Does your airline still cross seat belts?
A ten-point lean checklist for leaders

Wasteful processes abound at many supposedly lean airlines. How does yours measure up?

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The airline industry has begun to embrace lean operations in recent years, for good reason. Airlines are process, labor, and capital intensive: small reductions in waste—the eternal enemy of lean—go straight to the bottom line, improve the customer experience, and engage employees in a more productive "value added" workplace.

An airline that fully adopts lean techniques can cut its costs significantly while enhancing the experience of employees and customers by sharpening on-time performance, reducing wait times for guests, increasing the working availability of aircraft and ground assets, and helping employees to make the most productive use of their valuable time.[1] Many airlines have internalized the message: posters encouraging employees to follow lean principles are now common in terminal baggage piers, maintenance facilities, and crew lounges. These companies use lean tools to reduce the time needed to turn aircraft around at gates, to compress maintenance activities, and even to train pilots. But businesses that have truly embraced lean see it as more than a matter of posters, one-off productivity fixes, and cost cutting: it is a mind-set, a culture, that systematically seeks and eliminates sources of waste, variability, and inflexibility in operations.

In the lexicon of lean, "waste" (or *muda*, Japanese for futility) is anything that doesn't add value—as your end customers would define it. To put things simply, waste is work that doesn't benefit them. Genuinely lean organizations press hard to refine their processes by removing waste and making what remains of it transparent, thus launching the next cycle of innovation and improvement. Executives with experience in true lean transformations know that direct, personal observation can show whether organizations are really lean. If a quick walk through a facility reveals several sources of obvious waste in long-standing processes, your airline has more work to do.

To make things easy, here is a straightforward ten-point list of highly visible—and common—signal flags of airline waste. Individually, all of them are minor in the grand scheme of airline operations. Yet if you see many of these issues at your airline, and no one has at least tried to address them, we'd argue that you still have work to do.

1. Do gate agents still routinely walk down the jet bridge to confirm that aircraft are ready to board? Like an assembly line, lean airline operations require predictability and reliability at every step. The approval-based process that many airlines use to begin boarding embeds several sources of waste. First, it almost guarantees a gap between the time when aircraft are ready to board and when boarding begins. At best, the flight attendants tell the gate agent that "we're just now ready." In this case, the gate agent walks back to the podium, makes announcements, answers a question or two, and the first passenger boards three to four minutes later.

Second, the process encourages variability. If flight attendants or cleaners get to say, "We're ready when we're ready," you are allowing them to determine the cycle time of the process. In a truly lean airline, boarding begins at departure minus a fixed number of minutes, unless someone says otherwise. If the passengers must wait for a minute or two at the entrance to aircraft while the caterers finish their loading, so be it—that is the better error to make. Some airlines have adopted this practice.

2. Does your airline still use the "box" to size carry-on bags? Let's be clear: excessively large carry-on bags are a problem. But lean systems abhor process steps that aren't followed 100 percent of the time. The classic carry-on-sizing box is difficult to use and, more important, prone to false positives—identifying bags as too large even if they don't pose a problem on board. The box is largely irrelevant because it is the length, not the width or height, of luggage that creates issues. Carry-on bags that fit

wheels first into the overhead bin maximize the use of space but sometimes stick out of the box. That's why airline employees often ignore it and use their own judgment, which, unfortunately, is variable. Some travelers with excessively large bags therefore manage to board planes without being challenged. Others, whose bags stick out of the box though they fit in the overhead bin, are asked to check their bags at the gate.

A better, leaner solution? A line, marked on the boarding-queue poles, that indicates a carry-on's acceptable length (or rather height, since bags stand on their wheels). This is easy to scan visually, is unambiguous, and returns no false positives.

3. Do your check-in agents place "approved" tags on carry-ons? Many airlines have check-in agents vet carry-on bags and place "carry-on approved" tags on them. This is a classic case of overproduction: a process that adds no value and that no customer would pay for. Lean gurus would cringe at the thought. Why? First, applying the tag takes time—perhaps only 15 to 30 seconds per check-in, but that is material at a large airport. Second, the system is leaky: controlling bags at this point ignores the increasing percentage of people who check in online. Since many or even most passengers never have their bags vetted, airlines rarely police the system. The lean way is to address the fundamental issue (bag length) and to control it at the point of universal access (boarding).

4. Has your organization seriously considered eliminating check-in? Several lean tools can improve the speed and reduce the variability of check-in. Nonetheless, it is the poster child for a process that adds no value for customers. If anything, it detracts value—who wants to stand in line instead of relax in the lounge or shop? Besides, the process costs airlines money. For people who do check in bags, dropping them off can be completed as a separate, lean process.

Some low-cost carriers, and a few legacy ones in their domestic markets, have eliminated check-in altogether. Airlines created it to transfer the predicted passenger manifest (reservation list), one passenger at a time, to the actual flight manifest. Some carriers have developed processes that go in the other direction: they assume that the predicted manifest is correct and perform a brief delete/add procedure (such as deleting no-shows and adding go-shows) a few minutes before departure. Since that is often necessary in any case, why, in a world of largely nonrefundable fares, do airlines perform check-in at all?

5. Do your cleaning crews still cross—or, worse, buckle—seat belts? Cabins where all the belts are lined up across the seats have a look of uniform neatness, but the price is high: at perhaps two seconds a belt, an airline with 100 aircraft can expect to spend quite a lot of money on this routine. Only the first few people boarding aircraft observe the neatness your product team admires, and even then only if they are really tall. The rest of the passengers see the heads of the people who have boarded before them. The direct cost is not the only problem: passengers must undo the seat belt to sit down, which may add time to the boarding process. If you must fiddle with the seat belts, lay them out unbuckled and parallel to the armrests—ideally, because you did the math and proved that this approach speeds up boarding time.

6. Do you use the same aircraft-turnaround process for on-time and delayed flights? Lean strives for "standard work": invariably performing tasks the same way. But it also recognizes the value of flexibility: producing multiple product types and responding to customer needs. Your airline's standard turnaround process probably includes the full cleaning of aircraft, the onboarding of catering supplies, and preboarding for elite passengers. But in the event of delays, what would passengers say if you asked them whether they preferred to wait an

extra ten minutes for a perfectly clean plane or to leave earlier on a plane with a few crumbs on the floor? The leanest airlines have two standards—a normal turnaround, as well as a "power" turn eliminating key bottlenecks to gain time when inbound aircraft arrive late.

7. Is the gate the only place at the airport where aircraft can be cleaned, catered, and serviced? In the lingo of manufacturing, an aircraft turnaround is a "changeover process"—you are converting inbound aircraft (or aircraft in maintenance) into outbound aircraft. There is a well-established tool kit for speeding up changeovers, from massive industrial tooling to race-car pit crews. One of lean's key levers is "externalization": controlling downtime for a valuable asset by completing as many tasks as possible outside the changeover process. For airlines, this valuable asset is often the plane but, increasingly, it is also the gate. Terminals in major airports across the world are overwhelmed, so aircraft are often towed away to remote pads between arrival and departure, particularly when the commercial schedule requires a longer ground stop.

Yet many airlines service aircraft only at the gate for departure. They resist "preservicing" because they worry about aircraft swaps. Lean airlines, however, break the process into pieces: performing general tasks (such as grooming the cabin and servicing the fresh- and wastewater tanks) at the remote stand and flight-specific tasks (such as loading catering supplies) at the gate. Keen readers might argue that this approach could double service-crew visits per aircraft, introducing a new source of waste. That may be true, but you don't really know until you do the analysis, run trials, and consider creative ways to limit the downside.

8. Do your flight attendants still count passengers? Rework is a classic form of waste, though in rare cases it may be desirable (pilots, for instance, often repeat safety instructions). But most of the time, rework isn't necessary. At many airlines, to give one example, flight attendants count passengers as a cross-check for the departure-control system—a task that frequently adds a few minutes to turnaround times. First, in a world of 80 percent-plus load factors, it is amazing how many airlines count passengers rather than empty seats. If you must count, count the rare thing, not the common one. Second, look at the data. We find that in the vast majority of cases, when the flight attendant's count differs from the count of the departure-control system, the flight attendant is wrong. Getting past a gate agent in a single-file queue without having your boarding pass scanned is a magician's trick.

9. Has the percentage of nonroutine maintenance items at your airline remained the same over the past few years? Lean systems aim to eliminate surprises and to reduce the inherent variability of processes. But some instances of seeming variability are actually patterns that haven't been investigated. A standard airline A-check, for example, may include time for supposedly nonroutine maintenance tasks. Yet when one airline reviewed the data-maintenance tasks on A320 checks, it found that 60 percent of those tasks turned out to be quite predictable and therefore essentially routine. The rise of advanced analytics and artificial intelligence has increased the ability to detect patterns and make such predictions.

Although unexpected events (say, a catering truck striking an airframe) clearly do occur at airports, lean airlines constantly push to understand probability and standardize their responses to it. Suppose the data suggest that when mechanics complete task cards directing them to "inspect gasket for gap-seal tolerances," they find that the gasket is out of tolerance limits more than half of the time. The instructions on the task card should be changed to "inspect and replace gasket unless

the gap seal is within tolerances." The improved procedure would ensure that mechanics had the proper parts, tools, and paperwork from the start. That would eliminate the need to track down the necessary kit (which might take several hours) to deal with the so-called surprise.

10. Does your sourcing and supply-chain organization insist on making lean improvements a part of every contract? Another key theme of lean is continuous improvement. Such efforts should focus not only on internal operations but also on external ones. Many airlines try to resolve service, quality, or cost gaps by putting pressure on their suppliers' profit margins. Truly lean airlines look for tangible moves to identify and remove real waste across the end-to-end process. Simply squeezing your suppliers will never lead to sustained, year-over-year cost reductions. Eliminating waste in the overall process—including waste on the suppliers' side—can do precisely that. This is the golden core of the "end-to-end cleansheet" cost analyses that the sector's best companies, including major aerospace OEMs, are now ramping up.

Our list is far from comprehensive, and we acknowledge that some of these issues, in isolation, may not have a material impact on either your bottom line or your customers' views about your airline. But they are highly visible to your employees and managers. If such sources of waste have persisted without being questioned, your airline probably has hundreds—even thousands—of additional waste issues throughout its processes.

We also acknowledge that local rules may inadvertently create some sources of waste. Many civil-aviation authorities, for example, formerly prevented simultaneous boarding and fueling; now, most allow it. Often, the underlying technology and our understanding of risk profiles have advanced, so an airline should never take waste-generating regulations for granted. Unless you run a persistent, senior-level campaign to challenge them, you are not doing everything you can to promote lean.

Finally, in this article, we mostly propose simple, current-world solutions to resolve current-world sources of waste. The advent of big data, advanced analytics, and increased computing power opens up a whole new world of opportunity to eliminate even more variability from day-to-day operations. These new "eyes" allow us to see ever deeper into operational gaps and to find the evergreen sources of opportunity. ■

[1] Stephen J. Doig, Adam Howard, and Ronald C. Ritter, "The hidden value in airline operations," *McKinsey Quarterly*, November 2003, McKinsey.com.

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