

## The Role of Organisational Climate in Readiness for Change to Lean Six Sigma

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Climate Dimensions	Mean	SD	Range
Challenge	378	90	300
Freedom	370	97	400
Idea Time	371	86	400
Dynamism	278	115	400
Idea Support	371	105	400
Trust / Openness	303	112	400
Playfulness / Humour	348	89	400
Conflict	337	108	400
Debate	342	100	400
Risk-Taking	354	100	400

Table 1: Descriptive Statistics of Organisational Climate Scores

## The Role of Organisational Climate in Readiness for Change to Lean Six Sigma

### Abstract

**Purpose:** This study examines the role of organisational climate in readiness for change with particular focus on Lean Six Sigma (LSS). The main aim is to develop and operationalise an instrument to measure organisation climate to determine the organisational readiness of the Kenya Institute of Management (KIM) to progress to the next stage of the Lean Six Sigma (LSS) implementation lifecycle.

**Methodology:** A case study outlining the KIM journey to LSS is described. A quantitative survey was developed based on the ten organisation climate dimensions discovered by Ekvall (1983) and redefined by Lauer (1994). This was then used to measure the climate of the case study organisation. Data were analysed to determine individual perceptions of the climate dimensions within KIM. The average score for each dimension was used to determine overall organisational performance and hence readiness for change.

**Findings:** The generally positive scores across each dimension of the survey indicate that the KIM climate is ready for the next stage of its Lean Six Sigma implementation lifecycle although there may be some isolated pockets (individuals or groups) of resistance to change. However, the range of scores on each dimension indicates that there is disagreement within the survey group about the overall organisational climate.

**Limitations:** The response rate to the climate survey questionnaire was only two-thirds of the total staff at KIM Headquarters and approximately one-fifth of all staff. The views of non-respondents are therefore not known and this may bias the results.

**Practical Implications:** Since climate influences readiness for change it is essential that an organisation can measure it to ensure their environment is conducive to the implementation of

change generally and Lean Six Sigma particularly. The developed questionnaire is easy to use, easy to analyse and easy to interpret making it an ideal climate measurement instrument.

**Originality:** Previous papers on Lean Six Sigma concentrate on organisational culture rather than climate as a success factor for Lean Six Sigma implementation. This paper addresses that omission.

**Keywords:** Organisational climate, readiness for change, sustainability.

1. Introduction

In order to compete in today's global markets by offering products and services of the required quality, and at a price customers are prepared to pay, organisations must strive to continually improve their offerings. Two of the most popular methodologies for improving processes, products, and services, as well as increasing operational efficiency and effectiveness are Lean and Six Sigma. More recently, because these improvement methodologies were unable, individually, to solve all of their problems, many organisations have adopted hybrid programmes by, for example, integrating Lean and Six Sigma into what has become known as Lean Six Sigma. (Albliwi, *et al.*, 2014; Drohomerski, *et al.*, 2014).

However, despite the many reported success stories in academic journals not all organisations have gained the levels of benefits they expected from LSS implementation. The extant literature now cites some spectacular "failure rates" of Lean, Six Sigma and Lean Six Sigma initiatives. Between 60% and 70% of all continuous improvement initiatives fail to achieve the results expected of them (Ringen and Holtskog, 2011) and 70% of organisations implementing Lean have failed (Pedersen and Huniche, 2011). Six Sigma has reported similarly poor success rates (Albliwi *et al.*, 2014). Clearly successful Lean and Six Sigma implementation is proving problematic in many organisations despite the fact that there are step by step approaches to project improvement. For example, Lean has the six phase DRIVER approach (Define, Review, Investigate, Verify, Execute and Reinforce) (Oakland and Marosszeky, 2017). However, there is no standard organisation-wide Lean implementation process

/ framework. (Bhamu and Sangwan, 2014). Six Sigma also has a step by step project implementation process – DMAIC (Define, Measure, Analyse, Improve and Control). However, unlike Lean, there is a five stage organisational implementation process for six sigma (Gygi *et al.*, 2005). It is a reasonable assumption to make that what works for Six Sigma implementation will work for Lean Six Sigma implementation. This implementation process is the focus of this paper.

The 5 distinct stages of the Gygi *et al* (2005) implementation process are:

- Stage 1 – Initialize – is about preparing and planning for deployment;
- Stage 2 – Deploy – is about selecting, training and resourcing staff. Once trained, improvement projects should be selected and people assigned to them;
- Stage 3 – Implement – is about implementing projects and improving performance across financial and non-financial areas;
- Stage 4 – Expand – is about expanding the scope of the initiative to include other areas of the organisation and business;
- Stage 5 – Sustain – the initiative becomes embedded in the organisation and moves from a project orientation to a process orientation where the Lean Six Sigma tools support the improvement of business operations.

Each of the five phases has a set of prerequisites for success before advancement to the next phase.

Each of the phases requires changes to be implemented. The biggest change will come between stage 3 and stage 4, when organisation-wide roll out of Lean Six Sigma occurs. Unfortunately, approximately 70% of change initiatives fail (Balogun and Hailey, 2004; Pellettiere, 2006). Jadhav *et al* (2014) identified 24 barriers to Lean implementation including lack of senior management involvement, workers' resistance, and cultural difference. Bhamu and Sangwan (2014) identified a number of critical success factors for implementing Lean in SMEs including leadership and management, a performance evaluation system, and the culture of the recipient organisation. In a

study of SMEs in the USA, Zhou (2016) found that the biggest challenges faced by organisations implementing lean included lack of willingness from management and company culture changes. Albliwi (2014), in a review of the extant literature, identified 34 critical failure factors of Lean Six Sigma implementation including lack of top management commitment and involvement, lack of training and education, and resistance to culture change. Interestingly in developing countries the main barriers to Six Sigma implementation were issues related to culture and resistance to change (Aboelmaged, 2011). In healthcare Radnor and Boaden (2008) identified the main challenges for successful Lean implementation as including organisational readiness and embedding a culture of continuous quality improvement. The implementation of Lean, Six Sigma and Lean Six Sigma involve radical change for many organisations. How individual employees will respond to such change depends on their perception of the organisation’s climate (Gaddis *et al.*, 2003). So for that change to take hold and succeed the barriers to change and the forces resistant to change need to be identified and understood. In other words, organisational change readiness must be assessed as these readiness factors will allow an organisation to determine whether its current situation is favourable for implementing improvement initiatives (Al-Balushi *et al.*, 2014). Failing to ensure organisational and individual change readiness may result in senior management spending a significant amount of time and energy dealing with resistance (Jadhav *et al.*, 2014). Indeed Armenakis *et al.* (1993) suggested that it would be useful for organisations to assess their readiness for change (RFC) before beginning any change processes.

The main aims of this paper therefore are to:

1. Define “readiness for change”, “organisational culture” and “organisational climate” and examine the relationship between the three concepts.
2. Determine the influence of organisational climate on readiness for change.
3. Develop an instrument to measure organisational climate.

4. Operationalise that instrument in the Kenya Institute of Management to determine their readiness to move from LSS implementation stage 3 (their current level) to implementation stage 4.

## 2. Readiness for Change

The management literature discusses change at the individual, group and organisation-wide levels (Madsen *et al.* 2006). Al-Haddad and Kotnour (2015) define change methods as “the actions carried out by managers to deal with change”. In their review of the organisational change literature, they identify two categories of change methods: change management methods and systematic change methods. The latter involves using processes and tools to aid management to make a series of start, stop and continue decisions (Zook, 2007). Lean and Six Sigma are considered systematic change methods and are such involve large-scale organisational change (Al-Haddad and Kotnour, 2015). Such change cannot be successful unless individual change takes place and this cannot happen unless individual employees are ready for it (Cunningham *et al.*, 2002). Armenakis *et al.* (1993) define readiness for change as “the cognitive precursor to the behaviour of either resistance to, or support for, a change”. Stevens (2013) believes that establishing whether an organisation is ready for change is one of the key factors in determining whether the change will be successful. Susanto (2008) goes further by deeming it a critical factor for successful change implementation. For an organisation to be ready individual employees should be open, prepared and ready for change (Eby *et al.*, 2000). Employees either embrace or resist change therefore, it is important to assess each individual’s readiness perceptions before the change is attempted (Holt *et al.*, 2007; Susanto, 2008). The organisation should be change ready before implementing any change (Todnem, 2007). Readiness can be determined by looking into what are known as readiness factors (RF) (Antony, 2014). He defines readiness factors as “essential ingredients which will increase the probability of success of any CI initiative before an organisation invests its resources heavily on the initiative”. Al-Balushi *et al* (2014) define readiness factors as “any practice or characteristic that aids an organisational transformation by eliminating or nullifying possible inhibitors for success or providing

the knowledge and capabilities required to succeed in establishing change”. Radnor (2010) believes that it is the RFs that determine if the organisation will allow Lean Six Sigma to be a catalyst to change the culture of the organisation. It is organisational culture that is discussed next.

**3. Organisational Culture**

Understanding culture is not easy (Barker, 1994). The literature recognises two types of culture: national culture and organisational culture. A number of studies over the years have examined the impact of national culture on Total Quality Management (TQM) implementation (Tata and Prasad, 1998; Lagrosen, 2002;2003; Kumar and Sankaran, 2007) and concluded that national culture, as defined by Hofstede’s (1980) dimensions influenced the implementation of TQM in various countries. There is a growing body of literature (see for example, Pisani, *et al.*, 2009) that believes that national culture may be having a similar influence on Lean Six Sigma implementation. Lean was created in Japan and Six Sigma in the USA and as such the methods used and the way they are implemented reflects the Japanese and US cultures. So, it is argued Lean Six Sigma may not translate easily into other national cultures. However, mainly due to the successes of Toyota, who have successfully introduced their Lean production system (Toyota Production System – TPS) world-wide, organisational culture is now considered more influential than national culture. Organisational culture is defined as the organisation-wide (Bates and Khasawneh, 2005) shared assumptions (Ashforth, 1995) regarding the deep rooted beliefs, values, norms and traditions of an organisation (Denison, 1996; Ekvall, 1996). It is because of this deep rooted nature that culture is hard to change (Pellettiere, 2006). These existing beliefs and values may or may not support Lean Six Sigma implementation (Lertwattanapongchai and Swierczek, 2014).

A quality-driven culture is a prerequisite for the successful implementation of any quality philosophy (Psychogios and Tsironis, 2012) and indeed a quality culture has been identified by many researchers as a critical success factor for Lean Six Sigma implementation (Assarlind and Aaboen, 2014; Zhou, 2016). This quality culture must emphasise continuous improvement and customer satisfaction.



Although 70% of change initiatives fail, the statistics for cultural change in an organisation are even worse with Smith (2002) reporting that the median success rate for cultural change is 19%, which converts to a failure rate of 81%. The main reason cited for this high failure rate was the lack of internal analysis of an organisation's culture and climate prior to initiating any changes – in other words was the organisation ready for change? This has led to a large amount of research aimed at identifying Lean Six Sigma implementation critical success factors in countries and industries. For example, Antony *et al.* (2008) in UK manufacturing Small-to-Medium sized Enterprises (SMEs), Alsamadi (2012) in Saudi Arabia, Jayaraman *et al.* (2012) in electronic manufacturing services industry in Malaysia, Psychogios and Tsironis (2012) in the airline industry, and Timans *et al.* (2012) in SMEs in the Netherlands. Without exception these studies identified organisational culture as a critical factor to successful implementation. Not one study mentioned organisational climate. Climate is examined in the next section.

#### 4. Organisational Climate

Mahal (2009) believes that organisational culture and climate are distinct but interrelated. Sopow (2007) calls that distinction "subtle yet vital". Organisational climate is inferred by its members (Schneider *et al.* 1996) and is their shared perceptions (Ashworth, 1995) of the work environment (Joyce and Slocum Jr.1984). These perceptions are based on the day-to-day practices, procedures and policies as well as the behaviours that are rewarded and supported (Schneider *et al.* 1996). Denison (1996) called these "surface level manifestations". It is the individual employee's perception of climate that establishes the day-to-day norms regarding acceptable behaviour (Gaddis *et al.* 2003) and that influences how they will respond to, amongst other things, change (Bates and Khasawneh, 2005). Isaksen *et al.* (2000) distinguish between psychological climate, which is an individual's perception of day-to-day practices and patterns of behaviour, and organisational climate, which are the aggregated perceptions of those individuals. They argue that climate is distinct from culture and is more directly observable within the organisation. Gaddis *et al.* (2003) define climate as the

“shared normative expectations regarding social interactions and other work behaviours”. McMurray and Scott (2013) identified 5 dimensions relating to climate which are trust, support, recognition, fairness and innovation. They found that within an academic environment in particular, that employees were more sensitive to organisational climate and that it should be improved to ensure that any barriers to participation were removed.

5. The Relationship between Readiness For Change, Culture and Climate

Climate is a more tangible concept than culture. In order to communicate culture change an organisation must focus on the more tangible climate, i.e. changing the practices, policies and procedures that impact the beliefs and values that guide the actions of employees. Basically, a change of culture occurs when employees start to behave differently due to a change in the organisational climate (Amnis, 2012). For example, do employees believe in innovation, risk-taking or quality? An organisation can create climates for each of these and the climate communicates what is to be believed and valued – and these beliefs and values constitute the organisation’s culture. Therefore changing the practice (climate) of rewarding quantity of output to rewarding quality of output makes employees believe that the management values quality (culture) (Schneider *et al.*, 1996). Indeed Schein (2010) argues that changing work procedures, policies and rewards systems will influence changes in employees’ behaviours and in turn, influence climate. Clearly an organisational climate can prevail that either encourages or discourages the ability to instigate change. Therefore the present state of an organisation’s climate is linked to its readiness for change (RFC).

McNabb and Sepic (1995) introduced a model that identified the relevant factors that determined RFC for an individual and organisations. These factors included organisational culture, organisational climate, organisational policies and organisational performance outcomes. Bouckennooghe *et al.* (2009) identified enablers of RFC as the climate of change and the process of change elements. Indeed they went so far as to suggest that these two components could “make or break” readiness

for change. Given this pre-eminent role of climate in determining the success or failure of any change initiative, it would be useful if some method existed for assessing organisational climate to determine an organisation's readiness for change and so determine in advance the chances of success or failure.

## 6. Assessing Organisational Climate

A number of researchers have identified the key dimensions of climate. Litwin and Stringer (1968) defined organisational environment in terms of 9 climate dimensions: Structure; Responsibility; Reward; Risk; Warmth; Support; Standards; Conflict; Identity.

Schneider *et al.* (1996) identified 4 dimensions: The nature of interpersonal relationships; the nature of the hierarchy; the nature of work; and the focus of support and rewards.

Ekvall (1983) and Lauer (1994) identified 10 climate dimensions, which provided the conceptual basis for their Climate for Innovation questionnaire. It was developed from observing differences in how the working atmosphere in different Swedish companies affected the degree of participation in idea suggestion schemes. LSS is dependent upon the participation of many people at different levels of an organisation and projects can have an impact on multiple stakeholders. This impact is usually in the form of some kind of change, for example, changes to processes, changes to procedures that impact operators and managers, changes to inputs that impact suppliers and changes to outputs that impact customers (Kubiak and Benbow, 2009). For these changes to be successful it will require the cooperation and participation of those involved. Hence, the identified dimensions are relevant to LSS implementation readiness. The 10 dimensions are described below:

1. Challenge – to what degree are employees involved and committed to their work?
2. Freedom – do employees have autonomy with regards to how they design their work?
3. Idea time – are people given time to think through problems and how they could improve their work and performance?

- 4. Dynamism – are people positively energised by their work and the work environment?
- 5. Support – are people supported by management when they put forward new ideas?
- 6. Openness – is there trust between employees and employees and managers?
- 7. Playfulness – is the workplace relaxed and people able to laugh and joke with each other?
- 8. Conflicts – to what degree do people engage in interpersonal conflict?
- 9. Debates – to what degree are people able to conduct lively debates over contentious issues?
- 10. Risk Taking – is it alright to experiment with new things and fail?

The above 10 dimensions provided the conceptual basis for an Innovation Climate Questionnaire to assess whether the organisational climate would support improvement or undermine improvement. That questionnaire was adapted for use in this study to determine the organisational climate of the Kenya Institute of Management with regards to their readiness to advance to Stage 4 of the Lean Six Sigma lifecycle. Their journey on that lifecycle is briefly described below.

**7. The Kenya Institute of Management and Lean Six Sigma**

The Kenya Institute of Management (KIM) is a non-profit membership organisation which was established in 1954. KIM’s vision is to become a dynamic and internationally acclaimed centre of excellence for the development and dissemination of innovative ideas on the theory and practice of professional management. The institute has 220 staff members who are located at the head office in Nairobi, the capital city of Kenya; 19 other counties countrywide and also a branch in Kigali in Rwanda.

Implementation of the Lean Six Sigma initiative in KIM roughly followed the stages described by Gygi *et al* (2005). In Stage 1 the KIM senior management team were given an overview of the Lean Six Sigma deployment process and in 2012 formally committed to Lean Six Sigma. In Stage 2 the first candidates were selected and some trained to Lean Six Sigma Green Belt level and some to Yellow

Belt level. They were encouraged by senior management to identify opportunities within their departments and the institute for improvement so they could put their training to good effect. Teams were thus formed under the leadership of a Green Belt and short-term projects identified and selected that would hopefully lead to operational improvements that would in turn lead to increased customer satisfaction. In Stage 3 the first projects were implemented. These initial projects became part of the Belt training. A number of early successes from small projects were achieved. These successes have led to improved performance through reduced waste, improved productivity and increased customer satisfaction. The most successful project to be implemented through Lean Six Sigma was the "Optimal Utilization of Space" project.

This project was aimed at reducing the costs associated with having staff spread over multiple locations in Nairobi. As at 31st July 2016, this project had attained a cost saving of over 30 million Kshs (approx £200,000). There have also been several nonfinancial benefits realized. Firstly, there has been increased efficiency in operations. This is because all interrelated departments are now housed under the same premises and all consultations and face-to-face meetings are conveniently undertaken. Decision making is therefore faster which has led to increased customer satisfaction. Secondly, there is better utilization of time resource which used to be taken up travelling between locations.

KIM is now preparing to advance to Stage 4 of the Lifecycle where it will aim to expand their Lean Six Sigma initiative into new geographical and functional areas of their business. In order to do this successfully the organisational climate has to be conducive to this expansion. The next section of the paper reports the results of an organisational climate survey undertaken within KIM to determine if this is the case.

## **8 Method**

The study was conducted within the main office (HQ) of the Kenya Institute of Management (KIM). Data were gathered through a questionnaire distributed to all employees working there. Barker

(2008) reports that survey data can be used to derive organisational climate. The organisational climate survey was based on a questionnaire developed by Ekvall (1983) who identified 10 dimensions of organisational climate. The questionnaire consisted of 3 demographic items and 20 climate items. Each of the 10 climate dimensions was composed of two questions or statements rated on a five-point Likert scale ranging from 1=strongly disagree to 5=strongly agree with 3=neutral. All questions were written in short present-tense positive or negative statements directly referencing various elements of the subjects' work environment (climate) purported to support the implementation of continuous improvement principles and practices. These variables were used to conduct the statistical analysis. Examples of statements from two of the climate dimensions are shown below.

Dimension 6. Openness

Statement 1: the people I work with trust each other

Statement 2: the people I work with trust the motives of the managers.

Dimension 10. Risk Taking

Statement 1: the people I work with are prepared to experiment with new ideas.

Statement 2: the people I work with are prepared to take appropriate risks to implement changes.

**9 Results and Discussion**

The objective of the survey was to determine the organisational climate of KIM and to identify strengths and opportunities for improvement. Completion of the survey was voluntary and anonymous. Of the 70 surveys distributed 46 were returned giving a response rate of 66%. The statistical analysis showed that the 46 respondents consisted of 41.3% males and 58.7% females. The employees years of experience found 8.7% with less than 1 year, 71.7% in the range 1-5 years, 10.9% in the range 6-10 years and 4.3% with more than 10 years of experience. Employees position in the organisation were 6.5% Heads of Departments, 19.6% were Managers, 56.5% were Officers,

13% were Assistants and 4.3% were “other”. The overall reliability of the organisational climate dimension was checked and the computed Cronbach’s Alpha value was 0.983. Therefore it can be concluded that the data were reliable and valid for statistical analysis. The descriptive statistics for the various scores were calculated using SPSS v 22 and are given below in Table 1. KIM’s overall scores on the 10 dimensions were derived by taking the aggregate averages of their results for each dimension and multiplying this score by 100. All dimensions therefore have a theoretical range from 100 to 500 with higher scores indicating more favourable perceptions among respondents.

**Take in Table 1** (Table 1: Descriptive Statistics of Organisational Climate Scores)

Organisational strengths as perceived by staff are in the area of Challenge, Freedom, Idea Time and Idea Support. Schneider *et al* (1996) suggest that shared perceptions on, *inter alia*, support contributes to organisational climate, as do Litwin and Stringer (1968). Areas of weakness are perceived in the areas of Dynamism and Trust/Openness. Trust and support was two of the five dimension articulated by McMurray and Scott (2013). The wide range of scores for each dimension indicates that there is disagreement within the survey group as to perceptions of the organisational climate.

## 9. Conclusions

Readiness for change is often overlooked by management when implementing change initiatives. This is a mistake if management want to increase their chances of successful implementation. Organisational climate has been identified as an important enabler of readiness for change that can itself be altered in order to better facilitate intended changes. Surveys can be designed to measure organisational climate over a range of variables that can identify climate strengths and weaknesses so the necessary actions to improve those weaknesses in the work environment can be taken prior to implementation. This will facilitate acceptance and reduce resistance to change.

The organisational climate within the case study organisation has been found to be generally positive with all but one dimension scoring greater than 300 out of a possible 500. However, the wide range of scores in all dimensions indicates that not all staff have positive perceptions of the organisation's climate. This is potentially a problem for the organisation's senior management responsible for implementing change. Individuals or groups may resist the change attempts and so negatively impact the LSS roll out programme. As well as trying to change the mind-set of potential resisters, the senior management will also need to address the perceived weaknesses in climate identified from the survey findings. The results of this study can be used to design organisational interventions that will improve the quality of work life for the employees of KIM. Opportunities exist for improvement to every aspect of organisational climate measured in this study but priorities for improvement exist in the areas of Dynamism and Openness. These interventions will utilise senior management's time and energies but in the long run may lead to a successful LSS implementation.

**10. Implications**

Readiness for change is an important issue and organisational climate an important factor in determining that readiness. In order to determine climate it has to be measured and a survey instrument is a valid method of doing that. Organisations ignore their climate at their peril. Climate measurement will allow management to gauge the chances of success of their change initiative as well as help them to identify any areas where climate can be improved. This is good for management and good for staff whose perceptions are the key to successful change implementation.

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