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Quality 4.0 transition framework for Tanzanian manufacturing industries

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Abstract

Purpose – This research aimed at developing the Quality 4.0 transition framework for Tanzanian manufacturing industries.

Design/methodology/approach – The survey method was used in this study to gather practitioners' perspectives. The approach included open-ended and closed-ended structured questionnaires to assess respondents' perceptions of Quality 4.0 awareness and manufacturers' readiness to transit to Quality 4.0. The study's objective was to adopt non-probability and purposive sampling strategies. The study focused on fifteen Tanzanian manufacturing industries. The data were analysed qualitatively and quantitatively using MAXQADA 2020 and Minitab 20 software packages, respectively.

Findings – The study demonstrated a high level of awareness of Quality 4.0 among Tanzanian manufacturing industries (i.e. 100% in Quality 4.0 traditional attributes and 53% in Quality 4.0 modern attributes). Individuals acquire knowledge in various ways, including through quality training, work experience, self-reading and Internet surfing. The result also revealed that most manufacturing industries in Tanzania use Quality 3.0 or a lower approach to manage quality. However, Tanzanian manufacturing industries are ready to embrace Quality 4.0 since practitioners are aware of the concepts and could see benefits such as customer satisfaction, product improvement, process and continuous improvement, waste reduction and decision support when using the Quality 4.0 approach. The challenges hindering Quality 4.0 adoption in Tanzania include reliable electricity, high-speed Internet and infrastructure inadequacy to support the adoption, skilled workforces familiar with Quality 4.0-enabled technologies and a financial set-up to support technology investment. Moreover, the study developed a transition framework for an organisation to transition from traditional quality approaches such as quality control, quality assurance and total quality management to Quality 4.0, a modern quality approach aligned with the fourth industrial revolution era.

Research limitations/implications – The current study solely looked at manufacturing industries, leaving other medical, service, mining and construction sectors. Furthermore, no focus was laid on the study's Quality 4.0 implementation frameworks.

Originality/value – This is probably the first Quality 4.0 transition framework for Tanzanian manufacturing industries, perhaps with other developing countries.

Keywords Quality 4.0, Transition framework, Quality 4.0 framework, Industry 4.0, Manufacturing industries, Tanzania

Paper type Research paper

1. Introduction

Industrial technologies evolved from the first industrial revolution (1st IR) due to the invention of water and steam power and mechanical weaving loom in the 18th Century (Souza *et al.*, 2021; Taifa *et al.*, 2021a, b). It was followed by the second IR in the 19th Century, which

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