

# CRACKING THE CODE



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## OPTIMISATION IN CHEMICAL PLANTS

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In recent years, optimisation has gained a significant amount of attention as businesses are exploring various avenues to utilise resources efficiently and effectively, whilst maximising performance and minimising costs. During various stages in the design and operation of chemical plants, different optimisation modelling platforms are used to obtain the optimal operating conditions, design parameters, conversions, yields, recovery rates and profits, as well as minimise operating and maintenance costs. These platforms include MATLAB and Python, or process simulators such as Aspen Plus, Hysys, ChemCAD, etc. However, optimisation is not limited to chemical plant equipment and may be used to optimise plant personnel performance, which will ultimately improve the overall plant performance and financials.

SAIYL executed a plant optimisation project whereby Process and Industrial engineers analysed the process and plant personnel structure, and applied various tools and techniques to optimise the performance of the

plant and improve the overall production capacity.

Time and motion analyses were conducted to observe, measure, and analyse various tasks performed by the plant personnel. The durations and tasks observed were then modelled into FlexSim 3D Simulation Modelling and Analysis Software. FlexSim is a state-of-the-art modelling simulation used to simulate, analyse, visualise, and test real-time scenarios for any type of project or challenge. The software produces quick and reliable results, which can thereafter be applied practically. In this project, various scenarios were modelled into FlexSim 3D Simulation Modelling and Analysis Software and were compared against a base model to identify the bottlenecks in the process.

In essence, simulation modelling software is an extremely valuable tool in the optimisation of chemical plants, to virtually explore potential changes to the system that may be physically impossible to implement due to plant downtime, damage to equipment, safety risks, time constraints and raw material wastage.