

Beyond Entrepreneurship: How Innovation and Entrepreneurship Changes the World

-Jack M. Wilson

Chapter 10 Needs, Pains and Solutions

How do you know whether you have a product or service that will meet someone's needs? You may think it will, but in the end it needs to be a specific hypothesis which you take to the customers to test. It is always a good start to first ask whether the product is one that people need to have or one that they like to have?

Your product or service should address someone's pain. The more acute the pain and the more your solution can relieve the pain, the more likely it is that someone will buy your product. Josh Linker of Detroit Venture Partners (who attended Berklee College of Music to study jazz guitar) likes to ask "Are you selling vitamins or aspirin?" Vitamins are nice to have. Aspirin for a headache or other severe pain is a "need to have." He asserts that "businesses that service *burning demands* and *visceral human needs* tend to accelerate faster and require far less marketing push than those that offer stuff customers can easily live without."

Consider a few examples of products that were created to solve a problem and assuage someone's pain.

Owning an automobile in an urban area is a difficult and expensive proposition. Zipcar will provide a rapid rental in many convenient locations for the urban dweller.

Some of us absolutely hate to go shopping (yep, that would be me) but we still want to buy things. Amazon.com or eBay was created for us. Others of us want to sell things. The solution is eBay.

Meeting potential dates in a new place can be awkward and time consuming. Tinder provides one antidote to our loneliness.

We all like to tell others our opinions on everything, but no one listens. Twitter gives us the audience we dream of.

We want to share a picture but only for an instant. SnapChat and Instagram were created to let us take pictures, send them to friends, and then have them disappear. Many users were embarrassed to discover that users could save their pictures!

I want my music and I want it now! iPod, iPhone. Spotify, Pandora, and others are there to sell or rent music to you.

The traffic is terrible! Waze will alert you to the traffic and calculate an alternative route for you.

Notice that many of these need driven innovations were enabled by technology.

How much pain relief can you afford?

The law of supply and demand suggests that when the price goes up the demand goes down, but the more interesting insight is to ask just how fast the demand goes down as the price goes up. We refer to this as the **price elasticity of demand**.

If price greatly influences demand for a product or service, then we say there is **high price elasticity**. If demand does not change much with changing price, then this is called “**inelastic**.”

Demand for water, air, basic food, or aspirin is inelastic. Most people would pay whatever is required to get these things that are necessary for life itself. On the other hand, demand for designer clothing, jewelry, real estate, and automobiles is quite elastic. A high price quickly reduces demand.

Supply and demand works both ways. An inexhaustible supply (the air we breathe) keeps the price down. Shortages of supply keep the price high.

Netflix shows that it can be both. For casual viewers, it is “Nice to have” access to videos when they want to watch. For regular avid video watchers it removed the severe pain of trips to Blockbuster and paying late fees when returns are inconvenient. It was a “need to have.”

Drivers of Innovation

When developing innovative solutions to solve a customer’s pain, one is often calling upon a group of drivers of innovation. Those innovations that are directly driven by a need are often called “**need pull innovations**.” This is the clearest path to success. However, many innovations are driven by changes in technology or “**technology/knowledge push**.” These kinds of innovations can often be deceiving since the invention might look so good, but does not really address someone’s pain better than other alternatives. Frequently a new technology enables a previously unfulfilled need to be fulfilled so these two approaches can be related.

Crisis Driven innovation is essentially **need pull** on steroids. One good example of this was the development of the Zika Virus vaccine. Some innovations are **pure accidents**. The discovery of penicillin when mold on a bacterial culture killed the bacteria is one of the best examples. Post-it notes were invented when an effort to make a stronger adhesive product failed and instead a very weak adhesive was created –enabling the creation of easily torn off notes. Viagra was a drug originally developed for heart conditions, but someone noticed that there were often unusual side effects. Teflon happened when there was accidental polymerization of TFE.

Discovering customers at “The **Base of the Pyramid**” as Prahalad described provided a new area of entrepreneurship. We covered this in the chapter on Globalization.

Some other kinds of innovation include:

- **Process Innovation** – making an existing process work better. Examples include: Total quality management, business process re-engineering, Six Sigma, Lean Management, etc.
- **Mass Customization**: Have it your way. Dell Computer, in 80s and 90s built PCs to order and shipped direct to customer. Converse allows customers to order personalized athletic shoes.
- **User Innovation** – New approaches can often be fund by crowd sourcing and by consulting extreme users.
- **Imitation** –imitation is often the first source of innovation in emerging economies.
- **Recombinant Innovation** –New combinations of existing things.
- Changes in **regulatory and legal** processes.

- **Design driven innovation** – Apple always focused on design even when releasing products that were not that much different than existing products.

As we discussed in the chapter on opportunity recognition, opportunities can often stem from the four pressures exerted by economic forces, social forces, technology, and political forces. Many innovations take advantage of these forces to solve problems that might not have previously been solved or even new problems that are created by these 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.

Is there a compelling unmet need?

Identifying the pain – a clear unmet need – is a great start for any new venture. As we have seen in our discussion of Effectual Entrepreneurship, many entrepreneurs start with what they know. We call this the *bird in the hand* principle. Perhaps they have experienced some personal pain that they feel others have experienced and would pay to solve.

Tommy John undershirts were created because Tom Patterson was tired of having his undershirts come untucked. Micro-lending came into being when Muhammad Yunus saw that he could lend to women and both get a good return and help them establish small businesses. Zipcar was founded because the founders saw that owning a car in the city was too expensive, but that there were few alternatives. Facebook was an effort to meet new people. It was hard to meet prospective dates at Harvard. Snapchat made it fun to communicate quickly and graphically with friends, but you may not want those pictures to go too far.

Here are some questions that you can ask yourself to help identify that compelling unmet need.

Size: how many people suffer from the pain you are addressing? Clearly a larger market is preferable. If your solution does not impact enough people it will probably have a hard time getting market share. Other less effective alternatives may just be good enough. The number of people feeling the pain that you are addressing is called the “**total addressable market.**” (TAM).

What is the intensity of the pain each user feels? The greater the pain, the more inelastic the price demand is.

Is this pain felt once, or over and over again? Pharmaceutical companies find that drugs taken for chronic diseases like diabetes, high blood pressure, HIV, depression, and others are more profitable than “one and done” treatments like vaccines for tetanus, whooping cough, small pox, etc. This has introduced some perverse incentives into the markets which even prompted the Commonwealth of Massachusetts to create the Mass Biologics Labs under the University of Massachusetts to manufacture vaccines that private firms did not want to make due to the one time markets. This latter has been important in the moral and ethical issues around drug discovery, drug production, and drug pricing. Two more mundane examples are that Gillette makes far more money selling blades than it does by selling razors, and HP makes more by selling ink than it does by selling printers.

In our Chapter on Opportunity Recognition we told the sad story of the invention of a better Rabies treatment by the University of Massachusetts Mass Biologics labs. It was a much better treatment –far better than the ten times that investors look for. However there was not a large enough market to be able to support the enormous cost of bringing this drug to market. By licensing the technology to a vaccine manufacturer in India the total addressable market (the need and the pain) is much larger and the cost to bring the product to market is lower.

Durability and timeliness are two key points for any innovation. Enter a market too early and the market is not ready. Enter a market too late, and the market has moved past you. In the movie “Back to the Future” Marty McFly plays Johnny B. Good on the guitar, but his dramatic moves were a little ahead of his audience!

Some trends do not last. They do not possess **durability**. Examples of products that did not have durability include Y2K programming, the Blackberry smartphone, the Motorola Flipphone, and the dreaded Fanny packs.

Case: DailyWorth and Amanda Steinberg

A successful computer programmer, Amanda Steinberg was earning six figures, but she had built such an expensive lifestyle that even her best attempts at saving and investing were wiped out by life’s unexpected complications. Frustrated by her inability to build net worth, she launched DailyWorth from an attic office in Philadelphia with a newborn in her arms.

Today, DailyWorth’s newsletter reaches more than 1 million subscribers and growing.

In 2015, she started digital investing service, WorthFM, which received front-page coverage in The New York Times Business section. Oprah selected her for the inaugural SuperSoul 100, and Forbes named her one of 21 New American Money Masters. Amanda has also appeared on GMA, Today, CNN, and MSNBC. She’s also the author of *Worth It: Your Life, Your Money, Your Terms* released in February 2017.

Financial planning, budgeting, and goal-setting only work for a small percentage of people. “Worth It” flips the paradigm on “financial advice” for women and delivers it in fresh, unexpected ways.¹

Steinberg saw a pain being experienced by successful women and developed a set of products that were intended to address that pain and need. From the perspective of the Lean Launchpad, she made the assumption that *successful working women would want to get, and be willing to pay for, advice and support from other successful women*. To test that assumption she launched her first product. The ONLY answer to

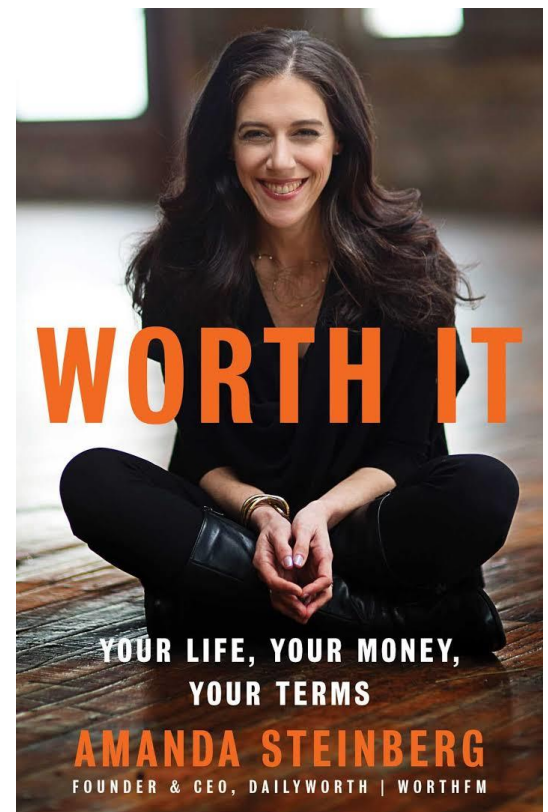


Figure 1 Amanda Steinberg

¹ <https://www.dailyworth.com/meet-our-founder-amanda-steinberg>

testing such an assumption comes directly from the customer –are they willing to pay for the product? They were.

MGHPCC -The Massachusetts Green High Performance Computing Center



The large research universities in Massachusetts were operating at a disadvantage because they did not have a high performance or supercomputing center in the region. MIT and the University of Massachusetts decided to team up to try to find a way to build one. They invited in Harvard and Boston University and then added Northeastern to the consortium. This meant that they had the five largest research universities in Massachusetts and 5 of the six largest in New England.

The Need and the Pain was that there was no High Performance Computing Center or Super Computing Center in the Northeast. This put us at a disadvantage in attracting research and faculty compared to those who did have one nearby. Illinois was the first supercomputer center followed by San Diego, the Research Triangle North Carolina, and Pittsburgh.

The Pain: To be great research universities you need access to high performance computing. Massachusetts had five great research universities, but they had to use outside centers for their research and had to provide expensive local facilities run with a lot of expensive electricity. There were significant problems with high cost of electricity and providing suitable facilities to host computers.

Their solution was to team up and raise \$100 million to build this jointly. You can read more about this in the Case of MGHPCC [Case: MGHPCC](#)

Tesla Motors

Finally consider Tesla Motors' development of all electric high performance cars. They took advantage of all four of the 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.



Figure 2 -Tesla (J. M. Wilson)

Elon Musk made the assumption that *the public was ready to buy an all-electric car*. This was an audacious assumption. The Goliaths in the automotive industry had decided that the public was not ready. Musk felt that an attractive product and a support structure of charging facilities could change the answer from “not ready” to “ready.” His first product, perhaps his “minimum viable product,” was the roadster shown above. He specifically targeted the early adopter market that was unlikely to purchase the econobox electrics that some of the Goliaths were testing. His roadster had outrageous performance that rivaled some of the Porsches and a range that outdid the electric econoboxes. With better battery technology and a political trend that favored and subsidized electrics, he was able to get a tentative “yes” to his assumption. The public was interested enough to buy his MVP and he quickly followed up with another larger car and launched his first mass market car at the end of 2017. Success is far from assured for Musk, but he has gone farther than most experts ever felt that he could.