Chapter 8

Life Cycle Management and Sharing Economy: Methodological Framework and Application in Sustainable Mobility

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ABSTRACT

The life cycle sustainability assessment based on Life Cycle Thinking is currently considered the most crucial paradigm that includes three kinds of sustainability variables. Life cycle management (LCM) is the most holistic approach in promoting sustainable value creation, embedding the social, economic, and environmental dimensions as a management tool. LCM is mainly applied in the manufacturing and products chain, whereas it is understudied in the service industry. This chapter proposes the development of the LCM general framework and the definition of indicators for the assessment of sustainability in the urban shared mobility. The research framework has been tested in the transportation sector focusing on car sharing context.

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INTRODUCTION

The globalization process, the growth of urbanization, and the excess of automobile usage impacts on the environmental, economic and social facets of urban life (Haghshenas and Vaziri, 2012; Florida, 2010), highlighting that is necessary adopting behaviour and practices that are socially and environmentally robust (Birkin and Polesie, 2012).

Disruptive technologies inspires the emergence of new business models and they need to embed social and environmental issues, besides the economic goals (Hart, 2007). Currently, innovative business models based on shared service are widespread especially in the mobility sector.

In particular, car sharing is a growing phenomenon that proposes to merge the three facets of sustainability (environmental, social and economic) and it represents a continuously rising trend, confirmed by the high number of overall registered users. Indeed, over 4.8 million members share more than 100 thousand vehicles worldwide (Shaheen, 2015; Lane et al., 2015).

According to Schiller et al., (2017) these business models are characterized by four features:

- Usage area of shared vehicles: city center broader city area or regional;
- Vehicles type: small/city cars, compact cars, SUVs and MPVs;
- Pricing: by time, by distance, fixed prices;
- Parking co-operations: parking permits, commercial, private.

It represents a flexible solution for fulfilling needs of transportation of an urban area, striving to solve issues related to car ownership.

Mobility concepts can be classified by the flexibility offered to customers as well the distance travelled which take into account the variation in usage areas (Schiller et al., 2017). Particularly, social and environmental effects are recognized by several authors (Shaheen and Cohen, 2012; Nijland and Van Meerkerk, 2017). However, potential impacts of car sharing on the society are widely discussed, although they lack of directions and empirical contributions.

Hence, shared mobility can contribute as a tool for improving sustainability at environmental and social levels; on this strength, a ‘green image’ is usually associated to car sharing (Nijland and Van Meerkerk, 2017).

In addition, in the last decade, the European Commission has strived to identify useful means for reducing the environmental impacts caused by the interaction of humans with the environment (EU, 2006).

Life Cycle Sustainability Assessment (hereafter LCSA) framework provides specific tools to evaluate each sustainability area (Kloepffer 2007, Finkbeiner et al. 2010). Moreover, Life Cycle Management (LCM) is a strategic framework for industrial application and evaluation of the sustainability concept.

Using the LCM tools, the authors define the indicators for quantifying the real and potential impacts in term of economic environmental and social sustainability using the cradle to grave approach.

This chapter proposes a theoretical framework that is applied to the sharing mobility, focusing on car sharing, based on principles for global sustainability.

The aim is to realize a new general approach to the management of materials products and services, here termed “strategic lifecycle management”.

More specifically, it deals with the analysis of the actual state of car sharing services, adopting the LCM approach and comparative analysis, and defining a set of indicators for evaluating the environmental and social impacts.
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