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THE TECH ENTREPRENEUR'S SURVIVAL GUIDE

How to Bootstrap Your *Startup*, Lead Through Tough *Times*, and Cash In for *Success*

BERND SCHONER, PhD
COFOUNDER OF THINGMAGIC

PRAISE FOR BERND SCHONER AND *THE TECH ENTREPRENEUR'S SURVIVAL GUIDE*

"In classic Media Lab 'Practice over Theory' style, Bernd provides a very practical and useful guide to technology entrepreneurs based on experience. A must-read for any tech entrepreneur trying to build a company."

—Joichi Ito, director of the Massachusetts Institute of Technology Media Lab

"Bernd is an insightful entrepreneur behind one of the great Kendall Square startups. I followed his story from beginning to end from the outside, while it was actually happening. What a delight to be able to hear the full story from the inside.

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—Sanjay Sarma, professor of mechanical engineering and director of digital learning at the Massachusetts Institute of Technology

"One of the most useful books on entrepreneurship I have read. Bernd's subtle sense of humor makes it an entertaining read from start to finish."

—Stefan Goetz, managing director at Hellman & Friedman Private Equity

"Bernd provides entrepreneurial guidance as a tech founder who has experienced the worst and the best of startup life. His advice is grounded in real drama, which makes the book a valuable guide as well as a fun read."

—Jens Wüstemann, president of the Mannheim Business School and professor at the University of Mannheim

"Bernd provides a fresh perspective, original insight, and innovative workarounds that are new even to a veteran startup and venture capital attorney like myself. Highly useful—and highly entertaining!"

—Jonathan Gworek, partner at Morse, Barnes-Brown & Pendleton PC

"A must-read for aspiring high-tech entrepreneurs. It provides practical details on all aspects of building a company, especially for situations where things do not quite work out as planned. The spot-on advice, delivered with a smattering of humor, is invaluable."

—Thomas A. Weber, professor of operations, economics, and strategy at the Management of Technology and Entrepreneurship Institute, Swiss Federal Institute of Technology

"Bernd provides broadly applicable lessons on how to make a tech startup successful. He does away with the cliché of the infallible tech genius and entrepreneur and presents a more realistic approach to entrepreneurship."

—Elgar Fleisch, professor at ETH Zurich and the University of St. Gallen

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Contents

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Only Ravi and I remained employed at ThingMagic at the time of the acquisition. Some 10 years earlier, we were the first full-time ThingMagic employees. We practically sat on each other's laps in our minuscule office, seemingly disagreeing on everything from the room temperature to the prospects of a career outside science. Somehow, we managed to translate those debates into a great working relationship that continues to this day.

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My parents, Adelinde and Konrad Schoner, generously raised me to travel far and explore everything the world has to offer and then proceeded to provide many decades of transatlantic long-distance support. I have been blessed with their unconditional love along with that of my extended family, including my siblings and their spouses, Ellen and Thomas Bryner, Viktor Schoner, and Julia Schmitt; my many nieces and nephews (whose names are hidden in the book); my parents-in-law, Murako and Mohamad Farbood; and my sister-in-law, Mina Farbood, and her husband, Kirk Simon.

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CHAPTER 1

The Entrepreneurial Dream

It's kind of fun to do the impossible.
—Walt Disney (1901–1966)

In the summer of 2000, four fellow graduate students and I, all with a decade or so of higher education under our belts, started to panic about what to do after our then imminent graduation from MIT. We were all going to get PhDs, which meant that we had to retire from grad school. A PhD is the one terminal degree that is truly terminal: no more hiding in fancy labs free of real-world worries; no more projects that were supposed to save the world, but—honestly—were mostly just a lot of fun to work on. We sat on the lawn in front of the Media Lab and decided to start ThingMagic LLC, a technology design and prototyping firm. Unlike most successful entrepreneurs who leave school to found a company, we founded a company because we had to leave school.

We decided to work out of a garage, just as all the other successful tech entrepreneurs in the twentieth century had done. It seemed like the right thing to do, and it was going to be free. We spent a few hours cleaning out the messy shed that belonged to the only homeowner among us, put up shelves and benches, pulled a network cable from the main house, and started designing circuits the very same day.

At the time, entrepreneurial activity was imploding in the dot-com bust (Figure 1.1). Investors and investment dollars had all but disappeared. With funding nowhere to be found, we started working on development projects for large corporations in exchange for cash.

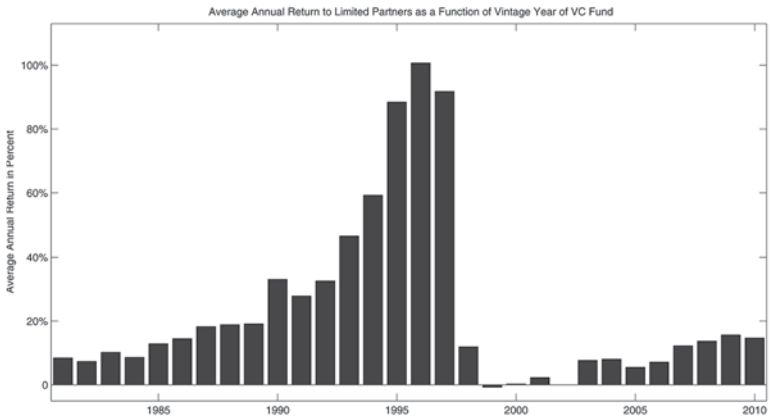

Figure 1.1: Average annual return of venture funds (net of fees, expenses, and carried interest) as a function of the vintage year (inception) of the fund. Data source: Cambridge Associates LLC in collaboration with the National Venture Capital Association (NVCA), *Venture Capital Returns, 1981-2013*, Arlington, VA, http://www.nvca.org.

To stay alive, we saved money in every aspect of our business. Our salaries were way below market, and the founders and management team had to live with a substantial amount of deferred compensation. We paid just enough bonuses to avoid the turnover of our most valuable employees. My cofounders never forgave me for purchasing what they considered test equipment unworthy of their talents: *used* oscilloscopes and computers with the Enron property sticker still on them, exchanged for a few dollars at a sketchy highway rest area. We did not travel unless someone else picked up the tab. I went as far as sharing a hotel room with a customer. Never do I want to get that close to a client again.

In managing the company through this period of bootstrapping, I earned the reputation for being an intolerable miser. I was Scrooge.

In my defense, we did operate profitably during our bootstrapping days, an accomplishment we could not repeat for a long time following the infusion of venture capital (VC). I remember those early years as a time of extreme improvisation and near-death experiences. Anyone who knew about our quarterly, or should I say weekly, numbers felt pressured by the uncertain cash flow. Yet, this early period was one of the most productive in the life cycle of the company. Frankly, I have never worked as hard before or since.

While bootstrapping the venture as a services company, we slowly built a product portfolio in *radio frequency identification* (RFID), an area in which we happened to come across a few funded projects. We didn't choose to focus on RFID technology; it chose us. Then, in 2004, Walmart and other major retailers in the United States and Europe issued their *RFID Mandates*. In essence, the retailers ordered their suppliers to apply RFID tags to all shipments. Walmart would no longer accept products from vendors that did not comply with the directive.

The technology industry stood in awe. What an unprecedented and unbelievable opportunity! The largest company in the world was mandating the use of a specific technology that hadn't even been fully validated. Even by conservative estimates, the RFID industry was poised to ship tens of billions of tags annually, in addition to supplying massive numbers of reader infrastructure, software systems, and business process reengineering projects.

For ThingMagic, the rapid market development was both a blessing and a curse. We had already established ourselves as a brand within the industry, and our name recognition and influence far exceeded our small size and revenue. We had bet on the right horse without too much thought, and we found ourselves in the best imaginable position to reap big profits and personal riches. On the flip side, the prominent opportunity quickly attracted competitors and capital. New startups popped up by the dozen, and within a few years, more than a billion dollars of investment had been poured into our industry.

Later that year, one of our startup competitors was acquired for a proud sum north of $200 million. We should have followed our competitor's example and tried to sell, but instead, we used the positive investment climate for RFID to abandon our bootstrapping ways and raise capital.

Up until then, we had pursued a licensing strategy for our RFID reader designs. A couple of large multinationals had paid us in exchange for the rights to make and distribute our technology. That strategy was working out well initially, but it became constraining when the licensees insisted on exclusivity, didn't aggressively market the devices, or couldn't respond to our own needs for manufactured products. We felt compelled to start our own manufacturing effort, which didn't exactly sit well with our licensee partners.

Should we have been surprised that manufacturing products is an expensive and risky undertaking? If you build inventory and the customers don't buy it (despite their earlier assurances), it is a problem. If you don't build enough and they want to buy, it is also a problem. Manufacturing the right number of products sounds like a simple forecasting exercise, but boy, is it difficult to guess right! We learned the hard way that bootstrapping without significant cash in the bank and manufacturing are not exactly compatible strategies.

In 2005, we bit the bullet. We changed our legal structure to ThingMagic, Inc., accepted more than $20 million in VC money, and hired a full-time CEO. The hype in our industry allowed us to raise money at a very attractive valuation, one we would never match again in future funding events. Overnight, we found ourselves in the middle of what, in hindsight, was our very own RFID bubble.

Following the capital infusion at ThingMagic, I was dumbfounded by how much our little company needed all of a sudden: annual external audits; extended liability insurance; market rate salaries; bonuses; trade-show booths ($100,000!); PR representation; volumes of legal documents; and key-person insurance. We were a *real* company all of a sudden, and being *real* turned out to be *really* expensive.

Only a few days after our Series A funding round closed, I heard one of our VPs state in a meeting: "We used to do things the cheap way. Now we are doing them the right way." I was quite offended, given my role in establishing a culture of frugality. The comment was unfortunately paradigmatic for the behavioral change in the company: every group and department felt an immediate need to spend, and hence, the money raised disappeared much more quickly than any of us had anticipated. A couple of years later, saving money was once again a top priority, and the VP quoted above had long ago left "to pursue other opportunities." While the meaning of "doing things right" changed multiple times in the life of ThingMagic, "doing things cheap" was usually spot on.

Venture capitalists and boards of directors like to use established formulas to get their arms around the unpredictability and complexity of startups. They are particularly quick to hire a team of seasoned executives to run a young company founded by inexperienced technologists. Any sign of difficulty presents an opportunity to bring in the guys *who have done it before*. In quick succession, we hired VPs of engineering, business development, sales, and manufacturing, and—just to be sure—we recruited an army of middle managers as well.

Unfortunately, it was less than two years before most of these executives had to leave. They were all very good professionals, but they could not deal with ThingMagic's specific challenges. Their prior professional experiences had not prepared them for a situation that required them to lay off people (rather than bleed to the tune of millions a quarter), change the business model dramatically (rather than design boxes that nobody buys), visit customers personally (rather than sending underlings to manage zero-revenue accounts), or shift production to China (rather than manufacture at the shop around the corner).

The boom in the RFID market was followed by the RFID bust. The industry that was going to take over the world, in which we were so well positioned, belly flopped in a heartbeat. The potential customers that had pushed us into developing this new technology all of a sudden were in no rush to spend actual money on our marvelous inventions. We had just finished staffing up to more than 60 people when we were forced to lay off almost half of our dear colleagues—without doubt the most painful period in our history.

I used to tell our disgruntled, overworked, and underpaid employees that we would be doing a bad job if we had every single resource we needed fulfilled and if we were not operating on the edge of the impossible. A healthy small business needs to manage with fewer staff than a conventional corporate approach would suggest. Surprisingly, this insight is not obvious to many startup employees, and the few who do get it easily forget it in the midst of their daily routine and workplace anxieties. Ironically and sadly, a round of layoffs silences even the biggest complainers. The survivors understand the principle that the company goes through a reduction in force in order to continue operations, preserve shareholder value, and protect the remaining jobs.

The downturn in our industry was accelerated by certain patent holders who used the opportunity of intense market interest to foment fear of an intellectual property (IP) war in RFID and to extort exorbitant and unjustified licensing fees from vendors. Ultimately, these patent holders never made much money, but their actions helped kill the interest in the very RFID products they were trying to collect royalties on. Faced with the prospect of an IP battle, many customers of the technology simply said, "Thanks, but no thanks." Since those early days, a second wave of patent trolls emerged who clearly did not learn the simple lesson from the earlier situation: when nobody is able to sell anything, nobody makes any money!

Unlike many of our competitors, we were able to adjust our business model and survive the RFID bust. We reduced our expenses and staff, and we focused on the development of technically advanced original equipment manufactured (OEM) components, which our larger competitors weren't interested in. Nevertheless, the A-round capital was soon depleted, and we found ourselves trapped in a fundraising spiral, constantly looking for more cash to keep the lights on.

Over the following three years we negotiated a number of convertible bridge loans from our investor group along with multiple new equity financings. As our de facto valuation was going down, the financial instruments became more and more creative. Our investors were patient and supportive. The RFID crisis had affected startups in our industry badly, but the crisis had largely gone unnoticed by the greater financial and technology communities. Investors continued to enjoy flexibility and the ability to protect individual portfolio companies, including ours.

We thought we had weathered the worst. Then in September 2008, the world economic crisis struck. It seemed as though commercial activity had come to a complete standstill. While previous crises, including the dot-com bust, had been more or less contained within specific industries, this was the mother of all crises, and it affected every market, region, and company, as well as everybody's personal livelihood.

Some of ThingMagic's VC investors ran into financial and leadership trouble themselves. In one case, there literally wasn't an investor representative left to look after us and actively manage the many millions they had put at risk. Banks started to go to extreme measures, such as foreclose on venture-funded startups, a fate that we were fortunately spared. No institution was safe, and capital came at an extra hefty premium, if there was any to be had at all.

There was one saving grace in all that misery: VC investors have no tolerance when their peers run out of money or are unwilling to support a troubled portfolio company. Those investors who don't play along and coinvest in follow-up financings are quickly demoted, and their preferred stock holdings are converted to common shares. Miraculously, ThingMagic was able to reduce its outstanding preferred stock, while raising follow-up funding rounds. As a management team, we had sudden and unexpected leverage coordinating the fight between those investors who remained stalwart in their support and those who had lost interest.

The world economic crisis resulted in modest demand for IT and RFID equipment, the benefits of which we started to feel in the years following the meltdown. In 2009, the founders and board decided that it was time to sell the company. Our investors were reluctant to pour any more money into ThingMagic, and the founder group had been whittled down to a tired and disillusioned bunch of three, some of whom barely talked to each other anymore. There was also little indication that the RFID market would recover from its curse anytime soon.

We hired an investment banker to bring a quick resolution to the matter, only to find ourselves struggling through another dramatic 18 months before we could conclude a transaction. During that final period, we lost yet another cofounder (at the worst possible moment, no less), we had a falling out with our lead investor, and we learned that an M&A negotiation doesn't bring out the best in people. The screaming matches among otherwise perfectly reasonable businesspeople would have been comical, had there not been so much at stake.

In the fall of 2010, we finally closed on the sale of our little company, more than 10 years after we first incorporated. We sold the venture that we and the market had transformed many times over to Trimble Navigation, a billion-dollar public technology company headquartered in California. In the end, our investors were reasonably content and glad to move on (Figure 1.2). We had negotiated hard to protect our staff and the integrity of ThingMagic beyond the acquisition. All of our employees were given secure jobs, to the extent that there can be job security in the technology sector in our day and age. Personally, I did not make enough money to buy myself the proverbial private island, and I expect to be working for a living for years to come.

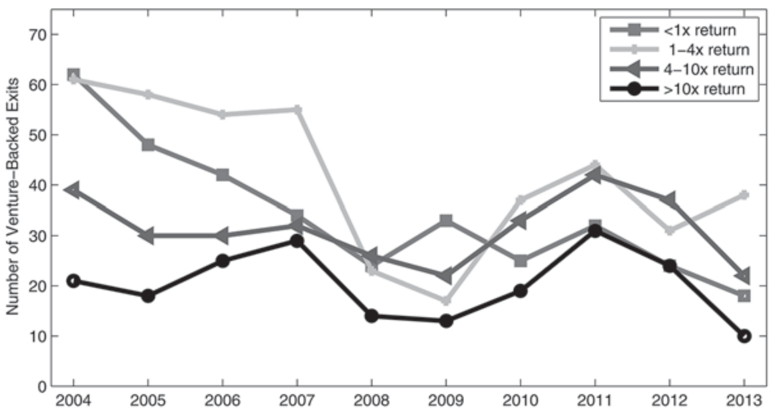

Figure 1.2: U.S. venture-backed exits and returns on exits, 2004–2013.
Data source: National Venture Capital Association (NVCA), *Venture Capital Statistics, 2000–2014*, Quarterly Reports, 2004–2013, Reports and News Releases, Arlington, VA, http://www.nvca.org.

Three of my cofounders had left ThingMagic by the time it was acquired, and even I had considered jumping ship many times during the life cycle of the company. In the end, the founders and key managers who did stick around were instrumental in the outcome of the acquisition and its impact on our employees. Naturally, talk of money dominates M&A negotiations, and yet there is a human component to this transition that requires champions lest it be forgotten. Startups that don't sell at multiples of their invested money have no contractual safety net built in for their employees. A founder who is no longer there cannot watch out for the interests of the company and the staff or her own legacy.

After the acquisition, I was put in charge of integrating ThingMagic's technology with the parent company's product offering, essentially operating as an in-house corporate entrepreneur. In many ways, the post-acquisition months and years resembled the early days of ThingMagic. We were asked to apply our technology and make it commercially successful in a highly resource-constrained environment. To our surprise, being part of a large public corporation is hard work as well.

In summary, neither world economics nor the RFID industry nor ThingMagic's internal dynamics have been kind to me and my fellow ThingMagicians. Yet we came out the other end of the tunnel and created products and a brand that have a good chance of living on for many years.

Why have I written this book? I spent a decade of my life trying to make a technology company successful in the face of every imaginable obstacle and catastrophe. I'm sharing that experience in the hope of helping high-tech entrepreneurs get through their own difficulties with the fewest scars possible. I have also reached midlife, and I figure that authorship is a more constructive outlet for extra energy than buying a Porsche or getting a mistress.

This book introduces entrepreneurs to the process of starting, financing, and selling high-tech ventures with a particular focus on typical crisis situations at every stage of the natural startup life cycle.

Part I guides the reader through the initial startup process. Setting up shop is not rocket science, but it had better be done right in order to fully realize the business potential. Bootstrapping techniques are necessary early on, and they can come in handy at later stages of a technology venture.

Part II shows a path through the treacherous jungle of venture capital financings. Investors can bring success to a venture, but in many cases, outside funding can be fatal to the interests of founders and employees. If capital is needed to build the business, founders and managers should be prudent about how much to take, from whom, and when.

Part III offers advice on how to sell a technology company profitably despite underwhelming financial performance, disgruntled employees, and bad market conditions. Keeping the team intact and looking strong are two of the most important tools in lining up a successful exit.

Many technology entrepreneurs end up watching their companies die, wondering what went wrong. Many venture capitalists see their portfolio companies burn through millions without generating a single dollar in return. Many employees of small tech firms find themselves looking for a new job every other year without getting anywhere close to a financial windfall. It doesn't have to be this bad! With the methodology presented in this book and reasonable expectations on the part of the various stakeholders, many a startup could be spared an unfortunate end.

In this book, I address the technology entrepreneurs who are leading their companies to success, somewhere between gigantic flops and spectacular initial public offerings (IPOs). I'm hoping to help tech company founders be successful, even if they operate in a difficult market, deal with economic crises, fall out with their cofounders, or end up in bed with hostile investors. Startup books like to introduce technology entrepreneurship as a neat chess game, in which the right strategy and skill lead to inevitable success and riches. In reality, running a tech company is more like guerrilla warfare: the best planning is made obsolete by events totally outside your control. Strategy is important, but so are opportunistic tactics to keep the company afloat when earlier assumptions don't pan out.