

Taguchi Methods (TM) And the Internet of Things (IoT) In Additive Manufacturing (AM): A Brief Literature Review

RRK Sharma

Department of Industrial and Management Engineering,
IIT Kanpur 208016 India
rrks@iitk.ac.in

Vinay Singh

ABV-IITM Gwalior, India
vinaysingh.iitk@gmail.com

KK Lai

President, CYUT Taiwan
laikk.tw@gmail.com

Abstract

Additive manufacturing (Wiki on 3-D printing) is an emerging manufacturing technology that needs to be perfected before it can start delivering. It is a game changer. It is planned that the AM printer will be kept in the customer's premises and will receive instructions head office over IoT (Wiki on IoT) for printing layer by layer and the job will be done before the eyes of the customer. It has been proposed in the literature that for optimal performance of AM printing Taguchi Methods (Wiki on Taguchi Methods) can be used for parameter optimization. If AM is deployed for customization, then experiments (and generating required sampling points) is likely to be costly. We touch on a few AM-related organizational issues such as strategy (cost leader CL and differentiator DIFF). Finally, we give a few heuristics for scheduling jobs on AM machines.

Key Words:

Taguchi Methods, Internet of Things, and Additive Manufacturing

Prof. RRK Sharma: He is B.E. (mechanical engineering) from VNIT Nagpur India, and PhD in management from I.I.M., Ahmedabad, INDIA. He has nearly three years of experience in automotive companies in India (Tata Motors and TVS-Suzuki). He has 32 years of teaching and research experience at the Department of Industrial and Management Engineering, I.I.T., Kanpur, 208016 INDIA. To date he has written 1192 papers (peer-reviewed (389) /under review (22) / working papers 781 (not referred)). He has developed over ten software products. To date, he has guided 64 M TECH and 21 Ph D theses at I.I.T. Kanpur. He has been Sanjay Mittal Chair Professor at IIT KANPUR (15.09.2015 to 14.09.2018) and is currently a H.A.G. scale professor at I.I.T. Kanpur. In 2015, he received "Membership Award" given by IABE USA (International Academy of Business and Economics). In 2016 he received the "Distinguished Educator Award" from IEOM (Industrial Engineering and Operations Management) Society, U.S.A. In 2021, he received IEOM Distinguished Service Award. In 2019 and 2020, he was invited by the Ministry of Human Resources Department, India, to participate in the NIRF rankings survey for management schools in India. In 2019, he was invited to participate in the Q.S. ranking exercise for ranking management schools in South Asia.

Proceedings of the 5th European International Conference on Industrial Engineering and Operations Management Rome, Italy, July 26-28, 2022

Dr. Vinay Singh: He has earned his Bachelor Degree in engineering (Computer Science and Engineering) from RBS College Agra, Masters in Human Resource Development and Management from IIT Kharagpur and PhD in Management from IIT Kanpur. Currently he is working as Assistant Professor in the department of Management at ABV-Indian Institute of Information Technology and Management Gwalior, India since Nov 2012. So far he has 26 publications in peer review journals to his credit. He has supervised 92 Masters Students and guided 02 PhD theses. He has also earned two national patents in embedded products design and has developed three software packages. He has received 03 research project grants from prestigious agencies of India.

Prof. KK Lai: He is currently President of CYUT Taiwan. He has numerous publications to his credit.