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What Is Innovation?

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New technologies

Many would-be entrepreneurs search for existing or emerging customer problems that can be solved with new technologies and new knowledge. The application of new technologies to anticipated problems is arguably the most exciting path to take, but it is also the most risky in terms of business success. When new technologies are applied to solve new problems, it usually takes a very long time before the mainstream customer perceives any significant improvement in value. Since in this case “a very long time” is usually measured in decades, the corresponding business plan must take the long view. The application of new technologies or products to existing problems or markets is much less risky since there is already a group of customers ready to hear your pitch. Even in this case, however, it is crucial to search for and understand the exact nature of the improvement in value that the customer wants and needs.

Innovations based on new technology are most effective at generating profits when they are matched with existing challenges and existing demand, not with what new products or services might be supplied. The resulting profits and goodwill can be used to fund the long view, perhaps using partnerships that focus further out, while the mainstream business remains focused on short-term results.

Perception is reality

Significant business opportunities can be found in areas in which people’s perceptions are changing and trends can be identified. Do you remember, for example, the days of 300-baud telecommunications? How about yesterday’s 28K connections? Most of those who have experienced today’s high-speed Internet and computing would never be able to go back to working under such conditions—although they were previously perceived as being more than adequate. Similar examples can be found in the health care and transportation industries. The important point here is that investigating the beliefs of a carefully selected sample of people can tell us all a lot about what we are likely to value in the future.

In one example from our own industry, New Focus understood from the beginning that offering “simply better” would give them a pathway to ownership of the fastest-growing segment of the market. They invested their time, worked hard, listened and learned, and earned the support of the people that shape opinion in the world of optics. Real innovation requires that we understand that expectations, perceptions, and “definitions” of people and groups are time dependent. In fact, the most significant opportunities exist at times in which changes are extensive and trends are predictable. Clearly, the only way to uncover the definition of value is to investigate the customer’s beliefs. This is hard to do because although people often recognize the challenges they face, they may not know or be able to explain what
innovations are needed to solve the problem. Another key variable: changing laws and regulations, whether actual or perceived by the customer, can also lead to significant business opportunities.

Demographics

Another area in which one can look for opportunities is defined by demographics. Entrepreneurs can use the fact that qualified labor will one day be in short supply in certain countries (if no changes are made in immigration laws) at a time when citizens are demanding productivity enhancements in manufacturing, health care, and national defense. Solutions may be found in high-tech processes, but the most successful innovations will probably come from a combination of human and capital resources available from global partners with complementary demographics. Consider, for example, the history of outsourcing optical-manufacturing processes to developing countries. As global logistics companies continue to evolve, quality and lead-time no longer play a back seat to cost. Since demographics are generally fixed at a given time and location, consider the opportunities that can be created under different geopolitical conditions. While a crystal ball would be nice, simply being aware of the scenarios that could evolve will allow you to be prepared to act quickly.

Emerging needs and wants

Surprises, as we all know, can be good or bad. The explosion of demand for optical communications has caused us to struggle, in real time, with the concepts of standardization and automation: this is a positive development destined to yield innovations in manufacturing and customer service. But we need not look far for a bad surprise: the recent change in the balance of freedom vs. security around the world, with the resulting changes in the value of certain goods and services, as well as the emergence of new opportunities to add value. For example, note that the airlines are designing “trusted-traveler” programs that employ biometrics and background checks to help improve the travel experience of their own best customers. One way that engineers can create an “emerging needs situation” is to systematically seek out or create applications for their products in different markets for different customers. The design engineer might be the best member of the team to reach out and provide the marketing expert with prototypes and contacts in new markets. To seek out such emerging opportunities, most entrepreneurial engineers make it a point to read trade publications for a variety of industries. In the context of true innovation, one cannot overemphasize the importance of multidisciplinary collaboration.

Industry shifts

Surprises can also occur in industries that are growing quickly. The problem here is that the successful incumbents may be the last to accept the fact that a dramatic change in the structure of the market has really occurred. New competitors exploit the change while the entrenched leaders continue to operate as if nothing has happened. And why should they change, since they are already successful and convinced that they understand the market better than the newcomers? In this case, the competition is free to pick and choose, to eat the incumbents’ lunch and dinner while leaving the unprofitable breakfast behind. Look, for example, at the U.S. Postal Service, UPS, FedEx, and the Internet. UPS took the parcel business and FedEx filled the need for overnight service. Consider the inroads being made by the Internet into the traditional market for first-class mail. Consider Wal-Mart’s strategy in the grocery business and its potential future effects on the established supermarket chains. Wal-Mart is building a supply chain, the best and most efficient on the planet, to distribute groceries through a growing number of its stores. In an example from our own industry, did the HeNe laser manufacturers decide to control the high-volume semiconductor laser business? How about the effect of digital photography on the market for photographic film? I recently heard of a hunting party in which a group of deer hunters in the field photographed their quarry with four digital cameras—even in such a traditional setting, there were no conventional film cameras to be found. This means the mainstream is well into the process of embracing a film-less solution. Entrepreneurs can often exploit changes that the comfortable incumbent may refuse or ignore. But not all incumbents are dinosaurs, and entrepreneurship does not always imply the creation of a new, small company. FedEx, although it is large, continues to win out over the competition in the area of customer service.

Continuous improvement

Entrepreneurship is the careful monitoring of the landscape in an attempt to identify innovative ways to improve the customer’s lot. A disciplined and systematic approach increases the probability of success. Another concept that can help create value for the customer (and lead to sustainable profits for the supplier) might be called “continuous improvement”: here the focus is on eliminating waste, or on maximizing value to people, in a process or system. While this approach is not exactly loaded with sex appeal, a culture of continuous improvement across all functions can provide for innovations that power high rates of growth in earnings and stock prices. System innovations can be identified by asking, “Is there a more efficient way to do this?” Here, as is the case for all innovations, it is crucial to formulate the right questions. Leaders must lead by setting high expectations for the team, and by creating a culture that honors process improvements. Clarity in the defined set of objectives is another key to success. Sustainable competitive advantage is a result of the entire organization seeking real and measurable increases in value.

Entrepreneurship, a multidisciplinary process of seeking and providing greater value, can be learned and practiced: it is a long way from “seat-of-the-pants” management, and it is also not a gift that people are born with. Innovation occurs in successful companies of all shapes and sizes. Successful entrepreneurs ask questions, and learn and care about people, their needs and wants: they are curious, they listen, they are persistent, they have high expectations, they are good at combing and managing resources, they have strong egos but check them at the door, and they want a better life. Hmmmm... these also sound like the characteristics of a good engineer!

In the next installment of “The Optical Entrepreneur,” we will continue to explore marketing, markets, and customers.

References


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