

Selling time, function rather than a product may not always be sustainable

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Original equipment manufacturer businesses, such as jet engine makers, may think the servicizing leasing model is a more environmentally friendly business model, but they should also weigh whether outright sales aren't better for the bottom line before signing those contracts, according to Smeal College of Business researchers. Credit: John McArthur/Unsplash.

In the current business-to-business (B2B) landscape, servicing products—a leasing model that often includes remanufacturing—rather than selling them, marks a shift toward a new model of consumption that focuses on sustainability. However, a Penn State Smeal College of Business research team reports there may be significant trade-offs in this seemingly beneficial model that could negatively affect a company's bottom line.

Their research suggests that original equipment manufacturers (OEMs) using the servicing model for [market segments](#) that use the equipment less frequently, while selling outright to those with higher use rates. Finding those segments can be a win-win for both the OEM and their clients, according to the researchers. The findings are [published](#) in *Production and Operations Management*.

In the servicing business model, which resembles standard leasing arrangements, the enable customers to make payments for a product over a set period, as opposed to outright purchases. However, unlike standard leasing where the product is re-leased after minor cosmetic adjustments, after the customer returns the product in a servicing model, the OEM remanufactures the product in a costly process and then re-leases it, creating multiple use cycles for a single product.

One example of servicing is an airline that leases a jet engine from a manufacturer instead of purchasing it, with the manufacturer responsible for maintenance and potential upgrades over time.

Aligned with what many experts consider "the circular economy"—an economic system aimed at minimizing waste and maximizing the continual use of resources through reuse, remanufacture and recycling—servicizing initially appears sustainable and economically beneficial.

"One of the current buzzwords is the circular economy, but businesses hoping to align their practices with the [circular economy](#) might not fully understand the nuts and bolts of servicizing, which isn't a trivial set of decisions," said Saurabh Bansal, professor of [supply chain management](#). "I think that a lot of companies that rush into the space don't have adequate information about all the ramifications of servicizing. And, in the companies that I've worked with, they've had to redo their entire organization. This just isn't a little snap of the finger decision that you make; your entire company has to be refocused."

For companies that strategically incorporate it, servicizing seems to benefit both OEMs and their customers, according to Daniel Guide, Smeal Chaired Professor of Operations & Supply Chain Management.

"The benefits of remanufacturing are pretty well documented," Guide said. "You're going to save about 60% of the materials—and it only requires about 40% of the energy a new product requires. So, you have lower resources and lower energy going into it."

OEM customers also avoid the costs associated with hiring workers to maintain and upgrade the product, Guide said, and because remanufacturing products extend the lifespans of those products, there are environmental benefits as well.

"So, it seems like everybody wins with servicizing—it's easier to keep that equipment up and operating, there are cost savings, materials savings, energy savings; it has always struck me as a no brainer weapon for companies," Guide said. "However, the part that often gets lost is that servicizing can be very complex for companies to manage."

To better understand these complexities, Yinshi "Agnes" Gao, who earned her doctorate in supply chain in information sciences at Penn State while working on this study as a former doctoral student in [supply](#)

[chain](#) and [information sciences](#) at Penn State Smeal, led the researchers in analyzing data from Xerox's High Speed Imaging Group.

The team used a mathematical model to run several different scenarios and investigated the difference in profitability between servicing and sale-only modes for various customer classes. They examined scenarios where customers have the same rate of product usage and where they differ. The researchers also explored various strategies, including servicing to all customer segments or selectively servicing to some while selling to others.

Challenges arise when companies adopt the practice without thoroughly understanding their customers' usage patterns. For example, Guide said that while a higher usage rate of leased products may translate to increased revenue for OEMs, it also escalates remanufacturing costs. The study reveals a critical tipping point: if a [customer's](#) use rate exceeds a certain threshold, the cost of remanufacturing overshadows the lease revenue, making it more financially viable for the OEM to sell the product instead of servicing.

"Which segments are the best suited for servicing?" Bansal said. "We found that the low-use segments actually are really good for the following reason: Those segments are populated by smaller companies, which tend to have less money in terms of their working capital. What our results show is that these companies do not have the ability to buy expensive equipment, and they would find servicing to be more economical on an annual basis. Interestingly, these companies also are profitable customers for OEMs; their usage is low enough that OEMs make more money than the remanufacturing cost."

The researchers recommending that OEMs carefully consider their servicing and sales strategies, rather than relying on a single, all-or-nothing approach.

"Businesses should rely on a portfolio strategy where they lease as well as sell the equipment," Bansal said. "The paper also explains how a [company](#) can come up with reasonable contracts that will be attractive to only those customers who are going to use the product in a reasonable way. And by default, that contract will be unattractive for those customers who may overuse the product."

More information: Yinshi (Agnes) Gao et al, OEM-servicizing with a multiusecycle product: Model analysis and insights, *Production and Operations Management* (2023). [DOI: 10.1111/poms.14076](https://doi.org/10.1111/poms.14076)

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