Chapter 14
TQM for Sustainable Development through NPD in Developing Countries

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ABSTRACT

Challenged with intense market competition, developing countries are searching for methods to ensure sustainable development through business performance. In this regard, TQM and NPD play a major role. However, research is limited in the area of addressing the contextual link between TQM, NPD, and sustainable development. Therefore, this paper examines the relationship between the three and the outcome of the relationship. The results show that TQM in the context of NPD for sustainable development in developing countries focuses on adaptive products through incremental improvements on production technology, NPD system, product development, production process, and employee know-how. It is also found that TQM revolutionizes the conventional R&D system by enhancing innovation capabilities. It reduces development costs and time alleviating financial limitations. The results further reveal that process focus on the TQM framework has contributed to sustainable ecology management through various environmental management systems.

1. INTRODUCTION

It is believed that technological innovation is the driver of proactive NPD. Fasil and Osada (2011) indicated that while market change brings on new needs, technological innovation brings up the seeds of new developments. Whether it is incremental or radical innovation, TQM brings new technologies that help customers. However, strategic NPD decisions need to determine the future technology level. For this purpose, existing customer requirements, engineering metrics and technologies can

DOI: 10.4018/978-1-4666-3613-2.ch014

be considered as reference points. Meanwhile, market research and technology seeding can be used to forecast future technology requirements. In this regard TQM is used for the purpose of technology scanning and environmental analysis with regards to current technology shortcomings. This helps to identify new technology metrics for future market. Hence, this helps the companies to have a view of the future product image with regards to the technology forecast. This requires having two dimensional approaches vis-à-vis: technology dimension and market dimension. The consideration is a bi-dimensional consisting of current technology level vs. current market and customer requirements, technology seeding vs. business innovation, and future technology level vs. future market and customer requirements. However, the authors have stated that in developing countries, the capacity and capabilities limits the process of inverse technology learning and management. This factor is very useful tool to achieve the transformation and development. This pushes technological innovation to create values for the customers through quality products, sustaining performance, and innovation.

2. LITERATURE REVIEW

NPD has been the source of prosperity and sustainable development for several decades. Companies through various ways have stimulated NPD in their organization to benefit from its contributions to growth. Similarly, TQM was used to enhance management capabilities and efficient utilization of resources for decades in the face of sustainable growth. Both NPD and TQM were subjected to different innovative way of handling issues in their contexts, thus contributing to the sustainable development of organizations. This section is therefore dedicated to explore some of the concepts utilized by organization in the areas of NPD, TQM, and innovation for sustainable development.

Concepts of TQM in NPD

In the last two decades speedy NPD has been one of the most significant factors that have affected manufacturing companies (Sun, Zhao, & Yau, 2009). One such critical factor in the speed is to shorten the NPD cycle time that help companies to meet markets at the earliest possible time. Costa and Henrique (2007) has suggested that business process management can be used as one way to improve the NPD process. This is to help companies facilitate their project implementation program concerning NPD. According to Lockamy and Khurana (1995) it is stated that TQM can be applied in NPD through cross-functional teams to facilitate the effectiveness of quality function deployment (QFD). Meanwhile, Ehigie and McAndrew (2005) indicate that the need to outlive, surpass, and outsmart competitors, the rapidly changing business environment has driven both employees and companies to continuously search for new ideas, new processes, new products and services, and new strategies. Hence, most successful companies have fostered innovation in order to adapt, survive and grow in such challenging environment, which is the key element of many modern management initiatives and practices. Ozer (2006) has discussed a lot of factors concerning NPD but neither conclusion is made nor is the issue discussed in the context of TQM. However, Bonner (2005) and Wagner and Hoegl (2006) have addressed the importance of suppliers and customers in NPD which these two components are integral part of TQM. In another context, Fasil and Osada (2009, 2010) have stressed that TQM, as a profound management system, ensures sustainable growth in developing countries through effective and efficient process technology innovation. In this view, one of the specific targets for such business success is assumed to be NPD. In this regard, TQM is utilized in synergizing development of strategic dimension and company business excellence dimension for stakeholder value creation (Mele & Colurcio, 2005).