

## Teaching Note: Leadership implications in complex projects: The Boeing Dreamliner and Jim McNerney

### Abstract:

Jim McNerney, CEO of Boeing Corporation from 2005-2015, was responsible for the implementation of the Dreamliner 787. The aircraft had been plagued with delays and problems, including being grounded by the FAA not long after it was finally delivered. Some have blamed McNerney for his management style and the organizational paradigm developed for the 787 production, including build-to-performance, extensive outsourcing, and subsystem preassemblies. Students are challenged to determine the impact of this organizational paradigm and management of human resources on successful and timely implementation of the Dreamliner project.

### Knowledge Modules:

- Plan, distribute and manage project communication
- Project team building and motivating
- Project organization and context

### Key Words:

- Leadership, risk tolerance, organizational structure trust, motivation, communication, radical and incremental innovation

### Learning Objectives:

1. Design a communication-management plan that defines the participants, communication processes, tools, and methods required for appropriate project communication.
2. Analyze sources of conflict and apply a problem solving process
3. Based on the inherited linkage between the organization and the project, assess and recommend approaches to roles and responsibilities.

### Research Methods:

This teaching case is based on a research article published in *Project Management Journal*, Vol 47, No 2: 62-78 (Shenhar, Holtzmann, Melamed, & Zhao: The challenge of innovation in highly complex projects: What can we learn from Boeing's Dreamliner experience?), coupled with analysis of multiple published interviews with Jim McNerney and articles about the organizational challenges faced by Boeing during the Dreamliner development, rollout, grounding, and subsequent success.

### Usage Information:

The case is suitable for use with upper level undergraduates and early in the graduate level program when studying organizational behavior, leadership, and organization development. Students should be familiar with distributed group processes, leadership styles, and basic communication processes before attempting this case. Depending on the text you are using, those topics will probably have been covered by the middle of the term. An excellent article that covers this material in the aerospace industry is:

Sisti, Frank J.; Latimer IV, DeWitt T. *Journal of Integrated Design & Process Science*. Jun2007, Vol. 11 Issue 2, p73-89. I strongly recommend this article be assigned to students along with this case.

#### Discussion Questions

1. Using transactional/transformational theories, how would you describe McNerney's leadership style? What was the impact of his style on the production of the Dreamliner 787? (LO #2, #3)
2. What processes would you put into place to improve communication within the international supply chain? (LO #1)
3. What are the challenges of establishing a team of 700 different suppliers? Boeing addressed this by creating Tier-1 suppliers for 11 subassemblies. How would you create a team from these Tier-1 groups? (LO #2, 3)
4. What challenges does the build-for-performance make for Tier-1 suppliers? (LO #2, #3)

#### Pedagogy:

An exercise that will drive home the basic messages of communication and team building in distributed organizations involved in a complex project is the following multi-part role play. The role play requires students to do some outside research prior to class. This exercise is suitable for a 2 ½ - 3 hour class or can easily be divided into two class periods, with steps 1-4 in the first class, and 5-6 in the second class. Equipment required: Lego bricks or other construction materials.

1. **(before class)** Assign students or teams of students (depending on the size of the class) to research the Tier-1 suppliers (see Figure 1 in the case), one team for each supplier. Their goal is to learn enough about the company processes to be able to take on the role of the project manager of that specific group. One group should be assigned to the South Carolina assembly location. A simple search using terms such as Alenia Italy Dreamliner will return many entries and should take under 30 minutes to learn enough about the company and challenges of the project to do this exercise.
2. **(20 classroom minutes)** Hold a "team meeting" with one project manager from each Tier-1 supplier to work out general plans for ongoing communication, scheduling, and any other processes you want to emphasize. Bear in mind that the groups should be functioning within the build-for-performance model described in the case.
3. **(15 minutes)** The Tier-1 group of project managers should produce a document outlining the above decisions.
4. **(20 minutes)** Separating into their respective groups, using the simple diagram in Figure 1 and Lego bricks (one color for each element), the subassembly teams should "build" each component, per their Tier-1 assignment, led by the PM. At the end of this time period, all subassemblies should be delivered to the South Carolina Boeing assembly location.
5. **(15 – 30 minutes)** The South Carolina assemblers should put together the elements as delivered by the subassembly groups. Identify any problems in assembly and, using the communication/interaction document from step 3, meet with the specific subassembly group to rectify the problem.
6. **(15 – 30 minutes)** Debrief the group, eliciting from them the problems, challenges, ways they met them, things they "should have" planned for, alternate methods they "could have" put into place. This debrief can extend for a significant period of time and can be used creatively by the

instructor to develop a more general set of operational parameters that would be applicable to other projects.

#### DQ Answers

1. Using transactional/transformational theories, how would you describe McNerney's leadership style? What was the impact of his style on the production of the Dreamliner 787? (LO #2, #3)

Jim McNerney exhibited a transactional leadership style. There is no indication that he attempted to develop his personnel; in fact, he shifted project managers regularly. As a result, there were additional challenges added to those already existing in the Dreamliner production—an ongoing change in project leadership is likely to disrupt already tenuous relationships in the complex organizational build-to-performance model and subassembly process. There is evidence that McNerney used the same strategies he would have used in organizations manufacturing different, less complex products. These strategies may have been successful in simpler models, but they created extra challenges in terms of communication and final assembly in the 787 production.

2. What processes would you put into place to improve communication within the international supply chain? (LO #1)

Improved communication will result in a greater likelihood of project success. When the suppliers are far flung globally, even greater attention should be paid to communication processes. A few general rules to successful communication include a regular focus on meetings/interactions between and among suppliers to address both precedented and unprecedented systems and their mutual integration. A typical first step in designing a communication system is to prioritize stakeholders and suppliers. In this situation, all of the suppliers hold equivalent prioritization as all subassemblies had to be delivered to the same final location. Because the suppliers were responsible for the entire process from R&D through delivery, they were likely to work independently, especially as they would retain ownership of their own research. The challenge of encouraging the kind of information sharing that would facilitate timely development was due, in part, to the competitive rather than collaborative nature of this organizational paradigm. Boeing should ensure that communication lines were opened between subassemblers and should serve as hub of this communication network. Boeing should encourage partnerships between subassemblers to improve design architecture and timely delivery.

3. What are the challenges of establishing a team of 700 different suppliers? Boeing addressed this by creating Tier-1 suppliers for 11 subassemblies. How would you create a team from these Tier-1 groups? (LO #2, 3)

The assembly of the 787 Dreamliner can be described as a System of Systems—a complex set of elements that must work together to be successful. The large group of systems that had to be integrated into this aircraft demanded an unusually concentrated focus on teamwork among the subassemblers. The challenge is to encourage or support collaboration while recognizing the competitive nature of the subassemblers. I would create a Tier-1 Council comprised of the project managers of each of the Tier-1 subassemblers. This council would provide a venue for resolution of design questions and manufacturing issues that might affect more than one subassembler. I recommend that this council be a separate organization, unassociated with Boeing, in order to allow for free and open discussion among the participants. Boeing should be invited to participate at specific times to address major issues that

affect multiple subassemblies. Subassemblers should be encouraged to interact directly with Boeing as needed, but should share what they learn during these communications with the council.

4. What challenges does the build-for-performance model make for Tier-1 suppliers? (LO #2, #3)

The build-for-performance model requires that independent suppliers provide the R&D costs up front, but have to wait for their share of revenue from future product sales. Suppliers normally do wait for payment until after completion and delivery of product; however, they are not typically tasked with the full development of project elements without printed specifications. The lack of general specifications meant that each of the many Tier-1 suppliers was responsible for confirming with others in the supply chain that their elements would be designed at the same performance level and would easily work together when received by the assembly factory in South Carolina. This resulted in considerable rework and delay, the costs of which had to be assumed by the suppliers.

Epilogue:

As of 2016, industry experts anticipate that the Dreamliner 787 will show a profit during 2016. Thus far, cumulative losses are estimated at \$33 billion. Based on its “accounting block” system of estimating profits, Boeing expects to recoup the losses upon the sale of the remaining 787s in the accounting block of 1300 planes. If they expand the accounting block further, additional profitability will accrue. (<http://www.fool.com/investing/general/2016/01/06/boeings-dreamliner-could-be-a-lot-more-profitable.aspx> Retrieved May 31, 2016).

According to Richard Aboulafia, “Under McNerney, Boeing’s stock price did very well. Cash flow was generally strong, and investors like short-term metrics like these. But he also leaves behind a toxic legacy that future leadership will need to deal with... McNerney’s focus on the company’s stock price and cash flow at the expense of the long term wasn’t merely due to short-sightedness and greed. It was also likely due to a misunderstanding of how the aviation industry works. If a CEO comes from a different industry and doesn’t try to learn what makes aviation distinct, he’s likely to apply a one-size-fits-all template... Yet aviation is not like other industries. There are certainly cost pressures, but this is a capital-intensive business with very high barriers to entry. Labor costs just don’t matter as much compared with other industries, and most producers and major subcontractors are domiciled in high cost countries... An experienced and motivated workforce, therefore, is the most important asset a company has. McNerney failed to recognize this important fact, and the company has suffered as a result.” (<http://www.forbes.com/sites/richardaboulafia/2015/06/24/boeing-mcnerney-and-the-high-price-of-treating-aircraft-like-it-was-any-other-industry/#69d3b3f67a90> Retrieved May 31, 2016).