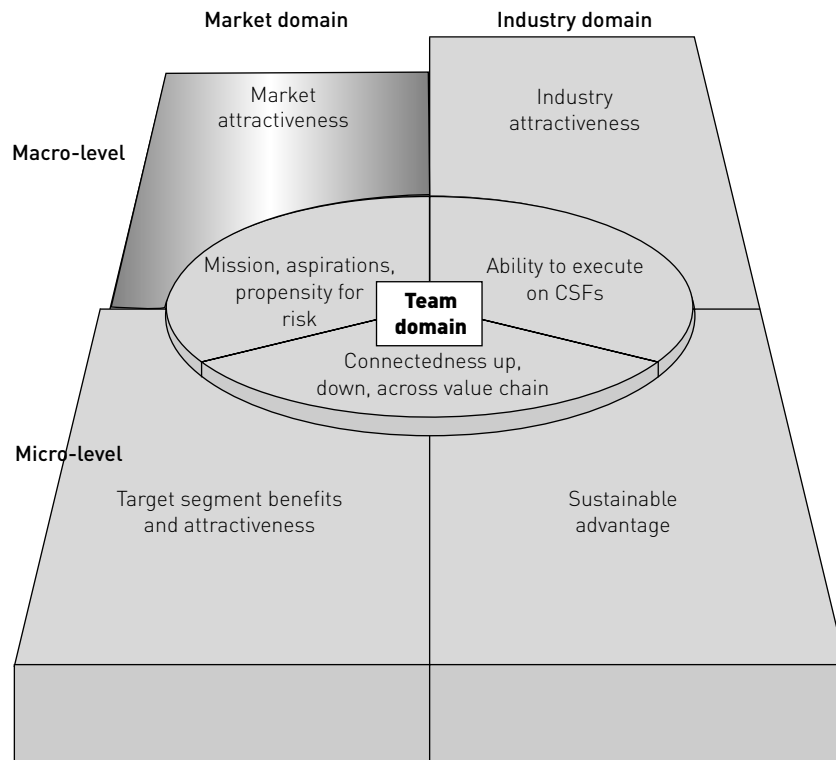


3

Is this a good market?



After years of searching for your dream car, a 1950s Austin Healey, you happen upon a mint-condition 1956 100 series BN2. With the exception of its price tag, it is perfect. Pillar-box red exterior. Leather seats. A dashboard more vintage than the car itself. With the money you saved over the past year, you hop on a plane to Las Vegas, ready to enjoy the desert sun and win yourself enough money to buy the car.

When you walk into the casino, you are entranced by the commotion. Ready (or steadying) yourself for a day of gambling, you sit down at the bar for a quick shot of vodka and a glass of freshly squeezed orange juice. At the bar, you notice a blank lottery ticket sitting in front of you. The payback in this game called Keno is enormous. For a small price of \$7, all you need to do is pick seven numbers. If all seven numbers are included in the twenty selected during the lottery drawing, your winnings are \$77,777. Not a bad return on an investment – if you hit the right numbers, of course. Your other gambling choice is a bit less rewarding. You sit at the bar and calculate how long it might take you to win \$77,777 at the blackjack table. Your realization is that \$77,000 is more than a day's work when playing blackjack under the very best of circumstances.

Knowing that the odds of picking all seven numbers correctly in Keno are about 41,000 to 1, whereas you have about a 50 per cent chance of winning a hand in blackjack, which game do you choose?

Do markets matter?

There is a tide in the affairs of men, which, taken at the flood, leads on to fortune . . . We must take the current when it serves, or lose our ventures.¹

Most entrepreneurs consider both risk and reward when starting a new business. As we have seen, the odds against hitting the jackpot as an entrepreneur can be every bit as daunting as those in Las Vegas or Monte Carlo. One way to mitigate the long odds, as we saw in Chapter 2, is to make sure you've identified an attractive market segment, one where the customers, according to evidence you've gathered, are almost certain to buy what you'll offer. But let's pause to ask some more questions:

- What if you are offering clear and compelling benefits to a carefully targeted market (as NTT DoCoMo did with iMode)?
- What if (like the 10 million young, diet-conscious, beer-drinking men that Miller Lite identified) you have plenty of customers willing to buy your new product?
- What if the segment you'll target takes you naturally into other segments (as did Nike's distance runner segment)?

Is it time to write your business plan? No. Not even close.

As we'll see in this chapter, I've only scratched the surface in giving you the tools you need to assess your opportunity. One domain down, six to go. Having a target market whose customers are likely to buy is like table stakes. It gets you into the game, but it's by no means the end of the story. Thus,

the next piece of the game we'll examine is the upper left quadrant of the seven domains model, the attractiveness of the market at the macro-level.

As Chapter 1 showed, one of the best ways to improve your odds for success – apart from serving an attractive target market – is to seek to do business in

“having a target market whose customers are likely to buy is like table stakes”

a market that's attractive overall. As we saw in Chapter 2, the assessment at the micro or the target segment level involves looking very closely at your target market to make sure that you offer clear benefits to a clearly defined group of customers. Assessing markets at the macro-level is done from 30,000 feet. What you are

looking for is big enough to be seen from the air and you'll need some distance – a macro-perspective – to understand what you're looking at. What you are looking for is evidence of market size and market growth, both today and tomorrow. Doing so involves asking the three key questions listed in Box 3.1.

box 3.1

Three crucial questions about markets

1. Is my market large enough today to allow different competitors the opportunity to serve different segments without getting in each other's way?
2. What are the predictions for your market's short-term growth rate? (In the absence of other information to the contrary, the recent rate of growth in your market may be the best available predictor of growth in the near future.)
3. What are the predictions for your market's long-term growth rate? (This is likely to be influenced heavily by macro-trends: economic, demographic, sociocultural, technological, regulatory and/or natural.)

In asking these questions as an aspiring entrepreneur, you must know what you want. If you take a long-run perspective and your aspirations include building a lasting venture that creates value over time, then you'll be concerned with the answers to all three questions. If you plan to exit quickly, selling your business and perhaps moving on to another one, or you plan to build a small business in a protected market niche, then questions 2 and 3 might be less crucial for you.

In this chapter, we examine the case histories of three entrepreneurial success stories driven largely by the attractiveness of the market in macro-terms. First, we travel to India to examine the story of Hero Honda, a joint venture between a local bicycle manufacturer and a global leader in small-engine technology. This venture reaped the benefits of an enormous Indian population in need of affordable transportation, one having still modest but growing buying power.

We then see how the tide of growing demand for natural and organic foods propelled Whole Foods Market into the front-runner position in a rapidly growing segment of the American supermarket industry.

Finally, we discuss how EMC, a data storage company, succeeded in tracking and anticipating technological trends through 20 years, outperforming its competitors and just about every public company in the USA. We also look briefly at its recent efforts to reinvent itself following the turbulent times that have followed the dot.com bust.

On the other side of the coin, we examine the story of Thinking Machines, a supercomputer company whose failure can, to a large degree, be attributed to insufficient market size. Despite its founders' hopes, Thinking Machines simply couldn't find a large enough market to sustain its ambitions.

To conclude the chapter, we explore the investors' perspective on market attractiveness, we examine lessons learned, and we consider how you can use these lessons to determine whether your overall market is attractive in macro-terms. Will you find yourself swimming against the tide? Or, like a sailor with the wind at your back, will you benefit from a favourable breeze?

'Fill it, shut it, forget it':² Hero Honda's rise to the top in India

In 1983, Hero Cycles of India signed an agreement with Honda Motor Corporation, forming Hero Honda. This agreement, between an Indian firm that got its start making bicycle parts, and the world's largest motorcycle manufacturer, marked Honda's entrance into the Indian market for motorized two-wheeled transportation. While the country was already crowded with competitors such as Suzuki, Yamaha, LML and Kinetic,³ Honda's executives and Hero's founder and CEO, Brijmohan Lall Munjal, saw significant potential in the Indian two-wheeled market.

Why was the market attractive?

At first glance, the Indian market was attractive because of its sheer size and significant growth. India boasted a population of approximately 725 million in 1983,⁴ growing at a rate of 2.2 per cent per year.⁵ At that rate of growth, the Indian population was expected to grow by 163 million people in the 1980s⁶ and to surpass 1 billion people by 2000.⁷ Not only was the total population of India enormous, but Munjal also knew that the adult age group most likely to purchase two-wheelers (15–65-year-olds) was expected to grow to over 500 million by 1990 and to an estimated 695 million by 2005.⁸

“but why would one want to pursue a market where 35 per cent of the population was impoverished?”

But why would one want to pursue a market where 35 per cent of the population was impoverished?⁹ Mitigating this fact was growth in the purchasing power of the Indian population, expected to grow per capita by 5.2 per cent between 1983 and 1993.¹⁰ Furthermore, even in the early 1980s, the country was wealthy enough to support an infrastructure of 1.4 million kilometres of highway.¹¹ In total, Munjal saw that a large population coupled with a substandard economic situation was an ideal environment for inexpensive, motorized, two-wheeled scooters.

Honda also saw the potential. With air pollution from industry and vehicle emissions topping India's environmental concerns, emissions regulations had become increasingly stringent. These regulations made environmentally friendly vehicles more attractive, and two-wheelers with their fuel efficiency and low emissions fit the bill. Honda also recognized that Asian countries such as India and China, with their huge populations and relatively low levels of economic development, were likely to embrace two-wheeled vehicles as a popular means of transport.¹²

In short, India offered a large and growing market for two-wheelers, supported by several favourable macro-trends that boded well for the future: growth in numbers in the demographic group most likely to buy two-wheelers, growing purchasing power across the Indian population, and regulatory encouragement.

How did Honda enter the market?

Rather than enter the Indian two-wheeled market alone, Honda opted to join hands with the established bicycle manufacturer Hero Cycles, a

company with proven manufacturing, distribution and management practices. Founded by Brijmohan Lall Munjal and his brothers in 1945, Hero Cycles was an ideal partner for Honda. In business for nearly 40 years, Hero had manufactured and distributed bicycle parts and bicycles in India for as long as Honda had produced motorcycles.¹³ And, with strong distribution channels and well-honed supplier management, the Hero Cycles name was as reputable in India as was Honda's in Japan.

But Hero Cycles was no ordinary partner. The Munjal family's management practices had led to exceptional results, low employee turnover, and never a day of strike in 40 years.¹⁴ The company used modern manufacturing concepts such as just-in-time supply chain management, multi-tasking assembly line workers, and stringent quality assurance programmes. Most importantly, Hero's management brought an intimate familiarity with the Indian economy, government, business culture and people. 'What drew Honda to Hero was the philosophy and value of the group. It's good management and customer-oriented thinking', said Honda's Kazumi Yanagida, one of two Honda directors on the Hero Honda board.¹⁵

Macro-trends steer India's two-wheeled market

In the 1980s, the geared scooter with a four-stroke engine was Hero Honda's most popular two-wheeled vehicle, providing inexpensive and reliable transportation to India's largely rural population and growing middle class. Hero Honda had seen something that all the motorcycle manufacturers had missed. The biggest chunk of demand was to come from villages, small towns and the middle-class office-goers in cities for whom the fuel economy of a four-stroke engine was a bigger draw than the looks and the power of two-stroke bikes. As Brijmohan Lall Munjal remarked, 'Looking into the rear view mirror today, the choice of a four-stroke bike in the 1980s may sound providential, but we knew that buying a product is one thing and running it for a long time is quite another. That is why we wanted the running cost of our vehicle to be low'.¹⁶

The advantages of four-stroke engines were threefold. Not only did they produce less pollution than a two-stroke engine (commonly used in other motorcycles) but they were also more fuel-efficient and ran for longer than the more powerful two-stroke engine.¹⁷ Fuel efficiency and product longevity translated directly into money saved. Saving money appealed strongly to India's middle-class consumer. Hero Honda had the first and for many years only four-stroke vehicle.¹⁸ As its early ads said, 'Fill it, shut it, forget it.' Yet

demand for these scooters would last less than a decade. The growing purchasing power of India's expanding middle class would soon change what they wanted in two-wheeled transportation.

In 1988, to understand its market better, Hero Honda conducted a massive customer survey, collecting some 25,000 responses. The survey told Hero

**“India's consumers
had changed their
minds”**

Honda a surprising story. India's consumers had changed their minds. Scooters were no longer the vehicles of choice. Motorcycles were to become the two-wheel vehicles of the 1990s.

Atul Sobti, Senior Vice President of Marketing and Sales for Hero Honda said, 'It's thanks to that survey that today we sell over a million motorcycles in a year'.¹⁹

Sobti couldn't have been more accurate. In response to these surveys, Hero Honda set up a second plant in Gurgaon to allow for additional manufacturing capacity. Ravi Sud, Vice President of Finance said, 'With additional capacity, we found it easier to cash in on the trend in favour of motorcycles'.²⁰ By 2000, motorcycles were the choice of 58 per cent of India's two-wheeled customers, up from 33 per cent in 1996.²¹

By making efforts to gauge and understand its market and the trends therein, Hero Honda cemented its reputation as a market-driven company, one that anticipated and acted upon these trends. As Brijmohan Lall Munjal said, 'The excellent results achieved by Hero Honda can be attributed to our continued focus on understanding and satisfying customer needs to the finest detail. We are committed to maximizing value to all our stakeholders, by delivering "value for money" products with the best in technology and service, to our customers, consistently, wherever they are.'²²

In response to its customers' desires, Hero Honda introduced other customer-friendly innovations to the Indian two-wheeled market, extending motorcycle warranties from six months to two years, and developing a Passport Scheme that included accident insurance and reward points for purchases and service.

The results of great market understanding

Being market-driven has its benefits. The proof of that mantra is in the pudding:

- Hero Honda had 5 million customers and 40 per cent average annual growth in sales between 1996 and 2000.

- In 2000, Hero Honda's Splendor, a model introduced in 1994, became the world's largest selling motorcycle.²³
- In the first quarter of 2001, Hero Honda became the number-one-selling two-wheeled manufacturer in India, usurping arch-competitor Bajaj Auto Limited's 43-year reign. In the first four months of 2001, Hero Honda outsold Bajaj by 40,000 vehicles, grabbing nearly 50 per cent of India's motorcycle market.²⁴
- In its year ending 2001, Hero Honda sold 1 million motorcycles, becoming the largest two-wheel company in Honda's worldwide family.

To put that in perspective, Honda's two-wheel market in India 'equals the whole of North America in cars',²⁵ commented Atul Sobti. With such a strong share of the market, Hero Honda expected to sell 1.4 million motorcycles in its year ending March 2002,²⁶ for net sales of more than 44 billion rupees (£400 million). For his

**“being market-driven
has its benefits”**

continued entrepreneurial accomplishments, Brijmohan Lall Munjal was named Ernst & Young's Entrepreneur of the Year for India in 2002.

It would be myopic to attribute Hero Honda's successes simply to the size and growth of the Indian market. As the company's case history shows, Munjal and his team have done many things well. Among the most important of these, though, is keeping a watchful eye on market trends in order to stay in tune with changing customer needs, appropriately matching their offerings to what customers want. They understood the opportunity in 1983. Their ability to stay in touch with changes in the market has enabled them to continue to seize new opportunities as they have presented themselves.

Tofu and toothpaste: the rise of Whole Foods

In the USA in 1980, retail sales of organic products totalled just \$178 million, and natural and organic products and foods appealed to just 2 per cent of the population.²⁷ The market for natural and organic foods was a small one, thought John Mackey, owner of Safer Way, a small health-food store in Austin, Texas.

But Mackey had noticed that his customers were asking more and more for natural foods and organically grown fruits and vegetables, so he figured the

market would grow. Mackey joined hands with Craig Weller and Mark Siles of the Clarksville Natural Food Grocery to form what would become the first Whole Foods Market. The new store would serve a relatively tiny clientele: an eclectic group of vegetarians, macrobiotic dieters and others whose diets included a variety of supplements with near-unpronounceable names – ginkgo biloba, echinacea and others that collectively formed an entirely new lexicon for the three grocers. Like other mom-and-pop organic shops elsewhere, the store was friendly, intensely concerned with its products' purity, and very expensive.

Happily for the three entrepreneurs, consumers were more numerous and more responsive than Mackey and his partners would have predicted in their wildest dreams. In its first year, their small 10,500-square-foot store sold \$4 million of natural products and organic foods.

Whole Foods' subsequent expansion from small-town natural foods grocer to a \$2 billion grocery store chain is not just a fairy tale. It is a story of real-life market savvy. In a class of their own, Whole Foods executives not only understood consumer demand for natural and organic products; they also knew what else drove Americans' supermarket purchasing patterns.

Understanding the trends

The decade that followed was the beginning of the nutrition movement in the USA and, soon thereafter, in the UK and elsewhere. 'The word "nutrition" was launched into the headlines more than in any previous decade', according to Elaine McIntosh, a biologist and writer on nutrition.²⁸ Sparked by increasingly widespread interest in health, food companies began to introduce more products that claimed to have less fat, fewer calories and lower cholesterol, while at the same time providing more nutritional values such as fibre, vitamins and minerals. This trend augured well for Mackey and his partners, and for others who saw these developments.

When organic supermarkets started springing up in the 1980s, their proprietors figured that the aisles would be populated by a nation of granola eaters happy to pay a substantial premium for the halo of purity. They were wrong. Americans remained a nation of committed junk-food eaters even while welcoming organic foods to the table. Further, there were limits to the premiums consumers were willing to pay for organic foods, and they were unwilling to give up any of the conveniences of shopping in large stores that stocked everything from tofu to toothpaste.²⁹ So, what did Mackey and his team do to meet consumers' desires?

For starters, they built larger stores. With an average store size that soon reached 26,000 square feet, the stores offered chemical- and preservative-free foods, organic produce, hormone-free meats, cruelty-free cosmetics and ecologically friendly household products. Each store had at least one aisle of nutritional items for homeopathic and alternative healthcare. But unlike the old niche stores, Whole Foods Markets were not ascetic: you could buy beer and wine as well as non-organic produce, foods with refined sugar, and even household cleaners – of the environmentally friendly kind, of course.

When the so-called home meal replacement market started growing in the 1990s, Whole Foods responded by selling quick entrées, side dishes, soups, rotisserie-grilled items, sushi and sandwiches, all of which were made fresh daily with natural ingredients from around the store.³⁰ They even added tables where customers could sit down and eat. A McKinsey & Company survey soon found that one of the dominant eating places for baby boomers aged 35–54 and mature middle-aged consumers aged 55–64 was the supermarket prepared-food section.³¹ Prepared foods became one of the fastest growing and most lucrative elements of Whole Foods' business.³²

Whole Foods also responded to its customers' growing interest in information by offering printed and Web-based information to help shoppers maintain a healthy lifestyle. The company also had an entire section of its website devoted to health issues and references.

Tasty results

As demand for natural and organic foods and products grew, so too did Whole Foods. The natural products market reached \$25 billion in sales in 2000 and the organic industry was growing at a rate of 20–24 per cent per year,³³ with US organic sales expected to top the \$10 billion mark in 2002.³⁴ Whole Foods enjoyed the ride.

- From one store in 1980 to ten stores in 1991, Whole Foods Market grew to 117 strong by 2001, with the help of several acquisitions financed by an initial public offering along the way.³⁵ It accomplished this feat in two ways. First, it kept pace with the growing interest in natural foods and products. Second, it drove demand for these products by offering consumers conveniently located, well-designed stores and an enjoyable shopping experience.

“catching the natural and organic foods wave and riding it early had served Whole Foods well”

- In 2000, Whole Foods customers forked out an average of \$826 per square foot, compared with the number-two natural-foods chain Wild Oats' \$538, far outpacing average supermarket sales of \$487 per square foot.³⁶

Catching the natural and organic foods wave and riding it early had served Whole Foods well.

EMC: matching technology to customers' changing needs

There are no better markets than technology markets for examining what happens when wave after wave of high-tech disruption washes up on every beach. Michael Ruettgers, former CEO of EMC, a data storage company, uses an analogy of 'a surfer spotting, catching, and riding successive waves, each

“ radical and continuous change is a simple fact of life in any technology-based business ”

one representing an opportunity created by a disruptive technology, new market, or new business model'.³⁷

Radical and continuous change is a simple fact of life in any technology-based business. Why can some companies keep pace with such change, reinventing themselves and their technologies to keep customers happy and competitors at bay, while others come and go as one-hit wonders? And what lessons can such companies teach budding entrepreneurs about assessing opportunities based on the next high-tech breakthrough?

EMC is hardly a household name. The company, founded in 1979, managed brilliantly for more than two decades to keep pace with the changing needs of its customers brought about by the changing capabilities of the computer software and hardware solutions they

“ what lessons can such companies teach budding entrepreneurs about assessing opportunities based on the next high-tech breakthrough? ”

employed. During the 1990s' bull market, EMC's 84,000 per cent stock price increase was the best in the US market, outperforming better-known companies such as Dell and Cisco. In 2001, however, another round of change hammered EMC's margins and market share. For the first time in more than a decade, EMC posted a loss

for the year, losing \$508 million on sales of \$7.1 billion. Its once-hot stock plummeted to \$7.20 in 2002, a loss of more than 90 per cent of its value since its peak in September 2000.³⁸

Spotting a market – decentralized minicomputers

In August 1979, Roger Marino and Richard Egan opened shop. The two computer industry veterans were intimately familiar with the corporate computer landscape. They saw that companies were moving away from mainframe computers to minicomputers, resulting in an increasingly decentralized minicomputer marketplace.³⁹

Business needs were driving the trend. Minicomputers and workstations enabled department managers and individual engineers to control their own projects and accomplish time-sensitive business tasks more effectively than centralized IT departments. With less centralized computing, data storage moved from the mainframe in the corporate data centre to decentralized servers and workstations. Egan and Marino realized that with such decentralization, there would be a growing need for additional memory for the rapidly proliferating number of minicomputers.⁴⁰

In response, the two concentrated on selling add-on memory for minicomputers. Their first product, introduced in 1981, was a 64-kilobyte memory board, developed for Prime Corporation. Sales for this board reached \$3 million in 1982 and \$18.8 million by 1984. The company soon sold improved memory capacity for minicomputers to customers like IBM, Hewlett-Packard, Wang and Digital Equipment. By the time of EMC's initial public offering in 1986, the company reported net income of \$18.6 million on \$66.6 million in sales.⁴¹ Not bad for a five-year-old start-up!

Market two – data storage

By the late 1980s, the memory business was becoming one of high volume and low margins, unappealing economics for a company like EMC accustomed to fat profit margins. To compound the problem, EMC was suffering from quality problems and was losing money. 'The quality of our products makes me puke', said new Executive Vice President for Operations Michael Ruettgers, having distributed airsickness bags to top executives to make his point graphically.

So in 1989, with Ruettgers' promotion to President and Chief Operating Officer, the company changed its focus from memory and memory enhancement to data storage. As Richard Egan recalled, 'We realized that [EMC] could reach a big but underpublicized market: disk storage.'⁴² The trend toward decentralized computing had generated huge amounts of new data, all of which had to be stored somewhere. EMC entered the IBM

mainframe storage market with the introduction of a mainframe-compatible solid-state disk subsystem, the Orion.⁴³ Orion's compatibility with a variety of IBM and other mainframes, coupled with its speed, allowed EMC to steal some of IBM's storage market. EMC continued to grow.

Market three – open storage

Technology shifted again in the mid-1990s. By then, most large companies had a number of different computer systems, most of which couldn't communicate effectively with one another. Data were everywhere, except, as it often seemed, where they were needed. Now CEO, Ruetters realized

“ Ruetters distributed airsickness bags to top executives to make his point graphically ”

‘There was a desire to consolidate data storage, but it would require a reliable storage system able to communicate with the variety of computers that usually exist within an organization’.⁴⁴ Ruetters spent over \$1 billion developing software that would make its storage units compatible with many types of servers.

With the introduction of its Symmetrix 5500 in 1994, EMC introduced the first platform-independent storage system, capable of simultaneously supporting virtually all major computer operating systems.⁴⁵ In 1995, EMC overtook its competitors, becoming the data storage leader, with a 41 per cent market share, up from just 5 per cent three years earlier.⁴⁶

Market four – networked data storage

By the mid-1990s, distributed computing had become unmanageable, notwithstanding EMC's efforts to support centralized but open data storage architectures. Complicating matters was a growing tension between centralization and decentralization of computing power, data storage and IT systems management.⁴⁷

EMC's answer was networked information storage, whereby far-flung data storage systems of various kinds could communicate with a company's typically far-flung network of servers.⁴⁸ EMC's enterprise storage networks wove together the hotchpotch of storage, switches, hubs and servers into a coordinated infrastructure that central IT departments could manage and scattered users running different operating systems on different platforms could use.⁴⁹ As new EMC president Joe Tucci asserted, the Symmetrix 8730 ‘is the industry's best-performing, most functional, most reliable, most

scalable and by far most open enterprise information storage architecture'.⁵⁰ Of the 14 largest makers of servers worldwide, eight sold EMC units with their computers.⁵¹

Market five – along comes the Internet

Every time an Internet surfer purchases a book from Amazon, buys stock online, or clicks on a banner ad, data are created that must be stored and tracked. For a data storage company like EMC, the advent of the Internet was

“EMC almost missed the Internet party”

a veritable gold mine.⁵² But EMC almost missed the Internet party. 'In our business, only a few large companies provided the majority of data storage, so we focused on companies with more than \$500

million in revenue, 150 people in the IT department, and so forth. But suddenly there were companies with little or no revenue who were poised to immediately buy as much storage as some of our largest customers', said Ruettggers. 'The Internet wave turned out to be much bigger and faster than we thought. It could have crashed over us'.⁵³

Realizing the size of this emerging new market for data storage, EMC focused its efforts not just on its usual Fortune 500 companies but also on smaller Internet companies. EMC posted a record year in 2000, with sales of \$8.9 billion and prospects for \$12 billion in 2001.

What goes up must come down

In early 2001, the bottom dropped out of high-tech, and EMC was hit hard. The market for data storage fell off a cliff:

- EMC's sales in the third quarter of 2001 were off by 47 per cent.
- The company posted a \$1 billion loss, including one-time charges.⁵⁴

Tucci, having taken the CEO's baton from Ruettggers in January 2001 when everything looked rosy, was faced with reinventing the company once more.

Will EMC be up to the challenge? According to some observers, this time the going will be tougher. EMC hung on to old technology too long, high-tech sales are in the tank everywhere, and some say the board lacks the independence necessary to cope with the difficult times the company now faces. 'When you see a board like this, trouble is waiting to happen', says Sarah Teslik, Executive Director of the Council for Institutional Investors.⁵⁵ By the summer of 2002, Hewlett-Packard, its presence strengthened by its

acquisition of Compaq Computer Corp, had overtaken EMC in market share. CEO Tucci was betting his company's future on storage software and services, in an effort to reinvent EMC.⁵⁶ Will Tucci's plan work? Stay tuned.

I thought I had a market . . .

There is no question that bright people founded Thinking Machines, a supercomputer maker in Cambridge, Massachusetts. The company's founder Danny Hillis was, at the time, a graduate student at the Massachusetts Institute of Technology's Artificial Intelligence Lab.⁵⁷ For his thesis, he conceived of what is known as a massively parallel processing (MPP) computer. His idea was simple but ingenious. Unlike a regular computer that has one processor that works on one piece of data at a time, parallel machines have thousands of processors working on data simultaneously.⁵⁸ As Hillis said, 'Instead of trying to do one thing fast, a parallel processor does a lot of things at once'.⁵⁹

Even folks like MIT's artificial intelligence guru Marvin Minsky supported the concept of starting a company that develops and sells MPPs.⁶⁰ How, then, is it possible that a company with such bright people, working on what seems to be such a clever idea, could last only 11 years before filing for bankruptcy?

A brief history of Thinking Machines

Started in 1983 with lofty ambitions but no clear business plan, Thinking Machines had two goals: to find a way to develop artificial intelligence software programs without worrying about university research funding, and to manufacture and sell supercomputers based on MPP technology. Market? Who cares?

The company was off to a running start when, in 1984, they won a \$4.5 million Defense Advanced Research Projects Agency (DARPA) contract to build supercomputers for the US defence industry. With the money from DARPA, Thinking Machines developed its first MPP machine. The 5-foot-square box with flashing red lights called Connection Machine number one (CM-1) was completed in 1985 and had a \$5 million price tag.⁶¹ CM-1 had limited appeal. Its

**“market? who
cares?”**

only real application was artificial intelligence, and its only buyer was DARPA. Fortunately for Thinking Machines, DARPA bought seven machines.

In 1986, Thinking Machines launched CM-2. Unlike CM-1, the newer model was able to run FORTRAN, the then-standard science computer language, and was therefore more appealing to a wider community of scientists. Capable of doing complex scientific modelling, CM-2 was an appealing purchase for anyone who:

- was interested in computational fluid dynamics, particle physics, global climate modelling, geophysics, astrophysics, linear and nonlinear optimization, magnetohydrodynamics, electromagnetism, computational chemistry, computational electromagnetics, computational structural mechanics, materials modelling, evolutionary modelling and neural modelling;
- had a budget that could support a multi-million dollar computer expense.

While somewhat more practical than the CM-1, the CM-2 still needed special software, and users still needed to learn new programming techniques. With its wider appeal, Thinking Machines sold CM-2 machines to Los Alamos National Laboratory, American Express, NASA and others,⁶² but by 1989 the company had still sold only 35 CMs, booking profits of \$700,000 on \$45 million in revenues.

In 1991, Thinking Machines announced its newest model, the CM-5. Like the earlier CMs, the CM-5 used anything from 32,000–64,000 processors. In techno-speak, it had teraflop capabilities, capable of performing a trillion calculations in a second. With a much more reasonable starting price of \$750,000, the goal was for the CM-5 to have even broader appeal, attracting businesses as well as the scientific community. Though Hillis claimed it had the highest ‘theoretical’ performance of any supercomputer ever made, there was just one problem. The CM-5 was actually slower than its predecessor the CM-2.⁶³

Later in 1991, the *Wall Street Journal* uncovered a scandal between DARPA and a number of technology companies, Thinking Machines being one of them. Over the course of their seven-year relationship, DARPA had subsidized the sale of 24 CMs – sometimes offsetting the entire purchase price – translating into \$55 million or 20 per cent of Thinking Machines’ lifetime revenues.⁶⁴

The party ended quickly. With the end of a cushy era of government subsidies, Thinking Machines found itself selling its CMs on a level playing field. No longer protected from its competition, the company went head to head with the likes of Intel, Kendall Square Research, MasPar Computer and nCube. By 1992, with products that just wouldn't sell, the company reported its first loss of \$17 million for the year. Not long later, Thinking Machines filed for bankruptcy protection under Chapter 11, the US equivalent of insolvency in the UK.

Why did Thinking Machines fail?

While Thinking Machines did last a decade, it was not because the company had a solid footing in the supercomputer market. Rather, the company stayed afloat almost entirely because of the fortuitous albeit somewhat scandalous relationship it had formed with DARPA. Without DARPA, the market for MPPs was not big enough to keep Thinking Machines in business.

The root of Thinking Machines' problems can be found in both micro- and macro-market domains. In micro-market terms, it neither identified nor understood its target market. Rather than examining its market, understanding the needs of its prospective customers, and then building a machine, Thinking Machines built powerful computers and hoped they would appeal to someone. As one of the company's research directors Lew Tucker remarked later, 'Our charter wasn't to look at a machine and figure out the commercial profit. Our charter was to build an interesting machine'.⁶⁵

In macro-market terms, the bottom line was that Thinking Machines' interesting machines were not interesting to a big enough market. For the academic community, the CMs were far too expensive and few academics needed such power. For most applications, PCs or workstations were more than sufficient.

For the corporate community, CMs were more technology than was needed. Even for the biggest corporations, the market for computers with the CM's power was very small. Buying a CM was like using a sledgehammer to kill a fly. According to Gartner Group Vice President Howard Richmond, 'The key is industrial acceptance, and industry does not do grand challenge applications. It makes automobiles and engines and other mundane things'.⁶⁶

The only real market for CMs consisted of that part of the scientific community involved in solving 'grand challenges' like decoding the human

genome.⁶⁷ But there were few such grand challenges on the radar, and even fewer entities to fund them.

“there were few such grand challenges on the radar, and even fewer entities to fund them”

What went wrong? With no clear understanding of market size or market needs before launching the company – or afterwards, for that matter – Thinking Machines had little chance of success. Observers noted that CEO Danny Hillis was so intent on building MPP computers that he

neglected to notice that the market was voting with its feet to buy networked workstations and clustered architectures.⁶⁸

What investors want to know

As we saw in Chapter 2, not every entrepreneur wants or needs investors. Some investors – like the three Fs: family, friends and fools – don’t really need returns on their investments, although they’ll be happy if they get them. While they *hope* for returns, the real motivation of most of this group

“aspiring entrepreneurs should not mistake such expressions of love for confidence in the venture, nor should they treat them as affirmation of their opportunity’s merit”

is to support someone they love. Aspiring entrepreneurs should not mistake such expressions of love for confidence in the venture, nor should they treat them as affirmation of their opportunity’s merit!

Most other investors – business angels and venture capital investors – invest in order to achieve returns on their investments. Knowing that most new ventures fail, they expect spectacular returns in order to make it worth their while to bear the significant risks they know are involved. What sort of returns do such investors require?

A successful venture capital portfolio might, at the end of its life, have one or two in ten of its investments hit the jackpot, returning ten times their investment or more. Three or four more – the living dead, as they are called in the trade – may return their capital, but little more. The remaining deals – lemons – lose the firm’s entire investment. It’s not a pretty picture. On the other hand, if the one or two good deals are good enough, then the fund earns an overall 25 or 30 per cent annual return over the five-to-ten-year life of the fund, enough to reward the partners handsomely and to make the pension funds and others who provide their capital happy indeed.

Given this picture, what sort of return do you suppose a venture capital firm seeks from each deal it invests in? A typical rule of thumb is ten times their investment over, say, five years, a figure that amounts to something like a 60 per cent *annual* return on their investment. Angel investors might invest in deals with returns projected at only half this level. But what does all this have to do with market attractiveness at the macro-level?

Do you know any (legal) business that returns that kind of money year after year? Invest ten pounds or ten dollars, return six, again and again? No, neither do I. The only way venture capital investors can get the kind of returns they require is for the business to grow so fast that it becomes worth far more tomorrow than it is worth today. They then sell the business, either to another company or to the public in an initial public offering. This kind of growth doesn't happen in niche markets, for there simply isn't the market potential to make it happen. Large markets are required. Nike did well in running shoes, but the overall athletic shoe market provided the scale that enabled Phil Knight and his team to grow the business substantially.

Thus, if you are a would-be entrepreneur seeking venture capital to start your company, market attractiveness – in macro-terms – is a big deal indeed.

We need to know whether the opportunity has the potential to be big – in other words, scale.

RJ, UK

A large and growing market is not the entire story, by any means, but an opportunity lacking such a market is unlikely to get funded by professional investors. Why? Large and growing markets offer two things that investors like. First and foremost, large and growing markets offer the opportunity to build a large company, one worth much more tomorrow than today. That's good for returns. Equally important, large markets offer the chance for multiple players to be successful, each serving a different segment perhaps in a different way. That's good for reducing risk, because it offers multiple pathways to success.

Lessons learned

We've seen why large and growing markets are important to investors and, in turn, to those who pursue high-potential opportunities through venture finance. On the other hand, if your purpose in becoming an entrepreneur is to build a business that you can control and run for a long time, without having to worry about bosses, boards of directors, or others looking over your shoulder – except bankers, perhaps – then market attractiveness may

work in reverse. Large, growing markets invite competitors – not exactly what you had in mind.

For you, a small and perhaps stable market or market niche – too small for the big guys to worry about – may be far more attractive. Unless you have intellectual property that can protect you from the competition that larger, faster-growing markets usually bring on – an issue to be addressed in Chapter 5 – then a smaller market where you can fly low, under the competitors' radar, may be more attractive.

So, what have we learned from the case histories we've studied in Chapter 3?

Lessons learned from Hero Honda

In 1983, could Honda Motor Company and Hero Cycles have predicted that the Indian market would buy 320,000 motorized two-wheelers each month in 2001?⁶⁹ Probably not. But Honda and Hero were confident of significant market potential for motorized two-wheel vehicles in India, given the sheer size of the Indian market and its emerging middle class. At the same time, they understood the limitations in the still-modest purchasing power of their target customers, so they offered products whose reliability and overall economy were unmatched by their competitors. Hero Honda's ability to identify an underserved market – one that was large and would grow – and match its offering to that market's needs were the twin factors that separated them from larger competitors who had targeted more upscale urban customers having quite different needs. These are simple ideas – marketing basics, really – but they comprise the foundation for many successful entrepreneurial ventures.

Lessons learned from Whole Foods Market

The story of Whole Foods Market provides dramatic evidence of the power of macro-trends to create opportunities that savvy entrepreneurs can capitalize on. Such trends – in this case, sociocultural ones – create groups of customers having needs not served well by incumbent companies. The trend toward health and nutrition that began in the 1980s is still going strong, and it continues to create opportunities for entrepreneurs in every country where the trend has taken root.

In the UK, for example, organic and other natural foods now comprise one of the fastest growing categories in the food industry, and this trend is breeding new ventures like Fresh! Organics, a supplier of fresh, organic prepared foods to supermarkets in England (see www.fresh-go-organic.com). Understanding

today's macro-trends is one key to discovering where tomorrow's entrepreneurial opportunities will lie. For those looking for a way to leave the corporate nest and start an entrepreneurial venture of their own, thinking carefully about macro-trends can provide the impetus to make such a move possible.

Lessons learned from EMC

For 20 years, EMC rode wave after wave in the high-tech world, successfully identifying and pursuing one opportunity after another. These opportunities, like those pursued by Hero Honda and Whole Foods Market, were driven by macro-trends – technological ones, in this case – that created an unending cascade of new needs for data storage. In an interview at the end of 2000, Michael Ruetters identified several key practices that had enabled his company to ride the waves for ten years without being swamped.⁷⁰ These practices, some of which extend beyond the macro-market focus of this chapter, hold useful lessons for entrepreneurs assessing and pursuing their own opportunities:

- *Lesson 1:* Speed to market matters, even if all the bells and whistles are not fully in place, a practice that, according to Ruetters was 'frustrating for engineers, who typically want to refine and refine to ensure that a product is perfect before letting it out the door. But left in their hands, a product might be released too late to catch the wave – if it ever leaves the factory at all.' But Ruetters tempered this lesson with the next one:
- *Lesson 2:* Sell the early versions to low-profile customers in out-of-the-way locations rather than to high-profile customers where failure can be costly. As Ruetters put it, it's like 'having out-of-town tryouts for a Broadway show'. It's not a bad idea for early-stage ventures to iron out the bugs and better understand customers' responses and real needs. Doing so can also be a precursor to raising venture capital, providing hard evidence – as opposed to a mere forecast – that customers will indeed buy.
- *Lesson 3:* Spend time with prospective customers. 'I talk with about 500 customers and prospects a year, which accounts for maybe 20 per cent of my time', says Ruetters. 'They can provide unexpected insights.' Ruetters' conversation in the early 1990s with the Chief Information Officer of John Deere reinforced EMC's hunch that there was a real

“pick up the phone or hail a taxi, and build your customer network”

need for consolidated data storage in large companies. Some entrepreneurs think the way to perform due diligence on their opportunity is to surf the Web for market and industry data. Doing so is an important start and helps to assess quickly market size and growth rate and identify macro-trends. But it's the tip of the iceberg really. So, pick up the phone or hail a taxi, and build your customer network. It will pay great dividends.

- *Lesson 4:* Be clear about what business you are in. In a word, focus. 'I think our focus on a single business actually helps us stay ahead of the curve. In some respects, this runs counter to what I learned in business school, where the prevailing wisdom was to diversify', said Ruettgers.

“**Focus. Focus. Focus!**”

'But our single-minded focus creates a special lens through which to view and interpret customers' current and future needs.'

Budding entrepreneurs should remember how limited their resources are, in terms of time, attention, money and people. It's usually far better to focus on doing one thing exceptionally well than to spread one's efforts all over the map. For entrepreneurs, such diversity increases risk, rather than mitigating it. Focus. Focus. Focus!

Lessons learned from Thinking Machines

It's perfectly fine for the product idea – rather than the customer need – to come first, to then be followed by the necessary work to identify a market that needs what might be offered. We've seen how such a strategy was successful for iMode in Japan. But Thinking Machines never really took the second step. They never really identified who the market was for the machines they would offer, thus they never really understood what those customers needed.

This error is all too common for technology-driven opportunities, where the entrepreneur's love for the technology can blind them to real market needs. As we saw in Chapter 2, without customers there will be no company. Without benefits there will be no customers. Identifying who the target customers are and understanding their needs are important first steps. A key element in doing so, as William Shakespeare noted in introducing this chapter, is riding upon the tide of macro-trends and taking the current where it leads. Equally important, though, as we've learned in this chapter, is to assess how many customers there are and how much customer spending there is – market size – and how fast these numbers will grow. Thinking Machines ignored all these steps, to their eventual peril.

The new business road test: stage two – the macro-market test

- What sort of business do you want? One with potential to become a huge business, or a small 'lifestyle' operation servicing a niche market? Without answering this question first, you cannot assess for your particular opportunity the meaning of the others below.
- How large is the market you are seeking to serve? In how many ways have you measured it?
- How fast has it grown over the last one/three/five years?
- How quickly will it grow in the next six months or two/five/ten years?
- What economic, demographic, sociocultural, technological, regulatory or natural trends can you identify that will affect your market, and what effect, favourable or otherwise, will these trends have on your business?

This information can be found from secondary sources – library materials or information from the Internet – and from primary sources too. What information on market trends can you glean from talking to your potential customers, suppliers or competitors?

Finally, are you seeking venture capital? If your market's not huge and/or growing rapidly, then forget it.