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**Innovation in Entrepreneurship by
Applying TRIZ**

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Today in a rapidly changing, highly turbulent and uncertain socio-economic environment, companies and organizations must think about procedures of methodical and constant combination of innovation inside their business frameworks, as a major condition for sustainable development.. Today TRIZ is quickly picking up as a vigorous system for characterizing and settling troublesome issues that remain as boundaries to product, process and business development. TRIZ is utilized to produce innovative solutions in an assortment of corporate settings under an assortment of conditions. Numerous organizations utilize TRIZ in regular business to enhance customer understanding, create new thoughts, take care of problems quicker, create innovations, track product advancement, create everlasting innovation, construct more grounded licenses, enhance new item achievement, streamline assets and by and large spare time and cash. This paper gives a case of how TRIZ thinking gave a thorough and methodical methodology for taking care of issues identified with pizza delivery.

Key Words: TRIZ, Contradictions, Delivery Box, Innovation, Problem Solving, Ventit

Introduction

Today, disruption and innovation is about considerably beyond developing new and innovative products. This is all related to reengineering business methodologies and developing altogether untapped markets that meet new customers' demands and needs. Most imperative, as the Internet and globalization broaden the pool of innovative thinking and ideas, and it is all about screening, choosing and executing the right ideas and putting up them for sale to the public in record time. Thus, to sustain and excel in this competitive world of business, organizations are required to enhance the rate of innovation. The theory of Inventive Problem Solving (TRIZ) is an approach that can enhance an individual's capability to originate creative solutions and can benefit almost every company to foster innovative capabilities. This paper shows how TRIZ is adapted to generate innovative solutions for hot pizza delivery.

TRIZ (Russian acronym for "Theory of Solving Inventive Problems") is a powerful tool for innovative approach and for solving a problem. A brilliant Russian patent examiner, Genrich Altshuller, declined to acknowledge the reality that innovation and creating new things were arbitrary work.. According to Altshuller, this was not logical that the inventive and creating new things, alone, were not possible to make out in a proper methodological scientific manner. He understood that we ought to have the capacity to reach and to teach the methodology for designing and developing innovative and new inventions.

For creating TRIZ, Altshuller strategically studied worldwide patents, work of archived innovations and intellectual property all over the world. While reviewing literature of several patents, he differentiated among ordinary and insignificant patents of lesser innovative quotient, and those that were really having high innovative quotient. After reviewing and analyzing, the effective and valuable patents, he was able to make out a similar set of innovative and inventive procedure adapted throughout various areas of engineering and technology. He categorized and codified all the inventive principles for making them effective and applicable for different areas of business and technology.

Not until 1990 did TRIZ arrive in the US. Today, numerous Fortune 500 Organizations use TRIZ, including Proctor & Gamble, Dow Chemical, Hewlett-Packard and BMW. All these companies apply TRIZ to develop innovative goods ; less waste producing system, to comprehend market trends and for improving their handling of intellectual property.

It is esteemed as an ace instrument that covers a group of imaginative thoughts, devices and procedures that have been used more than once to deal with troublesome issues and give a general method to manage creative basic reasoning to give answers for unsolved and troublesome issues and to give a general way to deal with innovative critical thinking.

Literature Review

In order to increase competitiveness among people, all the new companies are required to find out and evaluate new products and also in order to change and reduce the current states and also those states which are harmful or not giving productive results. In such a situation TRIZ methodology is considered to be the most effective and well equipped scientific technique which is majorly used by the managers and senior people of the company or investors. By this TRIZ Is a detailed, creative and innovative concept and in comparison to other techniques a very advanced one. [1]

There are some companies that require different divisions of the organization and different areas of the organization to find out that the system should be correct. ,quality testing is indeed necessary and it is the need of the hour there is also the need and requirement of new changes and new ideas to be inculcated into the system along the detailed and indented route .By having an understanding about the same , there is an ideal outcome about the various aspects of the company .[2]

There are various ideas in a system, out of which TRIZ is one of them. In order to find out the various functions and specific ideas in technology and to solve various technical solutions towards identifying a good solution by various new existing ideas, and then also create new ideas which are original in nature.

For example, Mr Waldman has created an all together different evolution of a pizza box. The basic objective of this box is to keep the pizza warm and fresh, so that it is edible for hours. It is required to create an closed and insulated container which actually prevents the pizza to get soft and out of taste.In such cases we all want the pizza to be hot and dry, but ideally if we look into the process , the ideal solution of a hot pizza is going to make pizza wet due to excessive vapour and ideally to keep the pizza dry for a long time will make pizza cold .[3]

By using various tools applicable in TRIZ , there ia a new method which is prepared by giving and informing three different routes and their different combinations by providing and involving innovative solutions by giving and creating new products and providing equal services. In relation to other approaches this method of TRIZ is comparatively more effective and flexible in solving various problems of various types in relation to technical contradictions, non technical contradictions and a combination of both. A case study on a data centre design is presented and prepared in the paper to understand and illustrate the new technology.[4]

In contrast to the technical changes the visual graphics and the knowledge of this activity in a graphical interface is an attractive tool for the new ones to start. As various tools , the understanding of the documentation of its contents and the cell arrangements of any box of pizza to create a new format and a new template . All the documentation is separate and it is necessary to define the various issues of the template all together. So, various steps need to be identified as, Step 1: Working on the sogginess of the pizza

Step 2 : Delivery of the pizza.. in that case a separate documentation is prepared to define the problem in detail , about the delivery at home and the delivery timings.

Step 3: To understand that what part of the customers are looking for pizza delivery, pizza supply and so on.[5]

No business or venture, however huge and making profits, can keep on holding a top position unless it perceives that cutting edge business works in a universe of running change which makes new challenges, risk and openings and for which they need to activate their strategies before these changes effect the organization.. To do effectively, the entrepreneur and enterprise should know where this firm is heading and how the firm will reach there. This is turn requires a clear vision of the companies' goals and objectives that will help it to consistently adopt the changes necessary for its survival and growth. [6]

TRIZ is a splendid toolbox for supporting inventiveness and development. The intensity of TRIZ is that it very well may be utilized to recognize expansive scope of issues and challenges and can create better thoughts. It can likewise be coordinated with different procedures, as QFD, FMEA, Technology Road mapping, Six Sigma. Be that as it may, the main thing is the better approach for leap forward reasoning proposed by TRIZ: through wiping out inconsistencies towards ideality. Rather visually impaired inquiry and bouncing to thoughts and ends excessively quick, we altogether break down a circumstance, uncover logical inconsistencies, and resolve them in "winwin" way.[7]

TRIZ Principles

Kaizen, Six –Sigma, Cost –reduction, incorporating digital technology all these promote straightforward thinking, but TRIZ promotes a different kind of thinking. Companies are going to any length to hire people who can just think outside-the- box. TRIZ offers a set of principles that help people to think outside-the – box.

TRIZ Principle #1 –At Someplace, Somebody has solved a problem very similar to yours.. Innovation and Creativity means searching for that solution and adapting it to solve your present problem.

The quality improvement professionals believe in this principle because quality focused approach incorporates benchmarking, which is firmly related to the principle.

Concept of Someone, somewhere, has already solved your problem can be easily illustrated by this example. Take the case of dairy farmers in California. Milk production also involves managing large amount of manure. Earlier, the manure was recycled as fertilizer by drying and deodorizing in large ovens before shipping. But with time, the cost of energy started increasing and very soon use of drying ovens became highly uneconomical. Here, TRIZ played an important role to solve the problem. The strategy centers on taking a gander at different technologies for potential solutions begins with repeating the issue when all is said in done terms, underlining the capacities being performed, instead of the innovation itself. In this way, dairy agriculturists were not searching for enhanced approaches to dry compost; but rather they

began looking courses for isolating a fluid from solids. A basic hunt with TRIZ systems turned up a strategy, utilizing a hydrophilic gas, in which the gas diverts the water atoms. This strategy has been utilized for over 40 years for concentrating orange juice. Pharmaceutical industry was able to create a havoc in production process by following the concept of beer industry.

With reference to the current market study of the consumer products, we all are considering the following companies:

- Bounty majorly divided paper towel sheets simply like Kraft's separated cheese sections sold by Kraft.
- The model for many thick and translucent liquids which have gel like texture such as hair shampoos, hair conditioners, face packs etc is an inverted bottle of Heinz Ketchup bottle, with the lid at the bottom of the bottle.
- A new change in the area of manufacturing industry which is used by Company like Boeing has their seats lifted in an aircraft is a revised and advanced form of changes in a hay loader in 17th century.

TRIZ causes people to place issues as often as possible utilized or for the most part innovative standards. It empowers hunting down arrangements outside their essential field of utilization. During this process, these various activities are in organized, usable and in recovering phase. A great many people are acquainted with the riddle of interfacing the 9-spots with 4 straight lines. TRIZ elevates pondering how to put two and two together with no lines, as the perfect, and maybe one line in reality. TRIZ speculation asks, "By what method can the capacity or objective of a framework be accomplished without anything extra?" The answer may be exceptionally unreasonable, yet prompt 90% arrangements, that are down to earth.

TRIZ Principle # 2 – Idealized Final Result

The vast majority are acquainted with the process of joining the nine dots with four lines. TRIZ elevates contemplating what way to join the dots without lines, like the perfect and maybe single line in fact. TRIZ principle questions, "How can the function or goal of a system be achieved without anything additional?" The answer can be very vague, but it can possibly give solutions to 90% of problems, which are dealing with practicality.

We take a basic case. A machine administrator's employment, including machining, cutting, and so forth is being supplanted by a mechanical operation. In beginning test operations, metal chips stuck the machine, and conveyed the robot to a stop in the new establishment. Beforehand, the machine administrator cleared the metal chips away. Common building speculation is to add something to the framework to keep the chips from entering the machine - as affirmed by utilizing this issue with more than a 100 diverse designing

gatherings. Normal arrangements are a programmed sweeper, a hood, or a blower, creating extra multifaceted nature as far as upkeep and operability.

How about if we take a basic case. A machine's operating activity, including machining, cutting, et cetera is being substituted by an automated robot. In starting test activities, metal chips stuck the machine and made the robot to stop in the new establishment. Beforehand, the machine operator gathered the metal chips up. Majorly some arrangements should be made by innovation through which we can contribute something to its area to remove the chips to enter its machine over this matter which requires 100 technical experts.

Basic arrangements are a programmed floor brush, a hood, or a blower, producing extra unpredictability as far as upkeep and operability.

The TRIZ approach of Ideal Final Result proposes a romanticized outline where the chips are uprooted without anyone else utilizing the current assets, without adding anything to muddle the framework. Chips can fall away utilizing an asset effectively introduce - gravity. Basically flipping around the machine tackles the issue. In innovative issues comprehending, we frequently discuss "turning the issue on its head." TRIZ gives rationale to help you do that.

The TRIZ approach of Ideal Final Result proposes an idealized layout where the chips are evacuated without help of other resources and just using the present resources, without adding anything to obfuscate the system. Chips can fall away using an advantage successfully present - gravity. Fundamentally flipping around the machine handles the issue. In creative issues understanding, we every now and again talk about "turning the issue on its head." TRIZ offers reason to enable you to do that.

TRIZ Principle #3 – Find out the solution to complete various fundamental issues

One more of the central ideas driving TRIZ is that at the foundation of numerous problems is a fundamental contradiction that causes it (we'll give illustrations underneath.) In numerous cases, the best way for tackling an issue is to remove these contradictions. TRIZ recognizes two classes of contradictions:

1. **Technical contradictions** are classical engineering "trade-offs." The desired result can't be achieved because something else in the system stops it. At the end of the day, when something shows signs of improvement, something else naturally deteriorates.

Traditional cases include:

- Durability of the product increases (good), but with that the weight increases (bad).
- Service is customized to each customer (good), but the service delivery system gets complicated (bad).
- Training is comprehensive (good), but keeps employees away from their assignments (bad).

2. **Physical contradictions**, likewise called "inherent" contradictions, are situations in which an object or system endures opposing, inverse necessities. Everyday examples abound:

- Software should be complex (to have numerous features), yet ought to be simple (to be simple to learn).
- Coffee ought to be hot for enjoyable drinking, yet cold to avert burning the consumer.

TRIZ and Pizza Delivery

While designing products and processes, organizations face many challenges in form of physical and technical contradictions. Our favorite food pizza is not untouched by these contradictions.

Pizza lovers say that pizza is always better not eaten out of a box. But when 2.1 billion of the 3 billion pizzas eaten every year are eaten out of boxes, it's something we can't escape. Free home delivery and take away Pizza is lifeline to today's pizza business.

These two are giving more business to top pizza players like Domino's, Pizza hut and Papa zones. But delivering fresh and tasty pizza is not an easy job for them.

For delivering hot and pizza, it must be packed in corrugated box. However, packing it in box gives rise to following quality issues-

1. Pizza gets wet and soggy as the steam and heat evolving from the hot pizza finally gets settled to the bottom of the box.
2. Pizza getting cold.
3. The lid of the box collapses on the pizza and sticks to the pizza and eventually lifting a major portion of cheese with itself.

So we can state the contradiction:

- We want the pizza to be hot (it tastes better)
- We want it to be cold to prevent the lid from becoming soggy and sticking to the pizza.

The first two issues are very well addressed by a Mumbai based businessman named Vinay Mehta who has designed the world's best pizza box that has been patented over 70 countries. USA-based pizza fan, Scott Wiener awarded pizza box designed by Mehta as the best pizza box as it is able to deliver crisp and fresh pizzas. Wiener, who conducted tours for pizza throughout US, came to the final inference after reviewing six hundred fifty pizza boxes from forty five countries. He is additionally the author of Viva La Pizza, a famous pizza shop situated in New Jersey, USA. This company has its expertise in designing the Pizza Box, which is having outstanding pizza delivery boxes designed around the world.

Vinay Mehta is a long-time Reliance Industries food vendor, whose family was into the manufacturing of corrugated boxes since 1977. According to Mehta, he had been disappointed with the state of pizza packaging for a while as every time he ordered a pizza, he used to get soggy pizza. As being in the business, he thought a solution should be found.

He understood that most pizza boxes are insufficient in light of the fact that they have gaps as an afterthought to discharge steam—yet the warmth is really discharged from the top and base of the pies. 'The

problem with the present design is the lack of ventilation — steam created in the crate is caught inside and gathers on the pizza, and compromising the freshness." But shouldn't something be said about the gaps frequently found on one side of the container? "They are pointless, really. The warmth which renders home-delivered pizzas spongy and bland is discharged from the top and the base of the pizza, not the sides.

The warmth discharged from the hull, for case, stays caught," says Mehta.

For solving the contradictions, Mehta concentrated on TRIZ principles. "Out of all one of the basic ideas of TRIZ is that somebody, someplace, has already solved your problem or one similar to it. Creativity means finding that solution and adapting it to the current problem (Principle 1).He looked for solution everywhere and finally he got the solution. His solution was simple. Cardboard, consists of three layers: two flat surfaces and one ridged corrugated sheet in between. The pizza boxes designed by him have holes in the two flat surfaces, but not in the middle layer. This permits steam to travel through the grooves in the middle corrugated layer, without getting trapped inside the box. (Figure 1)

This solution was inspired by Indian homemakers who knows that it is always better to seal chapattis after waiting for some time when they are out from gas stove.They always wait for the hot air to pass to let it remain fresh.

While finding the solution, he also considered the solution should be cost effective and no additional material is required to manufacture the box.(Principle no-2: Idealized Final Result).

The cheapest and simple to execute answer for issue 3 the business had started on a plastic tripod stand that finally turn out from a place to large numbers of takeaway pizza boxes.

It settled the logical inconsistency of the pizza being hot and cold in the meantime. The pizza box turns out to be more perfect, from the point of view of the customer, through the goals of the logical inconsistency.

Conclusion-

TRIZ was initially made to manage building critical thinking. Anyway it has been reached out to applications in numerous other non-designing and administration fields. The utilization of TRIZ empowers authoritative critical thinking and inventive reasoning which is valuable for breaking down frameworks and tasks, recognizing and characterizing issues. TRIZ is an orderly way to deal with development which can be utilized to define procedures to enhance products, administrations, and frameworks.

Huge and small organizations are utilizing TRIZ on numerous levels to understand genuine, big or ordinary problems and to create methodologies for the fate of innovation. TRIZ is being used at ABB, Bosch, Chrysler, Ford, General Motors, Kraft, Motorola, Procter and Gamble, Samsung, Eli Lilly, Jet Propulsion Laboratories, 3M, Siemens, Phillips, LG, and hundreds more. TRIZ is relevant to each industry and in each condition for the increasing speed and advancement of critical thinking.

Present day TRIZ ought not exclusively be viewed as a system for taking care of building issues or another product improvement process; fundamental thoughts behind TRIZ turn into an intense tool for overseeing information and taking care of issues that contain logical inconsistencies in numerous regions.

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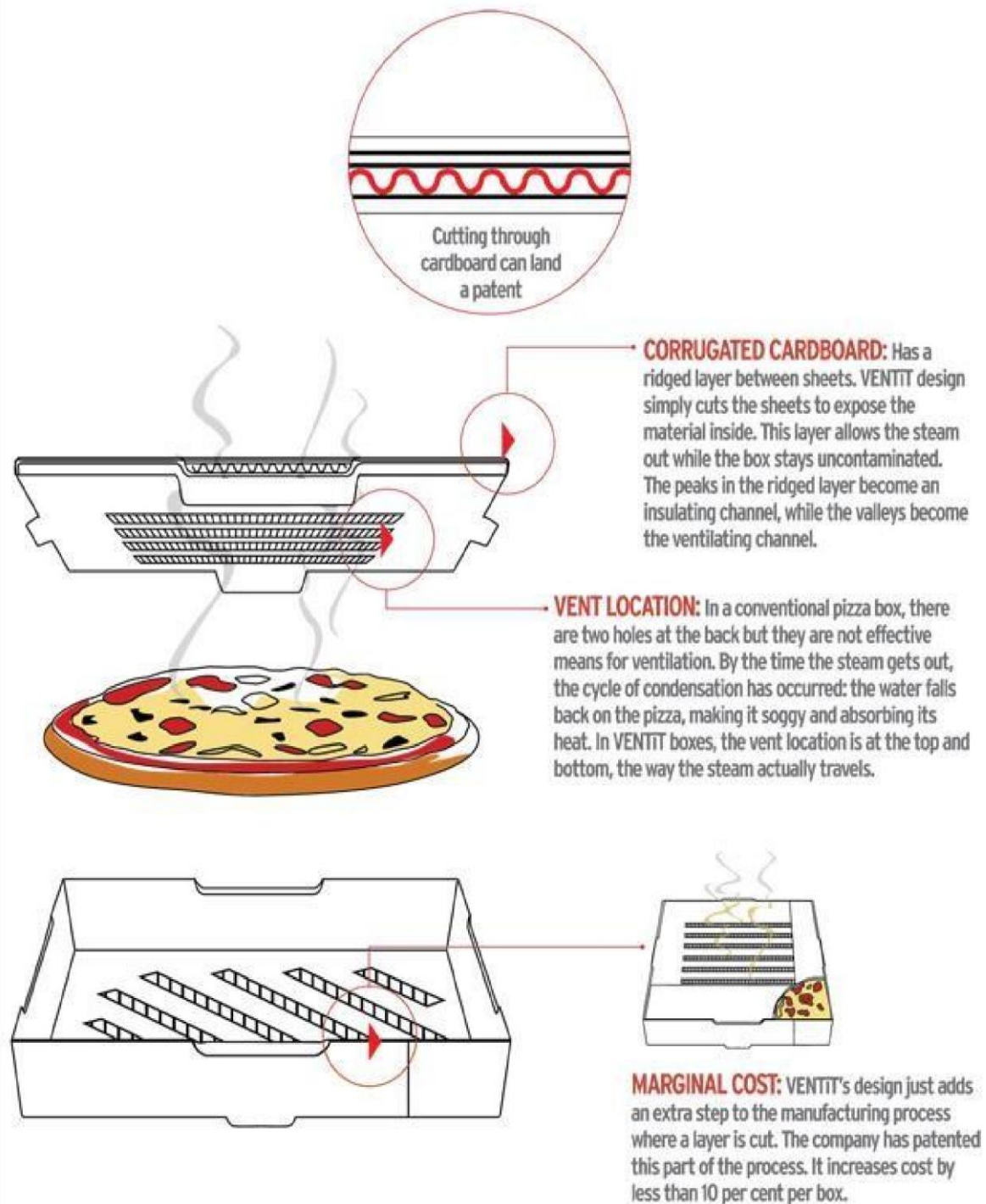


Figure 1: Ventit Design which helps to escape steam