The aerospace and defense industry has had its share of ups and downs over the years. Since a large portion of aerospace contracts are with the Department of Defense, the industry is largely driven and stimulated by the fiscal policy of the United States. The defense budget has been cyclical, rising of course during times of war and then subsiding during times of peace. The cold war during the Reagan administration had created a resurgence of government dollars allocated to the fight against communism. The aerospace industry flourished for a decade between the mid 1970s and 1980s and was the business to be in. During these “good times”, aerospace companies and their management’s had become less efficient, less competitive and more lax in the ways they conducted their long term business operations. The most predominant management strategy was growth as the companies became more short-sighted and focused on quicker profits. Most companies were successful at hitting these targets while the contracts were abundant. However, this spending could not be sustained; and eventually the defense budget began to decline in 1986, which has lead to the fierce competition within the military business units of all aerospace companies. Aerospace companies with large commercial aircraft divisions have also been hit with an erosion of profit margins due to recent airline price competition. This has been brought on by weak passenger demand due to the recent global recession. The commercial aviation business has also experienced increased competition from abroad. Airbus, the European consortium including British, German, French and Spanish units, has established aggressive pricing policies due to their heavy government subsidization.

The effects of declining defense budgets, the recent recession in commercial aviation, and the collapse of the Soviet Union and the cold war in 1992, began to pinch the aerospace and defense industry in the late 1980s. The “good days” were over and the management of many companies found themselves in the midst of a crisis with their current strategic plans. They wake up call had sounded for top management to develop new strategies to compete for the dwindling contracts and deal with increased civil aviation competition.

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Effective strategic management in the aerospace industry

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Abstract
This research paper was written in the Summer of 1995 in partial fulfilment of the requirements for Management 524 within the MBA program at California State University at Fullerton. Its purpose was to determine the effective management strategies within the aerospace industry since the defense budget began to decline in the mid 1980s. Through research of the top aerospace companies (according to the 1995 Fortune 500) over the past decade, this paper examines the various long-term management strategies employed during the recent recession.
Research approach
To determine the effective strategic management approaches in the aerospace industry, the strategies of the most successful companies currently in the industry were examined. To select these particular companies, Fortune magazine which compiles the top 500 industrial corporations each year was referenced. Corporations are evaluated and ranked in order within their respective industries according to their revenues and profits as a percentage of revenues, assets and return to shareholders. The top companies categorized within the aerospace industry included Boeing, United Technologies, McDonnell Douglas, Lockheed, Allied Signal, Martin Marietta, Northrop Grumman, General Dynamics, Textron, and Sundstrand. These companies will be the focus and provide examples of effective strategic management within the industry.

What is strategic management?
Successful companies have a vision of their long-term goals and a long-term plan which leads them toward achieving these goals. A strategic plan is developed around the company’s mission statement. The mission statement briefly defines the purpose of the company through its primary goals. The process of satisfying the mission statement and reaching the company goals is a function for the top management of the organization.

Strategic management is a process through which managers formulate and implement strategies geared toward optimizing strategic goal achievement, given available environmental and internal conditions (Bartol and Martin, 1994, p. 186). Strategic management helps identify and analyze the company’s strengths, weaknesses, opportunities and threats within the industry in which they are competing. The analysis must take into consideration the environment surrounding the company such as its technological, legal, political, and technological influences and how the organization can exploit them. Based upon the analysis, corporate level management then proceeds to formulate a strategy or strategies that provide the direction the company will take and the ultimate goals it will pursue.

Strategies employed
As a result of the economic downturn in the industry, aerospace companies have found themselves in the middle of a crisis. They have responded with organizational changes and a multitude of strategies. With no end of the budget cuts in sight, companies are still currently adapting their organizations to survive. “Three types of competitive organizational structures are emerging from the forces shaping the industry. Companies will compete as technology leaders, cost leaders or adaptable niche leaders. There is a necessity to downsize the industry permanently and the strongest technology and cost leaders are going to do it through innovation, acquisition and abandonment” (Dee, 131, p. 101). In the aerospace industry we have seen acquisitions, mergers, consolidation, reorganization, diversification, divestment, niche and cost reduction strategies and total quality management. Many companies are even looking to increase their competitiveness and efficiency by adopting a number of these strategies.

Acquisition, merger, diversification and abandonment strategies
One effective strategy is increasing market share through the strengthening of market positions. This has been done primarily through industry acquisitions, mergers, diversification, divestment and abandonment.

Profit Impact of Marketing Strategies, a 1970 empirical study of factors that characterize successful businesses found that market position is a strong determinant of profitability even in weak industries (Dyer, 132, p. 21). Even with the defense budget in severe decline, companies such as Lockheed and Martin Marietta have strengthened their relative market position with the purchases of General Dynamics’s and General Electric’s defense business respectively. Hughes Aircraft boosted its position against Raytheon after buying General Dynamics missile business. In April of 1994, Northrop’s acquisition of Grumman created a $6.5 billion manufacturer of aircraft, missiles and electronics equipment.

The merging of $11.5 billion Martin Marietta and $14.5 billion Lockheed this year created the world’s largest defense contractor. His defense giant will produce everything from rocket launchers and spy satellites to fighter jets and ballistic missiles. Lockheed
Martin expects to eliminate between $2 to $3 billion in overlapping operating costs over the next five years which will allow the company to gain a larger share of the defense market by underbidding its competition (Money, 24).

The complementary product lines of these prior companies will allow Lockheed Martin to be involved in almost every segment of the industry.

These companies, fewer but now larger, have begun to dominate the industry market share with their size and diversification. Some analysts believe that the future defense budget will be able to support only a few aerospace companies and will drive out most of the smaller firms or force them to serve only a niche within the industry.

While many aerospace firms have sought to gain market share through growth, some have decided to abandon the industry altogether. Alliant Techsystems, a corporate spin off from Honeywell, has allowed Honeywell to concentrate and prosper in other industries. Textron Incorporated’s strategy in 1985 was to unload subsidiaries that don’t fit in with the corporations long-term plans even if they are profitable. Textron sold American Research & Development (ARD) for $25 million even though for the seven years prior ARD had been returning almost 40 per cent annually. According to Textron, it didn’t want to be a conglomerate anymore and wanted to concentrate on the defense and financial services, two fields that were thought to be hot (Slutsker, 1985). According to the Fortune 500 figures, Textron Inc. has lead the aerospace industry with an average of 15 per cent total annual return to investors over the past ten years.

Reorganization and consolidation strategies

With the size of the Department of Defense cuts and budget restraints on federal agencies such as the Federal Aviation Administration (FAA), there has become a necessity to prompt business unit realignments within and among both the large and small aerospace companies. Most have reorganized and consolidated their organizations to various degrees in an attempt to cut cost, adjust scale of plant, improve market share and margins, achieve acceptable returns and improve utilization of financial assets while keeping a strong focus on their core competences.

Competition within the industry was lulled into dormancy due to the defense spending in the early years of the Reagan administration. Companies in the aerospace industry seemed to have deviated from their long-term vision and got caught off guard as the defense budget cuts hit the industry. Almost all of the recent reorganizations that have occurred in the industry were reactive rather than proactive.

Realizing in 1987 that it needed to increase its competitiveness and efficiency, Martin Marietta reorganized its operations into four product groups and eliminated a layer of management in the process. In another example, General Dynamics shuffled its top management officials in 1990 after it believed to be facing a $450 million cost overrun in the Navy's A-12 advanced aircraft program. GD believed that it needed to put increased emphasis on its projects by focusing on the A-12 and other existing military programs. McDonnell Douglas found itself in the midst of financial mismanagement and launched studies to determine the causes and some solutions. The findings were that the company had become bogged down with excessive layers of management and bloated staffs in each of the six operating groups. John McDonnell’s vision was to be a premier aerospace enterprise; a high technology company designing and building world class products for a wide range of customers. McDonnell realized that his only hope was to develop a strategic plan to increase financial performance. “Of all the steps McDonnell Douglas took to turn itself around, none proved more meaningful than the massive reorganization announced in August, 1992. That streamlined the decision-making process by consolidating six unwieldy defense and aerospace subsidiaries into two groups” (Velocci, 140). It eliminated counterproductive organizational barriers and allowed the flexibility to apply the corporation’s resources to the highest priority programs.

Since 1981, the European Airbus consortium which is heavily government subsidized has been increasing its bite into Boeing’s market share in civil aircraft production. CEO Frank Shrontz’s concerns also include McDonnell Douglas and potentially the Soviet Union and Japan in the future. Due to the decreasing defense budget, Shrontz responded to these threats by targeting Boeing’s defense and space group. This group
which once was six separate businesses was consolidated into one. Out of approximately 450 labs, around 200 were eliminated due to overlap in overhead. This saved $30 million a year for Boeing and forced a cut of over 10 per cent of the workforce in the military side (Banks, 1991).

Even though these strategies may have been reactive, since the industry as a whole experienced a degree of competitive complacency, these companies still find themselves “tops” within the industry according to Fortune. However beneficial to the current financial and competitive position of the companies that have gone through such organizational changes, such changes have created some concern about the affected long-term viability of the industrial and technological bases of the industry.

**Niche strategies around core competences**

The industry customers have also dictated changes in the way companies have conducted business. Many companies that cannot compete with the larger conglomerates monopolizing the shrinking markets have decided to focus on their strengths to find a particular niche within the industry that can make them a leader.

The approach of James Walsh, CEO of Wyman-Gordon's Co. which produces aluminum and titanium forging for jet engines and aircraft, increased its capital investment to focus on a niche. The company has heavily invested in specialized equipment and bought Scaled Composites from Beech Aircraft which fabricates aircraft parts from plastic composite materials. “It's only the first phase,” says Walsh “of a process that should transform Wyman-Gordan from a traditional metals manufacturer into a supplier of ultra-high technology aerospace materials” (Slutsker and Zwieg, 1989, p. 82).

Toby Warson of Alliant Techsystems, the spin-off from Honeywell, has also decided to make a go at becoming a niche leader. He decided to build a company tailored to the changing circumstances in which drastic changes would have to take place. After feeling that the munitions budget had seen its big cuts, Warson restructured to a more simplified organization. Warson saw munitions as a disposable commodity that needs constant replenishment and is not a major target of defense cuts since it is a small fish compared to the shipbuilding or airframe businesses.

**Flexibility through cost reduction strategies**

In addition to most of the strategies that particular companies have pursued, becoming more flexible within the industry seems imperative. Many companies are lowering inventories, fixed costs and capital spending while increasing internal financial goals and using cash flow to reduce debt. “[Aerospace companies] have a heightened recognition for a healthy balance sheet. Liquidity, low debt and strong cash flow are becoming top priorities industry wide. Companies are beginning to recognize that these are the key to the flexibility they need to respond quickly to market opportunities as they develop” (Velocci, 136b, p. 38).

Many companies are operating with less debt and generating more cash and are no longer burdened with substantial overhead expenses. Many have devoted more attention to the most efficient use of financial resources. “Here are even some operations, like Precision Casting Corp., that are asking, ‘What kind of company do we want to be?’ With a net debt-to-equity of zero, this highly successful niche company will have all the flexibility it needs in charting its future course” (Velocci, 136b).

Boeing CEO Frank Shrontz’s strategy is hoarding billions in cash to finance large development programs. Northrop’s operating margin in 1991 was up more than 20 per cent over the 1990s and its debt-to-equity was reduced from 92 to 47 per cent despite flat sales for the year. General Dynamics and McDonnell Douglas reduced their debt-to-equity ratios by 25 and 50 per cent respectively.

Perhaps the industry’s most serious financial problem has been that companies found themselves saddled with over capacity from the 1980s. This drains efficiency by adding to the cost of operations which reduces returns making them less attractive to investors – an important source of capital. Hughes Aircraft Company has closed down its Fullerton facility and consolidated its operations in El Segundo due to the downsizing which left both facilities underutilized by approximately 50 per cent.

Northrop’s CEO, Kent Kresa, in 1992 stated that he expects to “look at lots of
opportunities during the next couple of years. We will have to grapple with what makes the most sense for all of us. The important thing is that we are acquiring the financial muscle that will allow us to consider all options” (Velocci, 136a, p. 44).

**Total quality management and human resources strategies**

The concept of total quality management (TQM) began pervading the aerospace industry in the early 1980s and has gained momentum throughout the decade and into the 1990s in an effort to become more efficient as a result of increased competition. The adoption of these quality practices by the Department of Defense has also prompted the introduction of TQM to the industry. “The potential bottom-line benefits of reduced costs, improved quality and better customer satisfaction are prompting major US firms to invest millions of dollars in training, new equipment and facilities to enhance their own competitiveness on a global scale” (Scott, 131).

Due to the success of many Japanese companies employing TQM, many aerospace companies have taken a crack at it. Some companies have even attempted to embrace it without really understanding what it is. TQM has no quick definition and its implementation depends upon various organizational goals, products, markets and work force, but most plans generally share the following where the bottom line is customer oriented:

- Encourages all employees to become involved in improving the product.
- Teams from various disciplines develop robust and simple designs to make the production and maintenance easier and less prone to defects.
- Management support of employees contributing to the improvements of the business.
- Top management making long-term commitment to quality.
- The use of statistical methods to measure product quality (Smith, 135).

Implementing TQM is a difficult task due to the different nature of its approach to operations and thinking. It requires total commitment on the part of top management since it generally runs against the grain of most current deep rooted cultures and requires a culture change at all levels of the company.

C companies that fail at implementing TQM due to a half-hearted attempt generally perceive TQM as another passing fad of management styles. However, the ones that have been able to overcome the culture shock and the adversarial hurdles to improve performance have been Martin Marietta, Lockheed, Douglas Aircraft, United Technologies and Allied Signal.

The most aggressive to pursue TQM is Douglas Aircraft Company. Due to Douglas’ (Mc Donnell Douglas Corporation commercial transport company) history of unprofitable manufacturing operations, it began its Total Quality Management System (TQMS) effort by a major reorganization. In February of 1989, the company flattened its management organization, and created product teams for its Long Beach operation (Scott, 132).

The primary thrust of the TQMS was to form small employee teams on the production line and decentralize authority down to these team levels. Management felt that these employee teams should be empowered to make their own decisions because they were in the best position to improve manufacturing efficiency and quality due to their first-hand knowledge. Relatively early however, management reneged on this half of the plan. They had a tough time giving up control to the teams at the production level and felt that the lowest level which could operate effectively was at the business level. Even though Douglas management did not implement its original plan entirely, it did achieve significant improvements in earnings and production rates along with improved communications, formalized business processes, multidisciplined teams and a greater focus on quality and customer satisfaction (Aviation Week & Space Technology, 135).

Martin Marietta has trained approximately 12,000 people in TQM related philosophies and techniques. Across the corporation’s company and divisions more than 930 “process action teams” have been established to work on improving specific areas that offer significant productivity payoffs. On one cost sharing contract, savings from team actions resulted in a return of $12 million to an army customer while adding $10 million to the profits of the company. TQM has also been responsible on the Lantirn night attack system program for decreasing overall scrap by 40 per cent, decreased equipment returned from the field due to latent defects by 98 per cent and
increased overall first-time product yields to over 96 per cent (Scott, 132).

United Technologies, currently ranking second in revenues just behind Boeing, is a major supplier to aerospace firms. It has been growing since the new CEO Robert Danili took over in 1985 from a $2 billion to a $15 billion a year firm. It attributes its success to the new management style of its CEO who stresses the importance of people, the customer and a participative management. Danili created a program that he has all his managers attend. The course emphasizes the need for creating and sharing a vision, taking initiative, empowering others and gaining support within the company (Furtado, 20).

Allied Signal’s CEO Lawrence Bossidy who took control in 1991 employs a strong human resources approach which has brought his company into the top five for the last five years. Bossidy adds a lot of emphasis on his people and action. In an interview with the Harvard Business Review, Bossidy is quoted “At the end of the day, you bet on people, not on strategies” and “Strategies are intellectually simple; their execution is not” (Tichy and Charan, 1995).

General Dynamics realized it lost its focus on the customer in the mid 1980s. Prior to CEO Stanley Pace’s direction as CEO, General Dynamics was notorious for its waste and corruption in military spending. It was known as the company who charged the government over $9,000 for a wrench. These scandals forced an overhaul of the GD culture and prompted a 20 page ethics booklet describing the appropriate behavior for a wide range of issues. According to Pace, he was not trying to make his employees honest, they all are assumed to be, it was the culture that was corrupt not the people. What he was trying to do was to heighten their awareness of the company’s values and tighten operating procedures. With this new direction, GD has regained trust and respect from the Pentagon (Worthy, 1986).

There is no single most effective strategy within the industry. As illustrated, there have been numerous strategies employed and as the industry environment continues to change or shift, so must each company by reviewing the effectiveness of their current long-term vision. Each strategy varies in degree and magnitude due to the company’s particular situation, however; there does seem to be one commonality. Whatever path companies choose to take in order to remain a player in the aerospace industry, it is imperative that they all remain focused on their core competencies. “While we want to diversify out of the [defense] industry, we must make sure that anything we venture into will be closely allied with our core competences, such as composite aerostructures”, said Kent K rosa, CEO of Northrop in 1992 (Veloci, 136a, p. 44).

Boeing, the industry leader, provides a good example. In the 1980s, military contracts began winding down and Boeing began to over aggressively seek new business which caused it to lose focus on its core competences. It sought and won the Peace Shield contract, a large scale air defense system for Saudi Arabia, but knew very little about the technology. After flailing around for several years, Saudi Arabia pulled the project and gave it to Hughes Aircraft Co which had the expertise. His program was a dismal failure for Boeing but a huge success for Hughes Aircraft.

Though many company strategies still need time to play out, some have given an edge to those firms which have already established a foothold in the industry. However, being on top today doesn’t promise anything for the future. “It doesn’t take long to slip in this business,” says Boeing CEO Frank Shrontz. The uncertain future of the aerospace industry will still take some new turns and the organizations that are ready and the quickest to adapt will become the industry leaders of tomorrow.

References and further reading


