Travis Bouck’s Review of *The Innovator’s Dilemma: When New Technologies Cause Great Firms to Fail* by Clayton Christensen (August 2000).

This book demonstrates how great managers in top-performing companies can lead their companies into financial disaster even while adhering to what were considered best practices during the late twentieth century. Throughout the book, Dr. Christensen draws insights from his observations of three industries (data storage, earth moving equipment, and steel production) in which the disruptive technologies resulted in lost market share for established firms that were unwilling adopt new standards.

Dr. Christensen provides a framework for managers to recognize disruptive technologies and he performs a case study of electric car technology to communicate how managers should react to the dual threat and opportunity presented by disruptive technologies. This landmark book deserves credit for reshaping strategic thinking on how and when to adopt and market new standards for products (and services) in every industry.

According to Dr. Christensen, established firms typically focus their energies on sustaining technology research and development and thus make incremental improvements to existing technologies that comply with the standards and specifications specified by the market. Working under such constraints naturally imposes limitations on the direction of these R&D efforts resulting in gradual improvements that bear little risk of market rejection.

The underlying assertion of this book is that the risk-adjusted rewards associated with performing R&D for technologies that deliver the anticipated (future) needs of the market may outweigh the risk-adjusted rewards associated with performing R&D for sustaining technologies. Managers have historically been taught to listen and respond to the immediate or near-term needs of the market, so allocating resources to development of disruptive technologies is a tough sell. In addition, disruptive technologies often have not only little or no immediate market, but also they may not work with complementary technologies and infrastructures (e.g., computer designers/assemblers must develop new chases to house 2.5 inch hard drives).

In my humble opinion, engineers and scientist have always recognized the dilemma described by Dr. Christensen but have never communicated the issue so eloquently. The lifecycle of development for nearly every technology platform exhibits diminishing marginal returns in improvement for incremental development efforts. New technology platforms must always be developed to bring significant increases in value to markets towards the end of any product development lifecycle. The power of Dr. Christensen’s message is that companies must,

- learn when to investigate, develop and deliver disruptive technologies (sooner)
- how to effectively organize a company to stimulate development of disruptive technologies
- how to recognize the value of disruptive technologies through conservative initial marketing practices, targeting appropriate markets, and frequent redesign during the early stages of development
By account of the destruction of numerous blue-chip corporations, Dr. Christensen establishes the imperative that every company must have a strategy to address disruptive technologies. He clearly demonstrates that many technologies are susceptible to profound innovation and that competitors with disruptive technologies (usually new entrants to markets) will likely attack your market from below, i.e., disruptive technologies are generally not as robust as existing technologies. Thus every company must,

- consider developing disruptive technologies,
- recognize the threat of disruptive technologies as they appear in the market,
- be prepared to incorporate the standards associated with these disruptive technologies into their products/services.

It is noteworthy that some companies have survived and remained profitable by maintaining existing technologies while losing overall market share to competitors that develop and market disruptive technologies. According to Dr. Christensen, these companies must retreat up-market to survive, e.g., hydraulic technology replaced cable-actuated technology in earth moving equipment in all but the most heavy-duty applications.

Dr. Christensen points out that development of disruptive technologies requires a major shift in how companies do business. First, management must be willing to accept the higher probability of failure associated with disruptive technologies. Second, established firms must be willing to find new markets for these products/services rather than pushing disruptive technologies towards existing customers. Finally, cultural norms in many organizations may result in across-the-board lack of support for disruptive technology development efforts if such technologies are not perceived to be central to the mission of the firm. Regarding the last issue, Dr. Christensen proposes that companies are well-advised to spin-off or otherwise create separate incentive systems for individuals involved with developing a disruptive technology.

Dr. Christensen notes several other advantages to creating more distinct operating divisions to handle development and marketing of disruptive technologies. First, large firms are generally dissatisfied with investments that do not generate cash from operations for extended periods of time. Furthermore, even if an investment in a disruptive technology generates cash, it is likely to initially capture only a small fraction of its overall market - another typical cause for a project cancellation within the confines of a large firm. A separate division is more likely to persist with its development efforts if all bets ride on the success of the disruptive technology. Such a division is also more likely to act entrepreneurial by initially targeting very specific customers (thinking small) rather than changing the technology to suit existing customers.

The last few chapters of the book consider the important point that disruptive technologies are likely to require several iterations of product redesign before they find a market. Thus, he strongly recommends that companies leave themselves enough cash to improve upon their technologies after initial development.

This book is a must read for every technologist and business manager. With a greater understanding of the applications presented in this work, large corporations will eventually build this thinking into their cultures and embrace the development of breakthrough innovations. Dr. Christensen has proven that standards will continue to be destroyed and redeveloped, and that markets can be made for disruptive technologies!