Changing the World: Entrepreneurship:

How Innovation and Entrepreneurship Changes the World

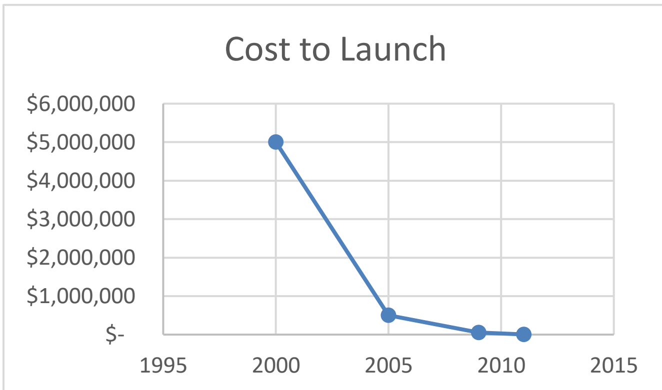
-Jack M. Wilson

Chapter 4 Recognizing Opportunities to Change the World

It may be that future historians will look back at the 90's and early 2000's as a time of unprecedented opportunities. The rapid deployment of the internet world-wide has enabled new companies, many of which, like Google (Alphabet), Facebook, Amazon and others, were born and flourished in that era. It also fueled the growth of two companies born in the microcomputer era: Apple and Microsoft. Not only did the microcomputer and internet incubate these giant companies, it also enabled countless smaller companies. In the life sciences, technology was also a driver and the computer and internet played a role, but the university and industry-based research breakthroughs were the primary forces moving new ventures.

By the time we were ten years into this Millennium, it became easier and easier to launch new companies -prompting many observers to exclaim that "The Cost to Launch is approaching zero.[1]" This is particularly true for internet and communication technology startups, but it is not as true for Biotech startups. These can be quite expensive. Back in the dot-com boom era of the 90's companies often needed to raise millions of dollars to buy equipment to get started. Today, with more and more web based services, the cost to launch can be quite low.

CB Insights has suggested that the cost of doing a startup has fallen from $5 million in 2000 to $500,000 in 2005, to $50,000 in 2009, and finally to $5000 in 2011[2]. Many others agree that the cost has fallen dramatically for some kinds of new ventures, but they tend to be a little less dramatic[3]:



There are so many more tools available to innovators these days. In the past, new ventures had to set up their own servers, websites, payments systems, financial systems, ecommerce systems, marketing programs, and so on. Today Google provides a platform to attract users to a new venture. PayPal will allow the startup to collect payments and make payments without expensive financial systems. There are now a plethora of new Cloud based services like Amazon Web Services

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[1] "Startup Opportunities" by Sean Wise and Brad Feld; John Wiley NY; (2017); p 7.

[2] https://abdoriani.com/startup-infographics/how-much-has-the-cost-of-launching-a-startup-time-to-reach-100-million-users-changed-from-2000-2011/

[3] http://bankinnovation.net/2015/10/is-the-cost-of-fintech-startups-really-falling/

(AWS), Google, Microsoft, etc.. All of these can provide cloud-based hosting for your services. Similarly, there is a long list of services to help you build an e-commerce store.

Others disagree that the cost to launch has dramatically decreased. Ben Brown of First Annapolis, another consultancy, claims that Bill Gurley, a general partner at Benchmark Capital, the venture capital firm, has said that the cost of launching a startup "*has largely stayed the same, just shifted from servers to salaries*."

The truth is probably somewhere in between. There is now quite an array of tools to help the enthusiastic innovator, but one should be cautioned that nothing is as easy as it appears. The creation of a global marketplace is the other thing that has made innovation more attractive. The trend from the end of World War II until recently was to break down the barriers of trade and movement of good and people. Since 2016, we are seeing that reverse a bit. Countries are tightening both trade and immigration barriers. The trend is not yet clear, but it could begin to constrain the entrepreneurial opportunities that we have seen in past decades.

In the Chapter 2 we saw that there are (at least) three models of entrepreneurship that can help anyone who is interested in starting a new venture.

- The Causal/Traditional Model
- Effectual Entrepreneurship
- The Lean Launchpad

We encourage potential entrepreneurs to understand each of these. The Lean Launchpad has come to dominate most approaches, but one is likely to encounter Business Plan Competitions and other programs that draw on the other models.

Access to capital is one of the most important things facing anyone launching any kind of new venture –whether it is a for-profit business or a social enterprise or a charity. The entrepreneur can usually count on spending quite a bit of time raising money.

We will consider this in more detail in a future chapter, and only consider this in broad terms now. For those interested in more details you might have a look at:
http://www.jackmwilson.net/Entrepreneurship/Principles/FinancingOrFunding.pdf

There are many sources of capital that new ventures might be able to draw upon. Among the most common are:

- Venture Capital
- Angel Investors
    - Accelerator Programs
      There are several great local examples of accelerator programs like Mass Challenge[4] and eFor All[5].

- Crowdfunding
    - Kickstarter is one of the most famous examples of crowdfunding sites and we will consider this case later: http://www.jackmwilson.net/Entrepreneurship/Cases/Case-KickStarter.pdf

Sean Wise and Brad Feld point out that "*The lack of barriers to entry allows terrible ideas to be pursued*.[6]"

Recognizing Good Ideas and making them happen.

If you want to change the world, then you need to see a problem and recognize it as an opportunity. We often say that those that can see a problem as an opportunity have **entrepreneurial alertness** or **entrepreneurial awareness**. But what exactly IS an opportunity?

An opportunity is a favorable set of circumstances that creates a need for a new product, service, or business. At times one can see that there is some kind of product or service that seems to be missing. We call this an **opportunity gap**. The entrepreneur identifies a missing piece, a NEED, and a new way to fill that gap. One of the classic examples of an opportunity gap was when Planet Fitness noticed that many individuals were intimidated by going to the gym and being surrounded by fit and strong looking people. So they decreed that they were the gym for the rest of us. The claimed they had a "no lunks" policy and a "judgement free zone." Many successful new ventures are the result of finding that opportunity gap.

An opportunity is NOT driven by a desire to make and sell. It is driven by a need. An opportunity is NOT an IDEA –unless that idea is directed at solving a problem that people will pay for. An opportunity is driven by filling a market's need to (and ability to) buy. This is a common error of inventors who assume that their latest greatest invention is going to be something that everyone needs. The old saying was that "if you invent a new mousetrap the world will beat a path to your door." Probably not.

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[4] http://boston.masschallenge.org/
[5] eForAll: https://eforall.org/
[6] "Startup Opportunities" by Sean Wise and Brad Feld.

We often categorize innovations on a spectrum -ranging from incremental to radical. Some innovations are **radical**, and represent an entirely new way to solve a problem or an entirely new product. Other innovations are **incremental**, or **sustaining**, and are extensions of existing solutions that are somewhat better than the existing solutions.

Incremental innovation rarely works for new businesses but is often the hallmark of established businesses. Incremental innovations are hard to introduce to the market that is used to something almost as good. Why change what you know how to do for a small improvement? If the improvement is 10 times better, then perhaps they will change.

Building a better mousetrap rarely leads to the market beating a path to the inventor's door –unless it visibly and significantly changes the game for mouse catching!

Some inventions are introduced to the market before the customer is ready for them. Others come to market long after other products or services have already established themselves. There is a **Window of Opportunity**. The innovation needs to be timely, not too early or too late. Opportunities depend upon acting at the right time. Too early and too late are sure ways to fail.

Here are three questions that often lead to innovations[7]:
These are ways to look for opportunity gaps –if many people share the same concern.

1. *If only there was a business that….*
2. *I wish I could buy a product or service that…*
3. *There has to be a better way to…*

Here are some specific examples of such questions that led to new concepts and companies.

- I wish I could find a gym that was not full of health nuts that intimidate me. => Planet Fitness
- I wish I could find a tee shirt that did not come untucked so often => Tommy John Underwear
- I wish I could carry my music with me everywhere => iPod
- I'm tired of carrying a phone, camera, laptop computer, and music player around with me => iPhone and other smart phones.
- I wish I did not have to transfer my files among my various computers => cloud computing
- I wish that I could better keep in touch with my friends and family => social media-Facebook, Twitter, Snapchat, LinkedIn, etc.
- I wish I could find a date in this new town. => Tinder
- There has to be a better way to shop than going to the mall. => Amazon.com

[7] Extraordinary Entrepreneurship, Stephen C. Harper, John Wiley.

When we think about opportunities, we need to ask whether the opportunity possesses four qualities:

- **Durable**: Does the product or service have staying power? Is that enough staying power to allow it to be monetized? How can I get revenue?
- **Timely**: Is the idea not too early nor too late, and is the market is ready to buy. Has the market already settled on an alternative?
- **Attractive**: Do the rewards (financial, social, or personal) exceed the cost. That cost needs to provide your return on investment (ROI) and also the return on your time (ROIT). There are direct costs but there is also an opportunity cost in time and money.
- **Adds Value**: Is it a product or service that your target market would find valuable? Why do they care? What pain do they have that this takes away? How badly do they want it? Do they need to have it or only want to have it?

If your innovation meets ALL of these criteria, then perhaps it is a useful innovation and not just another “great idea.”

A new Rabies Vaccine from UMass.

Consider the example of the Rabies Mono-clonal antibody which was invented a few years ago at the UMass Biologics Lab of the University of Massachusetts Medical School. These research scientists. It is spectacularly more effective than the then current treatment regimen of a 30 day series of rabies vaccine shots. (My son and I went through this process together and it is not pleasant.) The Rabies Mono-clonal antibody reduces the cost of treatment dramatically from current treatments as well as reducing the suffering of the person being treated.

Now, THIS is a great **IDEA**! However, is it a great **OPPORTUNITY**?

For an idea to become an opportunity it needs to meet the criteria of being durable, timely, attractive, and adding value. It also needs a market ready and willing to pay for the alternative treatment.

Is this a great opportunity? Ask yourself: Is there a huge need and demand for this product by a group that is willing to BUY it? Does that identified market represent enough economic incentive to create a business and justify the investment? What investment would be needed to bring this to market?

The market in the U.S. is very small. Thankfully, very few persons are treated for rabies each year. Those few patients are generally treated by public health organizations. The customers for the vaccine are government health departments and not individuals. For them there is no great pain that this product would solve. Changing procedures and products is always confusing and expensive. They spend very little on treatments in any case. The pain is felt by the patient and not the health department. This product does not solve any great pain that they (the Health Department leaders) have.

Consider now how much money and time it would take to bring this to market. The cost of doing animal and human clinical trials is huge. There are four phases: Pre-clinical, Phase 1, 2, and 3. The cost of bringing a drug to market in the United States is estimated at $1.2 Billion (Tufts -1990-2003) Even worse, it takes an average of over 8 years to bring that drug to market.

The conclusion is inevitable: there is no viable US market to justify the investment. There is **NO** (immediate) U.S. opportunity. It is too expensive and takes too long to reach a very small market. That is agonizingly sad, but it is absolutely true. It is a great IDEA, but it is not a great Opportunity.

It is also not that unusual in the medical field for great ideas to be unable to be converted into opportunities. You can get a Lyme vaccine for your dog, but not for you.

Is there an alternate strategy to convert this IDEA into an OPPORTUNITY? Not every place in the world has the same conditions as we do in the United States. In this case, rabies is endemic in India and tens of thousands die each year. The cost and duration of the treatment is unsustainable for so many victims in the most poverty stricken regions of India. The cost (and regulatory burdens) of clinical trials and development in India is much lower than it is in the U.S.

There may be an opportunity in India that does not exist in the US. Solution: license the mono-clonal antibody to an Indian company for development. Perhaps in the future, we may be able to bring it back to the US after it is established in the market in India and other regions with more patients. Time will tell.

From Trends and Forces to Opportunity

An opportunity takes advantage of the pressures exerted by economic forces, social forces, technology, and political forces:

- **Economic Forces:** economy; income; spending
- **Social Forces:** social-cultural; demographic; trendiness
- **Technology:** new; emerging; or a new use for old technology
- **Political Forces:** political arena; regulatory

These forces can create an opportunity gap through which new products and services can come to life.

Here are some examples of economic forces:

- A rising economy – more discretionary income
    - Until recently the growing China market has been one of the key factors driving the world economy.
- A falling economy – products that cut costs or expenses
- Increasing or decreasing energy prices
    - Gas prices are falling. Hybrid sales are down and truck sales are up.
- Increasing income disparity between groups.
- Interest rates are rising or falling, are low or high.
- Access to less expensive labor for products
- There are many others. Can you think of some?

Social forces include:

- This is the biggie for the last four decades: the **baby boomers** have changed every part of society as they have gone through the many stages of life from birth to retirement!
- The increasing diversity in the workforce has created many new opportunities.
- The formation of online communities and popularity of social networks
- The change from wired phones to mobile phones as the dominant communication device.
- An interest in healthy living (see boomers above!)
- Increasing use of alternative energy –especially “clean” energy.
- Popularity fluctuates wildly with variation in energy cost.
- As oil and gas prices decrease –alternative energy is less economical
- Educational need –continuing education. We are living in a learning economy in which a large premium is paid for education and skills.
- Income disparity is also a social force as well as an economic force

Here a few technology advances that have helped to define the economy we live in today:

- Personal computing
- The Internet
- Mobile phones.
- Medical Imaging
- Pharmacology
- Biologics
- RNAi – microRNA- gene silencing
- Genomics –personal medicine

Take a few moments to reflect and consider some of the new products, services, and companies that have been enabled by these advances.

Three technology advances that defined our present. The incredible advances that we have seen in computing, communication, and cognition have been driven by three rules:

Moore's Law:

- The number of components on a chip, and hence the computing power, doubles every 18 months.

Metcalfe's Law (Network Economics):

- The Value of a network scales as the square of the number of those connected to it. Value: economic, personal, societal,.... If you double the network you create four times the value! This is often called "network economics" or "network externalities" Social media depends upon capturing the largest network. If you double your network, you quadruple the desirability of your social media network. This is why Facebook dominated Mysapce, and Google dominates Yahoo.

***Gilder's Law** (Bandwidth deployment):*

- Bandwidth deployment doubles every 6 months (three times as fast as computing power doubles. This has provided us all with ample bandwidth to our homes.

More details on these three can be found at:
http://www.jackmwilson.net/Entrepreneurship/Cases/Moores-Meltcalfes-Gilders-Law.pdf

Political and Regulatory changes that have created opportunity gaps for new ventures

- Tax policy –gasoline, cigarettes, oil depletion allowances. Taxes do 2 things: 1. raise revenue and 2. decrease the use of the thing being taxed
- Health and safety regulation –OSHA, EPA
- Energy policies –alternative energy tax credits etc. Solar energy credits. Net metering –forcing utilities to buy energy back from homeowners solar panels.
- Cyber-security
- National Health Policy –Medicare, Medicaid, Obamacare, Drug coverage, etc.
- Education policies –financial aid, standards, compliance, Clery Act, FERPA, Deemed Exports,

Each of these changes has created challenges and opportunities.

Tesla: An example.

Tesla is an all-electric high performance automobile introduced in 2003 to a market that was probably not yet ready for it.

Figure 1 The first Tesla Electric Roadster -photo by Jack M. Wilson

Tesla took advantage of all four of the forces and trends:

- Economic Trend – increasing gas prices
- Social Trend –desire to be green
- Technology Advances –Battery and motor improvements
- Political Regulatory Trend – favorable treatment and support for alternative energy systems.

Executing Rationally on an Opportunity

A great opportunity is the right start, but making good decisions in implementation is an absolute requirement. Execution always trumps opportunity. No matter how good the opportunity, it requires excellent execution to become a success. As Tim Ferris in the opening essay in Wise and Feld suggests "*Trust me, your idea is worthless*." Mary Kay Ash of Mary Kay Cosmetics says it a bit more nicely: "*Ideas are a dime a dozen. People who implement them are priceless*."

Economists have long liked to model human beings as rational creatures who do rational things, but recent research has shown that premise to be false. Research on why smart people do (and say) dumb things has produced much better insights into the way the world works. That work has garnered three Nobel Prizes in recent years. Daniel Kahneman won in 2002 and has written a terrific book called "*Thinking Fast and Slow*." Robert Schiller won in 2013, and Richard Thaler won in 2017. These three are considered the founders of a field of **behavioral economics** which does indeed show that human beings do not always make rational choices. Understanding how we make these irrational choices can help us to avoid them

This extensive research has documented the sources of biases that catch many smart people in mistakes. The research also shows that those smart people do not even recognize they are doing it –but others often do.

This is a most important reason to have advisors and to take them seriously. All new ventures should have a board of advisors. You should also encourage argument. Aircraft co-pilots are now trained to criticize the captain, after research showed that some co-pilots were so deferential to the captains that they never said a word as they flew the plan into a crash.

Here are a few of the sources of irrational decision making:

Confirmation bias

- - Confirms an existing bias. If you already believe something, you will notice evidence to support the belief and ignore that which contradicts the belief.

Overconfidence

- –Research says that we all think we are above average. Sometimes we call that the “Lake Woebegone” effect. (Where all of our children are above average.)

Availability bias

- –if it is easy to imagine than it must be common! You have seen news stories on shark attacks (or terrorists) so you think they must be common. They are not.
- And the reverse (black swans –I’ve never seen a **Black Swan** so they do not exist.) Look for evidence and not just for what we expect.

Prospect theory:

- Too much importance is given with too small differences. A 1% chance appears much better than zero. It is not A 99% chance appears much worse that 100%. Again, it is not.

Priming and the Anchor point:

- We can have our expectations set by being given an anchor point. Marketing professionals use the anchor point to set your expectations! It works on even the smartest and most trained people. Research also shows that those smart people vehemently deny that it works on them.

The 2017 Nobel Prize winner was Richard Thaler of the University of Chicago for his work in behavioral economics.[8] His particular contribution, for which he is best known, was in the area of “nudging.” He wrote a book with Cass Sunstein of Harvard entitled “Nudge.” This work builds on the biases revealed in earlier work to nudge people in the direction of a desired decision. Marketing departments use his work to nudge you toward a decision to

[8] https://www.economist.com/blogs/freeexchange/2017/10/2017-nobel-prizes

buy their product. Governments use his work to nudge you toward making better decisions (quit smoking, drive slower, eat less sugar, etc) –at least from their perspective!

It is critically important for any leader to recognize these sources of potential error and take steps to avoid the disasters that have often ensued when other leaders failed to take them into account. You can begin by understanding the sources of error and then consciously reflecting upon them when you are making decisions. Ask yourself: Am I making this decision based upon information that confirms my existing biases, or have I sought out contrary opinions? Am I overconfident in my ability to do what I intend to do? Am I assuming a result is likely simply because I have heard it often, or do I have evidence that it is statistically likely? Am I assigning too much importance to small differences? Am I being fooled by being attached to some anchor point when I should really question the anchor point.

This latter point can be clarified by considering the case of a car dealer who suggests that "the retail value of this car is $50,000." Later, after beginning the sales process, the salesperson suggests that "I think I can get this car for you only $45,000." Check the anchor point and do not be fooled. Look at the internet sales prices and you might find that the car usually sells for $45,000. Most of us think that we are immune to such manipulation, but research indicates that anchor points work with even the smartest and most skeptical of us.

You should also recognize that you probably cannot do this yourself (Avoid the over-confidence bias). You need to create a team around you that is not afraid to question you and argue with you. Those who do not like to be argued with often make the worst leaders. Have employees and advisors that will help you avoid these Nobel Prize winning mistakes of behavioral economics.