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**Who's Afraid of Disruption?
Or
How I Cam to Love Being Disruptive**

Abstract

Disruptive technology can be developed and exploited by American technology based companies to leverage growth and realize financial vitality. Disruptive Technology is a term first used by Clayton Christensen of Harvard Business School in his book The Innovator's Dilemma published in 1997. His insights allowed for a new perspective with regards emerging technology and the disruption it can wreak on incumbent technologies. We take a position of pro-activity from the standpoint of the technologist and explore how technology based companies can leverage disruptive technologies to significant advantage. It is, from our perspective, the single most worthy pursuit of any company determined to grow and thrive.

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Greg Lyon has over twenty five years in technology development. He has worked in research & development and new products development at General Electric, Leviton Manufacturing, Thomson Industries and American Standards Testing Bureau. He is the named inventor on 14 US patents and 6 applications. He is now the principal at LTB Engineering, a firm specializing in enabling American manufacturers to develop and leverage their technology base.

The development and implementation of **disruptive technologies** can be the single-most powerful strategic tool for cash generation, growth and survival for manufacturers. The term disruptive technology was introduced by Clayton Christensen in his 1997 book The Innovator's Dilemma. The term was used to help explain why well managed companies failed when confronted with certain types of markets and technological changes. Instead of approaching the disruptive technology from a defensive standpoint, however, this paper will talk to the harnessing of such a tool for discontinuous growth and profit.

From a technologist's perspective, a disruptive technology is one that changes the rules. From a product and market standpoint, it may take some time for the new technology to pervade, but technologically, it's here and things will never be the same. The prior technologies and art are suddenly viewed in a significantly inferior light. They may become, in fact, irrelevant.

The impact cannot be overstated. The disruptive technology puts its owner in a unique position of leadership and control because it is his/hers to exploit. Smart application of the disruptive technology can lead to market domination with the attendant leading sales and margins.

The most typical course of a given product technology includes first a pioneering invention, followed by a long development, with a number of incremental, albeit important improvements. These sustaining technologies allow the product to continuously improve. Disruptive technologies, in contrast, are discontinuous by their nature. The disruptive technology is a departure from the norm; suddenly and sometimes without warning, a radically different method to achieve the desired result is found. It may afford a sudden improvement in performance. It usually affords a sudden cost savings. It may

Main Entry: dis-rupt

1 a : to break apart : **RUPTURE** **b**
: to throw into disorder <agitators trying to *disrupt* the meeting>
2 : to interrupt the normal course or unity of

suddenly be cleaner, smaller, simpler, stronger, and easier. It always, however, suddenly and permanently changes our perspective of the incumbent technology.

It's great fun to think of examples of disruptive technologies. When did you last use a slide rule? Will you next purchase a camera for digital or emulsion film? How do you light your gas lights? Words and phrases that are used to describe disruptive technologies include:

- Out of the box
- Breakthrough
- Leap frog
- Radical

These words and phrases conjure images of things that are not the norm, are not gentle in genesis, are certainly not incremental, and are wholly discontinuous.

Radical or disruptive innovation implementation provides the greatest potential for cash generation. The disruptive technology need not be applied to the whole of a product; it could be on the component level and may be hidden from sight. It is always, however, non-obvious and unanticipated.

Brother Rudy:

My brother is a gifted engineer with 21 US patents to his name. He refuses to load the company design software onto his computer because he will then be tempted to modify something already designed rather than start anew.

There is a discipline for the discovery of the non-obvious and unanticipated; it is in fact a way of doing things new-every-time. This new-every-time approach has been termed 'Guerilla Engineering' because of its irregular, unconventional methods and results. It is the approach that those not entrenched in the 'way it's done' use on a daily basis. It is the approach that is the absolute coolest part of the synthesis process; the ultimate application of imagination (see examples). It is, in fact, a declaration of war on the status quo. The best part, however, is when it becomes an integral part of your strategic technology portfolio; your proprietary arsenal.

The owner of a disruptive technology gets to exploit it. Because of its unique nature, it is almost always patent protect-able. It can provide:

- Cash generation
- New market segments
- More sales
- Lower manufacturing costs
- Higher profitability

It adds pizzazz to your product offering, since the radical innovations are by definition new and unique. If you elect to exploit a disruptive technology you can look forward to:

- An energized organization
- Perception of leader/winner
- Survival
- Fun

Electing, on the other hand to ignore or allow your competitor to exploit disruptive technology leads to:

- Competition on price
- Squeezing your organization
- Perception of old, low tech product
- Depression, economic and personal

Nay Sayers' Corner:

1. What about the Far East – don't they ignore patents?

Patent law reads: "to make, use and sell". Where are most of your sales? If they're stateside or the EU, you can protect yourself.

2. What about what we make now – won't this new thing cut into sales?

Probably – at a higher profit (margin) with a product your competitors can't offer.

The development of breakthrough, radical, disruptive technologies is the most effective means of protecting your price and profit base against offshore competition. These offshore competitors are marvels of manufacturing. They shine when a product technology is approaching maturity and it can be produced with relatively little threat of radical technology change. They cannot compete nearly as effectively when the technical landscape is in flux. Instead of standing in the price ring going toe-to-toe against a competitor with a fraction of your cost structure, you can change the rules. When you control the rules there is no reason not to win! This is not new; the genes to pioneer and innovate run strong in Americans. You need simply to harness the natural eagerness to invent and break down the barriers.

Good links:

http://en.wikipedia.org/wiki/Disruptive_technology

Good reading:

The Innovator's Dilemma

Clayton M. Christensen

Re-Imagine

Tom Peters

There are a number of impediments to the development of disruptive technologies within an otherwise superb organization. Most people are naturally inventive. It is the organization and culture that neuter the natural tendency of people to think up great new approaches. Great companies are consistent companies. They have all the processes, procedures, etc. documented and carefully arranged so as never to go astray. There are even formal procedures for innovation development! This organization is great for repeatable results, but the radical innovation is by definition new so how can it stem from repeatability?

Further, the culture of manufacturing tends to discourage new ideas. We are told continually, "don't re-invent the wheel". Part of this is reaction to management demand that new designs consume a minimum of time. Another factor is that most development and design personnel are required to split their time in the assistance of production. The modification of something that is 80-90% there is one heck of a lot easier than starting all over again, but this approach yields no more than variations on a theme. To be fair, these employees are usually very talented with expertise in the specific industry and technology that is nothing short of spectacular. In this case however, familiarity is the enemy! Paradoxically, a clean slate is often preferred because there are fewer paradigms to break down.

An example:

The traditional fabrication of rails for machine tool ways requires a million dollar grinder and takes about 20 minutes to finish a ten foot stick. It turns out that 85% or so of the market doesn't need anything so precise. So, using far less expensive raw materials and a fifty thousand dollar rolling machine, we produced two twenty foot sticks in one minute. The ratios of machine cost to finished foot in one shift? About 1600 to 1. See US patents 5,431,498 and 6,052,902.

Rock that boat!

Another example:

High performance laminated sails are made by a process developed in the 1980s and 90s based on a huge gantry supporting a 6 or 7 axis yarn deposition head. The development costs for this system are conservatively estimated at about \$8,000,000 and 5 years. Contrast that to a 2 axis LTB system costing only about \$250,000 and 1 year producing sails that are faster. (Development time) x cost ratio: 160 to 1. **Faster, Cheaper, Better.**

To bring forth the new, the old must be removed, or at least hidden! To develop disruptive technologies, impediments must be eliminated or reduced. For internal development, separation from systems and production is needed. Internal development teams also require specific nurture; innovation can be taught, but it is a significant commitment of resources. Management of such teams can be challenging as invention often stems from chaos. The best inventors and innovators tend to be those who have a multitude of thoughts and ideas simultaneously. They can see relationships between the ideas that others can't. Consider further that you're most alert and aware when confused by too many ideas. It's not always comfortable, but can be a terrific idea generator.

An alternative approach is to externalize the development of the new and disruptive ideas; the separation from the systems and procedures comes with the relationship. This is however, not a common offering; just Google 'disruptive technology'. As stated previously, unfamiliarity with the specific product can be desirable. When the technology developer is not entrenched in the existing technology, the likelihood of inventing the same old thing is almost nil. The developer requires a strong founding in the underlying sciences, however, and experience at innovating is especially key. Innovation specialists exist that have trained in the new-every-time approach and have considerable experience with records of repeated disruptive innovation and implementation.

One more example:

3. The encapsulation of an electronic device intended for service in hostile atmospheres was the subject of a patent developed by an MIT spin-off think tank. The combined royalty and cost to use this approach was about \$30. Instead, the use of readily available packaging film was adapted by LTB for a total cost of about 48c. In fact, the materials for the entire first year of production were shipped as sample; the total order didn't make the vendor's minimum. By the way, this solution outperformed the expensive system. Patent pending. **Never look back!**

Disruptive technology and innovation implementation provide the vehicle for optimized cash generation for manufacturers. Disruptive technology is not to be feared, but embraced for survival, growth and unchallenged leadership in the marketplace. The disruptive technology is an effective means with which to avoid profit deterioration from off-shore competition. It can be developed either in-house or externally, and can be harnessed for tremendous effect.

What to do now:

If you would like to explore the possibilities of how you can exploit disruptive technologies for growth and cash generation, we want to talk to you! We would be thrilled to provide a complimentary consultation to discuss how disruptive technology can be developed and tailored to suit you.

Click here for our website: www.ltbeng.com

Or here to send an email: ltbeng@ltbeng.net

We look forward to hearing from you!