Point of View

LTIMindtree Digitizing Automotive Remanufacturing

Author
Siddhartha Nigam

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Remanufacturing - Trends and Opportunities

The Remanufacturing Industries Council defines remanufacturing as "a comprehensive and rigorous industrial process by which a previously sold, worn, or non-functional product or component is returned to a "like-new" or "better-than-new" condition and warranted in performance level and quality." Remanufacturing is not the same as "refurbishing," "recycling," or "repairing," as none of these processes warrant a "like-new" or "better-than-new" performance of the products. Hence, remanufacturing is a more specialized and complex element of the circular economy due to its unique proposition of lower purchase cost and "better-than-new" quality that comes with original equipment manufacturer's warranty.
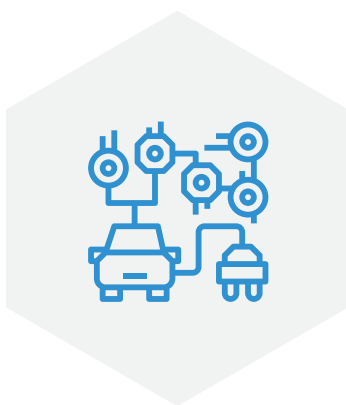
$ 33 Bn
Estimated worldwide market (2016) for auto remanufactured parts

35 Mn
Auto remanufactured parts sold across EU in 2016

6.6 %
Expected CAGR market growth from 2017 - 2025

According to the research firm ResearchAndMarkets, the automotive parts remanufacturing market was valued at US$ 33.16 billion in 2016 and is estimated to grow at a CAGR of 6.6% from 2017 to 2025 (1). Another market research firm, Persistence Market Research, indicated that in 2016, close to 35 million units of remanufactured automotive parts were sold across Europe. This number is expected to soar at a 7.4% CAGR and surpass 56 million by the end of 2024 (2). The last decade has also seen remanufacturing gaining significant traction in the Asia-Pacific region

with new investments in China. While these forecasts are driven by positive factors such as high penetration of vehicles in the western economies, aging vehicle population, rising raw material prices, carbon footprint reduction, etc., there are quite a few unique business challenges as well.

At the crux of the 4th Industrial Revolution (Industrie 4.0), digital transformations across manufacturing have opened a plethora of opportunities that will drive remanufacturing business transformation and expansion.

Remanufacturing ecosystem and value chain

In addition to reverse logistics and collection cycles, the remanufacturing ecosystem has similarities to the aftermarket ecosystem. The main players in this ecosystem are as shown in Fig.1.
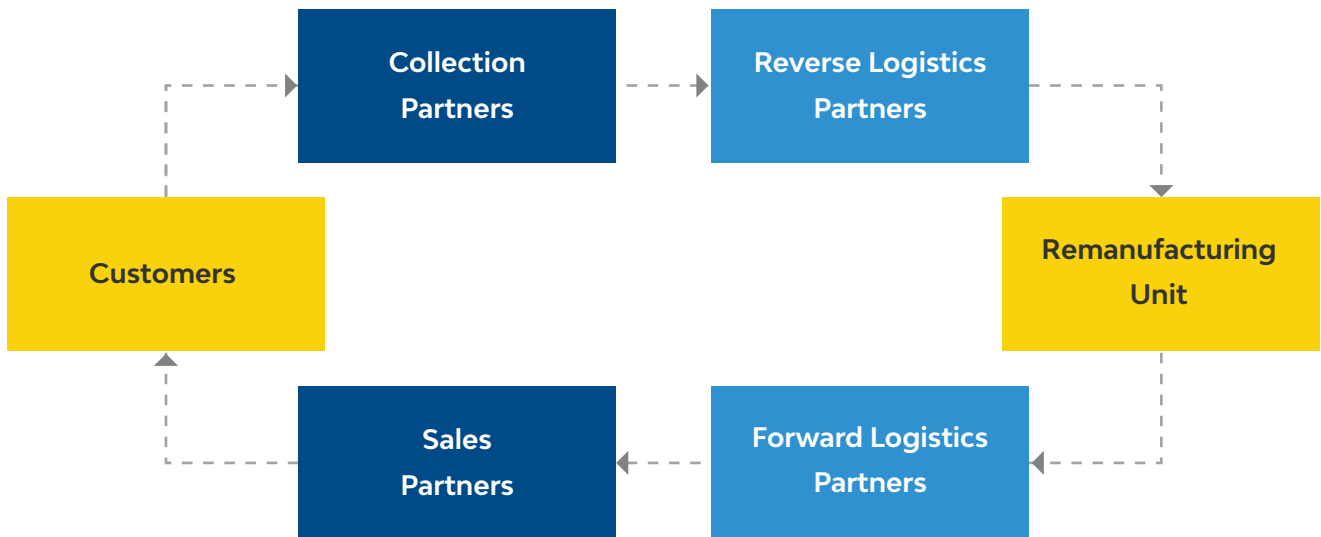

Fig.1 – Remanufacturing value chain

A brief of each of the players along the value chain is as mentioned below:
· **Customers**: They refer to the end users of the product who need a replacement part. In the automotive market, the customers usually are individual vehicle users, businesses such as fleet owners, and government agencies who own fleets of vehicles. The customers are the source of the used parts (Cores) for remanufacturing and the consumers of the remanufactured parts.
· **Collection partners**: They are the OEM dealers, service outlets, aftermarket stores, brokers, etc. who collect or purchase the used parts from the end customers and redirect them to the remanufacturing units. In majority of cases, the collection partners and the sales partners are the same entity where the customers can exchange their parts for new remanufactured parts.
· **Reverse logistics partners**: The reverse logistics partners are usually the third-party logistics (3PL) partners who collect used parts (Cores) and supply them to the remanufacturing unit. The reverse logistics partners can also be the same partners who provide the forward logistics services.
· **Remanufacturing unit**: The OEM manufacturing unit which carries out the remanufacturing operations
· **Forward Logistics Partners**: The forward logistics partners are 3PL partners or logistics firms who distribute the remanufactured parts to the sales partners.
· **Sales Partners**: They are OEM dealers, service outlets, aftermarket stores, brokers, online marketplaces, etc. who are responsible for frontline sales of remanufactured parts to end customers.

Current challenges

Although remanufacturing has been around for the last 70 years, businesses have to deal with considerable challenges across the value chain as indicated in Fig.2.

Consumers

- Perception of remanufactured products as used products
- Availability of products

Logistics Partners

- Fragmented collection & distribution brings complexities in logistics planning (LTL/FTL)

Remanufacturing unit

- Demand and supply uncertainties
- Quality of used parts (cores)
- Complex production planning
- Labor/Skill intensive operations

Sales Partners

- Customer perceptions
- Demand uncertainty

Fig.2 – Challenges across the value chain

Re.Think for Remanufacturing processes using digital levers

Technological advancement within the last decade has changed the way traditional businesses function. Enterprises are now exploring ways in which technology can be leveraged to improve the business holistically. The following are a few anticipated opportunities in the remanufacturing industry:

Internet of Things or IoT (telematics, track and trace)

Connected technologies are disrupting the automotive industry, resulting in new business models. IoT-enabled vehicle telematics has enabled OEMs to collect vehicle usage data in real-time, and run remote diagnostics on the vehicles. This allows them to identify possible failures in the vehicle even before they occur. The influence of IoT on the supply chain also has benefits such as real-time view of products supplied to the various stakeholders. This drives enhanced decision-making and optimization of inventories. The visibility of finished goods also helps fulfill the end customer demands against availability.

Mobility

Traditionally the remanufacturing business does not have a B2C connect, however, this is bound to change in the near future. The new-age mobility platforms that are available today connect the varied value chain partners, to facilitate real-time and near-time view of the demands. It is imperative for businesses to have a strong online presence both on the web as well as mobile. This can be done via engaging websites and apps or being present in online marketplaces to make the end customers aware of the value proposition of the products. It is extremely important to provide the end customers not just a product, but an experience which they will appreciate.

Blockchain

The buzz which blockchain technology has created across industries is remarkable. The power of a secure, distributed ledger has a multitude of possibilities which are still being studied, nevertheless, industries are proving the effectiveness of blockchain by developing use cases. The technology also has a lot of potential across the remanufacturing supply chain. If each remanufactured part can be in the blockchain, it will provide secure visibility to various stakeholders about the origin, remanufacturing, shipping and sales data. This could streamline the financial transactions involved between the various partners and can be lucrative for the vehicle insurance companies as well.

Data Analytics

Any nature of business in today's world generates large amounts of data across functions such as sales, operations, and supply chain, etc. The computational prowess applied on this data with intelligent algorithms provides significant and valuable insights for businesses which gives them the much-needed edge in a highly competitive market. Remanufacturing can also utilize data analytics platforms to optimize the most challenging issue in remanufacturing - the balance of demand and supply of remanufactured parts. To facilitate clear visibility of available cores, and predict the potential behavior of remanufacturing customers, adoption of data analytics with machine learning can drive continuous learning.

Virtual reality and Augmented reality

The remanufacturing business is heavily reliant on specialized skills of operators. They are required to dismantle used products and conduct a comprehensive quality check to verify if the incoming parts are worthy of remanufacturing. Skilled workers might eventually limit the scale of operations for a remanufacturing unit. Taking this into account, operator assistance technologies such as virtual reality and augmented reality can be used to guide and train operators to effectively execute required operations. This mitigates the reliance on highly skilled workers needed for remanufacturing operations.

Conclusion

In the next 5–8 years, we believe China, Eastern Europe, and India will see a prominent growth in the Remanufacturing business. Global Commercial Vehicle and Passenger Car Majors are expected to make heavy investments in remanufacturing in these geographies to expand their top line and profitability. Their objectives from Digital levers are likely to be: a) To improve demand and supply visibility b) Establish Direct Customer connect & c) Introduce NextGen customer experience We think Remanufacturing business is ready to transform itself by using "DIGITAL LEVERS". As part of an ongoing discovery of Digital use cases for the Industrial sector, we have curated the following top three use cases that remanufactures can leverage to define and execute their Digital agenda:

- **Telematics integrated digitization of core qualification and purchase**
- **Use of Big Data Analytics for core supply and Reman product demand forecasting**
- **Driving Customer/Dealer engagement using Mobile Applications**
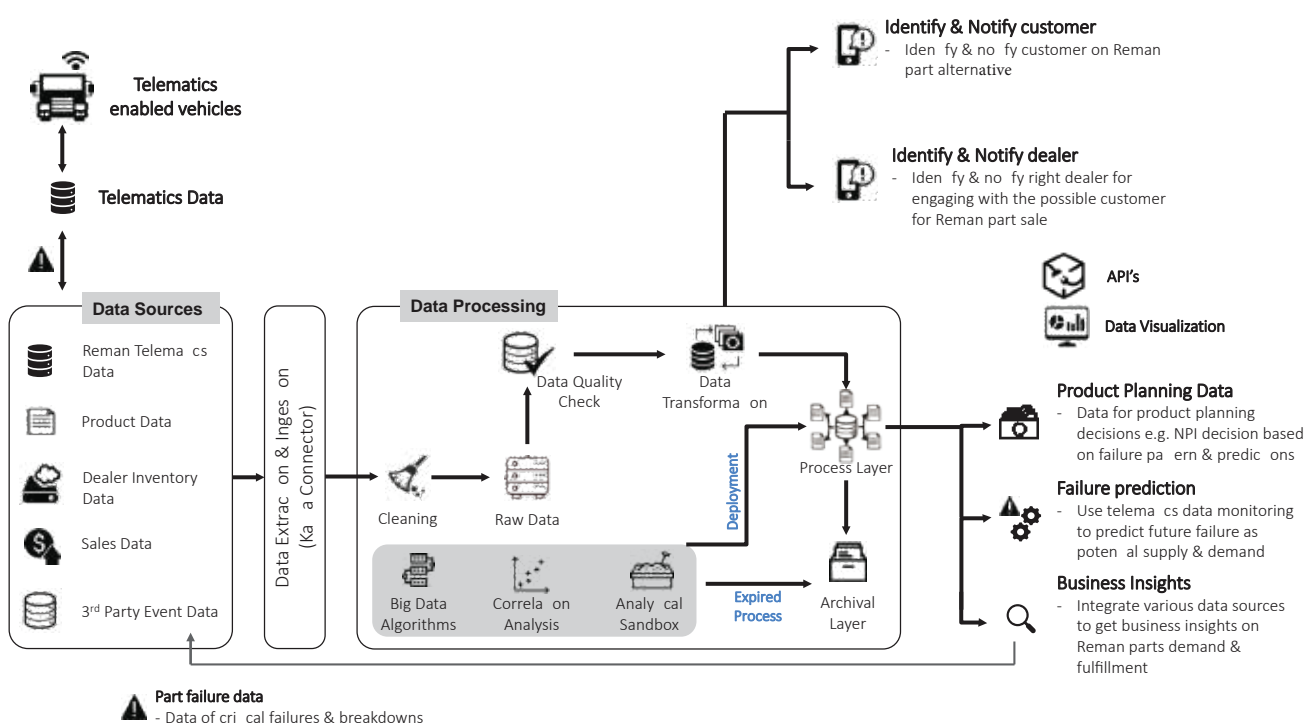

Fig.3 – Conceptual architecture

The aforementioned use cases will need an architecture (Refer Fig. 3) with three technology pillars for realization viz. a robust platform, for data ingestion and segregation from connected vehicles and system of records, a solid analytics platform and a digital, social platform for collaboration. This proposed platform will also have built-in NextGen capabilities around machine learning and AI to utilize the technological capabilities offered. Such a data-driven architecture will provide the business with insights and capabilities needed for operational excellence and targeted marketing to drive the next growth spurt for remanufacturing businesses.

To conclude, we are of a strong opinion that it is the correct time for the remanufacturing businesses to invest in digital technologies to transform their environment friendly business and make it sustainable and future-ready.

About the Author
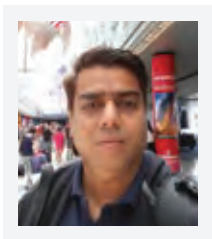
Sachin Kulkarni
Lead Consultant, Thought Partner Digital Consulting & Advisory, LTIMindtree

Sachin has over 20 years of experience across Manufacturing and Information Technology, and has been leading Strategic Consulting engagements, Global Transformation programs, establishing and operationalizing Automotive & Digital Consulting in addition to new client acquisition.

Avik Roy
Senior Consultant, Digital Consulting & Advisory, LTIMindtree

Avik has over 9 years of experience across Manufacturing and Information Technology, and has been assisting clients in various programs towards benchmark studies towards improvement in products and operational capabilities. He has also been engaging with clients to embrace NextGen Digital Technologies to drive the next wave of operational excellence and business growth.