The MKN Project: Knowledge retention and recovery in chemical manufacturing R&D

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Abstract

Chemical manufacturing companies are being challenged to retain and replace expertise during the “crew change” or industry-wide, generational turnover of professionals. The impacts of lost expertise are magnified in R&D groups that rely on experience and lessons learned to maintain a safe work environment when developing and testing new processes and products. Training, mentoring, and online information sharing sites are a partial solution for transferring information and experience, but novel approaches are being developed that accelerate and improve the retention, sharing, and recovery of both explicit and implicit expert knowledge, effectively reducing the time to competency for less experienced employees.

This paper introduces the Manufacturing Knowledge Network (MKN) method for improving safety by enabling expert knowledge sharing using an online, process-oriented, visual method. Real-world scenarios are presented in order to highlight how expertise impacts safety in chemical manufacturing R&D; and how safety incidents can be prevented by improving knowledge sharing and the transfer of lessons learned. Domain visualization examples show how understanding and communication are improved by visual representations that provide contextual information and functional relationships between domain elements.

For recovering and accessing external expertise, the MKN method includes how to access knowledge sources outside of the subject department or organization; so that retired or relocated experts, vendors, consultants, and academic institutions can contribute relevant knowledge to a given domain. The business value of this approach is discussed.

Keywords: Knowledge retention, knowledge recovery, human capital, mental model, visualization, knowledge network, process safety