

Abstract in English

This project aims to modernize a brownfield machine operating under conventional control systems by upgrading it to an Industry 4.0 compliant automation system using Programmable Logic Controllers (PLCs) and advanced industrial technologies. The implementation took place at Al-Quds Pharmaceuticals Company in Ramallah, Palestine, with the main goal of enhancing manufacturing efficiency through real-time data collection and analysis.

The transformation improves production quality, reduces operational errors, and optimizes maintenance processes, thereby minimizing downtime. Furthermore, the system provides flexibility for future upgrades and scalability to meet evolving market demands while ensuring compliance with international quality standards. This project represents a practical step toward advancing the pharmaceutical sector in Palestine and highlights the potential of automation in related industries such as food processing and cosmetics manufacturing.