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CREATING SUCCESSFUL ENTREPRENEURIAL VENTURES IN IT

*Four critical success factors are
evaluated and applied.*

The collapse of the dot-com bubble has grown into an avalanche of company failures and mergers, stifling the emergence of new technological ventures. Larry Ellison, CEO and founder of Oracle, suggested the computing industry is in decline for the long-term when he noted, “What’s going on...is the end of Silicon Valley as we know it...The next big thing ain’t computers” [8]. Many positive signs indicate it is not yet time to call it quits in the computing industry. This reminds us of Mark Twain’s remark, “The reports of my death are greatly exaggerated” after the *New York Journal* erroneously published his obituary.

ILLUSTRATION BY ROBERT NEUBECKER

Our objective in this article is twofold. We first evaluate the four critical success factors we have identified as most important in assessing entrepreneurial opportunities: target market growth rates; timing of market entry; near-term revenue potential; and the impact of the cyclical nature of the industry. We then apply these factors to three technological fields as examples: ubiquitous computing, e-commerce, and information security. From these evaluations we offer practical guidelines for entrepreneurs starting new ventures in the computing and IT industries.

The growth rate of the market has always been important and will continue to be so. In the last quarter-century the computing industry has grown much faster than the overall economy, although with some year-to-year fluctuation. Areas with the potential for high growth catch the attention of numerous constituencies. For Amazon.com founder Jeff Bezos, the eureka moment came in May 1994: while sitting in his Wall Street office and browsing the still-immature Web, he found a site that stated the Internet was growing at a rate of 2,300% a year. “It was a wake-up call,” Bezos said. “I started thinking, OK, what kind of business opportunity might there be here?” [10]. Soon thereafter, he resigned from his Wall Street job and relocated to Seattle, WA, where he founded Amazon.com.

As a simple example, if sales were projected to grow at 7% per year, sales would double in 10 years. In contrast, if growth was projected to be 28%, sales would increase by a factor of 12 in 10 years. If the expected growth rates are raised to the absurd level of 100% or more, as commonly done by analysts who evaluated Internet firms, then a firm with a profit of \$1 million at time zero would end up with a profit in excess of \$1 billion at the end of 10 years (see Figure 1). This explains the incredible increase of Internet company valuations during the dot-com bubble.

When the growth rate at the end of the dot-com bubble was forecast to be lower, the profit projection for year 10 fell by a huge amount, and valuations consequently crashed. The lesson from the sudden rise and fall of Internet-based investments is that growth rate is extremely important. A successful entrepreneur must necessarily look for a sustained, rapidly growing market to enter as it has the best prospects.

There is another caveat to pursuing growth markets. No matter how rapid the growth, sales will eventually bump up against total market potential. Once many people or firms in the market have already adopted the technology, there will be fewer prospects left for additional sales, hence restricting growth rate. Frank Bass, in his seminal article on diffusion of innovations, predicted that the rapid increase in color TV

sales in the late 1960s could not be sustained after most people had switched from black-and-white to color television sets [2].

Timing is everything. When a new technology evolves into practical forms, the resultant products open a number of market opportunities over time. Yet, getting the products to the market at the right time is vitally important. One reason for the dot-com meltdown was the impatience of marketers to expand sales dramatically for their products and services. For instance, MobileStar’s timing was unfortunate when it introduced portable data network accessible from hotels, restaurants, and coffee shops. At that time in 2001, most laptops were not capable of wireless communication. The usage rate never picked up as anticipated, and the firm had to shut down. MobileStar’s plight is characteristic of the “chicken-and-egg” problem facing service start-ups [7]; the product market cannot develop without its enabling technology and vice versa. A few years later, wireless-ready laptops are very common and hotspots are available in locations as disparate as Starbucks stores and the Paris metro because wireless technology is readily available, and users have become much more comfortable with the technology.

Allowing the market to take hold and forgoing the build-up of sales and marketing expenditures might not appear to be desirable at first, but the eventual clarity and accuracy in the sales and marketing direction would pay for itself in the long run. A typical profit-and-loss statement of a high-tech company indicates it will spend twice as much on sales and marketing than on research and development. Spending too much and too soon on marketing can sink the company, but spending too late usually only limits the opportunity. During the dot-com bubble, many firms poured millions of dollars to increase the adoption rate. When they failed, the negative cash flow from lack of sales was too severe for them to sustain operations.

Revenue, revenue, revenue. The best indicator of a successful entrepreneurial venture is a rapid increase in revenue. The need for revenue in the long run has always been obvious to businesses. What was different during the dot-com bubble was that investors, CEOs, and other stakeholders of the businesses differed in the definition of long-term. In an inflated stock market, the horizon for producing a profit is much longer than in a downturn where the horizon is significantly shorter, as shown in Figure 2.

In a market downturn, investors, CEOs, and other stakeholders require a clear path to profitability within six to 12 months. In an inflated market—such as during the dot-com bubble—a firm is usually willing to accept large negative quarterly cash flows with the hope

of getting a large segment of the market to adopt its product, resulting in large profits after several years. The prevalent belief today is that waiting too long for the market to mature and for profits to be produced is unwise because of uncertainty regarding the evolution of a market.

Cerulic, a company based in Portland, OR, had specialized in providing Bluetooth and 802.11 connectivity and travel services at airports for airlines and travelers [6]. Cerulic was a start-up firm with great promise; it had a major strategic investor, a trial project with a huge customer, and former American Airlines CEO Robert Crandall as the chairman of the board. Yet the firm shut down because it could not raise Series-B funding. “All those pluses still weren’t enough to help Cerulic overcome its biggest minus: delayed revenues.” [6]

One implication of the revenue focus is that start-up firms must offer more services that are billable to the customers. Another implication is that entrepreneurial start-ups should not reinvent the wheel and spend enormous amounts of resources and time for product development. Instead, they should take advantage of proven technology and work with existing platforms. As Larry Ellison noted, “To fly to California, you shouldn’t have to design your own plane, build your own airport, and learn to fly” [8]. The final implication is that entrepreneurs need to focus on one or two market segments and not delay revenues with some global plan. During the dot-com bubble, founders were fond of noting that their technology platforms was so broad-based they could ultimately reach all users in all markets at all times. Current market conditions do not permit such a grand vision. CEOs that use the excuse of a grand vision to

cover up poor financial performance get replaced, even in publicly owned entrepreneurial companies with anti-takeover measures [3].

Remember, the market is cyclical. The downturn after the dot-com bubble has given the impression that the computer industry is no longer fertile for new venture creation. There have been many such declines in the past, however. Each decline has been followed by a strong surge, which propelled the market to a level beyond the previous peak.

Consequently, there is an opportunity for entrepreneurial firms to enter the market and introduce new products and services during a market decline. The best time to jumpstart a venture may not be at the peak of the market; the same message is evident for those who bought the high-priced stocks, acquired unproven computer firms, and switched careers to join high-flying dot-com ventures during the peak of the dot-com bubble.

When the market is in decline, it is easier to hire talented staff and buy hardware and software at reasonable prices. Start-ups face less competition because many firms are going bankrupt, shutting down their operations, or discontinuing products. The key is to start a company that will survive with minimal expenses. Such firms must also use bootstrapped resources, as investments from venture capitalists and other sources also decline considerably during a downturn [11].

APPLYING THE ENTREPRENEURIAL PRINCIPLES TO EMERGING TECHNOLOGY FIELDS

Many promising technologies are evolving from the computing and IT industry. *Communications* published a special issue in March 2001 showcasing over 50 promising technological applications and tools. We will use ubiquitous computing, e-commerce, and information security as examples to be evaluated using our four critical success factors (see the table for a summarization).

Ubiquitous Computing. The rapid expansion of

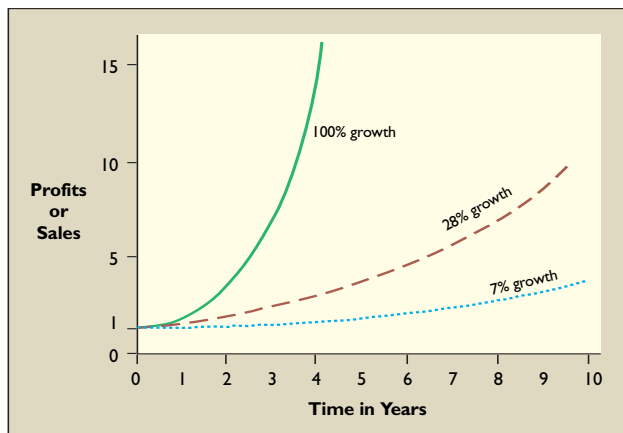


Figure 1. Sales or profits for various growth rates over time (sales or profits start at one unit).

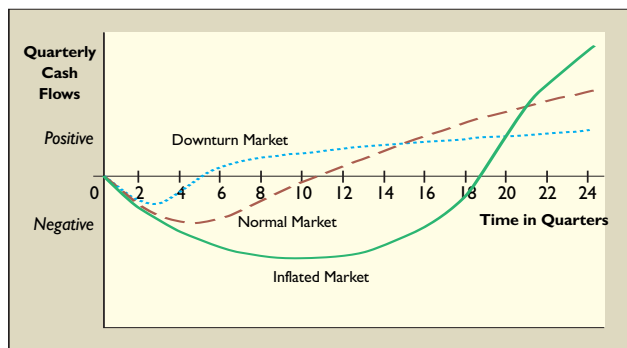


Figure 2. Cash flow expectations for entrepreneurial ventures during market downturn, normal, and inflated markets (such as during the Internet bubble).

ubiquitous computing—the capability of being connected at any time and any place—is driven by the need to enable new ways of human interaction, particularly in group settings [5]. Today’s professional, who is typically short of time, is expected to multitask work in multiple locations and faces the demand for increased productivity due to global competition. Thus, the growth rate of ubiquitous computing is expected to be high for the foreseeable future.

In terms of starting an entrepreneurial venture, an entrepreneur cannot find a better time than the early part of the 21st century. The market for ubiquitous computing is far from mature. For quick revenue generation an entrepreneur should focus on services in these growing areas rather than attempting to develop new technological tools. As the use of new tools in ubiquitous computing is a function of socialization and even changes in psychology, the adoption would be a slow process. Services in this area will satisfy a need for increased efficiency and convenience and hence open a new market.

Finally, this market is less cyclical because firms expect their employees to be able to work at any location and anytime in during an economic downturn. Thus, ubiquitous computing has bright prospects for new entrepreneurial ventures. The increased deployment and usage of wireless devices will only accelerate the demand for this technology.

E-Commerce. Many analysts consider the failure of e-commerce as a major cause of the dot-com crash. This so-called failure should be examined through the lens of growth rates. During the week prior to Thanksgiving in 2002, e-commerce sales had increased 41% from a year earlier. Holiday shopping on Monday, December 2, 2002, skyrocketed to \$380 million, a 49% increase from the first Monday of December in 2001. E-commerce soared to \$76 billion in all of 2002, up 48% over 2001 according to an annual study conducted by Forrester Research. All measures of e-commerce growth indicate e-commerce is growing faster than almost all other industries. Thus, by a growth rate criterion, e-commerce is a prime area for entrepreneurial activities. In spite of its rapid growth e-commerce

	A. Ubiquitous Computing	B. E-Commerce	C. Information Security
1. Growth Rate of Market	HIGH – Shortage of time for professionals – Trend of mobile work force – Need to be in touch at any place at any time – Explosion of portable devices, such as PDAs	VERY HIGH – Higher growth rate compared to almost any other industry – Very small share of retail sales, so future growth rates will not be inhibited	HIGH – Growing concern for individuals, firms, and government – Increased demand as the amount of data storage and computer access continues to expand
2. Timing of Market Entry	MEDIUM – Early stage of market evolution – The decline of communication costs makes “computing anywhere” a reality – A firm can carve out a niche	HIGH – Fewer competitors. As the fear of the dot-com crash continues to predominate, not many are getting into the field – Good time for entry	VERY HIGH – Excellent timing due to many of the concerns reaching the forefront only in the last two years
3. Revenue Flow	HIGH – Immediate revenue possible – As trade-off is time and convenience, users are willing to pay a premium	MEDIUM – Rapid growth will improve revenues in future – Lack of competition means margins will not be eroded – The costs to set up a Web presence have fallen	VERY HIGH – When applied as a service, this has the potential to get rapid revenue growth – Revenues from privacy guarantees, reducing credit card fraud, govt spending on national security.
4. Cyclical Markets	HIGH – The need for efficiency and convenience is likely to provide a stable market	MEDIUM – Cyclical in this market implies either fast growth or alternating with explosive growth	HIGH – Security is viewed as a basic need that is not reduced as a function of the economy – Less subject to cyclical market and not a fad

Note: A rating of “High” implies it is a positive feature of the technology/market.

Summary of evaluating emerging technologies and markets using the four critical success factors.

still amounts to less than 3% of retail sales, and is expected to be less than 10% by 2008.

Based on all the criteria, e-commerce has become a bright area for entrepreneurial activities, partly due to the thinning of ranks. Numerous online start-ups have gone bankrupt. Some firms have shut down their e-commerce operations and focus only on the traditional channels (such as women’s sports clothing retailer Lucy.com). The common wisdom, liberally given out in newspaper columns and at cocktail parties, is to avoid the dot-com ventures, so there is little competition. The area is in the early stage, not cyclical but growing rapidly, and assets can be purchased cheaply from companies that have closed down. E-commerce would be profitable for entrepreneurs only when the costs are kept low. The \$3–\$5 million spent by some dot-coms in 1998–2001 merely to develop a Web site could never be justified today. Profitable e-commerce ventures are a great opportunity with a low-cost Web site and, if feasible, outsourced services.

Information Security encompasses three overlapping areas: data security, software security, and network security. Data security ensures the privacy of information with the use of data encryption; software security deals with the integrity of applications and operating systems against intentional and unintentional modification; and network security protects the transmission of data from the source to its destination as a whole.

Today’s businesses increasingly rely on electronic methods for communication, trade, and collaboration. At the core of these transactions is the flow of information. Protecting information is crucial to every transac-

tion that takes place via electronic media, to consumers and firms alike, and thus this market is not cyclical. For example, the growth in the two areas discussed earlier, ubiquitous computing and e-commerce, have generated increased demand for information security. Telecommuters access sensitive data from remote locations, and this information must be secured. Online shoppers are afraid of fraud as well as loss of privacy [4] so e-commerce firms have an incentive to acquire and implement security measures. These factors mean information security is in the growth stage of the product cycle, and the timing for entering this market is promising. Security relies entirely on trust. Consequently, start-up firms would have difficulty in introducing products to the market. However, providing services based on product platforms from established firms would be an opportunity for quick revenue for entrepreneurs.

CONCLUSION

We foresee bright prospects for entrepreneurial ventures in computing and IT but suggest all ventures be evaluated carefully using our critical success factors. Suggestions for assessing entrepreneurial opportunities in the computing and IT industries include:

- Look for rapid growth rate. Markets are particularly attractive when high growth rates are combined with barriers to entry such as unique technology, patents, and exclusive distribution arrangements.
- Do not expect to be able to influence the market, instead be prepared to respond to changes with your products.
- Avoid lengthy development cycles and grandiose visions for market domination.
- Focus on niches and attempt to serve them as quickly as possible.
- Do not hesitate to start your ventures during the market downturn. Angels and early-stage venture capitalists are advised to examine promising investment opportunities during downturns, as these opportunities may be affordable only to large venture capitalists and institutional investors at other times.
- Keep costs under control using new accounting techniques such as activity-based information systems [9].

Some corporations may divest divisions or spin out poorly performing units. Corporate spin-outs can occur when a strategic business unit is not having cash flow that is within corporate norms or is in an area outside the firm's core competency. However, the opportunity might be great for an entrepreneur and a venture

capitalist, based on the critical success factors. Besides, due to heavy overhead costs and inflexible focus, strategic business units of large firms could have poor showing on these critical success factors, while they could be viewed much more favorably when they are operated as independent entrepreneurial ventures.

In spite of the pessimistic view many investors have of the high-tech industry, there are some who have invested after the bubble burst in 2001. Barry Diller, the head of Paramount Movie Studios, acquired Hotels.com, Match.com, Expedia.com, as well as an online mortgage firm, LendingTree.com, Inc. [1]. His views are shaped by the notion that customers will become more comfortable with technology and will start using e-commerce in large numbers. Investors and managers are indeed finding value in the computing and IT industries: Whether you are an investor looking for value or an entrepreneur hoping to create value, the computing and IT industries still hold enormous potential. **□**

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