

ABSTRACT

PT Mandiri Inovasi Bersama, a chemical manufacturer, still has problems in their current manufacturing processes that are still very manual, especially maintenance, quality control, and production scheduling. These manual methods lead to inefficiencies such as unexpected halts in production and time-consuming processes. To address these challenges this paper proposes to design a target enterprise architecture that harnesses the power of Generative Artificial Intelligence (GenAI) for enabling predictive maintenance, better process optimization, and quality control. The study was carried out following the Design Science Research (DSR) process and employed TOGAF ADM as the architectural framework and ArchiMate as the modeling language. This design covers the following phases such as Architecture Vision, Business Architecture, Application Architecture, and Technology Architecture towards an ability to integrate in real-time across intelligent systems. The proposed design was subjected to expert interviews and evaluated using the I-CVI and S-CVI/Ave. The assessment results indicate that the developed architecture is considered to be very valuable and useful in enabling business areas such as predictive maintenance, AI-facilitated quality control, as well as production efficiency. This architecture provides a solution for how to bring order and efficiency to chemical manufacturing processes with decreased time-consuming process, with the advantages of GenAI for chemical manufacturing processes.

Keywords: Generative AI, enterprise architecture development, TOGAF ADM, manufacturing process.