

## Problem-Solution Cycle in Entrepreneurial Innovation

For every problem solved, new subsequent problems emerge further requiring innovation or adaptation. This is referred as the Problem-Solution Cycle for the sake of this article. With regard to innovation, there is always talk of the need to take advantage of opportunities or to address problems as if the two (problems and opportunities) are mutually exclusive. Opportunities exist because there is a gap between the actual and the desired. This gap is in fact a problem regardless of how minute it might be. For this reason this article centres on problems, but because of this assertion is not exclusive of opportunities as a driver of entrepreneurial innovation.

### Problem-Solution Cycle

An innovation-aspiring entrepreneur must remember the following;

- New problems prop up everyday due to changes in our environment
- New solutions bring new problems that in turn require new solutions
- Old solutions become problems as new challenges make them obsolete

Thus a problem-solution cycle is constantly in our midst creating opportunities for ideas that the market might be willing to pay for. Once a product has been found as a solution to a particular problem or set of problems, if you look out carefully you will see that there is usually need for modification which can take any of the following forms:

- Perfective modifications
- Corrective modifications
- Adaptive modifications

Perfective modifications to an existing solution can be done to improve its features and performance or even cost. The solution currently works but there are further opportunities to improve it.

Corrective modifications are necessary when an innovation offers a solution but with major problems that actually require a new solution. The innovation does not need to be discarded because it does work but there is need to correct the anomaly or other unanticipated challenges resulting from its use.

Adaptive modifications are about making the product appeal to a certain environment for which it was not initially made for.

The problem-solution cycle is probably one of the reasons why products are always evolving regardless of us thinking technology has really outdone itself. This creates constant opportunities for innovative entrepreneurs. Observation will show that most innovations are not complete novelties in themselves but are improvements or modifications of existing products.

### **Current Problems**

The most consultative source of innovative ideas is the problems societies face at any given point. Part of these problems can be addressed through changes to objects that affect humanity. Amongst these objects are everyday products and services that we buy and sell as businesses. Society searches for solution to problems using 2 approaches:

- Active solution search
- Passive solution search

#### ***Active solution search***

Under the active solution search, society admits the existence of a major consequential problem and attempts to actively search for solutions for the alleviation or obliteration of the particular problem. The market will be looking for solutions amongst current products and if the current product portfolio is not helping much, there will be hoping that a new innovation will come up to assist this plight. Currently, cures for AIDS and cancer will be good examples.

#### ***Passive solution search***

Passive solution search is different from active solution search in that it involves existing problems that are not very consequential but can take away simplicity from life. Society is not searching for the solution but if one perches up, the market will take it.

### **New Innovations**

Ironically, a great source of innovative ideas is new innovations themselves. A new innovation creates possibilities for new changes along its value chain. The changes that the new product brings to the value chain provide an opportunity for new support products and services as well as production technologies, processes and raw materials. All these mean that the old value chain logistics now require new products and services if they are to efficiently support the new innovation. In short, a new solution has brought with it logistical issues – which we might as well define as problems.

Also a new product creates new accessory products which somebody might have to invent.

To fully present the above-explained concept innovation will be broken down into 3.

- Principal innovation
- Upstream innovation
- Downstream innovation

The principal innovation is our main innovation (that one inventor came up with for the market). Upstream innovations are changes to the technology and processes that make or support the principal innovation. Downstream innovations are new products, processes and services that are resultant of the new or principal innovation.

Given the above, we can see that major innovations can be quite systemic, i.e. affecting the whole value chain with new changes. So if a new phenomenal invention is unleashed an astute entrepreneur will look up and down the value chain to see what else may be needed for the smooth flow and adoption of this novelty.

### **Trend Forecasting**

Trend forecasting can help aspiring innovators to take advantage of the Problem-Solution Cycle from a futuristic perspective.

The market problems are never static. Customers require a constant upgrade of products and services in line with changing times. Demands for new things is driven by a lot of factors amongst them the need to be different, the desire for better as well as satiation with existing products.

An entrepreneur can forecast what society can and may want next. One has to study the past and the products society applied in a given area of life, the current products in use for the same benefits and possibly how society may want to satiate the same benefits given technological, sociological and economical changes.

Forecasting the future under uncertain circumstances usually tends to be speculative. However this speculative approach can work. The forecaster needs to get in touch with the pointers that may determine the future product requirements. For example one can look at how society has become more cancer-conscious or how the go-green initiatives are gaining ground in the business world.

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## Serendipities

Serendipities are accidental or chance discoveries. An innovator may discover something by chance while in the quest of inventing something else. In history there are several accidental findings that have resulted in great innovations. Chance discoveries will only make economic sense if they fall on part of the Problem-Solution Cycle that the market is willing to pay for. However, not all solutions will result in positive returns. Other socio-economic factors such as demand, propensity to spend on the new change, market knowledge, depth of the problem etc. come into the equation.

## Personal Factors

Inventions have a lot to do with personal factors of the inventor. Inventions come from the mind. Personal factors such as intelligence, knowledge, personal experiences, intellectual exposure, professional experience, skill, expertise and personal interests and desires all contribute in varying degrees to innovative ideas.

A notable contributor to innovation is field of study or field of interest. Most innovations have much if not all to do with one's discipline or area of interest in life. Persons with varying degrees of factors mentioned above come up with innovations whose common denominator is area of interest.

Regardless of the said personal factors, society's problems are as diverse as humanity itself. As such there is always a niche where one can make a mark taking advantage of their personal strengths.

## Brainstorming

Brainstorming involves listing down all ideas about possible inventions and innovations that come to mind given the Problem-Solution Cycle mindscape for a particular area of interest. The ideas are then relooked into later to see if any of them make sense. All ideas that seem impractical are dropped and the few that seem feasible are studied further.

Brainstorming can be help an entrepreneur think along the Problem-Solution Cycle if it is defined. Usually with a group of colleagues brainstorming for as many ideas as possible can result in any of the following scenarios:

- No ideas
- Some ideas
- Ideas that can be combined

If there are no ideas, worry not, great ideas do not come that easy. Refine the brainstorm process further through some pre-brainstorming activities. In our current example where we want an innovation that can fight aerial bacteria in public restrooms, we can look at other gadgets in a variety of fields that disperse substances to see if any ideas can be gotten from them. We also need to study aerial germs further to understand their characteristics. By also looking at current products used for the same purpose e.g. chemical aerosols and other applied chemicals we can get a better understanding of what we are trying to do.

After further pre-brainstorming activities mentioned above, redoing a brainstorm can be more positive-hopefully.

### Other Technical Fields

Whilst product categorization will differ more visibly, technologies involved in the products may not differ as much. Think of the difference between kitchen gadgets that use powered rotation such as, kitchen blenders and mixers and workshop tools like electric drills etc. All these products, from an engineering perspective are the same in that they are driven by an electric motor. Whilst they differ significantly in outlook and use, from a mechanical view they are driven by the same technology.

What has this got to do with invention ideas? The answer is ideas can be taken from other fields. The aerial germ killer we are trying to come up with might as well get ideas from the kitchen or the home for example. An answer for problems might exist but in a different sphere. What may be required is to simply adapt and fine-tune.

In conclusion, innovative entrepreneurship can generally be viewed from varying perspectives, the Problem-Solution Cycle being one. The advantages it gives are that it instills pro-activity by challenging entrepreneurs to look into the future of products and services given the status quo. It also encourages comprehensive thinking as it also looks at invention along a value chain.

