

# **Integrated Lean Concept to Healthcare Delivery Framework for Urgent Care at Home**

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## **Abstract**

Reducing crowd volumes at Emergency Department (ED) of healthcare delivery system is a major concern to healthcare provider. One of the most promising option for doing so is to offer at-home healthcare delivery system, which we referred here as Urgent Care at Home (UCH). It can reduce the ED visits by patients with non-critical condition. In this research, we have considered an integrated lean concept to make UCH effective, efficient and reduce operating cost. To achieve this objective, first, we have designed a simulation model using ARENA 14.7 for UCH by considering its mechanism to assess its current performance. To study the feasibility of considering lean concept for UCH, we have incorporated the idea of value stream mapping (VSM) using electronic value stream mapping (eVSM). We compared the outcome of eVSM with the current system performance obtained from ARENA, and used Lean Six Sigma DMAIC to determine opportunities for improvement.

## **Keywords**

Urgent care at home, Healthcare delivery, Simulation, Value Stream, Six sigma.

## **Biography**

**Ali Al-Muflih** is a PhD student in the Department of Mechanical & Industrial Engineering at Northeastern University. He worked for Industrial Engineering department as a Teacher Assistant for about 12 months at King Khalid University (KKU) in Saudi Arabia. Currently, he is a faculty member at King Khalid University (KKU) in the Department of Industrial Engineering as a Lecturer. He received a full scholarship from the Ministry of Higher Education in Saudi Arabia to pursue his graduate degree. His research interest lies in the intersection of operations management and data analytics, in particular, as applied to healthcare delivery system framework, supply chain engineering and lean concepts. He also completed a M.Sc. degree in the Department of Mechanical & Industrial Engineering at Northeastern University (NEU) in 2015 and a B.Sc. in the Department of Industrial Engineering from King Khalid University(KKU) in 2011.

**Md Noor-E-Alam** is an Assistant Professor in the Department of Mechanical & Industrial Engineering at the Northeastern University. Prior to his current role, he was working as a Postdoctoral Research Fellow at Massachusetts Institute of Technology. He has completed his PhD in Engineering Management in the Department of Mechanical Engineering at the University of Alberta (UofA) in 2013. His current research interests lie in the intersection of operations research and data analytics, particularly as applied to healthcare, manufacturing systems and supply chain. Before coming to the UofA, he served as a faculty member (first as a Lecturer and then as an Assistant Professor) in the Department of Industrial and Production Engineering at Bangladesh University of Engineering & Technology (BUET). He also previously received a B.Sc. and M.Sc. in Industrial and Production Engineering from BUET.