

Master Thesis Proposal

Towards a Circular Business Model through Remanufacturing

Remanufacturing is an industrial practice of “Returning a product to at least its original performance with a warranty that is equivalent or better than that of the newly manufactured product.” It is an important component of a resource-efficient manufacturing industry and a key strategy within the circular economy: by keeping components and their embodied material in use for longer, significant energy use and emissions can be avoided. In addition to its environmental benefits, remanufacturing provides opportunities for the creation of highly skilled jobs and economic growth. Despite these advantages, remanufacturing is an undervalued part of the industrial landscape and an under-recognised sustainable industry, in particular in Europe. Most legislation encourages products to be sent for recycling; but initiatives and interest in remanufacturing are growing, and it can be a quite profitable business model towards circularity. But there are several challenges: remanufacturing requires more complex operations, infrastructure and resources for transport and processing; understanding consumer willingness to buy remanufactured products is crucial; remanufactured product sales may cannibalize new product sales; product returns must be incentivized but still are uncertain, as is quality and legislation. Furthermore, new waste and emissions streams may be created.

The tasks and objectives of the master thesis are to

- Review current industry trends in remanufacturing as well as different remanufacturing business models.
- Review some showcase examples of successful companies that have successfully embraced a circular business model through remanufacturing.
- Review and classify the academic OM literature on remanufacturing with a focus on approaches to model the impact of remanufacturing-related decisions on revenue/cost and the environment.
- Assess any gaps between the models in the academic literature and practice needs for decision support in remanufacturing.

Requirements

- OPM 7xx
- Good knowledge in Operations Management
- Analytical skills

Administrative information for writing a master thesis at the Chair of Service Operations Management can be found [here](#).

Selected Literature Recommendations

- Abbey, J. D., Blackburn, J. D., & Guide Jr, V. D. R. (2015). Optimal pricing for new and remanufactured products. *Journal of Operations Management*, 36, 130-146.
- Abbey, J. D., Meloy, M. G., Blackburn, J., & Guide Jr, V. D. R. (2015). Consumer markets for remanufactured and refurbished products. *California Management Review*, 57(4), 26-42.
- Abbey, J. D., Meloy, M. G., Guide Jr, V. D. R., & Atalay, S. (2015). Remanufactured products in closed-loop supply chains for consumer goods. *Production and Operations Management*, 24(3), 488-503.
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- Johnson, F.P. & Chandrasekhar R. (2018): John Deere Reman: Creating Value Through Reverse Logistics, Case No. [W18286](#), Harvard Business School Publishing.
- Hopkinson, P., Zils, M., Hawkins, P., & Roper, S. (2018). Managing a complex global circular economy business model: Opportunities and challenges. *California Management Review*, 60(3), 71-94.
- Ovchinnikov, A. (2011). Revenue and cost management for remanufactured products. *Production and Operations Management*, 20(6), 824-840.
- Zhang, X., Zhang, M., Zhang, H., Jiang, Z., Liu, C., & Cai, W. (2020). A review on energy, environment and economic assessment in remanufacturing based on life cycle assessment method. *Journal of Cleaner Production*, 255, 120160.
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