Framework and Strategies Supporting IR 4.0 for Sustainable Manufacturing: A Way Forward

Md Raziff Zainal Abidin

Muhamad Zameri Mat Saman\*

Nor Hasrul Akhmal Ngadiman

School of Mechanical Engineering, Faculty of Engineering University Technology of Malaysia

\*zameri@utm.my

ABSTRACT

The IR 4.0 involves challenges that all stakeholders must address so that this transition to recent industrial technologies is optimally implemented at all stages. This digital revolution also refers to the more intelligent and efficient technological developments in manufacturing sectors. This accelerated technological change requires sustainable and broad planning by each party involved including national policy makers to support the commercial revolution and to fully employ IR 4.0. The purpose of this organized review is to identify and facilitate an understanding of IR 4.0 concepts as well as its design, enablers, drivers and sustainability in the context of its integration in sustainable manufacturing. The mapping of existing practices highlight the research gaps and possibilities. The conceptual framework which was formed based on the technological pillars of IR 4.0 is used to measure sustainable manufacturing, previously identified opportunities, and aspects of sustainability, as well as guide the systematic analysis. However, the analysis of gaps and opportunities to advance the field of research has become more sophisticated and thus require further contribution to complete the development of the IR 4.0 in sustainable manufacturing in the economic, environmental and social dimensions.

Keywords: IR 4.0, sustainable manufacturing, intelligent and efficient