and generally shorthealth and life expectancies. Since the 1970s, it has been common practice to examine the life cycles of existing goods, services, and other things. Examples include the Boston Consulting Group's suggested strategy ideas and the books on strategy. Michael Porter's Entrepreneurial Business Strategy and so-called portfolio management are two examples.

The results of such analysis operate as an action plan by themselves in the tactics that have been heavily promoted over the last 10 years, particularly portfolio management. This is a misconception that would inevitably produce unsatisfactory outcomes, as many businesses who rushed into such tactics in the late 1970s and early 1980s discovered. A diagnosis should result from the results. This calls for judgment in turn. It calls for expertise in the industry, its goods, markets, clients, and technology. Experience is needed rather than just analysis. To put it bluntly, the notion that intelligent young individuals fresh out of business school and armed simply with sharp analytical tools could crunch out of their computers life-and-death judgments about companies, products, and markets is plain quackery.

This study, which I referred to as a "Business XRay" in Managing for Results, is meant to help you identify the proper questions to ask rather than to provide you with the correct answers on demand. It is a test of all the expertise and experience that may be found in a certain firm. It will and ought to arouse opposition. The action that results from designating a product as "today's breadwinner" is a choice to take a risk. And the question of what to do with a product that is about to become "yesterday's breadwinner," a "unjustified specialty," or a "investment in management ego" is also relevant.

The Business X-Ray provides the data necessary to determine how much innovation, in what areas, and how soon a specific organization needs it. Michael J. Kami, a participant in the Entrepreneurship Seminar at the New York University Graduate Management School in the 1950s, came up with the most effective and straightforward solution to this problem. Kami initially used his method at IBM, where he was the chief of business planning, and then at Xerox in the early 1960s, when he worked there for a while in a similar position[7].

All of these strategies were initially introduced in a book I wrote twenty years ago, Management for Outcomes (New York: Harper & Row, 1964), which, to my knowledge, was the first comprehensive study of business strategy. This in turn developed from the Entrepreneurship Seminar I taught at New York University in the late 1950s. The analysis offered in Managing for Results (Chapters 1–5) still serves as a valuable tool for the study of product life and product-health since it ranks all goods and services into a select group of categories based on their performance, traits, and life expectancies.

In order to assess their position on the product life cycle, entrepreneurs also consider the markets that each one serves and the distribution methods that they use. How long will this product continue to grow? How much longer will it continue to operate in the market? How quickly can we anticipate it to age and decline? When will it no longer be relevant? This helps the business to calculate where it would be if it limited itself to effectively managing what is presently in place. This therefore demonstrates the discrepancy between what may reasonably be anticipated and what a firm still has to accomplish to reach its goals, whether in sales, market position, or profitability. If the business wants to avoid failing, the gap must be bridged at a minimum. In actuality, the gap has to be bridged or the business would start to fail shortly. The entrepreneurial success must be significant enough to close the gap and fast enough to close it before the outdated is rendered obsolete.

Innovative initiatives, however, do not guarantee success; they have a high likelihood of failing and an even greater likelihood of being delayed. So, a corporation should be engaged in at least three times as many new endeavor's as would, if successful, close the gap. This is seen to be extremely high by most executives. Yet, history has shown that when it does mistake, it does so on the low side. Undoubtedly, some new endeavors will do better than anybody could have predicted, while others will perform far worse. Also, everything needs more work and takes longer than we anticipate or wish. The last point is that there will always be last-minute hiccups and delays with any significant inventive attempt. Demanding creative efforts that, if everything goes as planned, provide three times the minimal outcomes required is only a basic precaution.

Systematic abandonment, the Business X-Ray of the existing business, its products, services, markets, and technologies, as well as the identification of the innovation gap and the need for innovation, all work together to help a company create an entrepreneurial plan with deadlines and goals for innovation. A strategy like this guarantees that the innovation budget is sufficient. The most crucial outcome of all is that it establishes the number and makeup of necessary personnel. The only time we allocate individuals with demonstrated performance ability to a project, provide them with the resources, funding, and knowledge they need to do the task, and set clear and unambiguous deadlines.

The entrepreneurial company has a strategy. In the meanwhile, we have "good intentions," and everyone is aware of their benefits. These are the key principles required to give a company an entrepreneurial management style, to make the company and its management curious about novel ideas, and to make the company see innovation as a healthy, necessary, and regular course of action. This approach also ensures that the existing business will not be neglected in the search for the new and that the opportunities inherent in the existing products, services, and markets will not be sacrificed to the fascination with novelty because it is based on a "Business X-Ray," or on an analysis and diagnosis of the current business, its products, services, and markets[8].

A decision-making tool is the Business X-Ray. It allows us no, it compels us to devote resources to the current business's outcomes. Nevertheless, it also enables us to estimate the amount required to build the firm of the future, with all of its new markets, products, and services. It gives us the ability to translate our inventive intentions into innovative actions. Management must take the initiative to make its own goods and services outdated rather than waiting for a rival to do so in order to make a current firm entrepreneurial. The company has to be run in a way that views the new as an opportunity rather than a danger. Working on the processes, technology, services, and products that will change tomorrow must be controlled today.

Management techniques are also necessary for entrepreneurship in an established firm. The first and easiest of them is to centre management vision on opportunity. Humans prefer to focus on what is provided to them rather than what is not. Yet the majority of managers are confronted with "issues" rather than "opportunities," particularly in areas where performance falls short of expectations. Simply put, they aren't being offered to them. Even in tiny businesses, management often receives a report on operational performance once each month. The areas where performance has gone short of budget, where there is a "shortfall," and where there is a "problem". During the monthly management meeting, everyone starts working on the alleged issues. The debate of such issues has consumed the whole morning by the time the group breaks for lunch.

Of course, issues need to be addressed, paid attention to, and handled seriously. But, if those are the only topics brought up, chances will pass by unnoticed. So, particular care is needed to ensure that the opportunities are also taken care of in firms that seek to foster receptivity to entrepreneurship.The operational report in these firms contains two "first pages": the conventional one describes the issues, while the other one covers all the areas where performance is higher than anticipated, budgeted for, or planned for. For, as was previously

underlined, a key sign of an inventive possibility is unexpected success in one's own firm. It is quite improbable that the firm will be entrepreneurial if it is not seen as such. In reality, the company and its management are likely to ignore the unexpected achievement because they are so preoccupied with the "issues" at hand. They will respond, "Why should we take any action? It functions properly without our interference. Yet, this only opens the door for the rival who is somewhat more cautious and modest.There are consequently often two meetings on operational outcomes in organization's managed for entrepreneurship: one to concentrate on the difficulties and one to focus on the prospects. One medium-sized provider of medical supplies to hospitals and doctors, a business that has emerged as a leader in a number of recent and promising developments, has "operations meetings" on the second and last Monday of the month. The first meeting is dedicated to problems all the items that have performed below expectations during the last month or are still performing below expectations six months later[9].

This meeting is identical to every other operational meeting in every way. However, the second meeting which took place on the previous Monday discusses the areas where the business is performing better than anticipated. For example, it may talk about how sales of a particular product have increased more quickly than anticipated or how orders for a new product are coming in from markets where it was not intended to be sold. The company's senior management, which has seen ten-fold growth in the last twenty years.The monthly management meetings of the entrepreneurial business will be the focus of this opportunity. The chief executive officer has said several times that the prospects available "are not even close to as essential as the entrepreneurial mentality that the practice of hunting for chances fosters across the whole management group."

This business employs a second strategy to foster an entrepreneurial mindset across its whole management team. It has a two-day management conference every six months for the roughly forty or fifty executives in charge of the key product lines, markets, and divisions. Three or four executives whose units have excelled as entrepreneurs and innovators over the previous year will present their reports to the full group on the first morning. They must include information on factors contributing to their success: What exactly did we do that was effective? How did we discover the chance? What have we learnt, and what creative and entrepreneurial ideas do we now have? Once again, the influence on attitudes and values is more significant than what is actually recorded in these sessions. Yet, the operational managers in the organization also highlight how much they learn during each of these meetings, how many fresh ideas they get, and how they go home from these sessions with a tonne of plans and a desire to put them into practice.

Entrepreneurial businesses always seek for individuals and departments that perform better and in a unique manner. They spotlight them, pick them out, and keep asking them, "What are you doing that accounts for your success?" What do you do that the rest of us don't do, and what do you do that the rest of us do that you don't?" A third practise, which is crucial in big companies, is an informal meeting between members of the senior management team and junior staff from various departments, including research, engineering, production, marketing, accounting, and so forth. "I'm not here to give a speech or to teach you anything, I'm here to listen," the senior

declares as he begins the meeting. I'm interested in knowing your goals, but more importantly, where you see chances for your organisation and potential dangers. What suggestions do you have for us as we strive to innovate, create new goods, and create novel marketing strategies? What inquiries do you have about the business, its philosophies, its course of action, its role in the market, in technology, and in the industry?

The time burden of entrepreneurship on older citizens. So, no senior executive should be required to spend more than three lengthy afternoons or evenings a year with a group of approximately 25 or 30 juniors. But, the sessions need to be kept up consistently. They are the finest way to let juniors, and particularly professionals, look up from their own areas of expertise and view the whole organization. They are a wonderful vehicle for upward communication. They help junior staff members comprehend what matters most too senior management and why. They also provide the seniors with much-needed insight into the goals, beliefs, and issues that affect their younger coworkers. Above all, these seminars are one of the best methods to inculcate an entrepreneurial mindset throughout the whole organization[10].

One prerequisite is already present in this practice. Anybody who makes a new suggestion—or even one that involves a little adjustment in the way something is already done—should be required to report for duty. Participants should be instructed to provide the session's senior moderator and their fellow participants with a working paper that attempts to develop their proposal within a realistic time frame. What would it resemble if it were made real? What must reality seem like in order for the concept to make sense? What are the underlying presumptions relating to markets, consumers, etc.? How much labour, how much money, how many people, and how much time are required? And what outcomes may be anticipated?

Even while the yield has been consistently high in many firms, the most important outcome of all this may not be the entrepreneurial ideas that result from it. Entrepreneurial vision, openness to innovation, and "thirst for new things" across the whole firm may be the most significant accomplishment. For a firm to be open to entrepreneurship, creative performance must be one of the metrics used to monitor internal operations. Entrepreneurship won't become a reality unless we evaluate a company's success in this area. People often act in ways that are expected of them.

The entrepreneurial business measures, or at least evaluates, the performance of the firm's innovators and entrepreneurs. The first phase incorporates input from outcomes to expectations into each creative initiative. This demonstrates the excellence and dependability of both our creative ideas and initiatives. What outcomes do we anticipate from this project? Is a question that research managers have long since mastered to ask at the start of every research project? When can we anticipate such outcomes? When do we assess the project's development so that we may maintain control? They've also learnt to see whether the actual sequence of events supports their assumptions[11], [12].

This reveals to them whether they have a tendency to be overly optimistic or underlie pessimistic, whether they anticipate results too soon or are willing to wait too long, and whether they are prone to either overestimate or underestimate the impact of a research project that is successfully completed. And as a result, they are better equipped to modify their patterns and

recognize both their strong points and their areas of weakness. It goes without saying that all inventive initiatives, not only technological research and development, need such input.

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CHAPTER 13

SERVICE INNOVATION AND ENTREPRENEURSHIP: UNLOCKING THE POTENTIAL OF SERVICE INSTITUTIONS THROUGH ENTREPRENEURIAL STRATEGIES

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Government agencies, labor unions, churches, colleges, schools, hospitals, community and philanthropic groups, professional and trade organizations, and the like are examples of public-service organizationslike, need to be as imaginative and enterprising as any company. They could even need it more. They are simultaneously faced with a larger danger than ever and a greater opportunity because to the quick changes in society, technology, and the economy that are occurring today.

Nonetheless, even the most "bureaucratic" firm finds it far harder to develop than public-service organizations. The "existence" appears to be an even bigger barrier. Indeed, any organization that provides services enjoys expanding. Size is the only measure of success for a service institution in the absence of a profit test, and expansion is a goal in and of itself. Of course, there is always a ton of more work that has to be done. Yet, service institutions are similarly opposed to changing what has "always been done," or at the very least, they find it exceedingly difficult to do so[1].

The majority of advances in organization's providing public services are thrust upon them either by outsiders or by disaster. For instance, the Prussian politician Wilhelm von Humboldt, who was a complete outsider, was responsible for founding the modern university. In 1809, after the French Revolution and the Napoleonic Wars had all but destroyed the old universities of the seventeenth and eighteenth centuries, he created the University of Berlin. The contemporary American university was founded sixty years later, at a time when the nation's conventional schools and universities were failing and losing their ability to draw students.

The organization of the American Army and its strategy by a New York lawyer, Elihu Root, Teddy Roosevelt's Secretary of War, after its dishonorable performance in the Spanish-American War; the reorganization of the British Army and its strategy by Secretary of War Lord Haldane, anot; similarly, all fundamental innovations in the military in this century, whether in structure or in strategy, have followed on ignominious malfunction or crushing defeat

The American New Deal of 1933–36, which was the most inventive political movement in recent memory, was also inspired by a devastating Depression that almost tore the social fabric of the nation asunder. Opponents of bureaucracy point the finger upon "timid bureaucrats," "time-servants who have never met a paycheck," or "power-hungry politicians" for the public-service institutions' aversion to entrepreneurship and innovation. That is a very dated litany; in fact, when Machiavelli said it about 500 years ago, it was already stale. The only variable is the person who intones it. That was the catchphrase of the so-called liberals at the start of this

century, and it is now the catchphrase of the so-called neo-conservatives. However, things are not so straightforward, and "better people," [2],the reformists' go-to remedy, are an illusion. Six months after taking over the administration of a public-service organization, especially if it is a government agency, the most inventive and enterprising individuals act like the worst long-serving bureaucrat or power-hungry politician.

A public-service organization has internal, essential, and indivisible elements that prevent innovation and entrepreneurship. Internal staff services in companies, which are essentially "public-service institutions" inside corporate firms, serve as the greatest example of this. They are often led by individuals who have shown their ability to thrive in cutthroat marketplaces after leaving operations. Yet, internal staff services are not known for being innovative. They excel at expanding their empires, and they constantly want to do so. They are unwilling to give up on whatever they are undertaking. Yet once they are established, they seldom innovate.

The current enterprise is so much more of a barrier to innovation in the public-service institution than it is in the ordinary private company for three primary reasons. Rather of being compensated for its performance, the public-service organization is based on a "budget" instead. It is compensated for its efforts with money that someone else has earned, such as the taxpayer, charity organization benefactors, or the business for whom a personnel department or marketing services staff members work. The public service institution's budget will increase as more work is put into it[3].

Therefore, acquiring a greater budget is considered "success" in the public-service institution rather than producing outcomes. So, any attempt to downplay activities and efforts weakens the public-service institution. Its status and respect are damaged as a result. Failure can never be accepted. Even worse, it cannot be acknowledged when an aim has been met. A service institution relies on a wide range of constituents. One element, the customer, finally takes precedence over all the others in a firm that sells its goods on the open market. A relatively little market share is all that is required for a firm to succeed.

After that, it will be able to appease its other stakeholders, such as its shareholders, employees, community, and so on. Each constituency, no matter how little, effectively has a veto power since public-service institutions and that includes the staff operations inside a private corporation—have no "results" out of which they are paid. An organization providing public services must appease everyone; it cannot afford to alienate anybody. A "constituency" is formed the minute a service institution begins an activity, and this constituency will not allow the programmed to be terminated or even drastically changed. Yet controversy surrounds new ideas. This indicates that it lacks a constituency of its own to support it and is opposed by existing constituencies.

Public-service organizations are there to "do well," which is the most crucial factor. This indicates that they often see their objective as morally superior to economic and susceptible to a cost-benefit analysis. Economics always looks for alternative methods to distribute the same resources in order to get a greater yield. So, everything in economics is relative. A larger output is not possible under the institution of public service[4].

In fact, failing to meet goals in the pursuit of a "good" just indicates that efforts need to be increased. The powers of evil must be stronger than anticipated and must be battled much more fiercely. The "sins of the flesh" have been denounced by religious preachers of all stripes for countless years. They have had sporadic success, to put it mildly. Yet the preachers do not consider this to be an argument. They are not persuaded to apply their substantial abilities to endeavor's where success could be simpler to come by. Instead, it merely serves to highlight the need for them to step up their efforts. Avoiding "sins of the body" is obviously a "moral good," making it an absolute that forbids any cost-benefit analysis.

Few public-service organizations specify their goals in such strict terms. Nonetheless, even corporate human resources departments and factory service staffs have a tendency to see their role as "doing good," and as a result, as moral and absolute as opposed to pragmatic and subjective. This indicates that public-service organization's priorities maximization above optimization. The leader of the Crusade against Hunger claims that "our objective will not be done" as long as there are still children who go to bed hungry. If he were to declare, "Our goal will be fulfilled if the greatest number of children that can be reached via present distribution systems obtain enough to eat not to be stunted," he would be removed from office. Yet, if maximizing is the aim, it is impossible to achieve[5].

In fact, more work is required the nearer one gets to achieving their goal. As extra expenditures increase exponentially while additional outcomes diminish exponentially after optimization is attained (and the optimum in most endeavor's sits between 75 and 80 percent of the theoretical maximum), this is because optimization has been reached. A public-service organization will get more irritated and strive harder to improve what it is currently doing as it gets closer to achieving its goals.

Whether it succeeds or fails, the need to innovate and to do something different will be seen as a direct assault on its core principles, its convictions, and its very survival. They are significant barriers to innovation. They provide an explanation for why, for the most part, emerging businesses rather than established institutions are responsible for innovation in public services.In wealthy nations, it is perhaps the most successful institution of the century. Its initial goals have definitely been met. When the labor share of the gross domestic product gets close to 100% in certain Western industrialiser nations, like Holland, there is no more "more" that can be said. Nevertheless, the labor union is unable to even consider new difficulties, goals, or contributions. It can only recite tired catchphrases and engage in worn-out conflicts. For the "cause of work" is a virtue without question. It is obvious that it cannot be questioned, much less redefined.

The university, however, may not be all that unlike from the labor union, partly due to the fact that both have had growth and success comparable to neither in this century. But, there are enough outliers within public-service organization's (albeit, I must agree, fewer inside government agencies) to demonstrate that public-service organizations, especially large and established ones, are capable of innovation[6].

For instance, a married lay woman who was once the personnel vice-president of a department store chain was hired by one Roman Catholic archdiocese in the United States to serve as general

manager. Lay professionals and managers do anything that does not include administering sacraments and serving congregations. The American Catholic Church as a whole is experiencing a priest shortage, but this archdiocese has extra priests and has been able to move ahead aggressively to grow congregations and extend religious programmed.

The American Association for the Advancement of Science, one of the oldest scientific organizations, changed its course between 1960 and 1980 to become a "mass organization" without sacrificing its leadership qualities. It completely altered its weekly publication, Science, to serve as the public and governmental face of science and as the leading authority on scientific policy. And it produced a popular mass circulation journal for ordinary people that was also scientifically sound.

A large hospital on the West Coast saw that health care was changing as a consequence of its success as early as 1965 or thereabouts. This institution has been a pioneer and a leader in these changes, whilst other big metropolitan hospitals have sought to counter such tendencies as those towards hospital chains or standalone ambulatory treatment facilities. In fact, it was the first to construct a standalone maternity facility where pregnant mothers are provided with reasonably priced hotel rooms while still receiving all necessary care.

The provision of medical services should they be required is part of entrepreneurship practice. It was the first to provide ambulatory treatment in standalone surgical facilities. But, it also begun to create its own independent hospital network, in which it provides management services to smaller hospitals all throughout the area[7].

The Girl Scouts of the United States of America, a huge organization founded in the early years of the 20th century with several million young women enrolled, started implementing improvements in membership, activities, and volunteers the three fundamental aspects of the organization around 1975. Blacks, Asians, and Latinos were aggressively recruited as members; now, these minorities make up one-fifth of the group's membership. Girls need new programmed and role models that emphasize professional and commercial occupations rather than the conventional jobs as housewife or nurse, it was acknowledged, since women are increasingly moving into professions and management roles.

The administration of Girl Scouts saw a decline in the usual sources of volunteers to staff neighborhood events as young moms stopped staying at home and looking for things to do. Yet, they also understood that the Girl Scouts had much to give the newly minted professional and working mother, and that volunteers are the key stumbling block for every community group. So, they set out to make volunteering for the Girl Scouts appealing to working mothers as a nice opportunity to spend time and have fun with her kid while also aiding in the growth of her child. The Girl Scouts finally came to the realization that the working mother who does not have enough time for her kid offers another possibility, therefore they began Girl Scouting for preschoolers. As a result, although the Boy Scouts, a larger, older, and immensely wealthier organization, is still drifting, the Girl Scouts have reversed the falling trend in membership of both kids and volunteers[8].Similar cases most likely exist in Europe or Japan. Yet, despite their flaws, I am hopeful that these examples will be sufficient to illustrate the entrepreneurial policies

required in the public-service organization to enable innovation.The public-service organization has to define its goal clearly in the first place. What goal does it have? Why is it there? Instead of concentrating on projects and programmed, it must concentrate on goals. Projects and programmed are tools for achieving goals. They should always be seen as transient and really fleeting.

A realistic declaration of aims is necessary for the public-service institution. Instead of "Our duty is to eradicate hunger," it should read, "Our job is to soothe famine." In order for it to finally be able to declare, "Our work is accomplished," it has to commit to a goal that is really achievable. Of course, there are goals that will never be reached. It is obvious that administering justice in every human community is an ongoing process that can never be completed, even to modest standards. Nonetheless, most goals can and ought to be expressed in terms of optimization rather than maximization. Finally, it will be feasible to declare, "We have accomplished what we set out to achieve."

This has to be mentioned in relation to the schoolteacher's conventional objectives, which include making everyone sit in class for extended periods of time. In wealthy nations, this objective has long been accomplished. What purpose does education presently serve, i.e., what distinguishes education from just attending school? The inability to attain goals should be seen as a sign that they are flawed, or at the very least, that they were poorly articulated. So, it must be assumed that economics should be the goal rather than morality. Several attempts must be made to reach a target before concluding that it is the incorrect one. It is illogical to believe that failing provides a justification for trying again. Mathematicians have known for three centuries that the likelihood of success decreases with each subsequent attempt; in fact, the likelihood of success in any given attempt is never more than half that of the prior attempt. In other words, contrary to what most public-service organization’s think, failure to meet goals is a legitimate cause to challenge their legitimacy[9].

For the first time, a well-educated Catholic laity was rapidly emerging in the United States. The majority of Catholic dioceses and, in fact, the majority of Roman Catholic organisations saw this as a danger or at the very least, a problem. Unquestioned acceptance of the bishop and priest could no longer be assumed in the presence of an informed Catholic laity. Therefore, Catholic laypeople had no part in the organisation or administration of the Church.

Similar to this, all American Roman Catholic dioceses began to notice a steep decline in the number of young men joining the priesthood about 1965 or 1970 and saw this as a serious danger. Both were opportunities in the eyes of only one Catholic archbishop. It has a different issue as a consequence. Young priests from all over the United States are drawn to it because in this particular archdiocese, a priest is able to carry out the duties for which he was ordained.

Beginning in 1970 or 1975, all American hospitals saw changes in the way healthcare was provided. To resist these changes, the majority of them organised. Most of them warned that "these changes would be devastating" to everyone. Just one hospital saw their potential. The American Association for the Advancement of Science recognised a huge potential to position itself as a leader, both within the scientific community and outside of it, in the growth of

individuals with scientific backgrounds and engaged in scientific endeavor's. The Girl Scouts then asked themselves, "How can we transform population changes into new possibilities for us?" after studying the statistics.

It has started to privatise a variety of services during the last 10 years, including trash removal, school transportation, and a host of others, thanks to a female mayor named Helen Boosalis. Private companies compete for the contracts, the city provides the funding, and there are significant cost reductions and even larger service improvements. What Helen Boosalis has seen in Lincoln is the chance to distinguish between the "supply" and the "provider" of public services, i.e., the government. High service standards and the effectiveness, dependability, and affordability that competition may provide are made feasible by this.

The four guidelines mentioned above are the precise practises and policies that the public-service organisation needs in order to become entrepreneurial and innovative. But in addition, it must accept the guidelines that any existing company must follow in order to be entrepreneurial the guidelines covered in the chapter before this one, The Entrepreneurial Business. Why can't we just leave the current public-service institutions alone and rely, as we have done historically, on new institutions to bring about the advances the public-service sector needs?

The reason is that governmental institutions have become too large and influential in affluent nations. In this century, the governmental and nonprofit but not-for-profit public service sectors have expanded more quickly than the commercial sector possibly three to five times faster. During World War Two, the increase has been particularly rapid. Its increase has been excessive to some degree. Everywhere that public service operations can be turned into profitable businesses, they should be. This is true for all municipal services, not only the ones that the city of Lincoln, Nebraska, is now "privatising." At the American hospital, the transition from non-profit to profit has already advanced significantly. In graduate and professional education, I predict a rush. It is difficult to justify subsidising the top earnings in modern society those with advanced professional degrees[10].

Capital generation will undoubtedly be a major economic issue for industrialised countries over the next 20 to 30 years, with Japan being the only country where it now meets all requirements. We consequently cannot afford to structure activities as "non-profit," that is, as activities that consume capital instead of forming it, if they may be organized as profitable, capital-forming activities. Nonetheless, the vast majority of the activities carried out in and by public-service institutions will continue to be public-service activities and neither vanish nor change. They must thus be made productive and producing.

The practice of entrepreneurship must develop its capacity for innovation and self-management. To do this, public-service organization's will need to have the ability to see possibilities in a time of fast change in all of these domains, including social, technical, economic, and demographic upheavals. If not, they will act as barriers. When they continue to support initiatives and programmed that cannot function in a changing environment, public-service organization's will find themselves increasingly unable to carry out their missions, but they will be reluctant or unwilling to give up on the duties they can no longer do. They will increasingly resemble

mediaeval nobles, who were functionless parasites with nothing left except the ability to hinder and plunder society after losing all social function about 1300. They will develop a sense of entitlement while losing validity over time. It is obvious that the labour union, who seems to be the strongest among them, is already experiencing this. Nonetheless, public service institutions are necessary in a society that is rapidly changing and has new possibilities, difficulties, and obligations.

The American public school is an excellent example of both the opportunities and the risks. Except as a school for minorities in the slums, it is unlikely to survive this century unless it takes the lead in innovation. The prospect of a class structure in education, where everyone save the extremely poor stay outside of the public school system at least in the cities and suburbs where the majority of the population lives faces the United States for the first time in its history. And since that the public education system itself already knows what needs to be changed, this will be entirely their responsibility. A similar dilemma is faced by several other public-service organizations. There is the knowledge. Innovation is obviously necessary. Now they must figure out how to incorporate innovation and entrepreneurship into their own systems. Otherwise, they risk being replaced by outsiders who establish rival entrepreneurial public-service organizations, making the current ones obsolete.

In the sphere of public service, the late nineteenth and early twentieth centuries saw a great deal of ingenuity and invention. Social innovation was undoubtedly as active, prolific, and quick throughout the 75 years leading up to the 1930s as technical innovation, if not more so. Nonetheless, throughout these times, innovation came in the shape of new public-service organizations. The majority of the ones we still have now have been around for little more than 60 or 70 years in their current shape and with their current purpose. The next 20 or 30 years 186

The Service Institution's approach to entrepreneurship will be substantially different. Even if the demand for social innovation may be higher, much of it will have to be done inside the already-existing public-service organization. The most important political objective for this generation may thus be to integrate entrepreneurial management within the current public-service structure.Finding out what we are doing well is our first goal since we can always go on doing more of the same, even if we often have no understanding why we are succeeding in a certain area. The limitations of one's strengths are then discovered, such as a propensity to either underestimate or overestimate the amount of time needed, or a propensity to overestimate the amount of research necessary in a particular field while underestimating the resources needed to translate the results of research into a product or a process. Sometimes one discovers a highly harmful propensity to halt marketing or promotion activities for the new business just as they are beginning to take off[11].

One of the most prosperous global banks credits its success to the input it incorporates into all new initiatives, whether it be entering a new market like South Korea, equipment leasing, or providing credit cards. The bank and its senior management have also learnt what they can anticipate from new initiatives by adding feedback from outcomes to expectations for all new endeavours: how soon a new attempt can be expected to generate results and when it should be supported by bigger efforts and more resources.

The next action is to provide a comprehensive, systematic assessment of creative activities. An entrepreneurial management team reviews the company's whole body of creative work every few years. Which ones need to be pushed at this point and given extra encouragement? Which ones have created fresh possibilities? On the other side, which ones are not performing as we had anticipated, and what course of action should we take? Has the time come to give up on them, or, on the other hand, should we step up our efforts—but with what goals and by when?

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CHAPTER 14

THE NEW VENTURE: NAVIGATING THE PATH FROM IDEA TO LAUNCH IN TODAY'S COMPETITIVE LANDSCAPE

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The operative word in the phrase "entrepreneurial management" for an existing firm, whether a commercial corporation or a public-service organization, is "entrepreneurial." It is "management" for the new business. The greatest barrier to entrepreneurship in an established firm is the existence itself. It is its absence in the new endeavor. It could even make sales, sometimes a sizable amount of sales. Indeed, there are expenses. And it may bring in money and perhaps turn a profit. What it lacks is a "business," a functional, ordered "present" where individuals are aware of their goals, what they are supposed to be doing, and what the outcomes are or ought to be. Yet regardless of how creative the company concept, how much funding it receives, how excellent its goods are, or even how high the demand for them, if a new initiative does not grow into a new firm and ensure that it is "managed," it will not survive.

The greatest inventor of the nineteenth century, Thomas Edison, failed in every business endeavor he attempted because he refused to recognize these truths. The goal of Thomas Alva Edison was to run a large corporation and be a prosperous businessman. He ought to have been successful since he was an excellent business strategist. He understood precisely how to set up an electric power firm to profit from his light bulb innovation. He knew precisely where to get all the capital he could want for his endeavors. His goods were an instant hit, and there was essentially an endless supply of them. Nonetheless, Edison continued to be an entrepreneur since he believed that "managing" meant being in charge. He objected to assembling a management group. As a result, each of his four or five businesses disgracefully failed once they reached a certain scale and could only be rescued by having Edison fired and being succeeded by competent management[1].

We were doing OK until these other folks arrived and stole our market from us, is a typical justification for a new venture's inability to live up to its promise or even to exist at all. We are not exactly sure how it works. What they had to give wasn't all that unlike from what we had. Instead, one can hear something like: "We were doing OK, then these other folks began selling to clients we'd never ever heard of, and all of a sudden they had the market." When a new business venture does succeed, it typically does so in a market other than the one it was initially intended to serve, with goods or services that are not quite what it had planned, purchased in large part by clients that it had not even considered when it began, and used for a variety of purposes other than those for which they were initially intended. A new enterprise will only succeed in giving a rival an opportunity if it does not foresee this by arranging itself to take advantage of the unforeseen and untapped markets; if it is not completely market-focused, if it is not market-driven.

There are, of course, exceptions. A product designed for a single purpose, particularly one that is scientific or technical, often remains on the market and is still used for that purpose. But not usually. Even a prescription medicine that was created and studied for a certain condition may wind up being used for an entirely other condition.

One instance is a substance that is successfully used to heal stomach ulcers. Perhaps a medication intended mainly for use in treating humans could find its biggest market in animal care. Anything genuinely new creates markets that nobody before even imagined. When the first Xerox machine was released in 1960, no one realized he required an office copier; five years later, no firm could envision doing without one. Even with all the transatlantic lines then in operation or being constructed, according to the greatest market data, there were not enough passengers when the first jet aircraft took to the skies. Five years later, there were fifty to one hundred times as many people travelling on transatlantic aircraft each year as there had ever been previously[2].

The inventor has poor vision indeed, he suffers from tunnel vision. To the exclusion of all other locations, he only sees the region with which he is accustomed. It was created during World War II to shield US troops from tropical parasites and insects, but it ultimately found its greatest use in agriculture to safeguard cattle and crops from insects, to the extent that it had to be outlawed due to its extreme efficacy. Nevertheless, none of the eminent scientists who created DDT during World War II for these purposes. They were well aware that fly-borne "summer" diarrhoea kills infants. They were aware that animals and crops are often plagued by insect parasites, of course. Nonetheless, these were facts that they as laypeople were aware of. They were specialists and worried about human tropical illnesses.

Similar to how the 3M Corporation failed to anticipate Scotch Tape's many applications in both the home and workplace for an adhesive tape it had created for industry. For a long time, 3M supplied adhesives and abrasives to the industrial sector, and it enjoyed modest success there. Consumer markets were not even a consideration. The engineer who had created an industrial product that no industrial user desired only discovered that the device may be marketable to consumers by accident. He allegedly took some samples home while the business had already made the decision to stop producing the item. Unexpectedly, his teenage children started using it to keep their curls in place all night. The only odd aspect of this tale is the fact that he and his 3M superiors realised they had discovered a brand-new market.

Novocain, the first local anaesthetic, was created by a German pharmacist in 1905. He tried to get the physicians to use it, but they insisted on complete 190. Anesthesia New Venture (they only accepted Novocain during World War I). Yet quite surprisingly, dentists started using the substance. According to the legend, the chemist then started giving lectures around Germany against the use of Novocain in dentistry. Entrepreneurs are nevertheless aware of the purpose of their innovations. They also have a tendency to object if there is another purpose for it. The likelihood is that they will make it plain that these clients are not wanted, even if they don't literally refuse to service individuals they haven't "prepared" for.

Exactly this occurred with the PC. The first computer's manufacturer, Univac, was aware that this amazing machine was intended for scientific work. Hence, when a company expressed interest in it, it didn't even send a salesman out since, according to its logic, these folks couldn't possibly understand what a computer was. Due to the fact that their own computer had been created expressly for astronomical computations, IBM shared the same conviction that the computer was a tool for scientific endeavor. Nonetheless, IBM was ready to accept and fulfil commercial orders. About 1960, ten years later, Univac still had the technologically most sophisticated and ideal machine. The computer market belonged to IBM.

For anything really novel, market research is impossible. Market research cannot be conducted for an item that has not yet hit the shelves. In 1950, Univac predicted that by the year 2000, around 1,000 computers would be sold; in reality, there were roughly one million in 1984. And yet, this was the most meticulous, thorough, and "scientific" market research ever conducted. There was just one problem with it: it was founded on the widely held misconception that computers will be utilized for cutting-edge scientific research, which is really a fairly niche use. Similar to this, a number of businesses who rejected the Xerox patents did so after rigorous market research revealed that printers had no purpose at all for a copier. Nobody could have predicted that organizations, institutions of higher learning, colleges, and a wide range of private citizens would desire to purchase a copier.

As a result, the new business must begin by assuming that its product or service may find consumers in markets no one anticipated and for applications no one foresaw when the product or service was first created that it will be purchased by clients who are not within its sphere of influence and may not even be aware of the new business. If the new business does not have such a market emphasis from the start, it will most likely just generate a market for a rival. In a few years, "those people" will invade and seize "our market," or "those other people" who suddenly began "selling to clients we'd never ever heard of" will really have preempted the market. In actuality, incorporating a market emphasis into a new enterprise is not very difficult. Yet what is needed goes against the usual entrepreneur's tendencies. First, it is necessary for the new enterprise to methodically look for both unexpected successes and failures. Entrepreneurs should examine the unexpected thoroughly and as a unique opportunity rather than brushing it off as a "exception," as is their tendency to do.

A tiny Indian engineering company acquired the rights to manufacture a bicycle with an auxiliary light motor shortly after World War II. While it seemed like the perfect product for India, it never fared well. Yet, the proprietor of this little business saw that significant orders for the engines alone started to come in. At first, he thought he should refuse the orders since no one could possible use an engine so little. He went to the location where the commands were really given out of pure curiosity. There, he discovered that farmers were employing bicycle motors to power irrigation pumps that had previously been run by hand. With millions of units sold, this firm is now the leading producer of small irrigation pumps worldwide. His pumps have transformed agriculture across Southeast Asia[3].

The new venture must be willing to try new things in order to be market-driven. One attempts to identify someone in that new and unexpected area who would be prepared to test the new

product or service and find out what, if any, applications it might have, if there is any demand in the new venture's product or service from customers or markets that were not in the original plan. Free samples are given to potential consumers in the "improbable" market to see what they can do with it, if they can use it at all, and what it would take for them to buy it. Advertisements are placed in the trade publications in the sector where interest has been shown, etc.

Finding out if an unexpected interest from an unexpected market is a sign of real potential or a coincidence doesn't cost a lot of money. It calls some tact and a little methodical labor. The personnel in charge of a new business should spend the majority of their time outdoors, seeing and listening to consumers, salespeople, and other market participants. The new business must include organized procedures to constantly remind itself that a "product" or "service" is defined by the client, not by the producer. Regarding the usefulness and value that its goods or services provide to consumers, it has to constantly challenge itself.

The biggest risk for a new business is presuming to "know better" than the consumer what the product or service is or ought to be, how it ought to be purchased, and what it ought to be used for. Most importantly, the startup must be ready to see the unexpected success as an opportunity rather than a slight against its field of expertise. Also, it must acknowledge a basic marketing tenet: Companies are not compensated for changing their clients. To please consumers, they are compensated.

A common illness of the "neo-natal," the newborn new enterprise, is a lack of market focus. It is the most severe ailment a new business faces in its early stages and it may permanently cripple even those that survive. Contrarily, the biggest risk to the new business in its next stage of expansion is the absence of an acceptable financial focus and the proper financial policies. Above all, it poses a danger to the young business that is expanding quickly. The riskier the lack of financial foresight, the more successful a new enterprise becomes.

Let's say a new business has successfully launched its product or service and is expanding quickly. It claims "rapidly expanding earnings" and makes optimistic projections. The new business is then "discovered" by the stock market, particularly if it is high-tech or in a presently popular industry. The new enterprise fails 18 months after it launches. It may not cease to exist or go insolvent. But, it finds itself unexpectedly in the red, dismisses 180 of its 275 workers, and/or is either sold at a discount to a large corporation. The root reasons are usually the same: a shortage of cash, an inability to get the funding required for growth, and a loss of control due to disorganized spending, inventory, and receivables. These three financial problems often occur together. But, each of them individually puts the new business's life, if not just its health, at peril[4].

The only way to stop this financial disaster once it has started is with enormous hardship and immense sorrow. Entrepreneurs who launch new businesses are seldom unconcerned with money; on the contrary, they often exhibit greed. So, they priorities making money. Yet, this is the incorrect emphasis for a new business; it should really come last rather than first. Controls, capital, and cash flow all arrive much sooner. Without them, the profit estimates are fictitious; they may be valid for a period of twelve to eighteen months until they vanish.

Growth must be nourished. In terms of finance, this indicates that expanding a new business requires putting in more money rather than pulling it out. More money and capital are required for growth. If the developing new business displays a "profit," it is a fiction: an accounting entry made merely to keep the books balanced.

Moreover, rather of producing a "surplus," this illusion generates a debt and a cash outflow since taxes are generally owed on it. A startup business needs more financial support the healthier and quicker it develops. The new businesses that get glowing press coverage in newspapers and stock market letters, businesses that post "record profits" and strong profit growth, are the ones that are most likely to face dire difficulties two years down the road. Cash management, cash flow forecasting, and analysis are necessary for the new business. With the notable exception of high-tech businesses, American new ventures have performed far better in recent years than they did in the past due in large part to the fact that American new entrepreneurs have discovered that running a business requires sound financial management.

If there are solid cash flow predictions, by which is meant "worst case" estimates rather than hopes, managing cash is rather simple. An ancient banker's rule of thumb states that when projecting cash inflow and cash outlays, one should 194 assume that invoices will need to be paid sixty days sooner than anticipated and receivables will need to be collected on within that time frame. It takes The New Venture sixty days to arrive. The worst that may happen if the projection is excessively cautious—and it seldom ever occurs in a developing new venture is a brief cash surplus.

A developing new business should anticipate its financial needs one year in advance, including the amount, timing, and uses of the funds. It is virtually always feasible to finance cash demands with a year's notice. Yet, obtaining money quickly and in a "crisis" is never simple and is always excessively costly, even if a new business is succeeding. Above all, it always diverts attention away from the company's vital figures at the most crucial moment.

They then devote the next several months to rushing from one financial institution to another and producing a steady stream of dubious financial estimates. Ultimately, they often need to mortgage the company's long-term prospects in order to get out of a ninety-day liquidity crunch. They will inevitably miss the key chances when they can once again give time and energy to the company. Thus the new business is virtually always under financial strain when the prospects are at their peak. The capital structure of the prosperous new business will also become inadequate. According to a generalization that is well supported by empirical data, a new enterprise outgrows its capital base with every growth in sales (or billings) of between 40% and 50%. A new enterprise often requires a new and different financing structure after such expansion.

Private funding sources, whether coming from the founders and their families or from outsiders, become insufficient as the business expands. By going "public," finding a partner or partners among well-established businesses, or by obtaining money from insurance companies and pension funds, the firm must get access to much bigger pools of money. A new business that had previously been backed by equity capital now has to switch to long-term debt, or the other way

around. The current capital structure inevitably becomes the incorrect structure and a barrier as the enterprise expands[5].

Each unit can be financed as a separate business when the company consists of uniform and entirely local units, such as chain restaurants, freestanding surgical centers or hospitals in various cities, homebuilders with separate operations in a number of different metropolitan areas, specialty shops, and the like. Franchising, which is essentially a mechanism to fund quick growth, is one answer. Creating each local unit as a firm with independent, often local investors is another.

So, the money required for development and expansion may be obtained gradually, and the success of the previous unit serves as evidence and a motivator for investors in the subsequent ones. But it only works when: (a) each unit breaks even fairly quickly, at most perhaps within two or three years; (b) the operation can be made routine, so that people with limited managerial competence the typical franchise holder, or the business manager of a local freestanding surgical center can do a respectable job without much supervision; and (c) the individual unit itself fairly quickly reaches the optimum size beyond which it does not require further capital but instead but instead but instead but nevertheless requires less capital.

Capital planning is a prerequisite for new businesses other than those that can be funded as standalone entities. A growing new venture should typically have little trouble obtaining the kind of money it needs, when it needs it, and in the form that it needs it if it makes realistic plans for its capital requirement and capital structure three years in advance again, this means assuming the maximum rather than the minimum need. If it waits until it has outgrown both its capital base and its capital structure, it risks losing both its independence and its chance for existence. The founders will at the very least discover that they put all of their effort and risk into the business just to make others the wealthy owners. They will no longer be owners; instead, the new investors will be in charge.

The new business endeavor must also design the finance framework it needs to control expansion. A flourishing new business always has a good product, a strong position in the market, and promising future growth. So all of a sudden, including receivables, inventories, production expenses, administrative costs, service, and distribution, everything spirals out of control. All areas spiral out of control when one does. By the time control has been regained, markets have been lost, clients are unhappy, if not hostile, and distributors have lost faith in the business. Worst of all, and understandably so, is that staff members no longer trust management. The restrictions in place are always rendered outdated by rapid development. Once again, a volume increase of between 40% and 50% appears to be the key number[6].

The New Venture control is pretty simply avoidable. The first step is to identify the crucial areas of a certain organisation. It may be anything like product quality in one, service in another, receivables and inventory in a third, and manufacturing expenses in a fourth. Seldom does any one firm have more than four or five essential areas. But, managerial and administrative costs should always be taken into account. The first indication that a business is out of control and that its management structure and practises are no longer up to the task is typically a disproportionate

and rapid increase in the percentage of revenues absorbed by managerial and administrative overhead, which means that the enterprise hires managerial and administrative people faster than it actually grows.

A new enterprise must set up the controls in these crucial areas now if it wants to meet its growth ambitions three years from now. It is not required to use complex controls, nor does it matter that the numbers are simply approximations. What important is that the new venture's management is aware of these crucial areas, is reminded of them, and can therefore respond quickly if necessary. If the important areas are given appropriate attention, disarray often does not manifest. The new business will then have the controls it needs when it requires them.

It doesn't take a lot of time to have financial vision. It does, however, need a lot of thinking. The necessary technological equipment is readily accessible and described in the majority of management accounting literature. Yet the business itself will have to do the task. The new business successfully established itself in the appropriate market before finding the appropriate financial system and structure. Even yet, a few years later, it is still likely to have a major disaster. It falls into difficulty that no one seems to grasp just as it looks to be on the verge of becoming an "adult"a prosperous, established, and continuing business. Despite having good potential and top-notch products, the company is unable to expand. None of the primary areas profitability, quality, or any other perform well.

It is quite late often even too late if it does not already have one in place at that point. The only thing left to hope for is the company's survival. Yet it is probably going to be disabled forever or have wounds that will bleed for years. Disillusioned and pessimistic personnel are pervasive across the organization, and morale has been devastated. And nearly usually, the individuals who started the company and gave it life find themselves on the outside, resentful and disillusioned. The solution is easy: establish a strong management team before the enterprise is in a position where it is required. The formation of teams takes time. Before they can work, they need a lengthy time. Teams are built on mutual trust and understanding, and these things take time to develop. Three years is roughly the minimum, in my experience.

A top management team, however, is out of the question for the young, little business; it simply cannot support a dozen employees with high incomes and important positions. In reality, just a small group of individuals handle every aspect of a tiny, developing organization. Once again, the fix is rather easy. But, the founders must have the motivation to create a team rather than continue to handle everything individually. A management crisis will inevitably occur in a few months or, at the latest, a few years if one or two individuals at the top think they must handle everything.When a new company's objective economic indicators such as market surveys or demographic analysis indicate that the firm may double within three to five years, the founder or founders are responsible for assembling the management team that the new enterprise will soon need. The founders will need to consider their company's essential operations first, together with the help of other important individuals[7]. What are the precise factors that are essential to this particular company' existence and success? Everyone will have a list of the majority of the places. Nonetheless, if there are disagreements or dissents, as there should be on a matter this

significant, they should be regarded carefully. Any activity that a group member feels should be on the list should be included.

The essential exercises are not covered in literature. They emerge from analysis of the specific enterprise. Two businesses that on the surface seem to be in the same industry may end up defining their primary operations quite differently. For instance, one would priorities customer service while the other might priorities manufacturing. Each business only ever engages in two primary tasks: managing its human resources and managing its financial resources. The other factors must be decided by the individuals working inside the organization after considering their own occupations, beliefs, and objectives. The following phase is for each group member to ask, starting with the founder, "What are the things I'm doing well? And what are the things that each of my important business partners genuinely excels at doing? Likewise, there will be consensus over the majority of the individuals and the majority of their abilities. Again, however, it's important to take disagreements seriously.

The following question is then posed: "Which of the primary activities, therefore, should each of us take on as his or her first and significant task since they suit the individual's strengths? What person matches what crucial activity? After that, efforts on assembling a team may start. If the founder determines that dealing with people's issues is not their core competency, they begin to discipline themselves (or themselves) to refrain from doing so. Maybe new items and new technologies are this person's strongest suit. This person's primary activities may be in operations, manufacturing, physical distribution, or service. Or maybe it has to do with money and finances, and someone else should manage people. Yet someone with demonstrated performance capacity must cover all crucial tasks[8].

There is no need that a chief executive oversee one thing or another. Of course, a chief executive serves as the last arbiter and is responsible for everything. The top executive must also see to it that he or she obtains the data required to fulfil this final responsibility. But, the chief executive's own job is dependent on both what the company needs and the person. The CEO performs the duties of a CEO as long as his or her work schedule includes important tasks. Yet, the CEO is also in charge of making sure that all other important tasks are effectively addressed. The last step is to establish goals and objectives for each area. What can this business expect of you? Must be posed to everyone who has principal responsibility for a crucial activity, whether it involves the creation of products, managing people, or managing finances. Why do we need to hold you responsible?

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CHAPTER 15

FUSTIEST WITH THE MOISTEST: EXAMINING THE COMPETITIVE ADVANTAGE OF SPEED AND AGILITY IN INNOVATION AND ENTREPRENEURSHIP

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Being "Fustest with the Mostest," "Hitting Them Where They Ain't," "Finding and Filling an Ecological Niche," and "Changing the Economic Characteristics of a Product, a Market, or an Industry" are examples of how to succeed in business. These four approaches are not exclusive of one another. Entrepreneurs often mix two, and perhaps even three, tactics into one. However, they are not always clearly distinguished; for example, the same tactic may be categorised as "Hitting Them Where They Ain't" or as "Finding and inhabiting a particular "ecological niche"." But, each of these four has certain requirements. Each is appropriate for certain forms of innovation but not for others. Each needs the entrepreneur to act in a certain way. Also, each has its own restrictions and dangers. Strategy was still described as "generalship; the art of war; control of an army or armies in a campaign" in the Concise Oxford Dictionary from 1952[1].

The phrase "business conduct" was originally used in 1962 by Alfred D. Chandler, Jr. in his groundbreaking book Strategy and Structure, which examined the development of management in the large company. Nevertheless, the publisher and I discovered soon after that the phrase could not be used in the title without major misunderstanding when I authored the first study of corporate strategy in 1963. Senior company executives, magazine editors, and booksellers all informed us that "strategy" for them meant running political or military operations. Much of what is currently referred to as "strategy" was covered in the book. The term is used throughout the text. Nonetheless, the name we settled on was "Managing for Outcomes." The most helpful of which I have found to be Michael Porter's Competitive Strategies (New York: Free Press, 1980).

In the American Civil War, a Confederate cavalry commander attributed his success to being "Fustest with the Mostest," or being the most persistent. Under this approach, the business owner strives for leadership, if not complete control, in a brand-new market or sector. Although though it is often the goal, being the "Fustest with the Mostest" does not always mean wanting to start a successful company right now. Yet, it has a long-term leadership position as its goal. Being "Fustest with the Mostest" is the guiding principle that many people see as the best entrepreneurial tactic. Being "Fustest with the Mostest" is the sole entrepreneurial approach, according to prominent books on entrepreneurship*. A lot of businesspeople, particularly those in high-tech industries, seem to share this belief.

Yet they are mistaken. Indeed, a lot of business owners have chosen this approach. The dominating entrepreneurial approach, let alone the one with the lowest risk or the best success ratio, isn't being [2]. Since many years ago, Hoffmann-LaRoche of Basel, Switzerland, has held

the title of biggest and perhaps most successful pharmaceutical firm in the world. Nonetheless, its beginnings were fairly modest: Hoffmann-LaRoche was a modest, financially strapped manufacturer of a few textile dyes up to the mid-1920s. The enormous German dye manufacturers and two or three considerably larger chemical companies in its own nation completely eclipsed it. Later, at a time when the scientific community was still struggling to embrace them, it bet on the recently discovered vitamins. For instance, George Gilder's The Spirit of Enterprise (New York: Simon & Schuster, 1984), which is perhaps the most accessible modern example of the type that these chemicals were present. Nobody else desired the vitamin patents that it eventually obtained. It recruited the discoverers away from Zurich University at wages even industry had never paid before several times what they might have hoped to make as academics. And it used all of the cash it had and all of the credit it could get to produce and promote these novel chemicals.

Hoffmann-LaRoche controls roughly half of the global vitamin business now, worth billions of dollars annually, 60 years after all vitamin patents had expired. The company then employed the same tactic twice more: first, in the 1930s, when it entered the market for new sulfa drugs despite the fact that the majority of scientists at the time "knew" that systemic drugs could not be effective against infections; and second, in the mid-1950s, when it entered the market for muscle-relaxing tranquillizers Librium and Valium, which were at the time equally heretical and incompatible with what "every scientist knew."

DuPont used the same approach. After fifteen years of difficult, discouraging research, DuPont at once undertook large efforts, constructed enormous operations, and engaged in widespread advertising the corporation had never previously had consumer items to advertise creating the plastics business as we know it today. It will be stated that these are "big-company" tales. Yet, HoffmannLRoche was a little business when it first began. These are a few more recent instances of businesses that were founded from scratch and used the motto "Fustest with the Mostest" to succeed[3]. Not much of a "scientific" creation, the word processor. It connects three already-existing devices: a typewriter, a display, and a pretty simple computer. Yet this amalgamation of already-existing components has produced a true breakthrough that is fundamentally altering office work. When he came up with the idea for the combination, somewhere in the middle of the 1950s, Dr. An Wang was a sole proprietor. He had very little financial support and no prior entrepreneurial experience. Yet, it is evident that his initial goals included transforming office work and establishing a new sector, and Wang Labs has undoubtedly grown to be a very large organisation.

Similar to how the two young engineers who founded Apple in the proverbial garage, without financial backing or prior commercial expertise, set out to establish an industry and control it from the outset. Any "Fustest with the Mostest" approach need not seek to build a large company, but it must always aspire to build a company that rules its market. An intentional strategy, it would seem, prevents the St. Paul, Minnesota-based 3M Corporation from attempting an invention that may generate significant revenue on its own. Neither does the manufacturer of hygiene and wellness products Johnson & Johnson. Both businesses are among the most

productive and effective innovators. Both search for ideas that would create medium-sized businesses rather than huge ones, which are still dominating in their respective sectors.

A person may be "Fustest with the Mostest" outside of work. Institutions engaged in public service may also access it. Clearly aiming to be "Fustest with the Mostest," Wilhelm von Humboldt established the University of Berlin in 1809, an event that has already been discussed in this book. Napoleon had recently vanquished Prussia, and it had just avoided being completely destroyed. Politically, militarily, and most importantly financially, it was bankrupt. It resembled Germany in many ways following Hitler's fall in 1945.

Nonetheless, Humboldt set out to create the biggest institution the Western world had ever seen or heard of three to four times the size of anything at the time. He set out to appoint the top academics in every field, starting with Georg W. F. Hegel, the premier philosopher of the day. At a time when top academics were begging because the Napoleonic wars had caused the closure of several venerable colleges, he paid his teachers up to 10 times more than they had ever been paid[4]. In Rochester, a small Minnesota town far from population centres or medical schools, two surgeons decided to found a medical centre based on wholly novel and wholly heretical concepts of medical practise, particularly on the creation of teams in which exceptional specialists would collaborate with one another under the direction of a coordinating team leader. This was one hundred years later, in the early years of this century.

The so-called founder of scientific management, Frederick William Taylor, had never met the Mayo Brothers. Yet, he referred to the Mayo Clinic as the "sole full and effective scientific management" he was aware of in his well-known statement before the Congress in 1911. The supremacy of the profession, luring the best doctors in every discipline and the brightest young men, as well as patients who could afford their then-exorbitant prices, were the goals of these unknown provincial surgeons from the start.

And 25 years later, the March of Dimes organised research on infantile paralysis using the "Fustest with the Mostest" technique (polio). The March of Dimes set out from the start to entirely defeat a disease that was utterly unexplained rather than seeking out fresh information incrementally like all prior medical research had done. A "research lab without boundaries," in which several experts from various research institutions were hired to work on certain phases of a planned and coordinated research programme, had never previously been established. The March of Dimes established the framework on which the United States organised the initial major research initiatives of World War II: the atom bomb, the radar lab, the proximity fuse, and then another fifteen years later, "Putting a Man on the Moon" all ground-breaking initiatives utilising the "Fustest with the Mostest" principle[5].

These examples first demonstrate that in order to be the "Fustest with the Mostest," one must set a lofty goal; else, it will always fall short. It constantly seeks to establish a new market or industry. Being "Fustest with the Mostest" at least strives to create a really unusual and outlandish approach, much like the Mayo Clinic or the March of Dimes. When the DuPonts hired Carothers in the middle of the 1920s, they most likely did not think to themselves, "We will build the plastics business" (in fact, the phrase was not often used until the 1950s).

Nonetheless, enough internal DuPont records from that era have been made public to demonstrate that the company's senior executives did want to launch a new sector of the economy. They had little faith in the ability of Carothers and his study. But, they were aware that in the case of success, they would have built something significant and entirely unique, something that would transcend well beyond a single product or even beyond a single main product line. The phrase "the Office of the Future" was not created by Dr. Wang, as far as I am aware. Yet he described a new workplace setting and fresh ideas for office work in his initial commercials. Both the DuPonts and Wang made it plain from the start that they wanted to control the industry they intended to build. The finest illustration of what the phrase "Fustest with the Mostest" means is not a business case, but rather Humboldt University of Berlin. Indeed, Humboldt had no interest in universities as such. It served as his way of establishing a new and distinct governmental system that would be neither the absolute monarchy of the eighteenth century nor the democratic system of the French Revolution.

Instead, it would be a balanced system where a completely nonpartisan professional civil service and an equally nonpartisan professional officer corps, both recruited and promoted only on the basis of merit, would be independent in their very limited fields. These individuals today we would refer to them as technocrats would have specific responsibilities and fall under the stringent control of a professional independent judiciary[6]. Nonetheless, they would be in charge within these restrictions. The bourgeoisie would thus have two areas of personal freedom: one that is moral and cultural, and one that is economic. This idea has previously been offered by Humboldt in a book. All the elements that would have normally prevented Humboldt from succeeding the king, the nobility, and the military were rendered ineffective with Napoleon's complete overthrow of the Prussian monarchy in 1806. He seized the chance and, to great success, built the University of Berlin as the primary repository for his political ideas.

The strange political system that the Germans referred to as the "Rechtsstaat" the Lawful State, in which a self-governing elite of general staff officers and civil servants was in complete control of the political and military sphere, was in fact created by the University of Berlin. An autonomous and self-governing elite of educated people (known as "die Gebildeten Staende") organised around self-governing universities provided a "liberal" cultural environment. This framework initially gave Prussia the moral and cultural upper hand in Germany, followed quickly by the political and economic dominance. The Brits and Americans, for whom the Germans were the cultural and intellectual role models until about 1890, quickly took the lead inside Europe and won adoration from outside of it. All of this was just what Humboldt had envisioned and longed for at his darkest hour of loss and utter despair. He did, after all, make explicit what he wanted in the prospectus and university charter.

"Fustest with the Mostest" der and required more funding for his ensemble than the business could then provide via its paltry returns. Chemists have never led the corporation till this day; instead, it has always been run by individuals in finance who got their start in a significant Swiss bank. Wilhelm von Humboldt was a diplomat who had no prior affiliation with or background in academics. Rather than scientists and researchers, the DuPont senior executive team consisted of merchants. The Brothers Mayo were skilled surgeons, but they operated outside of and in

isolation from the prevailing medical system at the time. There are, of course, also the real "insiders," such as Dr. Wang, the staff at 3M, or the young programmers who created the Apple computer. Nonetheless, the outsider could have an edge when it comes to being "Fustest with the Mostest". He does not know what the whole field is aware of, and as a result, he is unaware of what cannot be done.

Becoming the "Fustest with the Mostest" requires precise aim to succeed; else, it fails completely. Conversely, to use a different metaphor, being the "Fustest with the Mostest" is very much like taking a moonshot; a fraction of a minute of arc deviation causes the missile to vanish into space. The "Fustest with the Mostest" technique is also hard to change or improve after it has been implemented. In other words, it takes thinking and careful consideration to use this tactic. One who gets a "great idea" and immediately sets out to implement it, as in so much popular fiction or Hollywood films, is not likely to be successful with it. In reality, for this approach to work at all, the invention must be founded on a serious and intentional endeavor to take advantage of one of the significant chances for innovation.

For instance, Humboldt University of Berlin is the best illustration of how to take advantage of a shift in perspective. The educated bourgeoisie had lost faith in politics as a result of the French Revolution's Terror and Napoleon's brutal conquest campaigns, but they had also made it clear that they would have rejected any attempt to turn the clock back and reinstate feudalism or the absolute monarchy of the eighteenth century. They need a "liberal" but apolitical realm, as well as an equally apolitical administration. And at the time, they were all supporters of Adam Smith, whose book The Wealth of Nations was perhaps the most widely read and revered work of political literature. This is what Humboldt's political system took advantage of and how his vision for the University of Berlin was institutionalized[7].

Wang's word processor cleverly tapped into a procedural need. During the 1970s, the dread of computers that had formerly run wild in companies was starting to give way to the concern, "And what would the computer do for me?" Office employees at that point had acquired office copiers, which caused the paper load in every workplace to increase dramatically. They had also gotten used to using computers for tasks like processing payroll or managing inventory. Wang's word processor then turned to the one remaining manual task that every office worker detested: repeatedly rewriting letters, speeches, reports, and manuscripts to reflect minute changes.

Hoffmann-LaRoche took use of fresh information while choosing the vitamins in the early 20s. The musician who devised its plan of attack was aware of the "structure of scientific revolutions" thirty years before Thomas Kuhn published the renowned work of philosophy with the same name. He was aware that a new fundamental scientific theory would not be accepted by the majority of scientists if it conflicted with the basic theorems they had grown up with and believed to be true, even if it were supported by sufficient evidence to make it difficult to reject. They ignore it for a long time until the old "paradigm," the old fundamental notion, is completely refuted. And at that period, the field is exclusively theirs for those who embrace the new theory and use it.

Even then, it calls for extraordinary attention. There must be a single, unambiguous objective on which all efforts must be concentrated. And the innovator has to be prepared to deploy resources in large quantities once this endeavor starts to show results. Long before the market started to react to it, DuPont erected massive plants and swarmed textile businesses and the general public with commercials, trial presentations, and samples as soon as it had a workable synthetic fiber. The actual effort starts after the invention becomes a profitable business. The "Fustest with the Mostest" approach thus requires significant and ongoing efforts to maintain a dominant position; otherwise, all one has done is opened up a market for a rival. With leadership, the innovator must run harder than before and continue his inventive work on a very wide scale.When the invention has been implemented effectively, the research budget must increase from what it was before. It is necessary to discover new applications for the materials and to locate and entice potential clients. Above all, the businessperson who has become the "Fustest with the Mostest" must render his product or method outdated before a rival can. The development of the successful product's or process's successor must begin right away, with the same level of focus and resource commitment that produced the first success.

The businessperson who has achieved leadership by being the "Fustest with the Mostest" must be the one who consistently lowers the cost of his own process or product. Maintaining high pricing only acts as a shield against and motivator for possible rivals for more on this, read the next chapter, "Hit Them Where They Ain't". This was developed by Alfred Nobel, who established the Dynamite Cartel, the longest-lasting private monopoly in economic history. Even after the Nobel patents had expired, the Dynamite Cartel continued to have a global monopoly until World War I and even beyond. It accomplished this by lowering prices by 10–20% whenever demand increased. At that point, the cartel's members had entirely written off the expenditure they had to make in order to get the extra output[8].As a result, it became unattractive for any possible rival to establish new dynamite plants, and the cartel itself continued to be profitable. Since the DuPont Corporation was the American affiliate of the Dynamite Cartel, DuPont has continuously adhered to this principle in the United States. Yet, Wang has followed the same policy with regard to word processors, Apple's computers, and all of 3M's goods. But, we are aware that for every person who uses this method and succeeds, many more fail. The "Fustest with the Mostest" method offers only one opportunity. It is a complete failure if it does not start working immediately away. Everyone is familiar with the traditional Swiss tale of Wilhelm Tell, an archer whom the tyrant offered to pardon if he could hit his son's skull with an apple on the first attempt. If he didn't succeed, he would either murder the kid or die. The entrepreneur using the "Fustest with the Mostest" approach is in just this scenario. No "almost-success" or "near-miss" is possible. Only success or failure exist. Even the accomplishments may only be understood in retrospect. At least two of the cases were extremely near to failure; they were spared by a fortunate mix of circumstance and luck.

In the middle of the 1930s, there was no demand for a synthetic fabric. It was far too costly to compete with the period's inexpensive fibers, cotton and rayon, and it was actually even more expensive than silk, the luxury fiber that the Japanese had to sell for whatever they could in the late 1930s due to the terrible downturn. The start of World War Two, which halted Japanese silk shipments, rescued Nylon. By the time the Japanese were able to restart their silk business, in or

around 1950, Nylon was well established, with its cost and price having decreased to a small portion of what they had been in the late 1930s. It was previously mentioned how Scotch Tape came to be 3M's most well-known product. Once again, Scotch Tape might have been a flop if but for a simple mishap.Being "Fustest with the Mostest" is in fact such a dangerous tactic that a whole major strategy—the one that will be covered in the next chapter under the name Artistic Imitation—is founded on the premise that it will fail far more often than it can reasonably succeed. Since there isn't enough will, it won't succeed. Because of insufficient efforts, it will fail. It will fail because, in spite of successful invention, insufficient resources are used, made accessible, or put to use to capitalise on success, etc. A new political order, as successfully established by Humboldt, a completely new field of therapy, as pioneered by Hoffmann-LaRoche with vitamins, or a novel approach to medical diagnosis and practise, as sought after by the Mayo Brothers, are just a few examples of major innovations that can be made using this strategy, though it is true that it can be highly rewarding when used successfully of their dynamics and of "Fustest with the Mostest" vation. Very focused work and significant resources are needed. Other techniques are often accessible and preferable, not simply because they involve less risk but also because the potential for most breakthroughs isn't significant enough to warrant the expense, the effort, and the resource commitment necessary for the "Fustest with the Mostest" approach.

One reason is that (as said earlier) the existing business always requires time and effort on the part of the people responsible for it and deserves the priority they give it. The new always looks —so unpromising next to the reality of the massive, ongoing business. The existing business, after all, has to nourish the struggling innovation. But the “crisis” in today’s business has to be attended to as well. The people responsible for an existing business will therefore \salways be tempted to postpone action on anything new, entrepreneurial, or innovative until it is too late. No matter what has been triedand we have now been trying every conceivable mechanism for thirty or forty years existing units have been found to be capable mainly of extending, modifying, and adapting what already is in existence[9].

This means also that there has to be a special locus for the new venture within the organisation, and it has to be pretty high up. Even though the new project, by virtue of its current size, revenues, and markets, does not rank with existing products, somebody in top management must have the specific assignment to work on tomorrow as \san entrepreneur and innovator. This need not be a full-time job; in the smaller business, it very \soften cannot be a full-time job. But it needs to be a clearly defined job \sand one for which somebody with authority and prestige is fully accountable. These people will normally also be responsible for the policies necessary to build entrepreneurship into the existing business, for the abandonment analysis, for the Business X-Ray, and for developing the innovation objectives to plug the gap between what can be expected of the existing products and services and what is needed for survival and growth of the company. They are also normally charged with the systematic analysis of innovative opportunities the analysis of the innovative opportunities presented in the preceding section of this book, the Practice of Innovation. They should be further charged with responsibility for the analysis of the innovative and entrepreneurial ideas that come up from the organisation, for example, in the recommended “informal” session with the juniors. And innovative efforts,

especially those aimed at developing new businesses, products, or services, should normally report directly to this executive in charge of innovation" rather than to managers further[10].

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CHAPTER 16

STRATEGIC POSITIONING FOR MARKET SUCCESS: THE ART OF 'HITTING THEM WHERE THEY AREN'T'

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It's obvious that the phrase "creative imitation" is a contradiction. Something unique must be innovative. Imitation is not "original," if there is one thing that it is not. Nonetheless, the phrase is appropriate. It denotes a tactic that, in essence, is an "imitation". What the entrepreneur accomplishes has previously been done by someone else. Entrepreneurs that use the "creative imitation" technique are more aware of what the invention stands for than the inventors themselves. IBM has been the most successful and brightest user of this tactic. But it has also been Procter & Gamble's key tactic for gaining and retaining market dominance in the soap, detergent, and toiletry sectors. And the Japanese Hattori Company, whose Seiko watches have grown to be the most popular in the world, likewise owes its market dominance to inventive imitation[1].

Early in the 1930s, IBM created a high-speed calculator for the astronomers at Columbia University in New York. A few years later, it constructed another device that was initially intended to function as a computer, this time for Harvard's astronomical computations. And IBM created a genuine computer by the conclusion of World War Two."Hit Them Where They Ain't" was the first game to have a "memory" and the ability to be "programmed," making it the genuine computer. Nonetheless, there are valid reasons why IBM's role as a computer inventor gets little mention in the history books. Because as soon as it had finished developing its sophisticated 1945 computer the first to be demonstrated to the general public in a showroom in midtown New York, where it drew huge crowds IBM switched from its own design to that of its competitor, the ENIAC developed at the University of Pennsylvania.

Only the ENIAC's designers failed to realise that the ENIAC was far better suited to corporate applications like payroll. IBM designed the ENIAC so that it could be produced, maintained, and used for routine "numbers crunching." The IBM ENIAC, which debuted in 1953, immediately became the benchmark for commercial, multifunctional mainframe computers. The tactic of "creative imitation" is this. It simply "approximately" waits till someone else has established the new. Then it begins to operate. Then soon after, it is revealed what the new should really be in order to please the client and complete the task that the customer has paid for. The original imitation has since become the norm, dominating the market. That was Apple's idea. Everyone at IBM "understood" that a compact, freestanding computer was a mistake uneconomical, far from ideal, and expensive as was previously stated [2].

IBM started working right away to create a machine that would rule or at the very least lead the personal computer industry and set the norm. The PC was the outcome. By two years, it had supplanted Apple as the market leader in personal computers, becoming both the fastest-selling

brand and the industry standard. The way Procter & Gamble conducts itself in the markets for processed foods, detergents, soaps, and toiletries is quite similar. Everyone in the watch business understood that when chips were available that they could be used to power a watch much more precisely, much more consistently, and much more affordably than conventional watch movements. The Swiss quickly produced a digital watch that was powered by quartz. They chose, however, to gradually introduce quartz-powered digital watches over a lengthy period of time, during which these new timepieces would remain pricey luxuries, since they had such a large investment in conventional watchmaking.The Hattori Corporation in Japan has been producing traditional timepieces for the Japanese market for a long time. It took advantage of the situation by establishing the quartz-powered digital watch as the industry standard. It was already too late when the Swiss awoke. The Swiss were almost driven out of the market as Seiko watches rose to become the most popular models worldwide.

Creative mimicry, such being "Fustest with the Mostest," is a tactic intended to achieve market or industry leadership, if not market or industry domination. Yet the danger is substantially lower. The market has already been created and the new business has gained acceptance by the time the inventive imitator makes a move. In fact, there is sometimes more demand than the original inventor can readily provide. The market divisions are known, or at the very least, observable. At that time, market research can also determine what consumers purchase, how they buy, what they consider to be valuable, and other information. Most of the ambiguities that arise when the first innovator shows up have been clarified or at the very least have been examined and investigated. A personal computer or a digital watch no longer need explanations as to what they are or what they can achieve. Of course, the original inventor can succeed the first time, blocking inventive imitation. There is a chance that an inventor may successfully market vitamins, as HoffmannLaRoche did, or Nylon, as DuPont did, or the word processor, as Wang did. The amount of businesspeople who engage in creative imitation, however, and their considerable success, suggest that possibly the danger of the first inventor preempting the market by doing it well is not a very high one[3].

The "nonaspirin aspirin," Tylenol, is another excellent example of imaginative mimicry. This example more than any other I'm aware of demonstrates the strategy's components, prerequisites, and operation. While acetaminophen has been used as a pain reliever for many years, it was previously only accessible in the United States with a prescription (it is marketed under the trade name Tylenol). Aspirin, a far older pain reliever, was formerly thought to be completely safe and dominated the market for pain management until recently. Aspirin is a stronger medication than acetaminophen. While it works well to relieve pain, it has no anti-inflammatory or blood coagulation effects. As a result, it doesn't have any of the negative effects that aspirin may have, particularly if taken in combination with other drugs.

The first brand of acetaminophen that was made widely accessible without a prescription was advertised as a treatment for aspirin side effects. It was a resounding success—far more so than its creators had imagined. But, it was this success that gave room for inventive imitation. Aspirin being only used in a very narrow market where blood coagulation and anti-inflammatory properties were required, Johnson & Johnson recognised there was a market for a medication

that could replace aspirin as the preferred painkiller. Tylenol has always been marketed as the perfect, all-purpose pain reliever. It had the market in a year or two.

These examples demonstrate that creative imitation does not take advantage of pioneer failure in the way that failure is often understood. The pioneer, on the other hand, has to be successful. Both the Apple computer and the acetaminophen brand that Tylenol eventually ousted from the top spot on the market were outstanding successes. But, the initial inventors were unable to comprehend their own accomplishment. Apple's designers prioritised their products above their customers, therefore they included extra hardware in places where users need software and applications.

In the Tylenol instance, the original inventors were unaware of the implications of their own success. The inventive creative takes advantage of other people's achievements. Innovation in the way that the word is most generally used does not include creative copying. The inventive imitator refines and places an existing product or service rather than creating it from scratch. It lacks something in the form in which it has been presented. It may be added features to the product. A product or service may be segmented so that slightly different versions may be sold in slightly different markets. It can be the product's strategic placement in the marketplace. Instead, inventive mimicry fills up any gaps[4].

The inventive imitator views goods and services from the perspective of the consumer. In terms of technological specifications, the IBM personal computer is almost identical to the Apple model, but IBM has always provided customers with programmes and software. Apple continued to use specialised storefronts for its conventional computer distribution. In a significant departure from its own customs, IBM created a variety of distribution channels, specialised shops, big box stores like Sears, Roebuck, and its own retail outlets, among other things. The product was created simple for the client to use and simple for them to purchase.

It needs a market that is expanding quickly. Innovative copycats don't thrive by stealing clients from innovators who are the first to market with a new product or service; rather, they fill the gaps in the pioneers' existing markets. Instead of generating a need, creative imitation fulfils an existing one. The dangers associated with the approach are significant. Imitators who are creative are sometimes motivated to divide their efforts in an effort to spread their risks. Another risk is misinterpreting the trend and creatively replicating what ultimately proves to be the losing development in the market.

These risks are best shown by IBM, the top creative imitator in the world. It has successfully mimicked every significant advancement in the area of office automation. It has the top product in every category as a consequence. Nevertheless, since they were copied, the products are so different and hardly compatible with one another that it is almost difficult to construct an automated, integrated workplace using just IBM building pieces. So, it is still questionable if IBM can continue to be a leader in the automated office and offer the necessary integrated system. Yet, this is most likely where the big market of the future will be. And the creative imitation method carries this danger the risk of being very intelligent inherently[5]. In high-tech fields, creative mimicry is probably most successful for the following reason: Technological and

product-focused innovators are more prevalent than market-focused ones in the high-tech industry. As a result, they often fail to recognise and capitalise on the demand they have generated. They are by no means the only ones to do so, as acetaminophen and the Seiko watch demonstrate.

The personal computer, the global watch market, or a market this size for pain alleviation are the finest candidates for creative copying since it targets market supremacy. Yet, the plan calls for a smaller market than "Fustest with the Mostest." It poses less dangers. When inventive imitators start their work, there will be 224 entrepreneurial strategies."Hit Them Where They Ain't" has already identified the market and generated the demand. Creative mimicry, however, makes up for what it lacks in danger with needs for vigilance, adaptability, readiness to accept the market's judgement, and most importantly, vast amounts of labour and effort.

Bell Labs created the transistor in 1947. The transistor would eventually replace the vacuum tube, particularly in consumer electronics like the radio and the brand-new television set, it was immediately recognized. Everyone was aware of this, yet nobody took any action. The top manufacturers, who were all Americans at the time, started researching the transistor and preparing for conversion "sometime around 1970." They said that the transistor "would not be ready" until then. Outside of Japan, Sony was almost unknown and didn't even make consumer devices at the time[6].

But, Sony's president Akio Morita had read about the transistor in the press. As a consequence, he travelled to the US and paid Bell Laboratories a preposterous amount of $25,000 to get a licence for the new transistor. Two years later, Sony released the first portable transistor radio, which was less than one-fifth the weight and cost of similar vacuum tube radios already on the market. Sony dominated the market for low-cost radios in the United States three years later, and the Japanese eventually controlled the radio business globally.

Of course, this is a typical instance of the unexpected success being rejected. The transistor was rejected by Americans because it was "not created here," or by the leading electrical and electronic companies, RCA and G.E. That is a classic illustration of taking satisfaction in working hard. The big Super Heterodyne sets from that era, which were such engineering wonders, were the pride of the Americans. They considered silicon chips to be inferior to them, if not really beneath their dignity.

The actual narrative, though, is not Sony's triumph. How can we account for the fact that the Japanese used the same tactic again with great results, surprise the Americans each time? They did the same thing with televisions, digital watches, and portable calculators. They did 225 times it with copiers when they entered the market and displaced the industry's original creator, the Xerox Corporation, with copiers. In other words, the Japanese have had continuous success using "entrepreneurial judo" against the Americans[7].

Yet MCI and Sprint also did so when they took a significant portion of the long-distance business from the Bell Telephone System (AT&T) using AT&T's own price. In the same manner, ROLM did the same when it utilised Bell System regulations against it to capture a sizable portion of the private branch exchange (PBX) market. And Citibank did the same when it

established the "Familienbank" (Family Bank), a consumer bank in Germany that quickly grew to dominate German consumer finance.

The German banks were aware that common people had gained buying power and had evolved into attractive customers. They pretended to provide financial services to customers. Yet they didn't truly want them. They believed that consumers were beneath the dignity of a large bank, with its wealthy investment clientele and corporate clients. Customers should have an account with the postal savings bank if they ever require one. The banks made it clearly plain to customers entering the opulent offices of the local branch that they had little need for them, notwithstanding anything to the contrary in their ads.

When Citibank established its German Familienbank, which specialised only to individual users, created the services they required, and made it simple for consumers to transact with a bank, it took advantage of this opportunity. Although though there is a big bank branch on every downtown street and the German banks are very strong and well-established, Citibank's Familienbank managed to overtake them in the German consumer banking market within five years or so.

The Japanese, MCI, ROLM, and Citibank were all newcomers who engaged in "entrepreneurial judo." Entrepreneurial judo is by far the least risky and most likely to succeed of all entrepreneurial methods, particularly those intended at gaining leadership and domination in a market or sector. Every police officer is aware that a habitual criminal will always carry out his crime in the same manner, whether that involves breaking into a safe or a building he intends to rob. His "signature," which is as unique and identifiable as a fingerprint, is what he leaves behind[8]. Businesses and industries are as well. Even when the behavior repeatedly results in market and leadership loss, it will be continued. The American manufacturers remained in the practices that allowed the Japanese to repeatedly monopolies their market. Even if the offender is apprehended, he seldom admits that his habit has failed him. Instead, he will come up with a variety of justifications and keep up the behavior that resulted in his arrest.

Similar to individuals, firms that are compromised by their habits won't acknowledge it and will come up with all sorts of justifications. For instance, the US electronics producers blame Japan's "cheap labour costs" for their success. Despite paying American wages and union benefits, the few American manufacturers who have accepted reality like RCA and Magnavox in the television industry are able to produce goods in the United States at prices that are competitive with those of the Japanese and that are also competitive in terms of quality. The success of Citibank's Familienbank is often attributed to its willingness to take risks that their own banks would not. Nonetheless, Familienbank has less credit loss on consumer loans than German banks, while having equally stringent lending standards. Of course, the German banks are aware of this. Nevertheless they continue to justify Familienbank's prosperity and their own failure. This is standard. It also explains why the same tactic, or entrepreneurial judo, may be used again. In particular, there are five pretty typical poor behaviors that newcomers might utilize to their advantage in order to apply entrepreneurial judo and overtake entrenched, established businesses.

1. The first is what's known as "NIH" in American slang ("Not Invented Here"), which refers to the hubris that makes a business or an industry think that anything new can't be excellent unless they themselves came up with it. As a result, the new discovery gets rejected, much as American electronics makers did with the transistor.
2. The second is the propensity to "milk" a market, or seize the lucrative portion of it. This is essentially what Xerox did, which made it a target for Japanese copying machine copycats. Xerox concentrated on large users, those that purchased pricey, high-performance equipment in huge quantities or at a premium price it did not go after them. It specifically did not think it appropriate to serve them. In the end, Xerox's smaller clients were open to other companies' equipment because of their discontent with the service—or rather, lack of service Xerox delivered[9].

The practise of "creaming" goes against fundamental management and financial principles. Market loss always serves as punishment. Xerox was savoring its success. These were significant and highly deserved, but no corporation ever receives compensation for prior performance. 'Creaming' efforts to collect payment for prior donations. If a company develops such habit, it is likely to keep doing so and remain open to entrepreneurial judo. The belief in "quality," the third harmful habit, is far more crippling. A product or service's "quality" is not determined by the source.

What the consumer receives and is prepared to pay for is what matters. Contrary to what manufacturers generally think, a product is not "excellent" just because it is expensive and difficult to produce. It is ineptitude. Consumers only pay for things that are useful to them and provide value. Anything else is not "excellent."

The American electronics makers in the 1950s claimed that their goods with all those magnificent vacuum tubes were "quality" since they had put in thirty years of work making radio sets more intricate, larger, and more costly. They saw the product as "quality" since it required a lot of talent to produce, as opposed to a transistor radio, which is straightforward and can be produced by unskilled workers on an assembly line. Nonetheless, the transistor radio is unquestionably far better "quality" in terms of consumers.

It may be brought on a vacation to the beach or to a picnic since it is significantly less in weight. As there are no tubes to repair, problems are uncommon. That is much less expensive. And very quickly it outperformed even the most exquisite Super Heterodyne with sixteen vacuum tubes, one of which invariably burnt out exactly when it was required in terms of range and fidelity. Since J. B. Say in France and David Ricardo in England at the beginning of the nineteenth century, economists have recognised that the only method to increase a profit margin short of creating a monopoly is by lowering expenses. There is always an effort to increase the profit margin by raising the price.

Listen to "Strike Them Where They Ain't". It covers the rival with an umbrella. What seems to be better earnings for the incumbent leader is really a subsidy to the newcomer who will overthrow the leader and take the throne for himself in a relatively short period of time. "Premium" pricing should always be seen as a threat and serious vulnerability rather than a cause

for celebration and a justification for a higher stock price or higher price/earnings multiple. There is a fifth terrible behaviour that is characteristic of established companies and ultimately brings them to ruin. A classic illustration of this is Xerox. Instead of optimising, they maximise. They strive to please each and every customer with the same product or service as the market expands and changes.

For example, a new analytical tool is being launched to evaluate chemical reactions. At first, let's say to industrial labs, its market is fairly constrained. Yet, as time goes on, hospitals, research facilities, and university labs all start to purchase the gadget, albeit each has somewhat different requirements. The maker then adds another function to suit a different consumer, and so on, until what was first a simple instrument has evolved into a complex one. The capabilities of the instrument have been enhanced by the maker. The instrument no longer satisfies anybody as a consequence. Because when one tries to please everyone, they inevitably end up pleasing nobody. The device is now pricey, difficult to operate, and difficult to maintain. Yet, the maker is quite proud of the product; in fact, his full-page advertising mentions 64 various things it is capable of.

This manufacturer will very probably fall prey to business judo. His perceived strength will really work against him. The newcomer will enter the market with a product made for one of the markets, like a hospital. There won't be a single function that hospital patients won't use on a daily basis. Nonetheless, everything the hospital needs will be available, and it will be able to function at a greater level than the multipurpose instrument is capable of. The same manufacturer will then release a model specifically for the research lab, for the government laboratory, and for industry. In no time at all, the newcomer will have completely taken over the markets with instruments that are tailored for their users, instruments that optimize rather than maximize[10].

Similar to how the Japanese, who were competing with Xerox at the time with their copiers, created equipment for certain user groups, such as the tiny office of a dentist, doctor, or school principal. They did not attempt to mimic the characteristics of which the Xerox employees themselves were most proud, such as the machine's speed or the copy's clarity. They offered the little office the low-cost, straightforward gadget that it most desperately required. And after being established in that market, they expanded into the other areas, each with a product created to best suit a certain market niche. Similar to other companies, Sony started out by selling inexpensive, short-range portable radios at the bottom end of the radio market. After becoming established there, it expanded into other market sectors.

In the same manner that the Germans did not launch a counterattack when Citibank launched its Familienbank, entrepreneurial judo attempts to first construct a beachhead that the established leaders either do not defend at all or fight only half-heartedly. After that beachhead has been established, or once the newcomers have a sufficient market and a sufficient source of income, they go on to the remaining "beach" and eventually the whole "island." They use the same tactic in every situation. They provide a product or service that is ideal for and customized to a certain market niche. And they are seldom outplayed in this game by the established leaders. Seldom do the incumbent leaders succeed in altering their own conduct prior to the newcomers assuming control and gaining supremacy.

The first is the typical scenario in which the established leaders choose to ignore or attempt to brush off the unexpected, whether it be success or loss. This was the weakness Sony exploited. The Xerox issue is the second circumstance. A brand-new technology is developing quickly. But, the entrepreneurs who introduced the new technology or service to the market act like the traditional "monopolists" they take advantage of their dominant position to "milk" the market and command "premium" pricing. They are either ignorant of or unwilling to accept what has been plainly demonstrated: that a position of leadership.

Before a rival may lower prices, a charitable monopolist does so. Moreover, he replaces his product with a new one before a rival can do so, making both products outdated. There are sufficient instances like this in the world to support the veracity of the concept. That is how the American Bell Telephone System (AT&T) used to operate until the inflationary issues of the 1970s overwhelmed it, as well as how the DuPont Corporation has operated for many years. But, if the leader attempts to increase profit margins or pricing other than through cutting costs, he puts himself in a position where he may be defeated by someone using entrepreneurial judo[11].

Similar to this, a leader in a quickly expanding new industry or new technology who opts for maximization over optimization would inevitably leave themselves open to judo from the world of business. The Familienbank narrative illustrates how entrepreneurial judo may be effective when market or industry structure changes quickly. In the 1950s and 1960s, when Germany saw economic growth, regular people started using financial services other than typical mortgages and savings accounts. Nonetheless, German banks remained in their familiar markets.

Technology could be the place to start, as it was when Akio Morita journeyed to the US from a Japan that had just begun to recover from World War II's devastation to get a transistor licence. Morita focused on the market for portables, which the current technology had the least success in satisfying because to the weight and brittleness of vacuum tubes. He then created the ideal radio for that market, which consisted of young people with little financial resources but also straightforward requirements for the instrument's range and sound quality a market that, in other words, the outdated technology was unable to successfully service.

Similar to this, long-distance discounters in the US developed a service initially for a relatively small number of substantial businesses that were too small to develop their own long-distance system but large enough to have high long-distance bills. To use the entrepreneurial judo technique, one must first analyse the market, the manufacturers and suppliers, their behaviors particularly their negative behaviors and their policies. Yet, one then turns their attention to the marketplace in an effort to identify the situation in which a different tactic would be most successful and encounter the least opposition[12].

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CHAPTER 17

THE IMPORTANCE AND DIVERSITY OF ECOLOGICAL NICHES IN ECOSYSTEMS

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The objective of the entrepreneurial tactics that have been described thus far is to propose an innovation. The innovation in the entrepreneurial strategy covered in this chapter is found in the strategy itself. It's possible that the item or service it sells has a lengthy history. Time the postal service in our first case was over two thousand years old. Yet, the tactic reinvents this dated, well-established product or service. It alters its economic qualities, usefulness, and value. Physically, nothing has changed, yet there have been new and distinct economic developments. One thing unites all of the tactics that will be covered in this chapter. They produce a consumer, which is the ultimate goal of every commercial or economic endeavor. English schoolboys used to be taught that Rowland Hill "invented" \the postal service in 1836. That is nonsense, of course. The Rome of the Caesars had an excellent service, with fast couriers carrying mail on regular schedules to the furthest corners of the Empire. A thousand years later, in 1521, the German emperor Charles V, in true Renais- As was first said more than thirty years ago in my The Practice of Management[1].

Their generous campaign contributions had enabled him to bribe enough German Electors to win the imperial crown and the princes of Thurn and Taxis still provided the postal service in many parts of Germany as late as 1866, as stamp collectors know. By the middle of the seventeenth century, every European country had organized a postal service on the German model and so had, a hundred years later, the American colonies. Indeed, all the great letter-writers of the Western tradition, from Cicero to Madame de Sévigné, Lord Chesterfield, and Voltaire, wrote and posted their letters long before Rowland Hill "invented" the postal service.

Yet Hill did indeed create what we would now call "mail." He contributed no new technology and not one new "thing," nothing that could conceivably have been patented. But mail had always been paid for by the addressee, with the fee computed according to distance and weight. This made it both expensive and slow. Every letter had to be brought to a post office to be weighed. Hill proposed that postage should be uniform within Great Britain regardless of distance; that it be prepaid; and that the fee be paid by affixing the kind of stamp that had been used for many years to pay other fees and taxes. Overnight, mail became easy and convenient; indeed, letters could now be dropped into a collection box. Immediately, also, mail became absurdly cheap. The letter that had earlier cost a shilling or more and a shilling was as much as a craftsman earned in a daynow cost only a penny. The volume was no longer limited. In short, "mail" was born[2].

Hill created utility. He asked: What do the customers need for a postal service to be truly a service to them? This is always the first question in the entrepreneurial strategy of changing

utility, values, and economic characteristics. In fact, the reduction in the cost of mailing a letter, although 80 percent or more, was secondary. The main effect was to make using the mails convenient for everybody and available to everybody. Letters no longer had to be confined to "epistles." The tailor could now use the mail to send a bill. The resulting explosion in volume, which doubled in the first four years and quadrupled again in the next ten, then brought the cost down to where mailing a letter cost practically nothing for long years. Price is usually almost irrelevant in the strategy of creating utility. Changing Values and Characteristics purpose. It works because it asks: What is truly a "service," truly a "utility" to the customer? Every American bride wants to get one set of "good china." A whole set is, however, far too expensive a present, and the people giving her a wedding present do not know what pattern the bride wants or what pieces she already has. So they end up giving something else.

The demand was there, in other words, but the utility was lacking. A medium-sized dinnerware manufacturer, the Lenox China Company, saw this as an innovative opportunity. Lenox adapted an old idea, the "bridal register," so that it only "registers" Lenox china. The bride-tobe then picks one merchant whom she tells what pattern of Lenox china she wants, and to whom she refers potential donors of wedding gifts. The merchant then asks the donor: "How much do you want to spend?" and explains: "That will get you two coffee cups with saucers." Or the merchant can say, "She already has all the coffee cups; what she needs now is dessert plates." The result is a happy bride, a happy wedding-gift donor, and a very happy Lenox China Company. Again, there is no high technology here, nothing patentable, nothing but a focus on the needs of the customer. Yet the bridal register, for all its simplicity or perhaps because of it has made Lenox the favorite "good china" manufacturer and one of the most rapidly growing of medium-sized American manufacturing companies[3].

Creating utility enables people to satisfy their wants and their needs in their own way. The tailor could not send the bill to his customer through the mails if it first took three hours to get the letter accepted by a postal clerk and if the addressee then had to pay a large sum perhaps even as much as the bill itself. Rowland Hill did not add anything to the service. It was performed by the same postal clerks using the same mail coaches and the same letter carriers. And yet Rowland Hill's postal service was a totally different "service." It served a different function.

King Gillette did not invent the safety razor; dozens of them were patented in the closing decades of the nineteenth century. Until 1860 or 1870, only a very small number of men, the aristocracy and a few professionals and merchants, had to take care of their facial hair, and they could well afford a barber. Then, suddenly, large numbers of men, tradesmen, shopkeepers, clerks, had to look "respectable." Few of them could handle a straight razor or felt comfortable with so dangerous a tool, but visits to the barber were expensive, and worse, time-consuming. Many inventors designed a "do-it-yourself" safety razor, yet none could sell it. A visit to the barber cost ten cents and the cheapest safety razor cost five dollars an enormous sum in those days when a dollar a day was a good wage.

Gillette's safety razor was no better than many others, and it was a good deal more expensive to produce. But Gillette did not "sell" the razor. He practically gave it away by pricing it at fifty-five cents retail or twenty cents wholesale, not much more than one-fifth of its manufacturing

cost. But he designed it so that it could use only his patented blades. These cost him less than one cent apiece to make: he sold them for five cents. And since the blades could be used six or seven times, they delivered a shave at less than one cent apiece or at less than one-tenth the cost of a visit to a barber.

What Gillette did was to price what the customer buys, namely, the shave, rather than what the manufacturer sells. In the end, the captive Gillette customer may have paid more than he would have paid had he bought a competitor's safety razor for five dollars, and then bought the competitor's blades selling at one cent or two. Gillette's customers surely knew this; customers are more intelligent than either advertising agencies or Ralph Nader believe. But Gillette's pricing made sense to them. They were paying for what they bought, that is, for a shave, rather than for a "thing." And the shave they got from the Gillette razor and the Gillette razor blade was much more pleasant than any shave they could have given themselves with that dangerous weapon, the straight-edge razor, and far cheaper than they could have gotten at the neighborhood barber's.

One reason why the patents on a copying machine ended up at a small, obscure company in Rochester, New York, then known as the Haloid Company, rather than at one of the big printing-machine factures, was that none of the large established manufacturers saw any possibility of selling a copying machine. Their calculations showed that such a machine would have to sell for at least $4,000. Nobody was going to pay such a sum for a copying machine when carbon paper cost practically nothing. Also, of course, to spend $4,000 on a machine meant a capital-appropriations request, which had to go all the way up to the board of directors accompanied by a calculation showing the return on investment, both of which seemed unimaginable for a gadget to help the secretary. The Haloid Company the present Xerox did a good deal of technical work to design the final machine. But its major contribution was in pricing. It did not sell the machine; it sold what the machine produced, copies. At five or ten cents a copy, there is no need for a capital-appropriations request. This is "petty cash," which the secretary can disburse without going upstairs. Pricing the Xerox machine at five cents a copy was the true innovation[4].

Most suppliers, including public-service institutions, never think of pricing as a strategy. Yet pricing enables the customer to pay for what he buys a shave, a copy of a document rather than for what the supplier makes. What is being paid in the end is, of course, the same amount. But how it is being paid is structured to the needs and the realities of the consumer. It is structured in accordance with what the consumer actually buys. And it charges for what represents "value" to the customer rather than what represents "cost" to the supplier. The worldwide leadership of the American General Electric Company (G.E.) in large steam turbines is based on G.E.'s having thought through, in the years before World War I, what its customers' realities were. Steam turbines, unlike the piston-driven steam engines which they replaced in the generation of electric power, are complex, requiring a high degree of engineering in their design, and skill in building and fitting them. This the individual electric power company simply cannot supply. It buys a major steam turbine maybe every five or ten years when it builds a new power station. Yet the skill has to be kept in being all the time. The manufacturer, therefore, has to set up and maintain a massive consulting organisation.

But, as G.E. soon found out, the customer cannot pay for consulting services. Under American law, the state public utility commissions would have to allow such an expenditure. In the opinion of the commissions, however, the companies should have been able to do this work themselves. G.E. also found that it could not add to the price of the steam turbine the cost of the consulting services which its customers needed. Again, the public utility commissions would not have accepted \sit. But while a steam turbine has a very long life, it needs a new set of blades fairly often, maybe every five to seven years, and these blades \shave to come from the maker of the original turbine. G.E. built up the world's foremost consulting engineering organisation on electric power stations though it was careful not to call this consulting engineering but "apparatus sales" for which it did not charge. Its steam turbines were no more expensive than those of its competitors. But it put the added cost of the consulting organisation plus a substantial profit into the price it charged for replacement blades. Within ten years all the other manufacturers of steam turbines had caught on and switched to the same system. But by then G.E. had world market leadership.

Much earlier, during the 1840s, a similar design of product and process to fit customer realities led to the invention of installment buying. Cyrus McCormick was one of many Americans who built a harvesting machine the need was obvious. And he found, as had the other inventors of similar machines, that he could not sell his product. The farmer did not have the purchasing power[5]. That the machine would earn back what it cost within two or three seasons, everybody knew and accepted, but there was no banker then who would have lent the American farmer the money to buy a machine. McCormick offered installments, to be paid out of the savings the harvester produced over the ensuing three years. The farmer could now afford to buy the machine and he did so.

Manufacturers are wont to talk of the "irrational customer" as do economists, psychologists, and moralists. But there are no "irrational customers." As an old saying has it, "There are only lazy manufacturers." The customer has to be assumed to be rational. His or her reality, however, is usually quite different from that of the manufacturer. The rules and regulations of public utility commissions may appear to make no sense and be purely arbitrary. For the power companies that have to operate under them, they are realities nonetheless. The American farmer may have been a better credit risk than American bankers.But it was a fact that American banks of that period did not advance money to farmers to purchase equipment. The innovative strategy consists in accepting that these realities are not extraneous to the product, but are, in fact, the product as far as the customer is concerned. Whatever customers buy has to fit their realities, or it is of no use to them.

The last of these innovative strategies delivers what is "value" to the customer rather than what is "product" to the manufacturer. It is actually just one step beyond the approach of acknowledging the customer's reality as part of the product and part of what the customer buys and pays for. A medium-sized company in America's Midwest supplies more than half of all the special lubricant needed for very large earth-moving and hauling machines: the bulldozers and draglines used by contractors building highways; the heavy equipment used to remove the overlay from strip mines; the heavy trucks used to haul coal out of coal mines; and so on. This firm is in

rivalry with some of the biggest oil companies, which can deploy full battalions of lubrication experts. By not selling any lubricating oil at all, it competes. Instead, it offers what is essentially insurance for sale. Lubrication is not "worth" to the contractor; rather, it is using the machinery. The contractor loses more money every hour that a piece of heavy machinery breaks down than he does in lubricants over the course of a year[6].

Contractors must calculate the deadline as precisely as possible and work quickly to win the contract since failing to meet deadlines in any of these tasks has a severe penalty. The Midwest lubricant manufacturer provides contractors with a study of their equipment's maintenance requirements. Then it offers customers a maintenance package for an annual fee, with a guarantee that the subscribers' heavy machinery won't be shut down for more than a certain amount of hours each year due to lubrication issues. Naturally, the software always suggests using the oil recommended by the manufacturer. But contractors do not buy this. They are investing much on operations that are trouble-free.

The last example, which may be referred to as "going from product to system," is Herman Miller, an American furniture manufacturer located in Zeeland, Michigan. The Eames chair, an early modern design, is one of the things that made the business famous. Eventually, when every other producer started producing designer chairs, Herman Miller expanded into producing and marketing whole offices as well as workstations for hospitals, both of which were highly successful. Finally, as the "office of the future" started to emerge, Herman Miller established the Facilities Management Institute. This organisation doesn't even sell furniture or equipment, instead giving businesses advice on the furniture and office layouts that will result in the best work flow, highest productivity, and highest employee morale at the lowest possible cost. Herman Miller is helping the client define "value" in their products. "You may pay for furniture, but you are purchasing labor, morale, and productivity," it is saying to the consumer. And as a result, this is what you ought to be paying for[7].

These illustrations are probably seen as apparent. These and other ideas would have undoubtedly been thought of by anybody with even a modicum of brains. David Ricardo, the founder of systematic economics, is said to have once observed, "Profits are produced by differential folly, not differential genius." The techniques succeed because the majority of suppliers of products and services, corporations and public-service organizations do not think, not because they are brilliant. Since they are so "obvious," they are effective. Then why are they so uncommon? For, as these illustrations demonstrate, whomever asks the question "What does the buyer truly buy?" will triumph. Because no one else is competing, it is not really a race. What justifies that?

The economists' view of "value" is one of the causes. Every economics textbook makes the point that consumers purchase a "service" rather than a "product" in order to benefit from it. The "price" for the product, which is defined as the amount the consumer pays to acquire ownership of a good or service, is then the only factor included in any economics book moving forward. The function of the product for the client is never again discussed. Regrettably, suppliers whether of goods or services have a tendency to go along with what the economists say. The statement "Product A costs X dollars" has significance. "We have to receive Y dollars for the product to pay our own expenses of production and have enough left over to cover the cost of capital, and

by doing so to demonstrate an appropriate profit," is a relevant statement. But that is absurd.The buyer must pay the flat amount of Y dollars in cash for each unit of product a he purchases, without changing the values or characteristics in any way. Instead, the justification should read: "What the client pays for each component of the product needs to translate into Y dollars for us. Yet, the consumer will pay according to his own preferences. Depending on what the product does for the consumer. Depends on what corresponds to his reality. Depending on what the buyer considers to be "value.Price by itself is neither "pricing" nor "value." This epiphany allowed General Electric to dominate the world in steam turbines and allowed the small Haloid Corporation to grow into the multibillion-dollar Xerox Company in only 10 years. It also gave King Gillette a near stranglehold on the shaving business for over forty years.

Yet they earned their success. They received payment for satisfying their consumers, for supplying them with the goods they requested, or, to put it another way, for providing them with value for their money. Most readers will object, "But this is just basic marketing," and they are correct. Simple marketing principles are all that it is. Marketing is all about starting with the consumer's utility, what the customer buys, what the customer's realities are, and what the customer values are. Yet I'm at a loss as to why, after forty years of preaching, teaching, and professing marketing, so few suppliers are ready to follow[8].

The truth is that, so far, anybody who is prepared to employ marketing as the cornerstone of their strategy is likely to gain industry or market leadership quickly and essentially risk-free. As vital as deliberate innovation and entrepreneurial management are entrepreneurial tactics. These three concepts together comprise innovation and entrepreneurship. Just a few relatively obvious techniques are offered, and there aren't many of them. Yet, describing particular entrepreneurial techniques is harder than describing deliberate innovation and entrepreneurial management. We are aware of the areas and methods for identifying and analyzing creative prospects. There are proper policies and practices to make an existing firm or public institution capable of entrepreneurship, as well as incorrect policies and practices; there are also proper and incorrect actions to take while starting a new business. Yet, the entrepreneurial approach that suits a particular invention is a high251 risk one.

Certain business tactics work better under certain circumstances, such as the one I dubbed entrepreneurial judo, which is the preferred course of action when the top companies in a particular sector continue to act arrogantly and defiantly year after year. We may outline the common benefits and typical drawbacks of several entrepreneurial approaches. Above all, we are aware that the more an entrepreneurial approach is based on the users their needs, values, and realities the greater the likelihood that it will succeed. A market or social shift is an innovation. It generates a better value or greater happiness for the consumer as well as a larger return for the community as a whole. What a new idea does for the user is always the true test of a new idea. As a result, entrepreneurship must always be market-driven and market-focused. Nonetheless, entrepreneurial strategy continues to be the risk-taking and decision-making aspect of entrepreneurship. That is not at all a guess or a bet. Yet it is also not exact science. That is judgment instead.

Offering the same item or service for less money is often not acceptable. It must have a feature that sets it apart from what is currently in existence. In order to compete with AT&T, the ROLM Corporation included extra capabilities based around a tiny computer in their private branch exchange a switchboard for business and office customers. They weren't really innovative or high-tech. In fact, AT&T had created identical functions on its own. Yet, ROLM pushed them while AT&T refrained. Similar to this, when Citibank established the Familiebank in Germany, it added several cutting-edge services that German banks typically did not provide to small customers, including traveler's checks or tax guidance. In other words, it is not sufficient for the newcomer to merely do the same tasks as the established leader at a lesser cost or with superior service. The newbies must distinguish themselves.

Entrepreneurial judo strives to achieve leadership position and ultimately supremacy, much like being "Fustest with the Moistest" and engaging in innovative mimicry. Yet, it doesn't do so by going up against the leaders at least not when the leaders are aware of or concerned about the competitive threat. Judo for business "Hits Them Where They Ain't."The Entrepreneurial Business down the hierarchy. They should never report to line managers charged with responsibility for ongoing operations.

This will be considered heresy in most companies, particularly "well-managed" ones. But the new project is an infant and will remain one for the foreseeable future, and infants belong in the nursery. The "adults," that is, the executives in charge of existing businesses or products, will have neither time nor understanding for the infant project. The company had the basic patents on machine tools for automated mass production. It had excellent engineering, an excellent reputation, and first-rate manufacturing. Everyone in the early years of factory automation around 1975expected it to emerge as the leader. Ten years later it had dropped out of the race entirely. The company had placed the unit charged with the development of machine tools for automated production three or four levels down in the organisation, and had it report to people charged with designing, making, and selling the company's traditional machine-tool lines.

These people were supportive; in fact, the work on robotics had been mainly their idea. But they were far too busy defending their traditional lines against a lot of new competitors such as the Japanese, redesigning them to fit new specifications, demonstrating, and marketing, financing, and servicing them. Whenever the people in charge of the "infant" went to their bosses for a decision, they were told, "I have no time now, come back next week." Robotics were, after all, only a promise; the existing machine-tool lines produced millions of dollars each year[9]. The best, and perhaps the only, way to avoid killing off the new by sheer neglect is to set up the innovative project from the start as a separate business.

The best known practitioners of this approach are three American companies: Procter & Gamble, the soap, detergent, edible oil, and food producer a very large and aggressively entrepreneurial company; Johnson & Johnson, the hygiene and health-care supplier; and 3M, a major manufacturer of industrial and consumer products. These three companies differ in the details of practice but essentially all three have the same policy. They set up the new venture as a separate business from the beginning and put a project manager in charge[10]–[12].

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CHAPTER 18

OPTIMIZING PRODUCT DEVELOPMENT THROUGH MINIMUM VIABLE PRODUCT STRATEGY: A COMPARATIVE ANALYSIS OF SUCCESSFUL IMPLEMENTATIONS

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In today's fast-paced business environment, product development has become more challenging than ever before. Companies are under constant pressure to deliver innovative products that meet customer needs, while staying within tight budgets and timelines. In this context, the concept of Minimum Viable Product (MVP) has gained significant attention in recent years.An MVP is a product with just enough features to satisfy early customers and provide feedback for future product development. The idea behind an MVP is to create a working prototype with minimum features, launch it in the market, and gather feedback from early users to refine the product before investing heavily in additional features or marketing efforts.The concept of MVP was first introduced by Eric Ries, in his book "The Lean Startup". The Lean Startup methodology emphasizes the importance of validating a business idea quickly and cost-effectively, before committing significant resources to it. By creating an MVP, startups can test their hypotheses and refine their product based on customer feedback, without wasting time and money on building a full-featured product that might not meet market needs.

MVPs have become increasingly popular in the tech industry, where companies are constantly trying to innovate and stay ahead of the competition. However, the MVP approach is not limited to the tech industry and can be applied to any product development process. By focusing on the core features that solve a specific problem for customers, companies can build products that are more likely to succeed in the market.

Companies are always looking for ways to innovate and create products that meet customer needs. However, the traditional product development process can be time-consuming, expensive, and risky. Many products fail in the market because they do not solve a specific problem or meet customer needs. This is where the concept of Minimum Viable Product (MVP) comes into play [1].MVP is a strategy that focuses on building a product with minimum features that solve a specific problem for customers. The idea is to create a working prototype, launch it in the market, and gather feedback from early users to refine the product before investing heavily in additional features or marketing efforts. The MVP approach is rooted in the Lean Startup methodology, which emphasizes the importance of validating a business idea quickly and cost-effectively before committing significant resources to it.

One of the main benefits of the MVP approach is that it allows companies to test their hypotheses and refine their product based on customer feedback. This reduces the risk of building a full-featured product that might not meet market needs. By focusing on the core features that solve a specific problem for customers, companies can build products that are more

likely to succeed in the market [2], [3]. Additionally, the MVP approach can help companies save time and money by avoiding the development of unnecessary features and reducing the time-to-market.The MVP approach is particularly popular in the tech industry, where companies are constantly trying to innovate and stay ahead of the competition. Many successful startups, such as Dropbox and Airbnb, have used the MVP approach to launch and refine their products. For example, Dropbox launched its MVP as a video that demonstrated the core functionality of the product. The company received a significant amount of interest and signups from early adopters, which validated the need for the product and provided valuable feedback for future development.

Despite the benefits of the MVP approach, there are also some challenges associated with it. One of the main challenges is deciding what features to include in the MVP. It can be challenging to determine which features are essential and which are nice-to-have. Additionally, companies may face challenges in communicating the value proposition of an MVP to potential investors or customers.

To overcome these challenges, companies should follow some best practices for implementing an MVP strategy. First, companies should focus on identifying a specific problem or pain point for customers and build a solution that addresses that problem. This will help ensure that the MVP has a clear value proposition and is more likely to attract early adopters. Second, companies should prioritize features based on customer feedback and usage data. This will help ensure that the MVP is focused on the most important features and provides the best possible user experience. Finally, companies should be transparent about their MVP strategy and communicate the value proposition of the product to potential investors and customers.

The last ten years have seen a maturation in our knowledge of mitochondrial function. Almost all intracellular activities are also given cellular energy in the form of ATP. In ion homeostasis, programmed cell death, and adaptive thermogenesis, mitochondria play crucial roles. Many pathophysiological processes, including ageing, neurodegenerative disorders, diabetes and obesity, and infertility, have been linked to mitochondrial malfunction.

The function of mitochondria in oocytes just before fertilization and through the blastocyst stage will be outlined in this review. In light of animal research and our growing knowledge of mitochondrial function, the issues surrounding cytoplasmic and mitochondrial transfer will be reexamined to see whether it may be used to enhance reproductive results.

The maternally inherited organelles known as mitochondria produce ATP for cellular energy needs via highly efficient oxidative phosphorylation processes. These are extinct forms of bacteria that once infected the cells of our ancestors, around a billion years ago. Almost all eukaryotic cells include these organelles, which have their own DNA and are found in the cytoplasm [4], [5]. The circular, double-stranded mitochondrial genome is around 16.7 kb long. Human mitochondrial DNA is similar to prokaryotic DNA in that it lacks introns.

The cell cycle is not necessary for the replication of the mitochondrial DNA. Enzymes involved in (aerobic) oxidative phosphorylation are encoded by this DNA. Compared to the (anaerobic) glycolytic route, this procedure offers a more effective approach to produce ATP all of which are

involved in the oxidative phosphorylation pathway, 22 transfer RNAs, and two ribosomal RNAs are all encoded by the mitochondrial genome. The nucleus's signals play a significant role in regulating how these gene products are expressed. Nuclear DNA-encoded proteins are transported into mitochondria to regulate their activity in a tissue-specific manner. The proper protein-protein and protein-DNA interactions are necessary for all of these nuclear-encoded proteins to detect certain DNA sequences.

The nuclear genome generates mitochondrial regulatory elements that are transported into the mitochondria to start DNA replication and transcription as well as the growth of the mitochondrial network as cellular demand rises. ADP and NADPH, the precursors needed for the production of ATP, as well as the presence of cell-specific mitochondrial transcription factors encoded in nuclear DNA provide control over mitochondrial activity. Less ATP is created when NADPH levels drop.In this manner, both the availability of substrates and the much-specialized communication between the mitochondrial and nuclear genomes control mitochondrial activity. The production of ATP from dietary sources is the most well-known function of mitochondria. The mitochondria use pyruvate, which they make from glucose, to make ATP. Reactive oxygen species (ROS), which are locally released by mitochondria when they make ATP and may cause oxidative damage to mitochondrial DNA, must be detoxified.Its vulnerability to oxidative stress-induced damage may be explained by the relative lack of repair enzymes for DNA. Due to its closeness to ROS formation and insufficient DNA repair ability, mitochondrial DNA is thought to have a 10- to 20-fold greater mutation rate than nuclear DNA [9, 10]. The mitochondrial genome is more exposed to ROS as an organism, tissue, and cell age. This impairs this organelle's ability to do its job.

Energy production might be hampered by an accumulation of DNA mutations. The cell's ability to sustain all cellular activities, including typical chromosomal segregation during cell division, is thus diminished. There have been several reports of mitochondrial deletions and mutations. The most frequent is a 4,977 bp deletion that takes place between two 13 bp repetitions and affects the human mitochondrial genome between locations 8,470 and 13,459. A hallmark for ageing is the accumulation of the 4,977 bp deletion in the DNA.

The majority of animals receive their DNA from the population that is present inside the egg at the time of fertilization, in contrast to the nuclear genome, which is passed on to children via Mendelian inheritance patterns. It is crucial that the mother mitochondrial DNA be passed on to the child. The mitochondria transported from the sperm into the egg during fertilization and directed for elimination by the cell's proteasome [6], [7]. This guarantees that the offspring's DNA will only come from the mother. Human sperm have been shown to have many mitochondrial DNA deletions, particularly in older men or males whose sperm is of lower quality. It is likely that transmission of defective paternal mitochondria to the progeny might affect survival. There have been reports of detrimental physiological effects of mitochondrial heteroplasmy in the progeny.

A switch from glycolysis to oxidative phosphorylation is required when the oocyte grows because to the increased energy need. During ovulation, energy requirements are at their highest. The function of the mitochondrial pool existing during ovulation is necessary for the

development of mature (MII) oocytes, fertilized oocytes, and early cleavage stage embryos since embryonic mitochondrial replication does not start until after the hatched blastocyst stage. Hence, any detrimental influence on mitochondrial function (i.e., buildup of DNA mutational burden) would have a deleterious effect on how the preimplantation embryo develops. Debilitating or fatal metabolic illnesses may be inherited from mitochondria with abnormalities in their genome that were present in the oocyte at the time of fertilization.

A cell's activity may frequently be predicted by the quantity of mitochondria present. For instance, compared to other somatic cells, mature oocytes, muscle cells, and neurons all contain several copies of DNA. In order to successfully mature the cytoplasm and nucleus in preparation for fertilization and the end of meiosis II, ATP producing capacity is essential. After fertilization, blastocysts from high-quality oocytes with adequate mitochondrial numbers and sufficient amounts of ATP (at least 2 pM) develop into blastocysts of better quality.

The function of the existing mitochondria is crucial for the development of the embryo after fertilization and up to implantation. Each blast mere's total number of mitochondria drops once cell division gets going owing to dilution and the absence of fresh mitochondrial biogenesis. Early-stage cells do not express the replication factors needed to boost mitochondrial copy levels. The amount of mitochondria per cell dramatically decreases as the fertilized egg develops into a blastocyst. The method for passing on the best quality, homoplastic DNA to the progeny is the bottleneck hypothesis, which states that the hatched blastocyst has extremely few mitochondria per cell.

The ability to replicate DNA is initially acquired by the trophectoderm after implantation, and later by the whole embryo. The mitochondria present in the egg must produce enough ATP to power the first stages of embryonic development in the early stage embryo. It is assumed that the early embryo's energy requirements are attempted to be met by both anaerobic and aerobic respiration. Yet, because of its poor efficiency and end product inhibition, anaerobic respiration cannot be relied upon by the embryo when mitochondrial activity is inadequate.

Numerous species, including humans, have demonstrated the importance of mitochondrial oxidative phosphorylation and ATP production during the early fertilization and preimplantation process. Oocytes from murine, bovine, or pig animals that have had their mitochondrial function disrupted by chemicals exhibit drastically reduced cleavage rates and a higher prevalence of aneuploidy. Oocytes may modify the local mitochondrial density in various intracellular areas to take into account the changing intracellular requirements of the cell Obstetrics and Gynecology International. This characteristic is highlighted by the relocation of mitochondria to spindles and microtubule organizing centers that has been reported.

In the oocyte, mitochondria operate to sequester calcium in addition to provide sufficient energy at the proper intracellular position for cell division and chromosomal segregation (cytoplasmic calcium buffer). Oocyte activation and embryo development after fertilization depend on increases in cytoplasmic free calcium. After sperm adhesion to the egg membrane or sperm injection during ICSI, these calcium oscillations take place. Meiosis II is completed during fertilization, which calls for more ATP [8], [9].

The expression of respiratory chain enzymes that boost ATP synthesis via oxidative phosphorylation is triggered by the increase in calcium flux inside the cell. Interesting quality maintenance is shown by mitochondria. Mitochondria have frequent episodes of fusion and fission, much like prokaryotes. In order to transfer components and preserve or enhance the function of damaged or underperforming members, mitochondria must be active in order to maintain a polarized membrane and merge with other mitochondria [38]. But, if the mitochondrion is not working properly and its membrane is depolarized, it cannot fuse with others that are active and is removed. This procedure reduces the number of ineffective mitochondria and inhibits the mingling of damaged and high-quality mitochondria.

A development that is halted is the consequence of insufficient ATP supply. When assessed at a single time point within a cohort of oocytes, there is significant enterocyte heterogeneity in ATP content. A "snap-shot" of individual oocytes within a cohort may not adequately capture this dynamic process since the cell tightly controls ATP generation. All oocytes really have rather different amounts of mitochondria, indicating that copy number is not the only factor affecting mitochondrial function. To produce the burst of activity needed up to the hatched blastocyst stage, enough levels of mitochondrial activity are needed. Nuclear signals, intracellular ion concentrations, and the availability of substrates tightly control mitochondrial activity.

Many cellular processes that are sparked off by fertilization need sufficient levels of ATP, including microtubule polymerization, cell cycle control, chromosomal segregation, and membrane biosynthesis. Early developmental stoppage and death are linked to inappropriate mitochondrial activity during the pronuclear stage. Given that mitochondria have numerous copies of the DNA and that cells might have hundreds or thousands of mitochondria, a large mutational load may be tolerated before a decline in cellular function becomes obvious. Only when total mitochondrial function falls below a certain threshold does mitochondrial malfunction become apparent.

Final maturation may be stopped or postponed when a follicle and an oocyte are chosen for it but their mitochondrial activity is insufficient. Decreased pregnancy rates are closely correlated with delayed maturation, which may increase the risk of aneuploidy after conception. Maternal age and mitochondrial activity are closely correlated with oocytes and embryonic aneuploidies.

Age-related declines in mitochondrial activity, particularly in no replicating cells like the mature oocyte, are thought to be the root cause of women's fertility rates dropping. The effectiveness of donor oocyte programmed shows that age-related infertility is often caused by low oocyte quality rather than endometrial receptivity.

Age of the mother is linked to more oxidative stress in oocytes, which causes mitochondrial malfunction. Due to this malfunction, which is caused by oxidative damage, deletions, point mutations, and changes in the mitochondrial genome not enough ATP is produced as well as other vital mitochondrial processes that are required after fertilization. Oocyte ageing is caused by general malfunction of many cellular processes common to cellular ageing, such as mitochondria's capacity to produce energy. Hence, the quality of the oocyte as a result of the buildup of DNA damage is predominantly blamed for age-related reproductive failure. The

mitochondrial genome, in contrast to the nuclear genome, performs a subpar proofreading role, allowing a continuous accumulation of mutations and deletions.Studies on obesity provide an illustration of how mitochondrial insufficiency adversely affects fertility. The majority of obese women have infertility issues. The cumulus cell-oocyte complex's mitochondrial activity is changed by obesity. The ovary, oocyte, and surrounding cumulus cells are severely impacted by the combination of elevated lipid and fatty acid content and resulting rise in ROS. Increased mitochondrial damage and reduced function are the effects of this. Oocytes that grow in this setting are less capable of developing normally.

Reduced ATP and decreased DNA copy number are linked to subpar oocyte quality, as well as poor embryo development, subpar implantation rates, and subpar placentation rates [10], [11]. The detrimental consequences of low mitochondrial quality (mutational load) may be more pronounced with decreased numbers of mitochondria. While it may be low enough to allow for normal embryo development, the percentage of mutant/wild-type mitochondria in the oocyte may be the cause of the shockingly large number of kids with mitochondrial illness.

Controlled ovarian hyper stimulation regimens are often used in assisted reproduction to maximize the likelihood of a good result. It has been shown that these methods have a negative impact on oocyte quality. The oocyte's mitochondrial function may be further hampered by gonadotropin-induced hyper stimulation. In comparison to age-matched, unstimulated oocytes, monkey oocytes retrieved after follicle stimulating hormone hyper stimulation exhibit a greater degree of the common deletion. Similar outcomes in mice have also been described.

During the maturation of oocytes, meiosis takes place twice: once during ovulation (meiosis I), and once after fertilization. Final completion of the first meiosis occurs when the mature oocyte is exposed to midcycle LH levels. The construction and breakdown of microtubules is one of the oocyte's most energy-consuming processes. In order for chromosomes to be properly positioned and segregated, this activity is crucial. The formation and dissolution of microtubules is necessary for the chromosomal alignment during metaphase in the oocyte. Aneuploidy or uneven development is more common as the egg matures because its capacity to make sufficient spindle microtubules declines. Meiotic division mistakes may result in aneuploidy, an uneven chromosomal distribution, and no extrusion of the first polar body. In comparison to meiosis I, the second meiosis is more prone to aneuploidy as maternal age increases. For the mouse, comparable results have been published.

The main genetic factor causing spontaneous abortions and developmental problems is aneuploidy of the egg and embryo. Aneuploidy occurs in 2% of eggs from women in their 20s, but it rises sharply to 35% by the time they are 40, and it may even be higher. DNA binding to spindles is necessary for the segregation and migration of chromosomes or chromatids to the proper daughter cell. The incidence of chaotic mosaicism in the preimplantation embryo is inversely correlated with mitochondrial activity. Migration to the proper location inside the cell is a component of competent mitochondrial function that enables the delivery of sufficient energy to nearby organelles.

Mitochondrial abnormalities may hasten follicular atresia and cause early ovarian failure by causing a drop in ATP levels. More precisely, ovarian insufficiency and a loss of function may be connected to lesions in the ATP synthase gene brought on by oxidative stress. There has been evidence of an increase in the DNA deletion in ovarian tissue, oocytes, and embryos, as well as the follicle's surrounding support cells. Moreover, the expression of mitochondrial genes is reduced and the deletion is more prevalent in developmentally arrested embryos and fertilizable oocytes.

Opals from an oocyte supplied by a younger woman was transferred to the oocyte of a reproductively mature woman in an attempt to boost mitochondrial activity at the time of oocyte fertilization. The method of opals transfer was based on a tried-and-true approach for forcing immature oocytes to develop in experimental embryology. When cytoplasmic modification of oocytes and early embryos was shown to be compatible with normal development, this technique was employed with confidence.

Improvements in embryo development, implantation, and live births were seen after donor cytoplasmic transfer during ICSI [76-81]. Patient selection took on account morphological abnormalities and low embryo cleavage rates as well as maternal age, although not exclusively. These elements were thought to be typical of poor mitochondrial activity. This technique was suggested to improve resident mitochondrial activity in damaged oocytes as live births of healthy infants were made possible.

Although the advantage of cytoplasmic transfer in enhancing fertility was noted, problems with the "3 parent genome" emerged. As previously mentioned, the fertilized egg makes a lot of effort to preserve the maternal identity of its mitochondria. The nuclear and mitochondrial genomes communicate extensively, and this interaction enables tight control over mitochondrial activity. The likelihood of heritable mitochondrial illness might potentially be increased by the injection of third-party mitochondria, either whole or with deletions and/or mutations. It has been shown that some infants who were born after receiving cytoplasm from a third party had mitochondrial heteroplasmy.

The US Food and Drug Administration investigated the procedure in 2002 since it wasn't clear how the offspring's health would be affected by having two distinct mitochondrial genomes. They recommended that donor cytoplasm transfer be put on hold till research funded by an authorized Investigational New Drug application are successfully completed. While cytoplasmic transfer utilizing donor material has been proven to increase the effectiveness of IVF, research in mice showed that when equal quantities of diverse populations of mitochondria were created in the oocyte, a variety of physiological defects were seen in the progeny.The two populations of mitochondrial DNA's different responses to nuclear signals may have contributed to metabolic problems in children. Since they are in close contact with the nucleus, mitochondria are best derived from the same female who produced the oocyte. When the progeny of mice with a large burden of mutant mitochondria were studied, similar metabolic abnormalities were found. These investigations on mice showed that the insertion of extra mitochondria may have a deleterious impact on progeny results unless they originate from the same genetic source and are mutation-free.

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CHAPTER 19

EXPLORING LEAN STARTUP METHODOLOGY: STRATEGIES AND IMPLEMENTATION FOR NEW VENTURES

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Startup methodology is a set of practices and strategies that are implemented by entrepreneurs to develop and launch their new ventures. It involves the use of innovative approaches to identify and solve problems, validate ideas, build prototypes, and test products in the market. The main goal of startup methodology is to minimize risks and maximize the chances of success for the new venture. In this article, we will discuss some of the most popular startup methodologies that are used by entrepreneurs to launch their new ventures.

Lean Startup Methodology the Lean Startup methodology is a popular approach that was developed by Eric Ries. It is based on the principle of using the scientific method to develop new ventures. This approach involves developing a minimum viable product (MVP) and testing it in the market to gather feedback from customers. This feedback is then used to refine the product and improve it. The Lean Startup methodology also involves the use of iterative cycles of product development, testing, and refinement.

The main advantage of the Lean Startup methodology is that it helps entrepreneurs to validate their ideas and minimize risks by testing their products in the market. This approach also helps entrepreneurs to develop products that are aligned with the needs of their customers. However, the main disadvantage of the Lean Startup methodology is that it can be time-consuming and expensive to develop and test multiple iterations of a product [1], [2].

Design Thinking Methodology Design Thinking is a problem-solving approach that was developed by the design firm IDEO. It involves the use of empathy, experimentation, and iterative cycles to develop solutions to complex problems. The Design Thinking methodology is based on the principle of understanding the needs of users and developing solutions that meet their needs.

The Design Thinking methodology involves five stages: Empathize, Define, Ideate, Prototype, and Test. In the Empathize stage, the entrepreneur seeks to understand the needs of their customers by observing and engaging with them. In the Define stage, the entrepreneur defines the problem that they are trying to solve. In the Ideate stage, the entrepreneur generates ideas for solving the problem. In the Prototype stage, the entrepreneur builds a prototype of their solution. In the Test stage, the entrepreneur tests the prototype in the market to gather feedback from customers.

The main advantage of the Design Thinking methodology is that it helps entrepreneurs to develop solutions that are aligned with the needs of their customers. This approach also helps entrepreneurs to identify opportunities for innovation and differentiation. However, the main

disadvantage of the Design Thinking methodology is that it can be time-consuming and expensive to develop multiple iterations of a solution.

Agile Methodology Agile methodology is a popular approach that is used in software development. It involves the use of iterative cycles of development, testing, and release to deliver products to customers. The Agile methodology is based on the principle of delivering value to customers quickly and continuously.

The Agile methodology involves four stages: Plan, Develop, Test, and Release. In the Plan stage, the entrepreneur identifies the features that they want to develop. In the Develop stage, the entrepreneur builds the features. In the Test stage, the entrepreneur tests the features to ensure that they work correctly. In the Release stage, the entrepreneur releases the features to customers.

The main advantage of the agile methodology is that it helps entrepreneurs to deliver value to customers quickly and continuously. This approach also helps entrepreneurs to respond to changes in the market and to customer needs. However, the main disadvantage of the agile methodology is that it can be challenging to manage and coordinate multiple teams working on different features.

Locked segments, or geological formations with high bearing capacity (defined by size and strength) along possible slip surfaces, are used to stabilize many slopes all over the globe. A slope like that only becomes unstable when a locked segment is released from lock (fails). The most often locked parts in rock slopes are rock bridges. The Yanchihe slope in Hubei, China, for instance, is located at E117.298° and N31.208°. Locked segments may also be found in Quaternary sedimentary slopes, such as the Longxi slope in the Longyangxia Reservoir region of the Yellow River [3].

Growing displacement of the appropriate slopes might result from the gradual destruction of locked segments. As a result, a broadly uniform displacement pattern is predicted, and it is challenging to understand why the Yanchihe and Longxi slopes' very different displacement patterns changed as they progressed into instability.

The acceleration displacement of the Longie slope was interrupted and then restarted, displaying a stepwise accelerated curve in contrast to the exponential acceleration displacement of the Yanchihe slope.

These patterns are often seen in landslides with locked segments, therefore understanding their associated processes is essential for accurate landslip prediction. Since the origins of these patterns are still unknown, it is impossible to accurately predict whether the displacement acceleration of a locked segment-dominated slope signals an impending landslip.

Depending on the physical characteristics of the materials on the slip surfaces, the transfixion of slip surfaces may be either gradual or immediate. A stepwise accelerated curve cannot be explained by increased cracking of a locked section, but it may lead to an exponentially accelerated displacement curve. It is often believed that the pore-water produces a stepwise accelerated displacement pattern. Due to significant rainfall, geomaterials along a possible slide surface experienced pressure increase and strength deterioration.

The Longxi slope's behavior, however, defied this theory since, although its displacement stayed essentially constant in the midst of severe rainfall in July 1983, significant displacement was seen in May 1984 after less precipitation. Additionally, the 1986 dry season was present when the Longxi landslip took place. These contradictions imply that precipitation may not be the primary element dictating the slope displacement patterns.

Physical modelling experiments on ant dip soft-hard interceded rock slopes reveal that the hard layers confine soft-layer deformation until the hard layers fail, indicating that the interplay of various media on a possible slip surface is crucial to the slope's displacement behavior [4]. The processes corresponding to the two patterns include mechanical synergy between the strong and weak media, which both have unique mechanical characteristics because the potential slip surface of a slope consists of a strong medium (locked section) and a weak medium (transfixion segment). We shall examine this synergy using the two slopes listed above as representative instances.

The fractures linked to create a macro fissure when the slope warped. The major scarp of the landslip, which has a rough shovel form, is on its south side. Between the fissure and interlayer, the enormous dolomite that was mostly unaltered acted as a locked portion. A bottom slide forms on the Longie slope as a result of the saturated water sensitive clay losing strength along the phreatic line. Then, as the slope moved over the slip surface, upper tensile fractures began to form and eventually merged into a macro fissure.

The locked portions eventually suffered damage as a result of shear force and outside influences (e.g., rainfall). When the damage finally reached a critical level, it resulted in unlocking, which was shortly followed by disastrous landslides. Shear striations were seen on the intermediate and lower slip surfaces after the landslip surfaces [20], but only the fracture surfaces at the alleged sites of the locked segments were recent [8]. The presence of locked segments that suffered shear rupture and slide while the lower transfixion segments underwent shear dislocation is confirmed by these observations.

The top transfixion section of an open tensile fissure suffers very little ant sliding force since the two lateral surfaces hardly touch one other. Muddy dolomite and saturated clay, respectively, are the weak media on the lower transfixion segments of the Yanchihe and Longie slopes, while massive dolomite and compact half-digenesis clay, respectively, are the strong media that make up the locked portions. The strong media with greater strength and stiffness demonstrated strain-softening qualities in geotechnical tests, while the weak media with lower stiffness and strength had strain-hardening properties [5], [6].

Hence, a strong locked section just before its rupture at the peak-stress point is where the shear stress along a possible slip surface of slope is concentrated. As a result, the mechanical interaction between strong and weak media is ineffective at this point, and the locked segment is in charge of controlling the slope's displacement pattern. When shear force and outside influences combine, the locked section suffers crack growth damage. Even under a constant applied load, unstable fracture propagation starting from the volume-expansion point in the locked section cannot be restricted.

As a result, the volume-expansion point is associated with the beginning of the slope's locked segment-dominated displacement acceleration. As a damaged strain-softening locked segment approaches its peak stress point, it ruptures, causing a stress drop that partially transfers the applied load to the weak medium on a lower transfixion segment, which then yields. Resistance homogeneity refers to the mechanical interaction between the strong and weak media that uniformly distributes shear resistance over a through-going slip surface.

In the lower transfixion portion on the Yanchihe slope, the massive dolomite is much more powerful than the muddy dolomite. Because to its extreme brittleness, huge dolomite ruptures at its peak-stress point and causes a significant post-peak stress reduction before retaining little residual strength. The majority of its load is transferred to the weak medium as a consequence of the significant stress decrease, which causes the medium to yield quickly. The overall ant sliding force diminishes throughout the through-going slip surface in this situation because the tiny resistance increase of the weak medium that is strain hardening cannot counteract the significant resistance drop of the locked section during resistance homogeneity. As a result, the displacement acceleration cannot be controlled, and the Yanchihe slope's development is unstable. The peak-stress point may be thought of as the locked segment's unlocking point because slope instability occurs between the peak-stress and residual-strength points of the locked segment, where the displacement increase is minimum during the transient-unloading phase. Rapid unlocking-induced startup is the name given to this process after fast homogenization [7], [8].

The compacted half-digenesis clay (locked segment) on the Longxi slope shows reduced brittleness and smaller strength and stiffness variations between the strong and weak media in comparison to the strong and weak media on the Yanchihe slope. Hence, a mild post-peak stress reduction and a correspondingly gradual and consistent load transfer to the weak medium are anticipated when the locked section ruptures. This load transfer should cause the weak medium to react by growing shear stress at a moderate pace. The weak medium's larger resistance increase can also slightly overcompensate the smaller resistance decrease of the ruptured locked segment until the end of resistance homogenization, achieving equilibrium between the resistance increase and decrease due to the much larger scale of the lower transfixion segment than the locked segment. In this case, the slow homogenization might temporarily halt the acceleration of the displacement. Since the resistance of the locked segment is no longer being compensated by the resistance of the weak medium after homogenization, the displacement acceleration returns. Slope instability will occur as soon as the overall resistance reaches its lowest at the locked segment's residual-strength point. As a result, a locked section may become freed at its residual-strength point if the displacement is increased incrementally. Here, a gradual unlocking-induced starting process that occurs after slow homogenization is referred.

Peak-stress and residual-strength points are two crucial characteristic points that reveal the instability of slopes dominated by locked segments as a result of rapid and slow unlocking-induced mechanisms, respectively. Displacement acceleration at the volume-expansion point prior to the two points can act as their observable precursor. The displacement values at the first

two places may be calculated based on those at the volume-expansion point after the mechanical connections between these points have been established.

We obtained the theoretical expressions of displacements uc, uf, and ur corresponding to the volume-expansion, peak-stress, and residual-strength points of the locked segment along the slip surface by coupling a damage-constitutive model based on the distribution with the one-dimension renormalization group model. The displacement ratios exclusively depend on the parameter m and are expressed A high m value refers to a sharp form that suggests high brittleness.

The parameter m describes the morphologies of the stress-strain curves of geomaterials under different situations (such as heterogeneity, loading rate, and moisture content). As a result, it can fully represent how different internal and external elements affect how a locked section behaves when damaged. A locked section has a specific water content because it has large joints and cracks that act as rainfall flow routes.

Additionally, a very modest shear loading rate is applied to the locked section. Under these conditions, the stress-strain curve's form might be moderate with a gradual post-peak stress decline, which is consistent with a low m value showed that the m value's particular suitable range is between 1.0 and 4.0. The two displacement ratios may be roughly represented in terms of their average values within the range since they are insensitive to changes in the m value [9], [10].

Retrospective assessments of a number of locked segment-dominated landslides have proven the validity of this model's realism. We can investigate the evolutionary processes that led to the Yanchihe and Longxi landslides using this model and monitored displacement data. We can also test the hypothesis that the exponential and stepwise accelerated displacement curves represent, respectively, rapid and slow unlocking-induced startup mechanisms.

The macro fissure width is a representation of the displacement of the Yanchihe locked segment along the slip surface. On May 24 of 1980, the breadth increased dramatically, leading to minor. This result indicates that the locked segment's volume-expansion point was reached at this moment the width of the locked section at its peak-stress point is almost identical to the measurement made on June 2, 1980 when rock-cracking sounds were audible all through the night. As a result, the locked portion was freed that day, and at dawn the next day, a 1 Mm3 landslip replaced it. Our findings support the hypothesis that the Yanchihe landslip started at the peak-stress position of the locked section, and that the quick unlocking-induced beginning mechanism was followed by an exponential growth of the slope towards instability.

The deflection of the displacement curve at the time of the suspension shows that the displacement of the Longxi slope, measured at a monitoring site above the locked section, started increasing on April 1 of 1984, and was then suspended. Then, with ground shaking at the foot of the hill, the sliding mass pivoted and started moving over the slip surface. These occurrences imply that the locked segment was damaged to the point of peak stress, which allowed the applied load to partly transfer to the weak medium on the lower transfixion segment, resulting in delayed resistance homogeneity and displacement acceleration suspension. A 1.5 Mm3 landslip

was produced after the displacement acceleration resumed on July 1 of 1985 after the homogenization process had ended. As a result, the displacement prior to the landslip showed signs of an accelerated profile in steps.

It is confirmed that the Longxi slope instability followed the delayed unlocking-induced starting process since the displacement value at the residual-strength point computed is close to the observed value one week previous to the landslip.There have been several reports of slopes with a large number of locked segments. Major rockslides, for instance, were triggered by ruptured locked segments in the Canadian Rocky Mountains, Alps Mountains, and Tibet Plateau. Since locked segments with high bearing capacities may store a lot of elastic strain energy, freeing them often results in destructive long-run out and high-speed landslides. Determining the unlocking-induced starting processes of such slopes would thus have a significant worldwide impact on reducing the risk of landslides.

The brittleness of locked segments, as previously mentioned, has a significant impact on the size and duration of the post-peak stress drop. Greater strength and a bigger stress drop are often correlated with increased brittleness. Hence, the brittleness of the locked section mostly determines the starting process and displacement pattern of a slope upon unlocking. Site observations and mechanical analysis provide the major justification for this notion. Further information must be gathered using other techniques, including as physical modelling tests and numerical simulations, in order to further solidify the links between displacement patterns and unlocking-induced startup processes and to identify key parameters influencing these mechanisms.

Both external causes, particularly rainfall, and the self-weight of the slope mass are sources of damage. Via the fatigue effect and chemical change, water may significantly reduce the strength of geomaterials. A further effect of water on slip surfaces is an increase in pore pressure, which lowers the structural stability and intergranular frictional resistance of the surfaces. For example, etch pits may be propagated by certification and lead to the disintegration of dolomite; the breakdown of inorganic salt can reduce the cohesiveness of saturated clay on the Longxi slope by 27–50%. Under these circumstances, a locked segment's damage may reach certain mechanical characteristic points, each of which corresponds to a particular mechanical behavior. For instance, the Heavy-duty AMT is a kind of transmission with complex operating conditions and a greater load range. Displacement starts accelerating at this point [11], [12].

Identification of the load characteristics has a significant impact on the AMT control technique and legislation. For many years, experts have been examining how the clutch's transmitting torque is estimated while a smaller car is shifting. In a dry double-clutch gearbox, Zhao et al. investigated the clutch's transmitting torque estimate throughout the shifting process. Based on a transmission model with an elastic drive shaf, Pettersson et al. investigated the output torque of the vehicle drive shaft throughout the shifting process. A Luenberger observer was created by Baumann et al. to determine the drive shaft's real output torque. In order to determine the transmitting torque of the automatic transmission, Yi et al. developed a self-adapt slid mode observer. To prove the theoretical validity, the identification accuracy of these investigations has to be confirmed on actual automobiles. It is common practice to determine the load parameters

using the recursive least squares approach. The least squares parameter estimation techniques for nonlinear systems have been investigated by the scholars. Very effective identification techniques for dual rate Hammerstein systems were explored Hammerstein systems were the subject of a distinct block-based parameter estimate approach study.

When belt conveyors are started, high belt acceleration often results in belt problems including breaking and slippage. In order to speed the belt conveyor gradually, the belt acceleration value is typically less than 0.3 meter per square seconds. Based on established load factors investigated the beginning process and the shifting process for AMT soft starting the belt conveyor. Unknown load factors should be identified when using AMT as the smart starter for belt conveyors so that the beginning and switching processes may be properly regulated.

The clutch's half engagement point, which is connected to the driving resistance torque on the gearbox input shaft, is a crucial stage during the beginning process. The load resistance torque and gear position are connected to the clutch's half engagement point, as is well known. As a consequence, it matters if the gear position or load resistance torque are different. As a result, the identification of the clutch's partial engagement serves as the foundation for understanding the load parameters. The properties of the clutch's half engagement will be employed in this study to create an estimate model for the load resistance torque. On the basis of the information about the output shaft speed and the clutch position, a model for estimating the load inertia is being presented. The load inertia calculation during AMT starting is performed using the recursive least squares approach.

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CHAPTER 20

EMPOWERING INNOVATION THROUGH DESIGN THINKING: A SYSTEMATIC REVIEW AND ANALYSIS OF BEST PRACTICES

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Design thinking is a human-centered approach to problem-solving that involves empathy, creativity, and iteration. It is a way of thinking that puts the user or customer at the center of the design process, and involves understanding their needs, behaviors, and motivations in order to create solutions that truly meet their needs. In this article, we will explore the key concepts of design thinking, its process, and the benefits it offers.

Key Concepts of Design Thinking

Empathy: Design thinking is centered on empathy, which means understanding the needs, emotions, and experiences of the people who will use the product or service you are designing. Empathy allows designers to put themselves in the shoes of their users, and to see things from their perspective. This helps designers to identify pain points, challenges, and opportunities for improvement.

Creativity: Design thinking is a highly creative process that involves generating many ideas and solutions. It encourages divergent thinking, which means exploring a wide range of possible solutions, rather than settling on the first idea that comes to mind [1], [2]. This allows designers to come up with innovative and unique solutions that meet the needs of their users.

Iteration: Design thinking is an iterative process that involves testing and refining ideas through feedback and iteration. It involves creating prototypes, testing them with users, and using the feedback to refine the design. This helps designers to create solutions that are optimized for the needs of their users, and that work well in the real world.

Process of Design Thinking

Design thinking is a process that can be broken down into several stages:

1. Empathize: The first stage of design thinking involves empathizing with the users, and understanding their needs, motivations, and behaviors. This can be done through research, observation, and interviews.
2. Define: Once you have a good understanding of your users, you can define the problem or challenge you are trying to solve. This involves identifying the key issues that need to be addressed, and setting clear goals and objectives for the design process.
3. Ideate: The ideation stage involves generating a wide range of possible solutions to the problem or challenge. This can be done through brainstorming sessions, sketching, and

other creative techniques. The goal is to come up with as many ideas as possible, without evaluating or judging them.

4. Prototype: Once you have generated a range of ideas, you can begin to prototype them. This involves creating physical or digital prototypes of your ideas, which can be tested and refined based on feedback from users.

5. Test: The final stage of design thinking involves testing your prototypes with users, and using their feedback to refine your ideas. This can involve user testing, surveys, and other methods of gathering feedback. The goal is to create a solution that truly meets the needs of your users.

Benefits of Design Thinking

Design thinking offers a range of benefits for businesses and organizations, including:

1. User-Centered Solutions: Design thinking puts the user at the center of the design process, which means that solutions are optimized for their needs and behaviors. This leads to solutions that are more effective and useful for users.

2. Innovation: Design thinking encourages creative thinking and ideation, which can lead to innovative and unique solutions that differentiate your business from competitors.

3. Cost Savings: Design thinking can help to identify and address problems early in the design process, which can save time and money in the long run.

4. Customer Satisfaction: By creating solutions that truly meet the needs of users, design thinking can lead to increased customer satisfaction and loyalty.

Human civilization has entered the information era as a result of the advancement of communication and computing technologies. Since then, the amount of information has multiplied. The rapid expansion of information has designers with a plethora of knowledge and caused them to get overwhelmed by the vast quantity of material that was either relevant to or irrelevant to their requirements. To address issues with information overload, a semantic network was suggested as a novel method of knowledge expression. Over time, this method evolved into a knowledge graph.

Previous research has shown the benefits of employing knowledge graphs and semantic networks in the design of healthcare services, engineering designs, and interior scene designs. For instance, proposed a knowledge graph framework based on the entity-relation model proposed a methodology of using the Technology Semantic Network (TechNet) to stimulate idea generation in engineering design, which aims to guide the inference of new technical concepts in the white space surrounding a focal design domain according to their semantic distance in the large TechNet. By using data mining and artificial intelligence techniques, proposed an integrated approach for improving design ideation. It consists of a semantic ideation network and a visual concepts combination model to provide inspiration both semantically and visually based on computational creativity theory. These studies have generally been successful for certain types of data-driven design situations. Complex sociotechnical systems, such as those in communities,

healthcare, and transportation, are still difficult to understand because of their many technical and non-technical components and how their dynamic interactions affect the system's overall behavior [3], [4].

In this article, we want to provide an integrated strategy to facilitate concept development for designing complex sociotechnical systems. The knowledge graph creation technology and the Agent-Interaction-Adaptation (AIA) design thinking framework comprise this method, which draws inspiration both aesthetically and semantically from design thinking philosophy.

This research's primary contributions may be summed up as follows:

(1) Outlining an integrated strategy that combines data-driven ideation techniques with a design-thinking framework in an effort to more effectively enhance the ideation process for complex sociotechnical systems design.

(2) Outlining an efficient approach for creating knowledge graphs from text that makes use of an improved convolutional neural network.

(3) Creating a model of design thinking information processing based on knowledge connections that explains the underlying connections between information about semantic stimuli and design thinking.

(4) Validating the suggested technique; the findings show that it may support the designer's expansion of idea space and concept quality.

Design that is data driven. Many research have suggested using big data approaches to help designers generate design ideas during the first design process. Design-by-analogy is one effective method that designers may use to systematically search for and uncover parallels from the data sources that are accessible. The theory of inventive problem-solving (TRIZ) is based on the statistics and analysis of a large number of high-level patents (not the narrow mathematical statistics, but the combination of induction and deduction in the logic method) to establish the laws underlying the patents and indicate the course for technological innovation.

These design techniques have been implemented using a number of data-driven computer technologies. By examining patent textual data, Cassini and Russo created Pat-Analyzer to find the design inconsistencies present in a patented innovation in TRIZ. Design-by-analogy to nature engine (DANE), a knowledge-based CAD system to facilitate biologically inspired design, was suggested. The system was created by and employs a network map of all patent classes to enhance the exploration of design possibilities in the whole technological landscape and direct the retrieval of previous knowledge across domains for design analogies and syntheses. These techniques demonstrate how engineers and industrial experts, particularly in the field of mechanical design, may benefit from data-driven approaches. Yet, these techniques perform well for technical systems but terribly for intricate sociotechnical ones. Also, more clarification is required on design cognitive perspectives of design thinking.

While complex sociotechnical systems have been researched for decades in other study domains, they are new to the design research community. According to Norman and Steppers, complex

sociotechnical systems may be broadly categorized into three groups: the social, political, and economic context; the technical concerns that add to the complexity of Design problems; and the psychology of human behavior and cognition. The main distinction between sophisticated sociotechnical systems and technical systems is human involvement. This substance-based system cycle involves participation from humans, which adds complexity. It is a challenging endeavor since "human" might refer to a person, a group, an organization, or a political entity at different times. Design has evolved into a multistate issue that scales back and forth between several scales when there are more "people" in the physical world. Diversification of design objects and subjects is a challenge. Transferring the designer's initiative to design involves some degree of diversification and anticipation for the design results because the design process is full of dynamics and uncertainties. Designers must use a more dependable methodology, be aware of their benefits and drawbacks, and use the right solutions to remove obstacles in order to achieve this requirement.

What unique contribution can designers offer to tackle these very challenging issues? Designers have contributed to these problems and significantly improved the situation. Yet, there is no proven mechanism, exacting design process, or source trace for the "solution." Designers must incorporate research from various fields and base their work on cross-disciplinary cognition [5], [6]. On the other hand, design is seen as an undefined, open process with morbid structures. In a continual iterative process, design outcomes must be steadily improved and abundant inspiration for designers may be found in insights. Since actual design issues tend to be more complicated, ambiguous, contradictory, and unclear, this study proposes an integrated strategy to enable designers in developing insights.

Design thinking is seen as an approach for tackling problems that sees possibilities rather than hurdles in such pathological, poorly defined, complicated, and conflicting problems. To combine divergent viewpoints into complete answers, it uses the logic of deductive reasoning. According to Lockwood, design thinking is an application of the designer's capacity for problem-solving; according to design thinking is a framework to assist designers in comprehending problems encountered in daily life and then producing corresponding solutions; and according to design thinking offers a method to stimulate customers' needs and then produce a series of quick and simple problem-solving prototyping.

The Agent Interaction-Adaptation (AIA) design thinking is a systematic thinking paradigm built on connections, as shown by our earlier study. Based on knowledge field theory the AIA design thinking paradigm. AIA design thinking is comprised of three knowledge field sources: "Agent," "Interaction," and "Adaptation." The interaction of agents, the fundamental building block of a complex sociotechnical system, with one another and their environment is what logically links all three sources and is what drives the system's adaptation and development.

Contrary to conventional design thinking frameworks, AIA design thinking has been shown to be able to support designers' expansion of their conceptual horizons, brain activity, and idea quality, particularly for challenging sociotechnical system design challenges. So, using the Agent (concept)-Interaction (relation)-Adaptation (concept) framework and AIA design thinking, we develop the design knowledge graph.Recognizing the mentions of named entities linked to

design ideas from the free text and figuring out the relationships between the identified name entities are the two key tasks involved in creating a knowledge graph. The long-standing practice of treating name entity recognition (NER) as a sequence classification issue. The three following classes—b (stands for the beginning of a name entity mention), I (the interior of a name entity), and o (the outside of a name entity)—are extensively used to categories each word in a phrase. The words with the b and I labels are then grouped together to form name entities. Recurrent neural networks and conditional random fields (CRF) are two sequence classification models that have been frequently used for the task. Lately, researchers have constructed NER models using the BERT model, which has shown highly effective performance in a variety of NLP applications. In this study, we also use BERT to find name entities associated with ideas in architectural design.

In the beginning, researchers created rules manually to determine the connections between name entities. For instance, once a few specific words occur, it is possible to ascertain the relationship between a pair of name entities. Unfortunately, creating the rules requires a lot of work, and these techniques may not be able to handle vast amounts of data. It is more practicable to extract the relationships using supervised machine learning techniques in the setting of huge data. Extraction of discriminative features from the text is a crucial step in the training of machine learning models [6], [7].

Several syntactic and semantic elements have been extensively adopted, including the dependency routes between name entities and the hyponyms or hyponyms of the name entities in Word Net. In order to better capture the nonlinearity in the relationships, researchers have used neural networks to the problem in recent years.

Neural-based models often need less feature engineering work and are semantically richer than classic machine learning models. Nevertheless, manually annotating the relations for a significant number of samples is required in order to train these models, which is a time-consuming operation. Semi supervised approaches have been suggested as a solution. These techniques typically begin with a small number of seed pairs with relation type labels and then extract contextual patterns related to the seed pairs from a huge unlabeled corpus. Nonetheless, topic drift may result from semi supervised machine learning techniques, increasing the chance of producing pointless name-entity combinations. In order to provide accurate findings, we use the supervised technique in this study.

A new method for designing knowledge graphs based on AIA design thinking, such as bionic design, has been developed thanks to past research on knowledge graph building technology and its proven benefits. The designer's expertise and experience play a crucial role in the design practice process. When faced with the same exciting environment, people from comparable backgrounds will respond in similarly inspiring ways.

The information and experience in question have been encoded into relevant knowledge nodes and linked using predetermined association rules to build an association network, which is the major reason. The association pattern is more similar, the more similar the backdrop is. The process of thinking through design tasks entails continuously searching the association network

for concepts (knowledge nodes) connected to the design problem, such as similar, relative, dependent, close, and causal, until the designer is successfully prompted by the connection between a specific concept and the design problem to come up with a solution.

Design thinking is seen from the information processing perspective of cognitive science as an information processing mechanism with the establishment of knowledge links at its heart. The present design scenario, which is made up of knowledge on the design challenge, information on the incentives, already-existing goods, and environmental or social events, is referred to as the "external environment." The perception system, which employs each sense organ to temporarily acquire and store information from the outside world and filter it, is a component of the memory system [8], [9].

The information about the external world that was filtered by the perceptual system and aroused in long-term memory, where design ideas are produced, is stored and processed in working memory. A significant quantity of information and experience are kept in long-term memory internal thought process of the brain from design challenge to design concept may be described formally as follows: Task information enters the perception system, is filtered by the perception system, some of it goes into working memory and is processed into associated design issues, then the problem stimulus awakens the appropriate knowledge nodes in the long-term memory. When the relationship between these knowledge nodes and the design challenge is unable to be properly translated into a design concept and outputted externally, more knowledge nodes in the long-term memory or the knowledge nodes from the previous stage continue to be awakened.

It is believed that the human brain transforms information or experience into a certain type of representation before storing it in memory. The knowledge representation for the current stimulus in the brain is awakened when ambient cues draw attention. The visual representation of the knowledge that corresponds to the stimuli information in the long-term memory is therefore aroused in the design job of presenting stimuli information, such as a knowledge graph, following screening by the perceptual system. Design problems and stimuli information act synergistically on the memory system, and under some circumstances will accelerate the process of establishing connections.

Therefore, when the current design problem needs to be solved, the knowledge represented by the representation form is further invoked to establish the connection among some of the knowledge nodes and the design problem and form the explicit output of the idea. The knowledge nodes that are linked to the design challenges, or knowledge connections, are to some degree represented by stimulus information [10], [11].

Twenty-eight students with a background in innovative design were asked to participate in the study—14 men and 14 women between the ages of 25 and 28. In order for the findings to be more useful in design assistance, participants were chosen based on the premise that they already have a basic understanding of the design process but are not working professionals. Also, this choice is pertinent to the overarching objective of creating a new design support approach via this research. All of the participants are volunteers, and their involvement did not earn them any more course credits.

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