

SERVITIZATION CASE STUDY

SERVICES RESILIENCE: ROLLS-ROYCE AEROSPACE



SERVICES ARE CRITICAL TO ROLLS-ROYCE'S RESILIENCE AND RECOVERY FROM THE IMPACT OF THE COVID-19 PANDEMIC

TOTALCARE SERVICES PROVIDED EFFICIENCY AND PREDICTABILITY OF COSTS FOR AIRLINE CUSTOMERS

SERVICES REVENUE HAS RECOVERED MORE QUICKLY THAN REVENUE FROM PRODUCTS

Rolls-Royce (owned by Rolls-Royce Holdings plc, a British multinational company) is a technology company established in 1904 that designs, manufactures and distributes mission-critical power systems for the civil aerospace, defence and energy industries.

In 2019 its underlying revenues totalled over £15million, it had 51,700 employees and a presence in 50 countries. The majority of its revenue (51%) came from its civil aerospace business which serves the large commercial aircraft, regional jet and business aviation markets with both products and services (1).

When it comes to servitization and advanced services, Rolls-Royce- and in particular the TotalCare offering of its civil aerospace business- is one of the leading examples. Since the 1980s, Rolls-Royce has used cutting-edge technical and digital capabilities, along with engineering expertise, to provide through-life support solutions. This has been held up as one of the most significant servitization success stories, with services generating over half of the revenue of the civil aerospace business year after year.(1)

THE SERVICES VALUE PROPOSITION

When it comes to aftermarket services, the main customer base is airline operators. There are three types of care available to these customers: TotalCare, SelectCare and Foundation Services, with TotalCare being the most comprehensive.

TOTALCARE

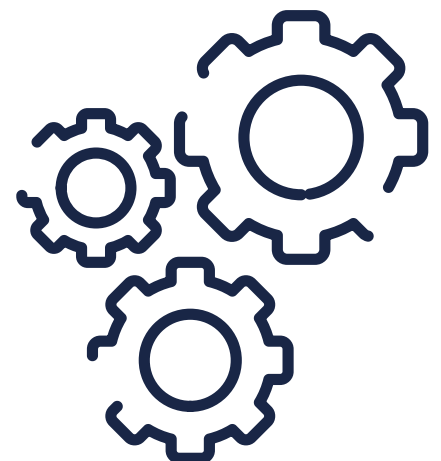
TotalCare covers predictive (off-wing) maintenance planning, work scope creation and management plus off-wing repair and overhaul activities. Time-on-wing and shop visit cost risks are transferred to Rolls-Royce.

By choosing TotalCare, the customer will experience (4):

- ✓ Secured cost of operating and maintaining their Rolls-Royce engines via a \$/engine flying hour (\$/efh) payment mechanism.
- ✓ Enhanced availability (on-wing) as a result of the deep engine knowledge that only the manufacturer can provide coupled with Rolls-Royce's scale, global reach and fleet-wide experience.
- ✓ Engine worksopes that deliver the lowest cost per engine cycle.
- ✓ Advanced engine health monitoring and inclusion of product durability and reliability improvements.
- ✓ Fully integrated service - they can concentrate on running their business, while Rolls-Royce takes care of the customer's engines.
- ✓ Increased asset value and desirability in the marketplace.

Around 90% of the newer programme (fewer than 12 years old) Rolls-Royce engines currently in operation are covered by TotalCare contracts. Outcomes are financially and operationally aligned with customer; the customer pays a fee per flying hour, so revenue for the customer = revenue for Rolls-Royce. Effectively the proposition is insurance on a performance-based outcome. The customer is relieved of the need to manage their maintenance and engineering, and transfers the financial risk associated plus operational risk to the OEM.

Growth in the airline industry is creating new entrants in the airline (aircraft operator) sector. New entrants may not have the depth of technical capability to conduct their own MRO planning and execution, and will likely value the outsourcing of aftermarket services to engine OEMs who can provide an integrated and competitive service. TotalCare is a service that tends to be favoured by customers with newer aircraft; the risk of operating these newer aircraft with newer engines, and therefore less tried-and-tested technology is higher than later in the lifecycle. Older fleets tend to be maintained on a different basis.



In 2020, Rolls-Royce hit the headlines as the global coronavirus pandemic grounded civil aircraft almost overnight. Reports that its share price had fallen to its lowest for a decade were soon followed by news of redundancies and re-structuring (2). There were comments and speculation that the main reason for the struggle was that, as a services-led company famously generating over half its revenue from services contracts linked to number flying hours, Rolls-Royce was more susceptible to the huge and sudden decrease in air traffic. In other words, it was the services business that was killing Rolls-Royce.

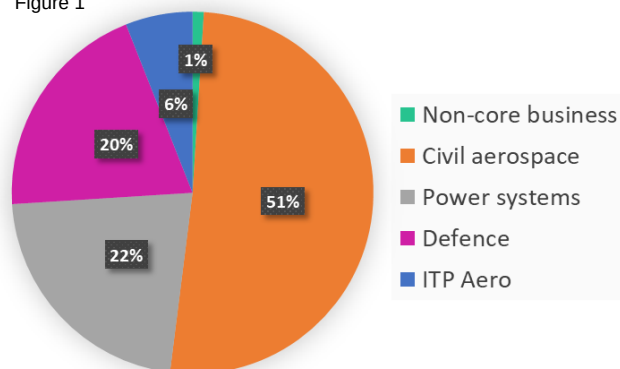
In actual fact, services has been the first part of the business to start to show recovery, while production rates which are expected to remain at the current low levels for some time. This case study outlines the reasons behind this resilience.

ROLLS-ROYCE CIVIL AEROSPACE

Rolls-Royce Civil Aerospace business is a major manufacturer of engines for wide-body commercial aircraft, regional jets and private business aircrafts. This business generates just over half of Rolls-Royce's underlying revenue (3) (figure 1). In 2019 this amounted to £8.1m. Of this, the majority of revenue (71% in 2019) is generated in the large engines market, supplying operators and lessors of wide body commercial aircraft (figure 2).

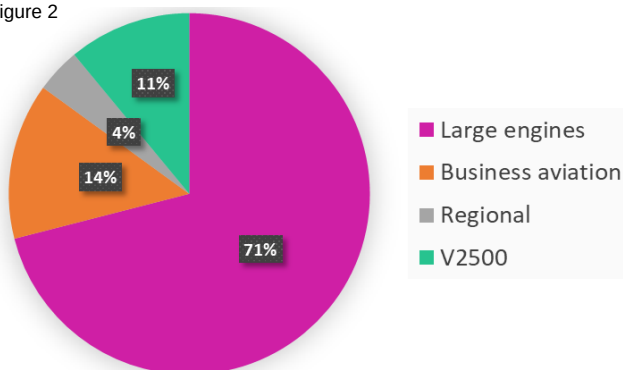
Underlying Revenue by Business

Figure 1



Underlying Revenue Mix in Civil Aerospace

Figure 2

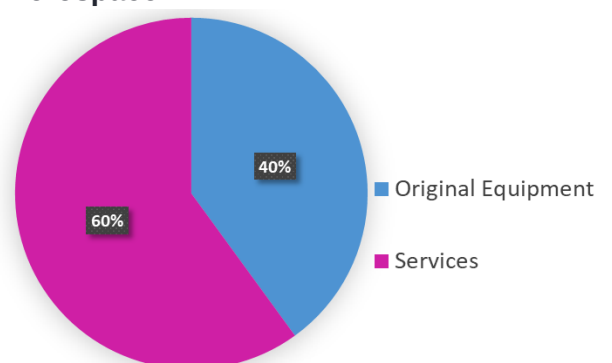


THE HISTORY OF SERVICES

In 2019, 60% of revenue in the civil aerospace business was generated by services (1). It has taken approximately forty years to get to this position. In the 1980s, Rolls-Royce was a 'break fix' business, generating revenue from the margin on products and spare parts. The end user took most of the risk of owning an engine, a very complicated product that inevitably had issues from time to time that needed to be managed. Most customers- e.g. airlines- had their own engine shops, carrying out their own maintenance and repair, something which was a cost, not a value-add activity, for them. In the mid 1990s the first Total Care agreement was made with American Airlines. This radically changed the incentives of Rolls-Royce, away from generating revenue through the sale of spare parts and into much more alignment with those of the customer.

Products and Services Underlying Revenue Mix in Civil Aerospace

Figure 3



THE 2020 GLOBAL PANDEMIC

In 2020, the coronavirus pandemic led to massive reductions in travel, including air travel. In October, the CEO of the International Air Transport Association said in a press release: '...the association expects total industry revenues in 2021 to fall 46% compared with the 2019 figure of \$838 billion. This is a more significant drop than the previous estimate of a 29% decrease.' The press release went on to say that S&P Global Ratings expects global air passenger traffic to drop by 60%-70% in 2020 compared with 2019, and by 30%-40% compared with 2019. (5).

THE IMPACT ON ROLLS-ROYCE

Due to the way its TotalCare contracts are constructed, a proportion of Rolls-Royce's fortunes are linked to the flying hours of its airline customers (often referred to as 'Power-by-the-Hour'). The significant reduction in flying hours of 2020 has therefore, inevitably, impacted revenues. At the end of November Rolls-Royce reported that flying hours covered through TotalCare in January to November were at 42% of 2019 levels, so annual revenue has been approximately 42% of the 2019 level (6). It can't be denied that this is a serious position for any company to find itself in.

However, consider the alternative: On older engines, the customer appetite for comprehensive services contracts is less. This is due in part to the age and maturity of the engine and in part to the type of operator that likely owns the aircraft at this point in its life. The early-adoption risk of owning and operating older (12 or 13 years plus) engines is less, because the technological innovations have bedded in, so the advantage of an insurance-type TotalCare contract is lessened and the cost-benefit analysis becomes less favourable. Moreover as an engine (and the aircraft it is on) moves through its lifecycle

it is more likely to be sold on to a smaller or legacy operator whose cost margins are tighter and who wants to take as much revenue as possible from the asset, albeit with slightly higher risk.

Across the industry, a greater proportion of older engines are managed by customers on a break-fix basis, paying the OEM (or themselves) for time and materials. Rolls-Royce does offer this- branded as Foundation Services for airline customers for example- but more airlines will also take this in house. In 2020, these revenue sources have been even harder hit than those related to advanced services. These customers hold a lot more financial risk themselves. In 2020 they cut all possible costs, including planned or event-based maintenance- preferring to just use a different aircraft rather than repair an engine.

In these cases, costs of maintenance and repair are more difficult to predict; if the engine operates with no problems then there is no repair cost to the airline. However an engine failure means an un-planned cost either for now or the future when the repair is done. For these customers, it is more difficult to predict and make judgements about the costs vs benefits of flying an aircraft so they have been more likely to be grounded. Customers have cut costs by cancelling or postponing maintenance or repair, but in the longer term this devalues the asset, and once the market reopens it presents perhaps a larger repair bill- and a logistical headache- to make the assets serviceable and reinstate them into the fleet. Even in those cases where aircraft were still flying, with repairs and maintenance cancelled or postponed, Rolls-Royce isn't generating revenue. As a provider of these services, it is difficult to make predictions and judgements of likely revenue.

TOTALCARE RESILIENCE

On a TotalCare contract, by contrast, any flying hours at all have generated revenue for Rolls-Royce and this has at least given an element of certainty of revenue. In commercial aviation (airlines and regional) airlines are making sure those aircraft that do fly are, wherever possible, the more recent models, with higher payload capability, best fuel burn efficiency and the latest gas turbine technology, in order to operate the routes more efficiently and generate most revenue with a greater mixing of passengers and cargo on the same flight. Rolls-Royce engines are on the majority of newer body aircraft, which are the most suitable type of aircraft for the current demand (they carry fewer passengers than older, larger aircraft but the same amount of cargo and also burn less fuel). And as we know, these are the aircraft more likely to be covered by TotalCare.

The same aircraft might be put to different uses during its life- many aircraft that begin as passenger carriers are used to carry freight as they get older. So in normal times, we'd expect a passenger aircraft engine to be more likely to be on a TotalCare contract and an engine on an aircraft carrying freight to be maintained on a break-fix basis due to its age. At the moment airline capacity far outstrips demand, and optimising which aircraft fly which routes with optimum payload and at the lowest cost of operation has been critical. In 2020, operators have been flying the most efficient aircraft that use the least fuel- i.e. the ones with the newest engines with the most recent technology, that are in most cases on a TotalCare contract. Dedicated, older, freight aircrafts have been more likely to be grounded and freight (including PPE) has been carried on passenger aircrafts to make up for the shortfall in passenger numbers and optimise the payload.

The benefit to the customer is that they know their costs per hour so it makes their decision to keep operating easier as they can see whether it is profitable. Advanced services like TotalCare support the customer to be as effective as possible in their core business. Never was this more necessary than in 2020.

The product business, by contrast, saw a greater fall in revenue because customers cancelled and deferred orders for new equipment; with aircraft grounded and no demand for increasing fleet capacity, this became a critical cost cutting exercise for customers. Not only this, but as flying hours increase slowly, demand for manufacture will come from the services business, i.e. providing spares, not from new production.

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CAPABILITIES ENABLING SUCCESS

One of Rolls-Royce's key competitive advantages is its digital capability. In the normal course of events, it has been possible to have a forward view of maintenance for the asset for the full 20-25 years of its life, enabling predictability for the customer and Rolls-Royce alike. For example, Rolls-Royce would usually be monitoring in real time 900-1000 aircraft at any one time, with an observation about one or more of those assets transmitted every three minutes, providing tremendous insight which is integrated into service delivery and product design.

During 2020 these capabilities have been put to developing new market analytical tools to understand flying patterns and aircraft usage and how an aircraft can have the most time on wing. It has accelerated some projects and new ones have been innovated, such as more work on flying patterns and understanding load capacity- all of which has helped customers to optimise their operations. There has also been work on understanding the disposition of an engine that's been grounded for some time to manage return to service risk and prevent unwanted events.

MAINTAINING RESILIENCE

One of the key lessons learned has been the need for diversity in order to maintain resilience. For example, all of Rolls-Royce's newest engines, with TotalCare contracts, are on wide body aircraft on long haul commercial flights, or on aircraft serving the business aviation market. While wide body commercial aircraft have generated some revenue- as we've seen- the long-haul market has not picked up as well as the domestic and regional markets and a marked improvement is expected to take up to five years. The business market, on the other hand, where wealthy individuals or corporations

with private aircraft have continued to fly, has recovered more strongly. These customers are covered by CorporateCare Enhanced, a similar offering to TotalCare.

Rolls-Royce's market penetration is possibly as high now as it's every likely to be; TotalCare covers the vast majority of newer aircraft, but on mid-life fleet the coverage is more like 40% so Rolls-Royce expects to see its coverage decline as assets age. The customer segment for which TotalCare delivers most value is those operating newer aircraft.

The offering to other customers needs to be more varied and flexible. Rolls-Royce will continue to develop and refine its value propositions around availability and on-time performance. There may be a greater range of services so that more customers can transfer risk to Rolls-Royce. These customers might be, for example, leasing companies and operators of older assets.

Different customer segments have a different appetite for taking on risk, depending on their business model and margins and the age of the assets they own or lease. Others will want the most technologically advanced aircraft and engine combination. Rolls-Royce sees a need to keep innovating its range of services offerings to keep up with the changing profile of the market and offer choice and flexibility to a wider range of customers.



THE FUTURE

The pandemic of 2020 brought a crisis that almost nobody had planned for. Contracts simply had not been designed with an expectation of this level of grounding of aircraft. Contracts already incorporate the possibility that an airline goes out of business, and there isn't seen to be enough benefit to build a contract around a once in a generation event. TotalCare contracts are 10 to 12 years long; in that timeframe, as Rolls-Royce sees it, what has happened for twelve or eighteen months doesn't necessarily need to define the longer picture and there are no plans to drastically change the contract in future. They expect the industry to change as a result of what has happened in 2020, with potentially fewer, more versatile, aircraft types being designed and less capital expenditure and more leasing and outsourcing of risk. Airlines will need to be even more resilient and agile in their operations and this may well lead to an acceleration in the take-up of contracts guaranteeing availability of the asset.

IN SUMMARY

The downturn in the aviation market in 2020 was hugely disruptive. There is significant short-term pain for the likes of Rolls-Royce, and the resultant redundancies are a tragedy for its workforce and for the town of Derby, UK where it is headquartered. Nevertheless, this is not a story about the failure of a services-led business model. Despite speculation to the contrary, TotalCare has- as we've seen- saved the civil aerospace business from a much worse outcome than might otherwise have been expected. Services have been the most resilient part of the business, and what will drive its recovery. This is a servitization success story.

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