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The Conceptualization of Sustainability in Operations Management

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Abstract

Regardless of the pervasiveness of sustainability, a deeper understanding of sustainable operations management is still needed. The aim of this article is to provide theoretical foundations of sustainability (environmental) in operations management, based on which patterns of sustainability operations strategies could be researched. Thus, sustainability (environmental) is first positioned within the enterprise on the managerial and operational level. Secondly, a framework depicting the relationships, impacts, functions and limits of sustainability as an operations strategy is designed. Thirdly, operationalized from the previous concept, a process for the planning of sustainability operations strategies is designed and proposed.

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1. Introduction

Operations Strategy plays a crucial role in linking business strategy with Operations and is faced with at least two essential challenges. The first one is to formulate an Operations Strategy that is in line with the business strategy and the environment and secondly to implement it. Those challenges become even greater when dealing with sustainability, as it is a novel operations strategy that can be extremely hard to effectively formulate (plan) [1] and implement [2], [3], as it is too often vaguely defined in business strategies. Paradoxically, the trend of sustainability is spreading very fast among manufacturing enterprises. Nonetheless, managers are aware that they risk of failing in dealing with sustainability (Berns et al., 2009). Consequently middle and operations managers need guidance on managing Operations Strategies focused on sustainability, for which much more research need to be undertaken. However, even though that many definitions of sustainability exist, none offer enough details needed to clearly delineate and position the concept of sustainability into a manufacturing enterprise in order to undertake systematic research, based on which sustainability related patterns, guidelines and methods with strong managerial implications could be derived. Namely, research should be able position sustainability initiatives into existing the strategic and operations managements of manufacturing enterprises. By positioning it clearly, it would enable managers to align it with their existing manufacturing and business strategies, thus additionally bridging the potential gap between management and operations.

Therefore the aim of this article is to build stronger theoretical foundation in the field of sustainability (only environmental) in manufacturing enterprises that would enable the design of strategies, guidelines and theories, that will help increase the effectiveness and efficiency of the implemented sustainability initiatives into existing operations. Concretely, this means that the exact role of sustainability in manufacturing enterprises has to be identified; by role it is meant the “characteristic or expected behavioral pattern in a particular setting” or also “the function performed by something in a particular situation or process” [4]. Furthermore, the concept has to be delineated and positioned within the manufacturing enterprise, while being aware that they are contingent [5] upon factors like industrial,

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market and legislative context. As the paper focuses on the field of manufacturing, which is extremely resource intensive, the article targets only the operational level. Consequently, the research question of this paper goes as following: "How can sustainability (environmental) within a manufacturing enterprise be holistically defined in operations management?" The results have to provide solid foundations for research. In order to provide the answer, one objective is to be met – the concept of sustainability will be conceptualized within the level of operations management of a manufacturing enterprise. This will be achieved through two sub-objectives based on Reynolds [6]. The first one is to define the limits, which will be done by positioning sustainability within an enterprise on both levels - strategic and operational; this way the concept will be delineated clearly. The second sub-objective is to define linkages (relationships) among the concepts, thus depicting the relations among sustainability strategy and sustainability operations, their management and finally their relation to diverse industries, markets and legislatives. Among others, the article will not provide only the core questions in relations to sustainability, but also where to start researching sustainability according to its positing and what kind of methodological tools are still lacking to perform a systematic research in order to identify hidden patterns and/or best practices. The results will be beneficial mostly for the research of Sustainability in manufacturing enterprises with the specific aim further on to identify best practices and develop guidelines about developing sustainability initiatives and implementing them.

In the following section, the methodology and the main concepts are briefly introduced. Then in the third section, sustainability is first positioned within the manufacturing enterprise, in strategic and operations management. Afterwards, in the second part of the section the linkages with the concept of sustainability on the operational level are depicted, which will result in the conceptualization of sustainability in operations management. Lastly, this concept is partially operationalized.

2. Methodology

Three main steps are undertaken. The first two steps result in the conceptualization of sustainability on the operational level, while the third provides potential paths for further research. Therefore, the following steps will be:

- The limits are set by defining the concepts involved, which provides the 'building blocks' for theorizing [6]; this will enable to position sustainability into the levels of operations strategy and operations.
- Afterwards linkage (relationships) among the concepts will be created [6], depicting the forces impacting sustainability and the relations with the main managerial functions.
- Possibilities of theoretical evolvement of sustainability are than presented.

After defining the role and impact of sustainability, thus identifying "what is it", it is defined how this can be effectively and efficiently managed. Furthermore, the nexus of the presented framework relies on theoretical foundation arising from strategic management.

3. Concepts

There are two main concepts involved in the article – sustainability and operations management.

There exist multiple definitions of sustainability, where the Triple Bottom Line depicts clearly the relations. Nonetheless, this article focuses only on environmental sustainability (eco-efficiency and eco-effectiveness). However, when talking about managing sustainability, we do not call upon only efficiency measures, but also upon sustainability strategies enabling to modify the current business models that are based on the idea to sell as much products as possible, hence not being adequate in terms of sustainability [7]. Hence, a need for managing sustainability as an operation strategy and an operation arise. Based on definitions of multiple authors, Starik and Kanashiro [8] defined sustainability management as the formulation, implementation, and evaluation of both environmental and socioeconomic sustainability-related decisions and actions. While other management theories explained the need for and advancement of sustainability management, none of those theories appear to have the unique features, benefits, opportunities, challenges, or orientations to assist individuals, organizations, and societies to move toward sustainability as much and as soon as appears necessary [8]. Furthermore, Schrettle et al. [9], based also on other findings, identify that it is still unclear why certain enterprises adopt sustainability practices while others do not and under which circumstances firms can realize competitive advantage by their adoption. Consequently, there is also no descriptive model, which supports decision making of firms facing sustainability challenge [9], while managers especially lack the right information upon which to base decisions and when enterprises do act, their execution is often flawed [1]. Hence, more research on the topic of sustainability with the objective to design dedicated managerial guidelines that will be capable to be aligned with specific operational context is needed; hence being capable to align specific set of complex manufacturing

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