

Case Study C

Company:	KYOCERA Document Solutions
Location:	UK sales subsidiary of Japanese-owned manufacturer
Product:	Single and multi-function printers
Type:	Multinational OEM
Maturity:	Experienced (in DfRem)
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KYOCERA is a diverse global corporation centred on core expertise in ceramics. One of the applications of ceramic technology is the manufacture of laser print drums that are far more durable than those made from other materials. This has enabled the development of an innovative print engine design where all functional parts are part of the printer, not part of the consumable. This avoids the need to repeatedly replace multiple working parts throughout the life of the product, thereby saving the raw materials, manufacturing, transport and waste emissions associated with those parts.

Motivation for Remanufacturing

Resource efficiency has been a strategic focus on KYOCERA for many years, underpinned by the company's philosophy. It is part of a holistic approach that aims to reduce product environmental impacts at every stage in the lifecycle.

Product Description

Single and multi-function printers (Fig. 5a) designed for all general office applications and aimed at business users, are increasingly sold as part of a managed document service that includes software, consumables, maintenance and professional services, which are charged for on a consumption basis. The hardware is a totally industry-standard in its functionality and comparable in price to conventional competitors.



Fig. 5a KYOCERA Single and Multi-function Printers

Design for Remanufacturing

KYOCERA has developed its own in-house ECOSYS¹ process, which focuses on developing long-life products for the outset and uses an evaluation checklist to ensure each design meets specific standards². A durable, robust metal sub-frame provides structural integrity in a product that is designed for using long-life components. The design is upgradeable and modular upgrades are available to support changing customer requirements, avoiding the need to replace the whole machine when all that's needed is an extra paper cassette, for example. Care has been taken to design the product to enable easy serviceability through replacement of parts, to minimise the time it takes to repair and reduce down-time, and to increase the period between routine maintenance interventions. Design for disassembly is achieved by minimising fastener use and all screws used have the same head, so a single screwdriver can be used to remove them all. Plastic parts clip apart and a symbol is embossed on them to indicate where to apply pressure, as well as the polymer ID symbol.



Fig. 5b KYOCERA's innovative print design demonstrating material efficiency in comparison with a conventional design

Environmental Benefits

The amount of material consumed during manufacturing as well as waste created by discarding consumables are reduced, as are the impacts of shipping consumables as the simpler ones are lighter and more compact. Compared to previous models, global warming potential can be reduced by 16%³. Simple toner cassettes are much easier to recycle as they contain only one or two polymers and no metals or other materials. Long life components also mean fewer replacements and less consumption of materials and energy during the product's lifetime.

Economic Benefits

Because the consumable is much simpler, the consumables cost per page is much lower. Extended service intervals and serviceability also mean there are lower maintenance costs.

¹ <http://www.kyoceradocumentsolutions.com/ecology/product/ecosys.html>

³ <http://www.kyoceradocumentsolutions.com/ecology/product/lca.html>

Social Benefits

The indirect sales business model creates jobs and generates revenue in the UK economy. Also, KYOCERA factories are all owned by the company and operated in line with its global CSR guidelines, negating the risk of labour rights violations.

Business Model

Channel to market is indirect, with products sold through so-called 'Servicing Dealers' that lease the product and use their own engineering resource to provide service support. Dealer engineers are trained by KYOCERA. Remanufacturing is done by these dealers, on their own premises, using parts supplied by KYOCERA. Depending on the dealer's own business model, remanufactured products may be sold or leased to new customers looking for a lower-cost alternative to the latest equipment, or supplied to an existing customer within a contract that does not specify that new equipment will be provided but instead commits to product performance and service levels. Dealers also routinely harvest viable spare parts from failed products to maintain machines in the field.

Future Challenges

The key limitation of this approach from KYOCERA's point of view is that it is not part of the remanufacturing system and therefore cannot collect data on remanufacturing or manage it. KYOCERA has so far not managed to find a way to achieve this that doesn't also add cost and complexity. The system works best when KYOCERA's channel partner leases the equipment – if the product is sold outright to the customer there is less opportunity to recover it and it could end up in the waste stream where, even if it is working, it will be treated as waste and opportunities for remanufacturing, re-use or disassembly for retrieval of individual high value materials, will be missed.