While all the current focus is on Manufacturing 4.0 it should be acknowledged that many initiatives have been implemented across industry sectors over the past 15 years. Initiatives such as the Six Sigma business and Lean Manufacturing business improvement strategies helped lay the foundations and innovative thinking that would facilitate more advanced analysis and control systems to in manufacturing facilities. In particular, the semiconductor manufacturing industry has been at the forefront of data system innovation for two decades. Through continuous improvement programs there was a clear understanding that real value lay in the data collated from processing steps, manufacturing equipment, manufacturing execution systems and measurement systems.

This talk will demonstrate how data driven decision making is not a new concept, more an evolving one that has gained significant traction as new and emerging technology and data systems have been developed. A short introduction will provide an overview of how simple business improvement techniques identified solutions that would replace some simple computational tasks. The second section of this talk will highlight how industrial practice evolved to capture subject matter expertise within rule based control systems. This knowledge was then augmented with other automated factory systems to make real time process control a reality. The final section of the talk will demonstrate how the dawn of new advances in machine learning and computational systems has enabled a rapid growth of advanced analytics within current manufacturing environments. Covering descriptive and predictive analytics, the final section will review how further advances in cognitive analytics is being implemented within current manufacturing control systems to move beyond simple tasks to more complex automated solutions.