

**“Themes of Success in a High-technology  
Environment”**

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#### Abstract

In a 1984 article in **Sloan Management Review**, M.A. Maidique and R.H. Hayes advanced the following themes of success in a high technology environment: business focus, adaptability, organizational cohesion, entrepreneurial culture, sense of integrity, and hands-on top management. They note that no one firm exhibits excellence in every one of these categories at any one time, but the successful high technology firms tend to score higher than the less successful ones in most of the six categories.

Since that publication in 1984, much water has passed under the bridge in the world of technological evolution and advancement. This study examines the six themes of success identified in 1984 to see how they stack up in the new environment. It traces the evolution of change and what it takes to be successful in high technology management.

## **Themes of Success In High Technology Firms**

Sloan Management Review of Winter 1984 carried an article by M.A. Maidique and R. H. Hayes in which they identified six themes of success for high technology firms. The success factors were listed as business focus, adaptability, organizational cohesion, entrepreneurial culture, sense of integrity and hands on top management. In this paper we review these factors to see how well they have endured the test of time over the last two decades.

### **Business Focus.**

Maidique and Hayes (1984) say that most successful high-technology firms are highly focused. They contend that with few exceptions, the leaders in high technology fields, such as computers, aerospace, semiconductors, biotechnology, chemicals, pharmaceuticals, electronic instruments, and duplicating machines realize the great bulk of their sales either from a single product line or from a closely related set of product lines.

The authors also state that another policy that strengthens the focus of leading high-technology firms is concentrating research and development on one or two areas. These companies maintain their technological leadership by dominating the research in the more risky and very profitable leading-edge explorations.

These companies have consistent priorities. They don't give equal weight to all issues. Some of them focus on manufacturing improvement and others focus on customer service, and so on.

When these companies concentrate on what they do so well, they have a deeper understanding and appreciation of their markets.

### **Adaptability.**

Maidique and Hayes (1984) state that successful high-technology firms must not only be business focused, according to their findings, they must be adaptable also. Since technology and its markets can change rapidly, the most successful high-technology firms embrace change readily.

Change also calls for organizational flexibility. Frequent realignment of both people and responsibilities become familiar scenes in these companies.

### **Organizational Cohesion**

Maidique and Hayes (1984) also find great amount of organizational cohesion in the successful high-technology firms they examine. These firms took great care to remove anything that would impede the flow of ideas. The traditional seniority approach takes a back seat to a more open system. Executive parking and dining rooms are less promoted in these firms. The doorways to creativity flow are made wider. Younger and older employees have equal opportunity to think and offer new ideas.

The authors note that companies that promote organizational cohesion have also good communication channels. Top executives are more visible.

These are policies that encourage job rotation and integration of roles. Some of the drawbacks of specialization are thick boundary lines. These companies soften these lines by job rotation and role integration.

The authors also find that these companies tend to have long term employment in order to foster a sense of loyalty.

### **Entrepreneurial Culture.**

Large firms are sometimes envious of how fast a small company can move and achieve results. Maidique and Hayes (1984) notice that successful high-technology companies emulate these qualities of small firms by doing their utmost best to encourage and promote entrepreneurial culture.

These firms accomplish the small-firm look by creating small divisions within the large firm and by pushing to have their research funding from a variety of channels, as opposed to being funded from only one source. These firms also tolerate failure, knowing that one cannot stub one's toe standing still. Because they don't readily punish one who has failed, they spark the fire of risk-taking.

### **Sense of Integrity**

Maidique and Hayes (1984) also state in their research findings that successful high technology firms have a high sense of integrity in their dealings with all their stakeholders - employees, customers, suppliers and the public as a whole. They adopt integrity because it makes for good business. They don't promise what they know they cannot deliver. Most of the leaders of these firms even went further to say that the sense

of integrity must start from the chief executive—from the top of the organization.

Otherwise, they contend, it is a big joke.

They also know their limitations and they are very careful not to go beyond what they can realistically achieve.

### **Hands-On Top Management**

Even though the executives in these highly successful companies have a deep sense of trust and respect, they conduct what can be termed “management by walking-around”.

Many of these executives are not technical people themselves but they know to ask tough questions. This is even the more reason these firms have narrow business focus. By walking around, these top managers sometimes run into projects that need to be accelerated to production stage. They understand how their organizations work.

### **Success Factors For Small Technology-based Firms in Australia**

Warren (2000) identified the following factors of success for small technology-based firms in Australia:

1. The firms never borrowed money
2. Co-founders enjoyed good partnership
3. The employee skill level was very high
4. All employees had sound knowledge of the business
5. There was generally good technical back-up

6. There was a lucky dimension – being at the right place at the right time
7. There was also the ability to spot and seize a market opportunity
8. The companies enjoyed good social atmosphere
9. These companies did not expand internationally too fast because they would not want to compromise their local market

### **Forbes Scorecard of United States dynamic technology companies**

Forbes (February 23, 1998) chose the “best” technology companies using the following factors:

1. Responsive to change: How well does the company respond to market change?
2. Market Opportunity: How big is the potential market for the company’s products?
3. Marketing Expertise: How good is the company at selling and marketing into the above opportunity?
4. Human Capital: How good are management, marketing, sales, and support?
5. Alliances and partnerships: How strong are its partners and its relationships?
6. Prospects For Growth: How fast is the company growing and can it continue to ramp up quickly?

The rankings produced Cisco Systems as number one, followed by the following companies, respectively: Smart Modular Technologies, 12 Technologies, DellComputerCorporation, Rambus, Yahoo and Worldcom.

### **Silicon Valley’s Factor**

There may not be any other region in the world with more technological success and breakthroughs than the Silicon Valley of the Western Coast of the United States. As we examine success themes in high technology companies, we want to understand the factors of success for the entire Silicon Valley.

Economist magazine (March 29,1997) says that Silicon Valley's technological success goes beyond the size and flexibility of its labor pool, the breadth of its network of suppliers, access to venture capital, excellence of its education facilities and research institutions. The magazine quotes Anna Lee Saxenian, a professor at Berkeley, as giving the following reasons for the Valley's success: culture and structure of the organizations involved. Culture is said to be more important to Silicon Valley's success than economic and technological factors. Other factors of success for Silicon Valley include tolerance of failure, risk- seeking, reinvestment in the community, enthusiasm for change, promotion on merit, obsession with the product, collaboration, variety, and "anybody can play" attitude.

In his book, *The Silicon Valley Way*, Sherwin (1998) states the following factors of success for Silicon Valley's Technology companies: these companies pick the right markets; they know their customers; they design exceptional products; they market their products creatively, and they distribute their products efficiently.

Seidman and Scancke (1990) say that successful innovative firms know where they are going and how they plan to get there. These firms are flexible and persistent in pursuit of

defined goals. They prioritize and they measure productivity. In these companies, leadership has open communication channels and is mobile. Innovation is greatly encouraged and employees are fully rewarded. These employees are enthusiastic and because they take pride in doing their work, they end up producing high quality products.

### The Case of Intel in 1999

We look at Intel here using our original success themes and company data for 1999.

#### **Business Focus**

Intel focuses mainly on technological innovation. When the company ventured into digital watch business, they retreated very quickly, in failure.

#### **Adaptability**

Intel likes change. The company is migrating from personal computers to the emerging internet economy. Chairman of Intel in 1999, Andy Grove, said that “Intel is undergoing an adaptation today that is a different version of the adaptation that occurred in the mid-80s. And its almost as dramatic. The adaptation today is to the connected computer universe.

#### **Organizational Cohesion**

Intel is organized in a matrix structure that consisted of both product and functional groups. Management ranks are deep and twenty nine of the top thirty officers, in 1999, were company grown. Intel is loyal to its employees.

#### **Entrepreneurial Culture**

Even though the company is huge in size, they operate in several smaller groups in order to realize advantages enjoyed by smaller companies with flat organizational structure.

Network communication group develops products. New Business group concentrates in growing opportunities in emerging business segments.

### **Sense of Integrity**

Intel reacted with dignity in a highly publicized Pentagon process flaw issue of 1994. The company went after the flaw and corrected it with great speed.

### **Hands –on Top Management**

Top management executives in Intel are actively involved in the innovation process.

### **Conclusions**

The most frequently mentioned themes or factors of success for high technology companies, according to our research, are business focus, adaptability/responsive to change, culture and structure of the organization, strong partnerships and collaboration, tolerance of failure, risk-seeking, market opportunity awareness, organizational cohesion and flexibility, marketing expertise, high-skilled employees and hands-on top management. These factors of success are, for the most part, based on United States' experience. They may vary from one region of the world to another.

Most of the factors of success identified by Maidique and Hayes in 1984 appear to still make the list of success factors of high technology companies in the nineties. The two factors that appear to be missing are the sense of integrity and entrepreneurial culture.

More studies are needed to explain these phenomena.

### **Opportunities for Further Research**

There is a need to research whether there are companies which failed, even though they applied the themes of success identified in this study. In other words, why do some high technology companies succeed and some fail when they equally apply these “success” factors?

There is also a research opportunity to find out success factors for high technology companies in other regions of the world.

## References

Aguilera – Hellweg, Max, “The ASAP Dynamic”, *Forbes* (February 23, 1998) pp. 51-76

Anderson, Christopher, “Taiwan Silicon Valley”, *Economist* (vol. 349 No. 8093, Nov. 7, 1998) pp. 14-16.

Burgelman, Robert A., M.A. Maidique and S. C. Wheelwright, Strategic Management of Technology and Innovation, 3<sup>rd</sup> Edition (McGraw-Hill, Irwin, New York), 2001.

Burrus, Daniel, Technotrends: How to use technology to go beyond your competition (Harper Business, New York) 1993

“Cisco Systems: The Dog Food Danger”, *Economist* (Vol. 355 No: 8165, April 8,2000) pp.64-66.

“Deep in the heart of Texas: Silicon Valley Survey”, *Economist* (vol. 342 No: 8010, March 29, 1997) pp. 14 -16

Farhan, Alan, Forbes: Great Success Stories: Twelve tale of victory wrested from defeat (John Wiley and Sons, Inc., New York) 2000

Forbes: Great Minds of Business ( John Wiley and Sons, Inc, New York) 1997

Hamel Gary, Leading the Revolution (Harvard Business School Press) 2000

Maidique, M.A. and R.H. Hayes, “The Art of High-Technology Management”, *Sloan Management Review* 25 (Winter 1984) pp. 18 -31

Neff, T.J. and James M. Citrin, Lessons from the top: the search for Americas best leaders (Currency Doubleday, New York, 1999)

Novak, Janet ,“Foothold in Enemy Country”, *Forbes* (vol. 158 No. 5 August 26, 1996) pp.54-56

Seidman, L. W. and Steven L. Skancke, Productivity: The American Advantage: How 50 U.S. companies are regaining the competitive edge (Simon and Schuster, New York) 1990

Sherwin, E.B., Jr., The Silicon Valley Way: Discover the secrets of Americas fastest growing companies (Prima Publishing, Rocklin, CA) 1998

Shotgreen, J.A., Skyhood for Leadership, (American Management Association, New York) 1999

Warren, Lorraine, “Success Factors For High-Technology SMEs: A Case Study From Australia”, *Journal of Small Business Management* (Vol: 38 No. 3, July 2000) pp. 86-91.

