

Choosing Innovation Projects

Bug Labs and the Long Tail^a

In a 2004 article in *Wired* Magazine, Chris Anderson coined the term the “long tail” to describe the strategy of firms that sell a large number of unique items to penetrate many market niches. While they may sell relatively few units of each item, collectively those niches add up to a big market.^b Anderson’s article focused on entertainment media such as films, music, and books. Traditionally entertainment media was “hit driven,” meaning that only big hits got distribution. Economies of scale, and constraints on things like shelf space, TV channels, and radio waves meant that firms simply could not afford to make all potential books, music CDs, or shows available. For example, according to Anderson, Wal-Mart must sell more than 100,000 copies of a CD to cover its retail overhead costs and make a profit; less than 1 percent of CDs, however, achieve that kind of volume. The importance of hits to sales volume is an example of the Pareto principle. The Pareto principle refers to the fact that many events (such as a customer choosing a particular book) have a power law distribution, meaning that 20 percent of the books, shows, or songs attract 80 percent of the business. The other 80 percent of the products (the “long tail” of the distribution) attract only small numbers of customers. The new business models used by firms like Amazon, Netflix, and iTunes, however, gave them virtually unlimited shelf space and unconstrained geographical reach, and soon these firms discovered that they could profit on this long tail. In some markets, in fact, the aggregate market for products in the long tail is significantly larger than the market for the hits. Anderson notes for example, that the average Barnes & Noble carries 130,000 titles, yet more than half of Amazon’s sales come from titles that rank lower than its top 130,000 titles. This means that the “true” book market may be twice as big as it appears to be.

The founders of Bug Labs believed that there might also be opportunities to serve the long tail for electronic devices. As founder Peter Semmelhack noted, there was a strong trend of “control moving from producer to consumer, primarily in the digital space, but not in physical space. If I wanted money from a bank I used to wait in line for a teller, now I use an ATM. Now I check-in for my plane flight online from my office. It’s about choice. Extreme personalization. I wanted

the same level of control in the physical world that I have in the software world." Bug Labs thus set out to address the long tail of electronic gadgets.

Traditionally corporations developed and produced devices for the mass market or high-profile clients with the resources to cover high development costs, while neglecting the long tail of niche devices, which are cost-prohibitive to provide on the small scale. As Semmelhack explained, "companies built one device for millions, rather than the millions of devices to serve markets of one." As a result, most consumers were conditioned to purchase premade devices instead of dreaming of new innovative devices to meet their personal needs. Millions of people with the need for a custom device, such as a portable GPS-enabled bar code scanner, would either have to spend hundreds of thousands of dollars to develop a proprietary device or suffer without the device. Bug's products would overcome the scale constraints, however, through employing an extreme form of modularity. Bug produced a range of individual Bug modules that performed different functions (e.g., global positioning system, camera, touch screen, audio player, motion sensor) that could be snapped together like Lego® to create a customized device. The modules used open source software with Web services that would enable the information on the module to be accessed by any type of networked device. This meant that end users could easily create their own "dream gadgets" without ever having to solder or learn solid-state electronics, and small businesses could develop new electronic products with very little development investment. This also meant that the modules themselves could be mass produced, while simultaneously allowing an endless variety of customized products to serve small market niches (for more information on modularity, please see Chapter 10).

New Product Development Projects at Bug Labs

The Bug Labs hardware platform relied on two key types of components: the portable BUGbase and the expansion modules, which snap onto the base to provide additional functions. Developers would attach the modules they needed to the BUG-base unit to create a programmable handheld portable device to give their clients.

In order to attract customers, Bug Labs had to offer a set of core modules offering the functions and expansion opportunities its customers demanded, as well as the products to demonstrate the multifunction applicability of the platform. Semmelhack explained that, originally, modules had to be developed to "show clients how you can build existing devices—devices people understood. LCD, camera, GPS, click, click, click. . . . You've got a geo-tagging camera. Now the client understands the system, and you can afford to be more specific."

Modules were expensive to design and manufacture, however, as new modules cost an average of tens of thousands of dollars from proposal to the production of a small run (a few hundred units). Furthermore, the product development team had the capacity to manage only a few projects at a time. Projects thus had to be chosen very carefully. Most of the traditional value analysis tools, however, were nearly impossible to apply. Calculating net present value was a fruitless exercise—modules were expensive to produce in short runs and NPV was heavily dependent on uncertain future module sales. Market size estimates fluctuated dramatically as Bug Labs' target customers began to change from individual hackers to system integrators and large businesses with in-house hardware

development teams, groups with drastically different needs. Development costs had to be amortized over a small number of initial sales, leading to untenable module prices if these prices were to enable breakeven on the initial production runs. Instead, Bug Labs relied heavily on qualitative screening. The major questions driving decisions in new product development meetings were:

1. How soon could the project reach the market?
2. What technologies are involved? How difficult will they be to develop?
3. How crucial would this project be to our marketing message? Will it gain visibility?
4. What and how big is the potential market? Is there evidence that the market is increasing/decreasing?
5. Have our customers asked us for this? Or does a developer like the idea?
6. Can we afford to develop the project alone without a partner?
7. Can we get a part supplier to sponsor the development project?
8. Do we already have something like it? Will it cannibalize sales of other modules?

After several modules that had entered the planning stage had to be canceled because of the lack of clear product differentiation, the company began to significantly decrease its number of module development projects. Rather than develop modules that the company hoped would find customers, Bug Labs intended to focus on existing customer demands. As Product Manager Michael Peddicord explained, "Our [initial] plan was to develop 80 different modules or more, but priorities have shifted to cost saving and building on demand—selling what we have before we dive into too much . . . development of modules has been stalled until we have clear direction, supported by sales, of what we need to develop." As Vice President of Business Development Maurizio Arienzo (former SMaL Camera Technologies CEO) highlighted, "what a small company such as Bug Labs needs is a single large customer. I've seen it before at SMaL. We need a customer that demands so much of our time and effort that we do not have enough resources to fulfill their requirements, just like any one of the large potential clients we're talking with right now. Then we focus on their needs and the real money starts flowing in."

Discussion Questions:

1. Why is it difficult for Bug Labs to use NPV or IRR in its development project decisions?
2. What are the advantages and disadvantages of Bug Labs' use of qualitative screening questions to make project decisions?
3. What are the advantages and disadvantages of focusing on the demands of current customers?
4. How are Bug Labs' project selection choices influenced by its strategy of focusing on the "long tail"?
5. Could Bug Labs use any of the other project selection methods described in the chapter? If so, which would you recommend?

^a Based on a New York University teaching case, "Bug Labs and the Long Tail," by Douglas Fulop and Melissa A. Schilling, April 2009.

^b C. Anderson, "The Long Tail," *Wired*, October 2004.