

MAINTAINING ALTITUDE

OPEN SOURCE APPROACH TO AFTERMARKET COULD KEEP
ENGINE MANUFACTURERS AT THE CONTROLS

AUTHORS

Geoff Murray, Partner

Tim Cleary, Principal

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The Global Aerospace Summit is an invitation-only event for C-level executives, senior decision-makers, and government officials involved with the aerospace, aviation, defense, and space industries.

The 2014 summit brought together more than 1,250 world industry leaders in Abu Dhabi's St. Regis Hotel, Saadiyat Island, to discuss the future of these sectors. At the April summit, 62 percent of attendees were C-level executives, vice presidents, or directors. They came from 52 countries and represented 468 companies.

ENGINE MANUFACTURERS SOAR IN THE AFTERMARKET, BUT CAN IT LAST?

Aircraft engine manufacturers have developed an aftermarket business model so successful that some companies have captured as much as a 90 percent share of the work on their products.

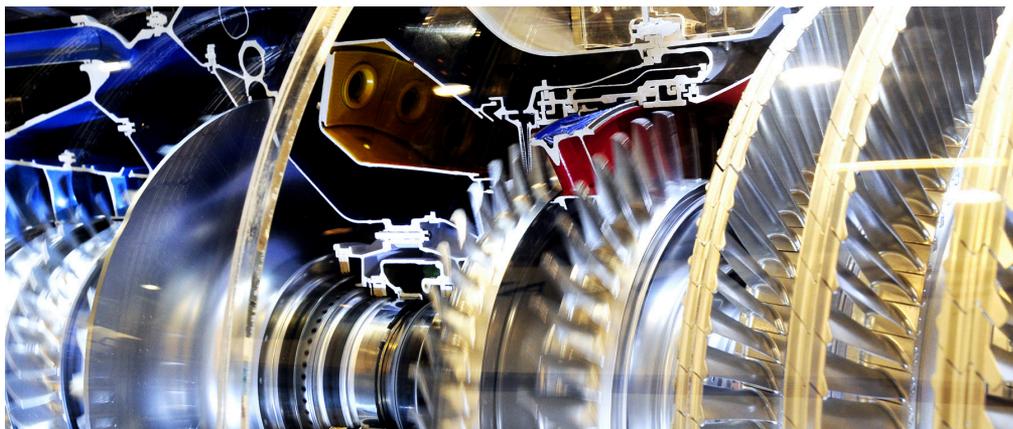
The question now is: How long can this trend endure? As the largest aircraft engine manufacturers capture more of the aftermarket share, aircraft operators continue to search for more cost-cutting options. If airline customers vote with their order books, manufacturers may have to consider a more open-source approach to the aftermarket. If engine manufacturers don't give customers what they want, OEMs could be vulnerable in the long run to disruptive change.

Many companies that long dominated other industries offer cautionary tales for the engine OEMs. Big-box chains like Wal-Mart have long ruled retail but now must grapple with Amazon and other online retailers. Local newspapers, once thick with classifieds and local ads, struggle to compete with Craigslist. Cable television companies are losing some of their once-captive audience to Internet streaming services.

Three potential disrupters loom on the horizon for engine manufacturers. First, airlines have already become more sophisticated about considering the total cost of ownership when purchasing engines, and this could lead to greater customer demands. Second, additive manufacturing could change the way engines or parts are made, sold, and even priced. Finally, as the aviation industry develops new fuels and solar aircraft, these technologies could allow a new engine manufacturer to gain a foothold in the market. The latter two trends aren't likely to shake the industry soon, but one or more could challenge the OEMs' position in the next decade or two.

The story of engine manufacturers' increasing presence in the aftermarket industry is well-known. OEMs moved to a position of strength through two primary means: setting parameters on airline customers' access to materials and repair processes and securing long-term service contracts by offering airline customers predictable maintenance costs at the point of engine purchase. These methods have allowed OEMs to lock in market share for years to come. Oliver Wyman has tracked the growth of these services during the past five years as part of the annual MRO Survey. In the 2014 MRO Survey, 69 percent of airline respondents said they expect to place engine maintenance with OEMs in the future.

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AIRLINES FOCUS ON TOTAL COST OF OWNERSHIP

While OEMs have pushed maintenance contract negotiations further upstream, airlines have become extremely sophisticated in their understanding of the total cost of ownership for engines. Now airlines are collecting their own cost and operational data and developing nuanced perspectives. Airlines are recruiting employees who can conduct this analysis and are including maintenance professionals on fleet strategy and acquisition teams. As the influence of this maintenance perspective increases, airlines will likely demand more control over maintenance costs and could begin favoring engine platforms that offer greater aftermarket flexibility or at least a broader set of parts, repair, and overhaul options.

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One result of such scrutiny of maintenance costs has been airlines' consideration of parts manufacturer authority solutions. PMAs, as well as non-licensed and surplus parts, are now common for some aircraft parts and components. While the PMA industry is growing overall, it is mostly confined to low-value parts that involve less intellectual property. The development of PMAs didn't force a change in the balance of power in the aftermarket, but it's an example of a small way that airlines and other industry players have tried to pick away at OEM dominance.

It is also true that airlines continue to demand the services that independent maintenance, repair, and overhaul companies provide, as healthy third-party MROs create more choices in the aftermarket. According to the 2014 MRO Survey, the top strategies among airlines to cut engine or component maintenance costs are reducing inventory levels, creating serviceable materials programs, and developing alternate repairs. Of the airline respondents, 84 percent said their serviceable materials strategy is active or comprehensive, up from 71 percent the year before.

After surviving the turbulence of recent years, some independent MROs could become the partners that airlines need. The MRO industry has undergone some consolidation. Those that remain have become more efficient since driving out significant costs and expanding their services and product offerings.



ADDITIVE MANUFACTURING IMPACTS THE INDUSTRY

Further in the future, additive manufacturing could become the Netflix of the airline engine industry. Most MRO Survey respondents agreed that 3-D printing could lower costs and inventory investment in the next few years. Engine manufacturers could try to block 3-D printing and might be successful for a time. Or they could embrace the technology and delight customers by offering a new choice. This would thwart would-be upstart competitors and turn a potentially threatening technology into a competitive advantage. Many engine OEMs have already made significant investments in 3-D printing for manufacturing, and the aftermarket is just a short distance away.

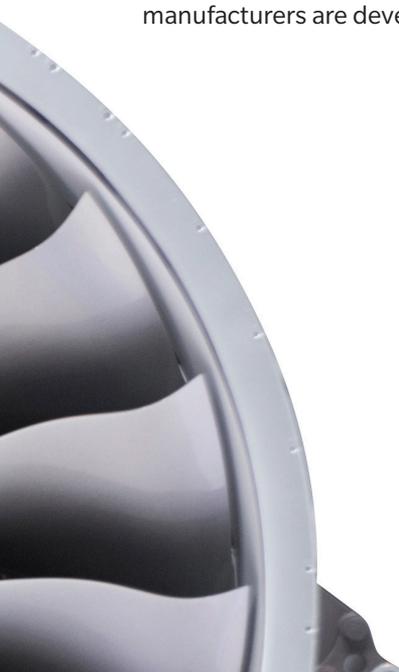
GE is an example of a company embracing additive manufacturing, publicly describing its work in the area. The company published a photo on its website of a model GEnx jet engine produced using an advanced 3-D printing technique called direct metal laser melting. GE also hosts a 3-D printing design challenge that has generated ideas about engine parts.

NEW TECHNOLOGIES COULD SPARK VISIONARY COMPETITORS

A third potential disrupter of the airline engine industry — this one even more remote — could be an upstart engine manufacturer. As the aviation industry develops new types of fuel, from biofuels to solar, new engine technologies could give birth to a visionary competitor. An Oliver Wyman analysis shows that several fuels could emerge as viable alternatives to petroleum-based jet fuel in the coming decades. Biofuels made from natural oils and animal fats could be economic in the short term; viable ethanol-based fuels could be developed in the medium term; in the long term, aircraft may be powered exclusively by electricity.

The barriers for these fuels are enormous. They require massive investment and commitment from companies throughout the aviation industry. Still, many airlines and manufacturers are motivated to develop alternative fuels, and if new fuels require new types of engines, this could be a point of entry for a technology company. Such a development would be years, if not decades, away. Further, incumbent engine manufacturers are developing their own technologies that could drive the trend.

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USE MRO PARTNERSHIPS TO MANAGE OPEN SOURCE ENVIRONMENT

Manufacturers could move to an open-source approach by developing broader, deeper collaborations with MROs.

Engine makers could mitigate potential negative repercussions of these trends with a more open-source approach to the aftermarket. Here's where MRO partnership could be useful for developing new technology. Manufacturers could move to an open-source approach by developing broader, deeper collaborations with MROs. Such partnerships could benefit the manufacturers in the long term while still allowing them to manage their installed product. Open-source partnerships could include the already deployed licensing model for repairs and could extend to development and certification of repairs by outside parties. Such repair certification could be isolated to a small set of the installed base, most appropriately the more mature engines, and could include the development of innovative parts, repairs, and services.

Consider the companies in other industries that have been threatened by disruptive change but have turned that change to their advantage. Cable companies have lost customers to online streaming services but have responded by upgrading technology and creating better products. As some utilities fret about losing market share to solar panels, others are offering services to people who want to install solar. Many big-box retailers are responding to Amazon by selling a wider selection of items online and using the channel to become more nimble, cutting store inventory, running quick sales, and marketing directly to customers with elaborate loyalty programs and email blasts.

In an open-source environment, MRO competitors can be collaborators and new technology can represent additional revenue. An open-source environment for aviation engines could offer airline customers greater choice on who performs maintenance work, with flexible programs that range from OEM-only service, to OEM-and-airline service, to outsourcing service to independent MROs, with licensing fees and royalties. Deeper partnerships with MROs could benefit the manufacturers in the long run by allowing them to offer greater choice and better engine care while still maintaining control of their installed product. Further, by adding flexibility to the aftermarket business plan now, OEMs could be better prepared for any technological upheaval the future brings.

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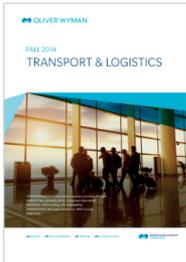
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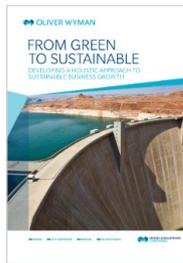
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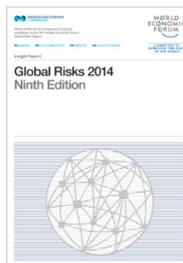
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For more information on this report, please contact:

GEOFF MURRAY

Partner

geoff.murray@oliverwyman.com

CHRIS SPAFFORD

Partner

christopher.spafford@oliverwyman.com

JEROME WEILL

Partner

jerome.weill@oliverwyman.com

MARCUS NEUDEL

Partner

marcus.neudel@oliverwyman.com

Elizabeth Souder edited this report

www.oliverwyman.com

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