Essay on qualitative analysis - reflective paper

Technology, Development

After having reviewed by initial paper, my perspectives on TRIZ are a little more fully developed, and I can feel a greater understanding of the innovative problem solving process. With the understanding of the 40 principles of TRIZ, each type of problem has their own specific rules to follow, all of which can be applied to strengthening one component without sacrificing another. The laws of product evolution also allow me to more accurately and effectively frame my search for potential evolutions. In this reflective paper, my change in perspective on TRIZ will be outlined, as well as new ways in which I can apply the principles of TRIZ and this course to my work in the outside world.

When I first started learning about TRIZ, I was under the impression that it had only to do with technical systems, and would involve a great deal of mathematical formulas and the like; I was very daunted by the specific applications put forth by the Fey & Rivin textbook. However, as I kept studying the material, it became clear to me that TRIZ is simply a set of guidelines that can structure one's problem solving. They can be applied to any field, in any capacity. This helped me gain a greater understanding of the principles of TRIZ, and improved my working knowledge of the system. All too often, the trial and error process is a crapshoot; random shots in the dark fueled by intuition and desperation. However, with TRIZ, it is possible to apply a helpful bit of tunnel-vision in this process, offering a guided solution to the issues that plague product developers during their project. Problems could even be predicted before they start, which would be invaluable in many industries, not the least of which my own.

Gone is my perspective that TRIZ would not appeal to every situation I could come across; by allowing this ordered sense of problem solving into my life in different capacities besides just my work life, it would also help me to find a solution more easily. I was unfamiliar with the concept of psychological inertia, and simply believed that I was using common sense to drive my brain towards certain solutions to problems. However, it was not until this course and my study of the principles of PDP that I realized just how much psychological inertia affects my decision making.

All too often, I would discount perfectly good ideas because I felt they did not make sense, and because I had not seen anything in my experience to believe that it could be possible. However, with the recognition of psychological inertia, I can more or less put that aside, with the help of TRIZ, and look at all possible solutions to a problem, guided by its principles. Being more aware of psychological inertia can help you understand just how much your culture and past influences your present decision making.

I work as a product developer for a hardware company; the principles of TRIZ should prove to be quite useful for me in this occupation. I design and create new brands of products all the time; everyone is looking for the next hammer, the next chainsaw; all of these products that have been developed to death, someone is trying for a way to make it better. Increasing strength while maintaining battery life, for example; the principles of TRIZ would help me look for solutions to these problems in a more ordered manner. If there were a way to create a technical system that allowed a cordless drill to run for eight hours on end, without sacrificing speed or power, that would have

tremendous applications and implications for faster, more effective construction. With the help of TRIZ, outside-the-box thinking could lead to these kinds of solutions.

The most useful thing, to me, that TRIZ brings to the table is the capacity to streamline and offer a definitive process for problem solving. Gone are the days of mindlessly poking around to find a solution; if I want to make a product stronger without sacrificing reliability, I just have to apply principles of beforehand cushioning and local quality to the mix. The triz40. com performance matrix website shall continue to be an effective and priceless resource for me as I continue my work in hardware engineering.

New areas of research in my field through TRIZ could be reached by applying the principles to my current work; new areas of application could be reached as well. We can attempt to develop new products that perform the same function as a crane, or a screwdriver, or a circular saw, but in a wholly new fashion that improves upon the meeting of needs of the customer. Construction efforts could be dramatically reduced in time spent and effort expended, with the help of new tools and new construction methods that speed up the process and make it easier for those who do the work.

The identification of a problem statement is a fantastic way to start off a project; it clearly identifies the problem and communicates it to all others who work on the project. This can eliminate any and all confusion that occurs within a research and development team; often, conflicts in what people think the problem is can lead to setbacks and a lot of wasted time in product

development. With problem statements applied more clearly to research projects, it is possible to make this process go much more smoothly.

New areas of research in my field could include a greater emphasis on auxiliary tools - all too often, we focus on creating primary tools that are better than the existing one. However, with the creation of the right auxiliary tool, we can indeed facilitate more effective use of that primary tool. Ax handles, screwdriver handles, smaller mechanical components of chainsaws, cranes and the like, all can be improved upon, all to enhance the creation and function of the primary tool.

When working on these various primary and secondary tools, the struggle against primary system conflicts is a large part of our work; sometimes, new ideas and new areas of application simply do not work as intended. Settling system conflicts would permit some aspects of the product to be improved, while maintaining the same effectiveness in other aspects. In a previous paper, I mentioned improving the strength of a crane without sacrificing power; this is a common question that comes up in some of my product development meetings, and with the help of TRIZ, a solution for that particular issue could be reached.

One way in which TRIZ could be helpful in my employment is to combine it with existing methods of product development that we use. I use QFD, or Quality Function Deployment, often in my work, and it is primarily used to determine customer needs for its products. By combining these two strategies, not only could I more effectively figure out what the customers' needs are, but I could learn the best ways to meet them through the

development of our products. Yamashina et al. (2002) found a method called IPDP, which stands for Innovative Product Development Process, that streamlines the combination of these two methodologies into a single process, one which permits technical innovation to be used to the customer's best interests. This, in my mind, could be the best way that TRIZ could be applied to my field of work.

Given the possibility of applying TRIZ to new research possibilities in hardware development, the law of increasing the degree of ideality of the system is one that fascinates me greatly. As I mentioned before, it would be incredible if someone could find a way to make already-perfect systems even more perfect - the perfect chainsaw, the perfect crowbar, the perfect screwdriver. After decades, if not centuries, of development, these products seem as though they have gone as far as they could in terms of performance and effectiveness. However, ideality could still be increased, to the point where the Ideal Final Result could be reached. Since each new generation of a product brings it closer to ideality, one can be tempted to just make small tweaks on a constant basis in order to achieve that ideality. However, I believe that TRIZ principles can guide me toward more reasonable, feasible improvements that will streamline the process in an incredibly powerful way.

The law states Ideality equals Benefits divided by the sum of Cost and Harm. This equation has stuck with me ever since I came across it. For far too long, I and a lot of my colleagues have been operating under the assumption that abstract thinking is the primary key to improving these products; however, providing this semblance of order and structure to product development

through the simple equation marked above should improve our search for the Ideal Final Result. I firmly believe that none of these hardware products have reached that IFR yet; also, the law states that the IFR cannot be reached. I think I can get these products closer to that point than ever before, though.

Another law of evolution that fascinates me, however, is the law of completeness, which states that a product can turn into being a completely automated process, without any human involvement. In the construction industry, this is both a frightening and an exciting concept; the construction company that makes cranes that can operate by themselves would be rich beyond the dreams of avarice, since construction companies would chomp at the bit for such an opportunity. However, the implications for the construction workers who normally operate that equipment would be disastrous, and it is possible that there will always been some degree of human oversight that is required.

As the law of completeness marches toward its eventual conclusion, however, that crane that I talked about earlier not only would be stronger and still powerful, but unmanned. There would be no possibility for human error due to fatigue or inexperience, and that might revolutionize the way the construction industry is structured. Therefore, great care would have to be considered as the chase towards completeness is conducted.

In conclusion, TRIZ permits me to circumvent psychological inertia and develop greater hardware products through the enhancement of auxiliary tools. With a greater emphasis on the things that make construction

equipment work, that same equipment can be made more effective without the primary tool even being touched. All that is required, really, is the application of these principles, an ignorance of conventional though, and pure hard work. By thinking outside the box, and guiding this more abstract thought through a product development process, we can achieve incredible strides in construction product development. This all stems from the change in perspective I have gained on the whole enterprise due to the understanding and instruction I have received on the tenets of TRIZ.

References

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