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**The Development and Testing of a Contextual Model for
Healthcare Quality Improvement using Lean and the
Model for Understanding Success in Quality (MUSIQ)**

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requirements for the degree of**

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Abstract

This study developed a new theoretical model of quality improvement (QI) contextual factors, for QI activity undertaken at the healthcare microsystem level. The *Model for Understanding Success in Quality* (MUSIQ) (Kaplan, Provost, Froehle, & Margolis, 2012), was aligned with Lean improvement activity using the Toyota Way framework. The aim of the research was to improve the effectiveness of healthcare quality improvement initiatives by providing more understanding of the associations, relative importance and precise functioning of critical contextual factors. A new survey instrument, based on the literature, was developed to collect data and the hypothesised theoretical relationships were tested using the partial least squares path modelling (PLSPM) technique.

QI practitioners at a large New Zealand District Health Board were surveyed on a range of contextual factors hypothesised to influence improvement outcomes. All survey participants had recently completed a small-scale improvement project using Lean, or were participants in training programmes that introduced them to Lean thinking and methods. Some participants worked autonomously on improvements of their own selection; others were part of a wider training programme derived from the National Health Service's (UK) 'productive ward' programme. In the healthcare organisational context, the majority of these improvement initiatives were carried out at the microsystem level – initiated and delivered by the teams responsible for the work processes being modified.

Survey responses were first analysed via principal components analysis (to examine the dimensionality of the scales) and then PLSPM. The defined contextual factors for 'Teamwork', 'Respect for People', 'Lean Actions' and the influence of negatively motivating factors all reached significance. Defined contextual factors for 'Previous Experience' and the influence of positive motivating factors did not reach significance at 5% level. The final model showed a statistically significant, moderate predictive strength, with an overall adjusted R^2 of 0.58. This result was an encouraging validation of the microsystem-level layer of the MUSIQ model using Lean as the QI method (context). The relative influence of 'Teamwork', 'Respect for People', 'Motivation', and a mediating mechanism for making process changes (in this instance, Lean) were measured and found to be consistent with the MUSIQ model. Identifying more detailed causal mechanisms (the present model was intentionally parsimonious due to the time

frame allowed and the resources available for the research), refining the operational definitions, and developing and testing predictive models for the defined contextual factors are the proposed next steps in the research.

List of Acronyms

AVE	Average Variance Extracted
BEF	Business Excellence Framework
CBSEM	Covariance Based Structural Equation Modelling
CDHB	Canterbury District Health Board
CFIR	Consolidated Framework for Implementation Research
CI	Continuous Improvement
CSF	Critical Success Factor
DHB	District Health Board
HR	Human Resources
MOH	Ministry of Health (New Zealand)
MUSIQ	Model for Understanding Success in Quality
NHS	National Health Service (United Kingdom)
PCA	Principal Components Analysis
PCR	Principal Components Regression
PLSPM	Partial Least Squares Path Modelling
QI	Quality Improvement
SEM	Structural Equation Modelling
TPS	Toyota Production System
TW	Toyota Way

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