

**A conceptual model for the  
successful deployment of  
Continuous Improvement – e.g.  
Lean Six Sigma**

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- Why this research?
- Background to the conceptual model
  - Quantitative research study in a hospital
  - Qualitative research on 4 case studies
- The Model
  - Literature review for model constructs
  - Data collection
- Challenges and future research opportunities

- Early 1990s TQM Flop - maybe??
- Six Sigma 1987 and onwards in mfg – reinvented
- BPR in the 1990's – still going
- Lean (no Six Sigma) from 1990 – mostly in SME's
- Lean Six Sigma (LSS) 2003 onwards
- Application in all non mfg sectors with initial focus on lean for low hanging fruit
- 2000s – Certificate IV in Competitive Manufacturing with Lean/Six Sigma emphasis
- LSS Abandoned by some large scale organizations

An example of a deployments  
varying over time

Automotive Paint

Manufacturer





Using a questionnaire with likert scales to collect data from senior managers in a Hospital in Melbourne we identified the following success factors for ease of patient access:

1. Training
2. Closer relationships with suppliers
3. Process focus
4. Measurements
5. Organizational structures
6. Zero defects mentality

*Article TQM and Business Excellence* **19**(9): 1-16 (Roger Hilton, Amrik Sohal, Margaret Balla)

Using semi structured interviews and action research to collect data from various managers responsible for the deployment of and projects in Continuous Improvement (variations of Lean Six Sigma) we identified the following success factors :

Cases were IT services, Large Bank, Medium sized Mfg, Smaller MFG in Auto SC

*Article Lean Six Sigma Special Edition (Roger Hilton, Amrik Sohal)*



# CSFs in Improvement Programs



CRITICAL SUCCESS FACTOR	IT Large	Bank Large	Med Mfg	Small Mfg	Hosp.	Cat .
No branding of program	X	X	X	X	X	CSF2
CEO leadership & Mgmt Commitment	X	X	X	X	X	CSF1
Line management drive			X	X	X	CSF1
Training in DMAIC	X	X	X	X	X	CSF3
Reward process			X	X	X	CSF2
Funded training			X	X		CSF1
Coaching process to follow up on training		X	X	X		CSF3
Building skills across the organisation	X	X	X	X	X	CSF3
Improvement is accepted as part of the culture	X	X	X	X	X	CSF2
Improvement initiative shared – cust. & suppl.			X	X	X	CSF1 & 5
Existence of a Cont. Improvement Facilitator				X	X	CSF1
Selection of projects	X	X	X	X		CSF4
Project focus	X	X	X	X		CSF4
Data focus	X	X	X	X	X <sup>•7</sup>	CSF5

The critical success factors from the cases can be linked to the following broad factors

<b>CSF1</b>	<b>Factors relating to leadership, communication, behavior and awareness of the CI program</b>
CSF2	Factors relating to policies, culture and organizational support and strategy
CSF3	Factors relating to education, training and competency of the Six Sigma experts
CSF4	Factors relating to project improvement teams
CSF5	Factors relating to performance evaluations based on quality criteria, information systems, data and measurement



# Competence of the Black Belts

Literature review suggests the following

Competency	Antony	Pyzdek	Byrne	Defeo	Hoerl	Porras	Technical (T)	Interpersonal (I)
Effective communicators	✓	✓			✓			✓
Change Agent and influence skills	✓	✓	✓					✓
Customer advocates	✓							✓
Project team mgt, facilitators, leaders, able to create learning	✓	✓	✓	✓	✓	✓	✓	✓
Results-driven mindset	✓		✓				✓	
Positive thinkers	✓							✓
Mathematical, statistical, analytical skills		✓	✓	✓	✓		✓	
Data driven		✓					✓	
Logical thought, problem solving capability		✓				✓		✓
Attitude		✓						✓
Strategic level knowledge			✓				✓	
Cross functional skills			✓				✓	
Process, finance orientation				✓			✓	
Desire for high level mgt positions				✓				✓
Committed to continuous learning					✓			✓
Self Awareness						✓		✓
Interpersonal competence						✓		✓

# Competence of the Master Black Belt

Literature review suggests the following

<b>Technical</b>	
1	Is able to develop implementation strategy
2	Is able to coach staff at all levels
3	Is able to coach project improvement leaders in advanced statistics
4	Is able to create training programs for the organization
5	Has an ability of obtaining and allocating resources
6	Is able to coordinate multiple projects across the organization
<b>Interpersonal</b>	
1	Is influential at getting buy in from all staff
2	Has equal influence to the leadership team members
3	Is able to step into a project leadership position if necessary

## Role of the CI Deployment leader

Some research in Quality management suggests that the influence level of the role of the CI deployment facilitator is important (extrapolating to Master Black Belt)

	Category	Example
1	Very high influence	Senior position on leadership team
2	High Influence	Improvement management responsibility across the organization
3	Average Influence	Business Unit responsibility/Middle management position
4	Low Influence	Department position
5	Very low influence	Analytical role

Lean Six Sigma deployment success is defined by

1. Deployment maturity – organizational level
2. Project Success – project level

## Deployment maturity is (from the literature)

1. The “Launch” is the starting point wherein an initial few visionaries in the organization launch Six Sigma, training is initiated and projects begin
2. The “Early Success” is where the initial projects are yielding results and early successes are being achieved
3. The “Scale Replication” stage is where the early success has led to other parts of the organization buying into Six Sigma and a broader launch of projects is underway
4. “Institutionalization” is where projects are yielding broad based financial impact throughout many parts of the organization
5. “Culture Transformation” is where Six Sigma is part of the organizational DNA, financial impact is sustained and the Six Sigma culture is pervasive – even beyond the Six Sigma practitioners and beyond the organization boundaries

# Project Success is (from the literature)

1. Impact on overall quality; responsiveness; process efficiency and cost reduction
2. Adherence to project schedule

We propose that there is a relationship between the successful deployment of Lean Six Sigma and the six explanatory variables:

- 1.The technical skills level of the deployment facilitator
- 2.The interpersonal skills level of the deployment facilitator
- 3.The level of influence of the deployment facilitator
- 4.The technical skills of the improvement project leaders
- 5.The interpersonal skills of the improvement project leaders
- 6.The organizational competence measured by the adherence to the various critical success factors

# Survey

- Respondent is the Master Black Belt or deployment facilitator of Lean Six Sigma or equivalent
- 120 deployment facilitators
- Aim: To develop a predictive model for Lean Six Sigma deployment success



## Statistical

1. Sample size
2. Some companies have abandoned their Lean Six Sigma program
3. Small and medium sized companies don't have the structure of CI like the large companies
4. Testing for explanatory significance; which constructs are better representative of each factor?

## Practical

1. If there is weakness in one factor is this crippling for sustainable CI?
2. Can strength in one construct of a factor balance weakness in another in practice?
3. Can we use this model to diagnose problems with a Lean Six Sigma (or CI) program?



1. Mail House

2. Pharmaceutical Dose Mfg &  
Pharmacy Retailer



**Finally**



- Do you want to be a respondent in a Lean Six Sigma (CI) survey about this?
- If yes, email me on [sixsigmastrategies@aapt.net.au](mailto:sixsigmastrategies@aapt.net.au)

THANKS!

