
Introduction

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Biographical notes: Barbara Marchetti graduated in Mechanical Engineering at Università Politecnica delle Marche. She received her PhD in Mechanical Measurements for Engineering from University of Padova in 2004. She has worked as Researcher at the Naval Research Laboratory of Washington DC. Her research activities are related to development and application of measurements systems for diagnostic, optimisation and control of production processes. She also studies quality management systems and environmental performances evaluations by the application of LCA methodology and supply chain management innovation. She is the author of several papers published on national and international journals and conference proceedings. Currently, she is an Associate Professor in the field of Mechanical Plants for the Università degli Studi eCampus.

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Nowadays, the majority of companies are faced with intense pressure of global competition, and there is a need for these organisations to consider incorporating the idea of sustainability in total quality management (TQM) in order to sustain their competitive advantage and continuous improvement. Business, through local and international trade, has a profound impact on the ability of a culture to provide basic human needs, and other goods and services. Therefore, commerce and how it conducts itself internally and interacts with its operating environment is axial to the success of sustainable development. Long-term business management requires the successful management of losses and gains; and, so it is with sustainable development. Sustainable development can be defined as the management of losses and gains resulting from the degradation of environmental factors that affect the ability of life, any life, to survive, now or in the future. The 'winners and losers' of environmental impact are often defined by the decisions made directly from those entities conducting commerce.

This special issue is open to researchers throughout the world who are interested in studying and applying advanced research in finding synergies between TQM and SD, in creating process models for implementing SD practices in a TQM management system and, more generally in comparing and combining values, methodologies and tools from TQM and SD. In this special issue, several topics were addressed: a methodology, called G.EN.ESI, to help designers (especially those ones without a specific know-how on eco-design), during the development of sustainable products was presented. The methodology consists of six main steps, thought to link the eco-design and traditional design activities. Other authors presented a new practice of robust design methodology (RDM). Other topics were related a methodology for the integrated sustainability assessment of a product-service system lifecycle, with the purpose to support continuous improvement on the side both of the manufacturer and of the user. Its eight steps are an extension of ISO 14040 life cycle assessment and consider all three sustainability dimensions – economic, environmental and social – and a service perspective, using the service unit. A set of indicators for the three dimensions, aligned to the service unit concept, is proposed based on literature suggestions. Moreover, the impact of product eco-redesign on CLSC performances through a system dynamic approach was evaluated in another paper. The internalisation strategies of external costs of transport for a sustainable logistics were also addressed as well as the product sustainability measurement within quality management systems through action research in automotive industry. The relationship between energy consumption and overall equipment effectiveness for improving manufacturing systems' productivity was also presented. Some authors dealt with the investigation of sustainability of a high-energy consuming industrial process to achieve total quality. Also, the LCA methodology applied to the realisation of a domestic plate and the confrontation among the use of three different raw materials was presented. Authors addressed the management of environmental driven change within manufacturing organisations and the way to move from reactive to proactive behaviour. The concept of sustainability was also faced developing a theoretical model for engineering educational institutions as well as the impact of renewable energy systems on local sustainability.

To conclude this special issue faces different aspects and topics related to sustainability from different points of view and can contribute in increasing the knowledge on this wide and up to date topic.