

The Fuzzy Front End (FFE) isn't so Fuzzy with TRIZ

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For the last 5-10 years, corporations have struggled with cost reduction, costly environmental regulations, competitive threats to their products, and other factors that affect the cost factor of the bottom line. TRIZ has played a role in all of these cost reduction activities by improving product and process designs, eliminating waste and duplication, and providing the problem solving component to supplement tools such as Six Sigma and QFD.

Most organizations, though not retreating on the effort to reduce cost, have begun to refocus on the top line involving new product development—recognizing that saving one's way into prosperity is not a long term business strategy. So what does a strong, state of the art new business and new product development effort look like today? It involves both employees and customers. Asking each for new product and business ideas is essential. However, talking to just your current customers can be fatal in the long term. Two recent books by Dr. Clayton Christensen of the Harvard Business School, "The Innovator's Dilemma" and "The Innovator's Solution" have highlighted the fatal mistake that many large companies make in extending their current business and product lines into the future as if it was a straight line. Example after example is presented, demonstrating the vast sums of money lost in this way of thinking. (Examples: mini-mills in the steel industry, Wal-Mart in retailing, hydraulics replacing cables, miniaturization of disk drives). Though the author of this book demonstrates no awareness of TRIZ in the writing of this book, numerous examples of old line companies being replaced by breakthrough new products and business systems have TRIZ toolkit fingerprints all over them, including many examples of separation principles and contradiction resolution.

This topic now is the driver behind many large conferences and further academic research. This area now has a name of its own—the Fuzzy Front End (FFE) of Innovation. Specifically, this is all the stuff that goes on **prior** to a project or business idea entering a stage gate or funnel process. Thousands of executives are now asking the question, "Where is the next breakthrough area for new business leverage? How do I identify it? How do I exploit it?" In other words, how do I figure out where the Fuzzy Front End (FFE) is?

Those of you who have read this far are probably having the same reaction that I did after reading these books and listening to speakers at several conferences---TRIZ can help! The FFE, from a TRIZ perspective, is simply a sharp transition governed by one or more of the TRIZ patterns and lines of evolution. It could also be a very difficult product or service contradiction that needs resolved by an entirely new design or business approach.

Simple examples of these applications include the separation (in space) of IBM research groups working on entirely new technology so that they would not be affected by all the day to day concerns of the current business product line. The development of flash memory cards vs. hard disk drives illustrates both contradiction resolution and separation in space.

We can go through all the various lines and patterns of evolution (no matter how many you believe there are or how you subdivide them) and use them to predict where future activity, acquisitions, and joint ventures should be focused. For example, the Line of Evolution relating to reducing the human component of systems would have caused us to look at self check out systems, automated toll collection systems, and on line bill paying systems before our competitors. The mechanical-thermal-chemical-field line can be followed along with the development of chemical catalyst systems, teeth cleaning, and photography (image capturing). What would your thought process be in applying this line to product line that has never left the mechanical stage, such as a screen door? What if we put on our TRIZ hats and use the more functional term, “entry system”? What kind of thermal or chemical detection/opening systems will we think of?

The power of the TRIZ “nine box” diagram (or 27 boxes if you like!) can also be powerful stimulant for forecasting where the FFE may be for someone else, including your suppliers and competitors. What is the next step in their lines of evolution? Is it the same as yours? Do you understand the lines of evolution for both customers and suppliers? For example, let’s take a look at products and systems involved in something as simple as a hamburger. At our hamburger making level, we can look at our “level” of the system and see the advancements that have occurred along several lines of evolution (meat is more ideal, i.e. fresher, safer; packaging and meat composition have evolved at different rates, illustrating non-uniform development). We might look ahead at our level and see meat and packaging merging together, telling us when the product is fresh. We could also imagine a hamburger making process devoid of human involvement. The FFE in this case is the technology in both meat and packaging needed to self identify contamination, and temperature profile. It could also include automatic tacking of the supply coming to the store where we make the hamburgers, or a system where they are made elsewhere and simply displayed in the store.

Below us is the production of the meat product. We have seen mass reduction in the human labor component as well as more effective use of byproducts over time. Using fields and tracking devices to replace human record keeping related to contaminated animals is also observed. What might the FFE look like at this level? Why couldn’t the meat producers integrate up into the home and retail sales and distribution business? What’s the barrier that prevents this? What are the contradictions that have prevented this in the past? How could this level of the system apply some matching and mismatching concepts to the customized delivery of meat to either current retailers or new customers?

Above us are the consumers of the hamburger product. The cooking of hamburgers, to some extent, has evolved along the field line quite far if we consider microwave cooking.

But we all know the quality of a microwaved burger vs. a grilled one. What are the contradictions that prevent me from getting the same texture and sensation? Could I do something at the meat production or distribution system to resolve this contradiction? What might the consumer do on their own that might negatively impact the lower two levels? What FFE opportunities does this all suggest for each level?

The structure and tools of TRIZ, especially those related to contradiction resolution and the evolution of technology, can be proactively used to do a better job of planning new product development efforts, new business development, collaboration with customers and suppliers, as well as competitive intelligence activities.

Readings and References

Christensen, Clayton. **The Innovator's Dilemma**, Harvard Business School Press, 1997 (hardback) and 2000 (paperback)

Christensen, Clayton and Raynor, Michael. **The Innovator's Solution**, Harvard Business School Press, 2003

Mann, Darrell. **Hands on Systematic Innovation**, Chapters 4, 7, and 13.

Mueller, Gernot, M.D. "Accurately and Rapidly Predicting Next Generation Product Breakthroughs in the Medical Devices, Disposable Shaving Systems, and Cosmetic Industries", **TRIZ Journal**, 3/99 (on line)

Domb, Ellen. "Bring the Fuzzy Front End into Focus", **TRIZ Journal**, 1/98 (on line)

Conference Sources on the Fuzzy Front End

10th Annual Innovation Convergence conference, Minneapolis, MN 9/27-10/2

"Using TRIZ to Predict the FFE", pre-conference workshop on 9/27

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www.iirusa.com/convergence

Institute for International Research, www.iirusa.com (2004 Boston conference Fuzzy Front End conference proceedings and 2005 conference plans)