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## Entropy in good manufacturing practices driven by innovative quality tool for pharmaceutical industry: New paradigm approach for manufacturing excellence and quality standards

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It has been customary to implement Good Manufacturing Practices (GMP) in pharmaceutical organizations as a systematic and comprehensive quality approach and sometimes by regulatory enforcement. In this scenario, determination of the obvious entropy/disorder arising during the implementation has not been taken care of yet. Therefore, this paper gives the basis for applying query and visual perception of GMP system driven visualization approach, particularly the Laplace equation, to the determination of disorder and deviation pattern inside the GMP system applied in the organization. In this study, a three-dimensional mesh approached with raw and intermediate input handled under GMP parameter is considered to produce high quality products with minimum entropy by adding the analogy wise different GMP parameters and process variables with Gauss Seidel iteration and thus producing visual picture of the entire system. The approximation involved in applying the concept in sterile drug manufacturing pilot plant. Using numerical technique and computer program, the Gauss Seidel iteration equations have been solved with appropriate GMP parameter and process variable. The result indicates that deviations vary over the GMP compliant system and that the process entropy affects the totality of disorderness. Implementation in GMP complaint drug development pilot plant confirm that the new method provides optimal manufacturing maintaining GMP and high product quality through the visual representation of the entire system and activity to bring into notice the deviations.

### Biography

Pradeep K Jha is a Senior Research Scientist at IIT Kharagpur and Visiting Faculty in JP Business School Meerut. He has completed MSc (Med Chem), MSc (TQM), PhD in Healthcare Management from Gautam Buddha Technical University Lucknow and EUROMA Summer Post-Doctoral Training in Global Operation Management in Hungary. He is Consultant and Member of IcubedG Ideas Pvt. Ltd., and SG ArtHeart Private Limited, respectively. He is Member of WABT France, EUROMA, ISSRF, SAI Professional Societies and Referee of several science and management journals. He has published 15 papers in international journals and presented more than seventy papers at national and international conferences.

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