

University of Washington - Michael G. Foster School of Business

Boeing Management Analysis Report

390 Consulting Group: Team 2

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BA 390: Business Honors Seminar
Winter Quarter 2014

In 2016, Boeing will have reached its 100th year as a company. Since their founding in 1916, Boeing has grown from a small Seattle company, to one of the world's largest aerospace suppliers. Unfortunately, long avoided obstacles, including a rift between the business and engineering sectors, outsourcing of crucial manufacturing processes, and the loss of intellectual property associated with the retirement of senior employees, are becoming detrimental to the future of the Boeing. As their key competitors begin to embrace innovation, Boeing must support growth and change in order to remain a key player in this highly competitive industry.

Two forces in Boeing have always been strong: labor unions and the opposition to the unions. The history between this immovable object and the irresistible force has created strong tensions among the airplane engineers and machinists side and the business side. The recent union votes demonstrate the volatility and instability of the company. To repair this rift, Boeing must cultivate teamwork with team projects and a more collaborative workspace and evolved politics.

Additionally, Boeing has increased outsourcing in the production process of its newer planes. While outsourcing to less expensive markets does present an opportunity for cost-saving, it led to major problems. The increased outsourcing of the 787 led to prominent issues in their supply chain and lack of quality control. Boeing failed to implement an adequate system to track the manufacturing process which led to well-publicized production delays. Another pressing issue is the offshoring of institutional knowledge. Boeing must buy into large capital investments to bring complex manufacturing in-house and hire top talent. These initiatives, while implemented from the top down, will be met with support from lower-level employees, as it supports in-state job growth.

The roots of Boeing's problematic future lie with their senior employees, most of whom are of the "Baby Boomer" generation. Boeing has historically managed to retain engineers who are highly skilled and technically competent, which is a large part of what has allowed Boeing to remain ahead of its competition in the past. Baby Boomers currently have a monopoly on management positions, which has prevented the development of younger leaders. As this generation of managers retires, younger, inexperienced employees are stepping into the vacancies. Even as Boeing strives to get younger and modernize, the Baby Boomers sensitivity to change is leaving Boeing behind in innovations. To regain their advantage, Boeing must help ease this transition by enforcing new sustainable hiring practices. It will be crucial to not only define the companies intellectual property, but to capture this in a younger demographic.

As stated by Steve Denning, Forbes contributor, "Success in this new world of manufacturing will require a radically different kind of management from the hierarchical bureaucracy focused on shareholder value that is now prevalent... Merely shifting the locus of production is not enough. Companies need systemic change—a new management paradigm." Boeing is no exception. They have the information structure, capabilities, and knowledge, but outdated management tactics have left them lacking innovation. In order to move forward, Boeing must embrace internal changes and promote sustainable business practices to remain competitive in the market.

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Critical Issues & Assumptions

One of the most critical issues facing the entire airline industry is the need for innovation, and the risks associated with adopting new technology. The next generation of aircraft is advancing into a realm of technological capabilities which seemed impossible just a few years ago. For example, major airlines companies are now demanding that planes be significantly more fuel efficient. These stipulations are driving manufacturers, like Boeing, to find ways to reduce the weight of their aircraft. To meet this challenge Boeing is in the process of replacing metal parts with new, lightweight composite pieces (Stone). However, with innovation brings about risks by way of design obstacles, such as the ones and Boeing with 787 production.

Another issue facing Boeing is the change of corporate culture that originated with their acquisition of McDonnell Douglas in 1997. This shift is rooted in the different value systems of defense industry suppliers (like McDonnell Douglas) and commercial sector manufacturers (like Boeing). Defense projects are paid as they go, ensuring stable cash flows and lowered risk. According to industry analyst Richard Aboulafia, “The McDonnell Douglas culture, averse to risk and obsessed with cost-cutting, weakened Boeing's historical commitment to making big investments in new products” (Surowiecki). This statement captures the internal struggles to commit capital to new, risky projects, such as the Dreamliner.

Instead of making the immense capital commitment that the internal production of an aircraft requires, Boeing chose to outsource both the design and manufacturing of the project. While this saved capital initially, it led to engineering difficulties that endangered the entire project. The clash of cultures between the defense-side and the commercial-side of Boeing will continue to be an issue unless it is addressed.

Another well-publicized issue facing the company is the difficulty replacing their rapidly retiring workforce with top talent. To survive, Boeing must tap into recent college graduates in both the engineering and business fields. However, the mentality of these potential new hires does not fit with a

traditional organization like Boeing. The millennial generation currently graduating from college puts an emphasis on jobs with a sense of purpose and achievement, ability to move around projects, and instant responsibility over their work. All of these desires clash with the traditional characteristics of the aerospace industry (Zillman). The rapid retirement of senior members of Boeing's workforce has been exacerbated by their inability to replace openings with top talent.

Trend Analysis

Boeing's divisions and age range makes changing with times necessary and extremely difficult. Both the demands of the consumers and government forces affect the company's decisions. As one of the top providers of aircraft to the public airlines, Boeing must cater to the new spectrum of wants from the consumer base. Boeing also is also affected by the enormous budget cuts in governmental spending. Finally as an employer, Boeing is at the mercy of the new age of workers entering the workplace.

The trends in airlines and their services heavily affect the planes put out by Boeing. The current market is either for luxurious flights with new technology or towards the low cost with few services. Boeing has created planes to satisfy the travel in style crowd with the 787 Dreamliner and lie-flat seats. The demand for these type of aircraft boosts sales of brand new planes, however the drift towards low-cost airlines balances that. These new Southwest imitators tend to keep airplanes longer and cut down on services and amenities to provide savings for themselves and the customers, driving the demand for new planes down. (Francis).

Currently, the decline in federal spending from budget cuts is affecting stock prices at Boeing. That in mind, investors also see the defense industry as a dying breed and no longer wish to invest in that market (2013 Defense Industry Perspective). With the decline in funds as well as decline in investor trust from Wall Street, shareholders are likely to go elsewhere to invest their money and Boeing will

remain high and dry with a fraction of the government dollars they use to get.

Boeing's older workplace structure will be facing a lot of changes when its main workforce, currently full of baby boomers a few years from retirement, will no longer be a part of the company. The rush to fill the positions in the near future will leave them struggling to grab top young talent that may be tempted to go elsewhere. Boeing has an internal group called the Future of Work (FoW) to mitigate the impending death sentence for the company if it does not change. The FoW hopes to create an inviting work environment to attract the next generation of workers to accommodate the diversity needs of these new workers as well as increase teamwork and collaboration among the employees (Meet Your Future Workspace).

Competition Analysis

Boeing holds a dominant market share in the commercial aerospace business, as well as in the defense, space, and security market segment. This does not mean, however, that their competitors have or will remain dormant. In fact, much of the fate of Boeing lies within their reaction to the emerging aerospace companies who drive innovation throughout the industry.

In commercial airplanes, Boeing's biggest competitor is Airbus. The competition between these two companies is highly publicized and often results in a debate between revenue, orders, planes produced. As of the latest end of the year reports, Boeing delivered 22 more jets than Airbus, which resulted in \$13 billion more in revenue for Boeing as well. However, Airbus was able to secure a record of "1,503 net orders vs. 1,355 net orders for Boeing" (Seattle Times). A closer look at the data suggests Airbus's surge in orders comes from narrow-body planes, whereas Boeing's higher revenue can be attributed to the sale and delivery of wide-body planes. Current market trends are showing an

increase of consumers flying in either smaller, more economical planes, or flying in luxurious, full amenity planes. Either way, until Boeing comes up with a clean-sheet design for a plane that fits this new market, Airbus will continue to win a larger share of orders.

Beyond Airbus, Boeing should also be aware of smaller, new market entrants coming from “Russia (Irkut- United Aircraft Corporation), China (COMAC), and Japan (Honda Aircraft and Mitsubishi Aircraft)” (Aeroweb), whom, like Airbus, may have an advantage in understanding the needs of creating narrowbody aerospace infrastructure.

Boeing’s Defense, Space & Security (BDS) is not only heavily regulated and funded by the federal government, but also faces strong competition in all market segments, primarily from Lockheed Martin, Northrop Grumman, Raytheon Company, and General Dynamics. Boeing’s merger with McDonnell Douglas in 1997, a top tier aerospace defence contractor, placed Boeing in the top tier for Pentagon purchases. During Bush’s presidency, Boeing bet heavily on projects that surrounded the idea of “military transformation” (Forbes). These efforts eventually fell by the wayside as the military became absorbed in prosecuting “counter-insurgency campaigns in Southwest Asia” (Forbes). Military transformation turned out to be a dead end, which in turn, lost Boeing billions of dollars in future revenue.

Currently, government defense spending is in a slight downturn. Nonetheless, it remains crucial for Boeing to continue to think long-term. Innovation developed today, will need to be applicable to warfare fought several years later. Lockheed Martin has positioned itself well for the future, investing in tactical aircraft, military space, naval electronics, as well as contracting with the National Security Agency by investing heavily in cybersecurity. Boeing’s positioning is not as strong, but does contain some bright spots, such as rotorcraft, electronic warfare, and “its hard-fought win of the Air Force’s

next-generation tanker program” (Forbes). However, these programs alone will not win Boeing the top spot in defense aerospace. Just as in 1997 with McDonnell Douglas, it will remain crucial for Boeing to stay innovative and ahead of the long term technological trends.

SWOT Analysis

<p><u>Strengths:</u></p> <ul style="list-style-type: none"> ● Two business under one enterprise allows Boeing to uniquely cater to both the government and the airline aviation industry ● Longstanding relationships with customers ● Demand for aircraft is high and Boeing has a 2 year backorder on many of its models 	<p><u>Weaknesses:</u></p> <ul style="list-style-type: none"> ● Cultural differences between BCA and BDS ● Defects with new products (especially 787) ● Very expensive product ● Distinct rift between engineering and business employees ● Outsourcing ● Ambiguity surrounding the identification and collection of IP
<p><u>Opportunities:</u></p> <ul style="list-style-type: none"> ● Innovation in terms of fuel economy ● Implementing composite plane material across the fleet ● Adapting all factories to a moving or pulse assembly line to increase production (huge success with the 737 moving line) ● 737 max launch ● LEAN program continues to clean up processes and maximize efficiency for both the engineering and business sides of the company ● New focus on 3 design centers (Everett, WA, Charleston, SC, and Moscow, Russia) 	<p><u>Threats:</u></p> <ul style="list-style-type: none"> ● Rapid change in technology with the long term ordering and assembly process ● Growth of Airbus and their monopoly on the European market ● Changing regulations of the FAA ● Intellectual Property leaks ● Union vs. nonunion labor forces ● Retiring baby boomers ● Meeting a delivery date is highly dependant on suppliers providing parts on time

Prioritized Management Issues:

The Rift

The future of Boeing relies heavily on innovation. With the current trends in the airlines towards luxurious travel, Boeing must put its best foot forward and come up with new planes to suit the needs of seats that can transform into a flat surface while still providing privacy to the traveler as well as allowing the airline to transport as many people as possible. These new planes require designers, mechanics, and office workers to get the aircraft out the door and into the marketplace. The rift between the business-side of Boeing and those that put the aircraft together, this is simply impossible. The most recent protest over the contract for the 777X is just another example in a long history of this issue. While Boeing still has remained on top with the Machinist union agreeing to the terms this time, who knows what the future has in store. Our recommendation for management is to change the culture of the business towards teamwork among the business and engineering sectors. In order to do this, we chose the “Blue Ocean Strategy” as described by W. Chan Kim and Renee Mauborgne (How to Change Your Organization’s Culture). First, Boeing must persuade everyone in the company why this has to change. Second is shifting Boeing’s resources to cause this change. Next will be to motivate the employees to change. Finally, Boeing must change institutional politics.

It is very apparent why Boeing must undergo the change. From the formation of the local Machinist union in 1935 through the most recent debacle over the production of the Boeing 777X, war has waged between divisions of Boeing. The real trick will be shifting the opinions of the employees from a polarized view of the sections as good or evil, to seeing each other as peers and equals. A memo will be sent out regarding new work spaces and new groups projects that will allow the mechanical side of Boeing and the business side to interact. The reasons for forming these groups will be fully disclosed,

making management's decision to change the way the engineers and business people work together fully transparent. No matter how the market is doing, Boeing still has vast amounts of resources and should have more once the labor issues have been sorted out. Their free cash flows from 2013 alone was \$5,805,000,000. Even just diverting money for other projects and making those more collaborative would significantly help to fund this effort. The group projects with collaboration on both sides should be in full swing a month after the memo. Ice-breaking activities and just pure collaboration will help each side view each other as co-workers and not generalized as the engineering sector or the business sector. By now the political atmosphere will have shifted due to the teamwork and collaborative effort of the employees. This will inspire contract terms to be fought less and agreed upon more. We expect that after a year of implementing this process, the results of the cultural shift should be analyzed.

Outsourcing

As the global economy becomes more connected, outsourcing has provided companies with an opportunity for significant cost savings. They are able to send the manufacturing processing overseas to areas where the parts and labor are less expensive. In the past, companies would only send the menial, easy-to-do manufacturing overseas. However, as foreign labor forces became more educated and skilled, companies began sending increasingly difficult tasks abroad. On the recent 787 project, Boeing took outsourcing to nearly unprecedented levels, by some estimates Boeing itself produced less than 40% of the plane (Peterson). Not only did Boeing outsource the manufacturing of some of the most complex parts, but they also allowed their partners to design the parts.

The nearly unprecedented levels of outsourcing have led to several major issues. The production of the 787 showed the consequences of excessive, poorly managed outsourcing. Even the smallest supply disruption led to major delays in production. The delivery date for the first 787 was delayed

several times because of problems in their supply chain. The second, more serious issue associated with the increased outsourcing is the loss of knowledge associated with outsourcing the design processes (Denning). If they continue to outsource the design and advanced manufacturing processes, they will shift their competitive advantage in the production to their suppliers. If that happens, it becomes extremely difficult to keep these suppliers from selling their products and innovations to competitors .

Instead of outsourcing all of the processes, Boeing needs to bring back the manufacturing of the key components back to their facilities to be designed and produced by their engineers. This will ensure that they can keep their competitive edge (Denning). This change will have to start from the top down. Top managers will have to make a commitment to revamp the supply chain and bring back the advanced manufacturing in-house.

Not all parts must be produced in-house as some outsourcing is still appropriate, but tighter controls must be put on the supply chain to ensure that production delays like those on the 787 do not happen again. Additionally, for the parts that Boeing continues to produce overseas, they should take a more holistic, total cost view of the project. Too much of the 787's planning was based around short-term profits, and failed to see take into account the risks and costs that might arise during the decade long production of their aircraft (Herrman).

Talent Management

Boeing is facing challenges today due to their unique talent management practices. Specifically, Boeing's large baby boomer demographic is now retiring, which creates two main challenges for the company: backfilling these positions and capturing Intellectual Property held by outgoing employees. Baby boomers have a monopoly on management positions and this dominance has stunted the development of younger leaders. In 2006 the Boeing Company published a statement saying:

The demographic composition of the work force at Boeing, like other technology companies, reflects the aging of the baby-boom generation (those born between 1945 and 1964). The average age of Boeing employees is 46. About two-thirds of Boeing employees are eligible to retire in 10 years. If these employees choose to retire, or even delay their retirement until the average age of 60, the company can expect up to 8,000 employees to retire each year over the next 10 years. (Davis)

Considering the timing of this article, Boeing has a real crisis on its hands as it is facing the height of the transition. These remaining baby boomers represent are Boeing's top talent: they have refined technical skill and a deep understanding of the market. Their departure creates a real challenge, as Boeing must quickly pull younger, and likely, underdeveloped employees up to backfill emerging vacancies. To address this issue Boeing must change the way it approaches hiring, making it a sustainable practice. Boeing needs to closely monitor and balance the age demographics of their employees and target potential new hires accordingly. Additionally, in the interim, the company needs to devote extra time and money into fast-track management development programs to quickly but adequately prepare replacements for retirees.

In addition to backfilling these vacancies, Boeing must concern itself with the potential loss in Intellectual Property. Here is a brief definition of IP given by Boeing: "Examples of Boeing intellectual property include proprietary information, such as pricing information, business plans and engineering data; invention disclosures and patents; copyrighted material; and trademarks. Understandably, intellectual property is referred to as the "company gold" because of its strong market value" (Glickert). IP at Boeing takes on various forms, this "company gold" is not always easily identified making it hard to protect. Boeing must assume that these soon to be retirees who have been with the company 10, 20,

30, even 40+ years, have accumulated a huge amount of IP. So much so, they may not even be aware of it. The company needs to institute measures and processes to help outgoing employees identify and record IP before it is lost. To mitigate these issues, Boeing's IPM (Intellectual Property Management) team needs to specifically target outgoing employees with education programs to help them identify IP and processes to easily document it before their departure.

Risk Analysis of Management Issues

The Rift

Telling employees that they now must work in new teams most likely not be embraced by either group. However, if upper management supports the idea and is genuinely behind it, employees buy in will follow in due time. The process will be a struggle, but the employees must know that a paradigm shift must be accomplished in order to save their company. Additionally, Boeing may be hesitant to divert the funds necessary for this implementation. Thus, it is absolutely imperative that leadership is united behind this effort. Their involvement is key to getting each division on board and foster mutual collaborating and buy-in throughout all levels of Boeing's workforce.

Outsourcing

Appropriately managed outsourcing has been shown to be extremely cost effective. By bringing back some of the outsourcing Boeing will risk incurring higher prices to create the same product (Hart-Smith). However, they will gain better control over the quality will make this worth it.

Outsourcing reduces the capital outlay necessary to start a product. Instead of the mother company building large production facilities, outsourcing allows it to pass on those capital expenditures to suppliers. Bringing the production processes in-house will force Boeing to make substantial investments, which can magnify the company's losses if the projects fall through.

Talent Management

As discussed earlier, it is recommended that Boeing meets the challenge of retiring baby boomers with two solutions: highly targeted hiring practices as well as management preparation programs, and implementing new processes for identifying and capturing IP. Both solutions involve designing and deploying new programs as well as policy. Such processes will be expensive as they require a substantial amount of initial research, manpower, and experimentation. Moreover, there will likely be pushback from employees when they are asked to change. To do overcome this, Boeing must candidly educate its workforce about the problems at hand and convey that the proposed solutions are the best options available. Although these risks exist, they are outweighed by long term positive byproducts of creating a sustainable culture surrounding these serious issues of talent management.

Conclusion

Any time a business sets out to change company culture, it will experience growing pains. Yet these pains are a necessary means to an end. Change is the precursor to success; without adaptation, innovation becomes impossible. 390 Consulting Group wholeheartedly believes that the risks involved with implementing these changes are far fewer than what Boeing stands to gain from these recommendations and should be used as a springboard into a new future.

Annotated Biography

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Business For 737s; Airbus Cinches Deals With Air France-KLM And SriLankan Airlines."

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This article discusses the results of the 2013 Paris Air show. Boeing dominated the awards this year, which was huge in winning sales over Airbus. Boeing's biggest sales came from AeroFrance and Ryanair.

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Frontiers Online. The Boeing Company, June 2006. Web. 03 Mar. 2014.

This article is written under the lens of Boeing's fast approaching 100th year anniversary (2016). It highlights challenges like competing for talent, The Future of Work Project, changes to the office environment and next steps. The text includes quite a few images to help readers visualize offices in the factory, hoteling spaces for virtual workers, and innovations to allow for virtual meetings and flexibility. Our group found the talent management information and information about future technology especially helpful.

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Murray, Alan. "How to Change Your Organization's Culture." *The Wall Street Journal* [New York City] 7 Apr. 2009: n. pag. Print.

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This article talked about some of the innovations that Boeing was attempting to create with the 787. It also talked about the problems with that aircraft that resulted from the new, untested technology and innovations.

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This was one of the primary sources that drove us to explore the issue of over-outsourcing. It brought up the issue that, although the outsourcing saved Boeing money in the short-run, it damaged their long term profits from the project. It also gave us the inspiration to look into how the McDonnell Douglas acquisition affected the corporate culture within the company.

Zillman, Claire. "America's Defense Industry Is Going Gray." *Fortune Management Career Blog RSS*. Fortune, 12 Nov. 2013. Web. 05 Mar. 2014.

This article talked about Boeing's struggle at recruiting top engineering talent coming out of college. It talks about the aging of Boeing's workforce and their difficulty replacing them with younger talent.

Peterson, Kyle. "Special Report: A Wing and a Prayer: Outsourcing at Boeing." *Reuters*.

Thomson Reuters, 20 Jan. 2011. Web. 05 Mar. 2014.

This source detailed some of the issues that faced Boeing's supply chain during the 787's production. It also detailed how the merger with McDonnell Miller changed the view of management to increase the amount of outsourcing on their next wave of planes.

Denning, Stephen. "Boeing's offshoring woes: seven lessons every CEO must learn." *Strategy & Leadership*. 2013: page 29-35. Print. This article addressed many major issues that Boeing is facing. It served as a start for many of the issues we addressed in this paper, specifically with a focus on the true

costs of outsourcing.

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Web. 06 Mar. 2014. This article talked about how much money Boeing was forced to spend trying to correct the errors in their supply chain caused by the outsourcing to many critical components. It also explained which types of products can be outsourced cost-effectively.

Hart-Smith, L.J. "Out-Sourced Profits - The Cornerstone of Successful Subcontracting." Boeing Third Annual Technical Excellence Symposium. 14-15 Feb 2001, St. Louis, MO. Print. This paper from 2001, highlighted the potential issues that outsourcing could lead to. It explains that outsourcing not only transfers the risks, but also the profits associated with large projects. In hindsight, the paper should have served as a warning to Boeing's executives that this could be a problem.

Appendices