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Uncovering the Barriers for Utilising Augmented Reality in a Supply Chain: A Literature Synthesis

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Abstract

One of the most groundbreaking innovations in the current digital era is Augmented Reality (AR). It is changing how people interact with the world. In real time, AR superimposes computer-generated content, including text, photos, sounds, and 3D models, onto a user's view of the outside world. This technology emerged as a valuable and workable tool only in the early part of the last decade (around 2010), with the development of mobile computing, sensors, and real-time rendering. It has been applied in gaming, education, healthcare, manufacturing, and retail due to the widespread use of smartphones, tablets, and wearable technologies. Similarly, its application in supply chain management (SCM) is slowly increasing, as it improves visualisation, real-time data fusion, and human-machine interaction. Recent literature has documented its use in the supply chain for warehouse management, inventory control, logistics and transportation, manufacturing and production processes, and equipment maintenance. However, the growth of AR applications in SCM is subdued due to various hindrances or barriers. In this paper, an attempt has been made to uncover the barriers to AR adoption through a literature synthesis. It was found that these barriers for AR can be categorised into multiple groups - such as technology barriers, organisational barriers, people-related barriers, etc. Uncovering and classifying these barriers can help managers overcome them by developing appropriate counter-measures. The academicians can use it to study the antecedents of these barriers, their relationship, impact, etc., using various theories, such as the Technology Acceptance Model (TAM), theories related to change management, etc. They can also validate these barriers in different industrial contexts using the case study approach and create a framework

by conducting survey-based research and analysing them using sophisticated statistical analysis such as factor analysis, cluster analysis and structural equation models.

Keywords
Augmented Reality, Supply Chain Management, Barriers, Literature Synthesis

Biographies
Dr. Anand Gurumurthy is a Professor in the Quantitative Methods and Operations Management area at the Indian Institute of Management (IIM) Kozhikode. He has about 22 years of teaching and research experience. He earned his Ph.D. in Lean Manufacturing and an M.E. in Manufacturing Systems Engineering from Birla Institute of Technology and Science (BITS) Pilani, Rajasthan, India. He also holds a B.E. in Mechanical Engineering from Sri Venkateswara College of Engineering, Chennai, India. His research interests include Operational Excellence (through Lean and Six Sigma, Total Quality Management, and Total Productive Maintenance), Humanitarian Supply Chains, and Benchmarking. Dr. Gurumurthy has received significant recognition, including the "Outstanding Professor in Lean Six Sigma" award from the IEOM Society International in 2021 and the "Dr. Theo Williamson Award" for an outstanding paper from the Journal of Manufacturing Technology Management. He is also on the editorial boards of the International Journal of Lean Six Sigma, Journal of Manufacturing Technology Management and International Journal of Quality and Reliability Management.

Dr. Bharti Ramtiyal, an Associate Professor in the Faculty of Management and Commerce at Poornima University, Jaipur, held various positions with other institutions, such as the Graphic Era University and the Jaipuria Institute of Management, before this appointment. She has a Ph.D. in Marketing from MNIT Jaipur. Her research spans diverse areas such as sustainable consumer behaviour, technology adoption among small businesses, the role of the metaverse in healthcare, and the sustainable supply chain dynamics of the dairy and apparel industries. Her scholarly work appears in notable journals such as Sustainability, Journal of Global Operations and Strategic Sourcing, and Electronic Commerce Research.

Dr. Gunjan Soni is an Associate Professor in the Department of Mechanical Engineering at the Malaviya National Institute of Technology (MNIT), Jaipur. His academic journey includes a B.E. from the University of Rajasthan, an M.Tech. from the Indian Institute of Technology (IIT) Delhi, and a Ph.D. from Birla Institute of Technology and Science (BITS) Pilani, Rajasthan, India. Dr. Soni has published over 100 papers in peer-reviewed journals on AI-based predictive maintenance, Industry 4.0 applications in supply chains, and sustainable circular economy solutions. His work has appeared in prestigious journals such as the International Journal of Production Economics, Annals of Operations Research, and IEEE Transactions on Engineering Management. He is also an Area Editor for the Operations Management Journal. His research contributions have garnered significant attention, with a Google Scholar profile showing over 5,000 citations. Dr. Soni's expertise is further recognised through his involvement in international projects that involved funding from the European Commission and the British Council.