Assessing Lean management transformation at Groote Schuur hospital using the CLEAR framework

A Research Report

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University of Cape Town

In partial fulfilment
of the requirements for the
Masters of Business Administration Degree

by

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8 December 2017

Supervised by: Dr Anton Grütter
PLAGIARISM DECLARATION

I know that plagiarism is wrong. Plagiarism is to use another’s work and pretend that it is one’s own.

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Jacobus van Zyl

8 December 2017
ACKNOWLEDGEMENTS

The journey of completing this MBA has been the most rewarding and fulfilling adventure I have ever embarked on. Looking back now, as I am sitting here just a few hours shy of the finish line, I can truly say that the sacrifices I had to make over the past two years was well worth it.

I would like to thank my parents, Gerrit and Anita, for their unwavering support and encouragement throughout my life, and especially the last two year. My partner, Pierre, for being able to keep up with my whims and moods, having taken care of so many of my responsibilities over the past two years, and having endured countless solitary weekends and holidays.

Dr Anton Grütter, without whom I would not have made it to the end of this dissertation, has been a phenomenal supervisor to work with. I cannot express my gratitude enough for the hours spent on Skype calls, the countless emails and ample face to face meetings he managed to facilitate with me. Also to the staff and management at Groote Schuur hospital for being friendly, accommodating and willing to participate in my research.

Lastly, to my classmates and especially the team of Modular Group 1 – you guys were amazing to work with and learn from.
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<th>Description</th>
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<td>CLEAR:</td>
<td>Centre for Lean engagement and research in Healthcare</td>
</tr>
<tr>
<td>GSH:</td>
<td>Groote Schuur Hospital</td>
</tr>
<tr>
<td>OPD:</td>
<td>Out-patient department</td>
</tr>
<tr>
<td>NHS:</td>
<td>National Health Service</td>
</tr>
<tr>
<td>AIR:</td>
<td>American Institute for Research</td>
</tr>
<tr>
<td>AHRQ:</td>
<td>Agency for Healthcare Research and Quality</td>
</tr>
<tr>
<td>GPS:</td>
<td>Groote Schuur Performance Measurement System</td>
</tr>
<tr>
<td>FMCG:</td>
<td>Fast moving consumer goods</td>
</tr>
<tr>
<td>IMU:</td>
<td>Information management unit</td>
</tr>
<tr>
<td>LIA:</td>
<td>Lean Institute Africa</td>
</tr>
<tr>
<td>RHT:</td>
<td>Refusal of hospital treatment</td>
</tr>
<tr>
<td>PDE:</td>
<td>Patient-day cost equivalent</td>
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ABSTRACT

Lean management in healthcare has been around for some years now, however, the body of rigorous research and knowledge about the successes and benefits of a Lean management philosophy in healthcare is still a new research strand. This study is focussed on assessing Lean management implementation at Groote Schuur hospital using the CLEAR framework in order to assess progress and organizational evolution towards Lean management.

The purpose of the research is explanatory in nature as it seeks to identify causal links between factors under deliberate control, and how that pertains to desired outcomes. Furthermore, the research aim was to assess a specific instance (Groote Schuur hospital) against an existing theory/process (CLEAR framework), therefore, a deductive approach was chosen.

The main research question: How effective has Lean management transformation been at Groote Schuur hospital, will be addressed by assessing the organization against the elements of the CLEAR framework.

This study will form one replication of the application of the CLEAR framework on a hospital setting and add to the body of more rigorous research on the complex phenomena of institutionalising a Lean management system in the healthcare context.

Keywords: Lean Management, Lean transformation, Lean in Healthcare, CLEAR Framework
1. INTRODUCTION

South African citizens are largely reliant on services and support from public hospitals and primary health care facilities – it is estimated that up to 80% of the population’s access to healthcare is exclusively through public services (Price, 2014). With the population growing steadily over the past 60 years, and the average life expectancy increasing (Statistics South Africa, 2016), there is increasing pressure on public health services to support the growing demand with limited available funding and resources. On the other end of the spectrum, private healthcare facilities have become highly competitive and cost-conscious over the past decades under mounting consumer (patient) pressure for higher quality services and better value healthcare, and medical aid schemes not always being willing to increase reimbursements (Graban, 2008).

This balancing act between available resource, quality of service, cost of service, and patient safety is prevalent in any healthcare system in the world today and by no means unique to South Africa. The focus of this research, however, will draw on global application and research literature, yet focus on the case of Groote Schuur Hospital (GSH) in Cape Town.

The challenges described above brings into focus the need for healthcare service providers to rethink the way they operate, how they control cost and quality, and how to better allocate resources. Several business optimization tools and systems reengineering approaches exist in popular literature, with one of the best known and widely applied theories being Lean management principles. Although Lean initially originated in the manufacturing arena focussed on optimization, it has successfully been adapted and implemented in several service-related industries such as Insurance, Finance, Software Development and even in the hospitality industry (Lean Enterprise Institute, n.d.).

The focus of Lean management is mainly on improvement of efficiency, elimination of waste, and increasing utilization of slack resources (Ruffa, 2008). There is thus a case to be made for Lean implementation in the healthcare arena to assist in unlocking additional capacity and improved quality within the limitations of existing resource structures. Lean in healthcare is by no means a new concept and has been around, in one form or another, for the past three decades – there is even evidence to suggest that routinization and waste reduction efforts in healthcare dates back as far as 1922 when Henry Ford applied learnings from his facility designs to a hospital in Michigan (Graban, 2008). More recently, during the last 15 years, investigation
into Lean in healthcare has been developing into a major research strand – books and peer reviewed articles started appearing from the early 2000’s (D’Andreamatteo, Ianni, Lega, & Sargiacomo, 2015).

The Centre for Lean engagement and research in healthcare (CLEAR) defines Lean in healthcare as:

“The development of a culture that enables an overall management system to create value for customers by eliminating waste and solve problems through the daily application of the scientific method in creating standard work. The end result is improved quality and lower cost for the patient (increased value)” (Centre for Lean engagement and research in healthcare, n.d.).

CLEAR developed a comprehensive Lean framework for hospitals/healthcare (Appendix A: The Clear Framework) that assesses the entire organization. In this research, the researcher applied the CLEAR framework to Groote Schuur hospital to assess Lean implementation from a “whole-system” perspective. Applying the framework at an organizational level is, at this point in GSH’s Lean journey, particularly relevant – as stated by Toussaint and Berry (2013), Lean is a journey that cannot be delegated or switched on, but requires constant and focussed effort from the top down.

1.1 History of Lean at Groote Schuur Hospital

The implementation of Lean management and Groote Schuur hospital started formally during 2014 with the first structured Lean project in the Out-patient department (OPD) focussed on reducing patient waiting time and optimizing the flow of patients through the department. At the time, twelve managers from the four main units in OPD (medical records, admissions, the eye clinic and outpatient pharmacy) were selected for training and exposure to Lean tools, however, not all the original team members completed the workshops, whilst several new members joined at various stages during the project.

Since then, the hospital has been on a continuous journey and the concept of Lean management has been evolving to where it is currently seen as the management strategy for service delivery
improvement at the hospital – guided by the hospital’s vision of innovative, patient centred healthcare and reflected in the hospital’s True North and GPS statements\textsuperscript{1}.

1.2 Research area and problem

This study focusses on assessing Lean management implementation at Groote Schuur using the CLEAR framework. The level of maturity of Lean management transformation in the organization drives outcomes and success against the elements of the CLEAR framework. The purpose of the study is thus explanatory in nature as it attempts to identify causal links between factors under deliberate control (implementation of a management philosophy and system), and how that pertains to a desired outcome (the CLEAR framework’s key elements) (Habib, Pathik, & Maryam, 2014).

It is important to note that the CLEAR framework is a comprehensive, systematic review framework for assessing Lean implementation in healthcare at an organizational level. Although the expected output of this study will provide less clarity on specific Lean projects than an isolated review would, the aim is to assess organizational evolution towards sustained Lean management in its entirety as that is what is presumed to drive sustained continuous improvement. This will add to the body of more rigorous research on the complex phenomena of institutionalising a Lean management system in the healthcare context.

1.3 Research question and scope

The research aims to assess the progress on Lean management implementation as a leadership philosophy at Groote Schuur hospital. The focus was split into four key areas to assess: (1) Organization wide factors required for successful Lean implementation; (2) Lean project related factors; (3) Intermediate organizational outcomes; and (4) Ultimate Outcomes. Within the assessment, the focus was on the effectiveness of leadership participation and setting up sufficient support structures, programmes, and resource allocation to ensure ongoing success. (The CLEAR framework will be discussed in more detail in the next section).

The main research question: How effective has Lean implementation been at Groote Schuur hospital, will be addressed by assessing the organization against the CLEAR framework and, specifically:

\textsuperscript{1} True North and The GPS statement is discussed in more detail later in the document.
• How well has the organization been set up to achieve success with Lean from a Leadership point of view? (See Table 1)

• Has the required support structures, tools, resources, and ongoing leadership support been put in place to ensure effective routinization of Lean initiatives? (See Table 2)

• How visible/obvious are the benefits of Lean in the organization – particularly from a culture, dissemination, and engagement point of view? (See Table 3)

• What progress has been made, as a result of Lean management implementation, towards delivering the hospital’s True North goals? (See Table 4)

The study is limited in its scope regarding empirical measures of specific Lean projects – assessing individual project progress is not included in the study and therefore, a secondary layer of detail is excluded. This has limited implications for this study since the main aim is to assess organization wide progress of Lean as a Leadership philosophy, rather than focussing on the success/failure of a particular project.

1.4 The CLEAR Framework

The CLEAR framework was developed by the American Institute for Research (AIR) as a tool to guide case-study research into Lean application in healthcare, specifically to assess how Lean works, if Lean works and to determine what specific mechanisms/processes makes it successful. The structured framework allows the researcher to assess a healthcare facility within its competitive-, and customer (patient) context.

Table 1 shows the elements identified in the CLEAR framework deemed necessary success factors to ensure that organization wide implementation is staged sufficiently and supported with the relevant training and development, goal setting, processes, and techniques. For the purpose of developing the literature review and given the time constraint on this research, these elements have been grouped by the underlying themes as indicated.
Furthermore, to ensure effective projects within Lean, Table 2 shows the necessary criteria for leadership, team composition factors, and established practices/activities for consideration and active, ongoing development. Again, the researcher grouped them, as indicated, by the underlying themes.

### Table 1: Lean Transformation - Organization wide factors

<table>
<thead>
<tr>
<th>Lean Transformation (Organization-wide Factors)</th>
<th>Thematic grouping</th>
</tr>
</thead>
<tbody>
<tr>
<td>Purpose: True North</td>
<td>Roll out of Managerial Vision for Lean</td>
</tr>
<tr>
<td>Lean goals</td>
<td></td>
</tr>
<tr>
<td>Alignment</td>
<td></td>
</tr>
<tr>
<td>Scope of Lean activities</td>
<td></td>
</tr>
<tr>
<td>Pace of Lean activities</td>
<td></td>
</tr>
<tr>
<td>Coordination of Lean activities and resources</td>
<td>Facilitation of activities and Dissemination throughout the organization</td>
</tr>
<tr>
<td>Development of Lean tools</td>
<td></td>
</tr>
<tr>
<td>Adoption of Lean philosophy and values</td>
<td></td>
</tr>
<tr>
<td>Ongoing assistance/support by facilitators and consultants</td>
<td></td>
</tr>
<tr>
<td>Change management model</td>
<td></td>
</tr>
<tr>
<td>People: Personnel selection, support, and retention</td>
<td></td>
</tr>
<tr>
<td>Process</td>
<td>Staff Engagement</td>
</tr>
<tr>
<td>Communication about lean</td>
<td></td>
</tr>
<tr>
<td>Educations and training</td>
<td></td>
</tr>
<tr>
<td>Problem solving</td>
<td></td>
</tr>
</tbody>
</table>

### Table 2: Lean Transformation - Project factors

<table>
<thead>
<tr>
<th>Lean Transformation (Project Factors)</th>
<th>Thematic grouping</th>
</tr>
</thead>
<tbody>
<tr>
<td>Leadership support and participation</td>
<td>Resourced and supported to ensure success</td>
</tr>
<tr>
<td>Central improvement team</td>
<td></td>
</tr>
<tr>
<td>Daily management system</td>
<td></td>
</tr>
<tr>
<td>Lean team size and resources</td>
<td>Skills building and autonomous team creation</td>
</tr>
<tr>
<td>Lean team composition</td>
<td></td>
</tr>
<tr>
<td>Lean tools and methods</td>
<td></td>
</tr>
<tr>
<td>Rewards for accomplishments</td>
<td></td>
</tr>
<tr>
<td>Compatibility with social structures and cultures</td>
<td>Organizational fit</td>
</tr>
</tbody>
</table>
Intermediate outcomes (at organizational level), is shown in Table 3. These are the areas within the organization where the expected outcomes of effectively implemented Lean leadership (and projects) within a healthcare facility will be most impactful.

Table 3: Lean Transformation - Intermediate organization outcomes

<table>
<thead>
<tr>
<th>Intermediate Outcomes (Organizational)</th>
<th>Thematic grouping</th>
</tr>
</thead>
<tbody>
<tr>
<td>Culture Change</td>
<td>Adopting Lean as an everyday activity/organizational Culture shift</td>
</tr>
<tr>
<td>Provider/staff satisfaction and engagement</td>
<td></td>
</tr>
<tr>
<td>Increased Lean knowledge and skill</td>
<td></td>
</tr>
<tr>
<td>Lean routinization</td>
<td></td>
</tr>
<tr>
<td>Dissemination of lean - inside organization and to other organizations</td>
<td>Benefit of Lean apparent and self-promoting</td>
</tr>
<tr>
<td>Responsiveness capability</td>
<td></td>
</tr>
<tr>
<td>Improved workflow</td>
<td></td>
</tr>
</tbody>
</table>

Lastly, Table 4 shows the measures from the CLEAR framework that specifically look at ultimate outcomes of Lean transformation – improved efficiency and quality of care, underpinned by a strategic and/or financial return on time, effort and resources invested.

Table 4: Lean Transformation - Ultimate Outcomes (Organization and Patient)

<table>
<thead>
<tr>
<th>Ultimate Outcomes (Organization and Patient)</th>
<th>Assessment</th>
</tr>
</thead>
<tbody>
<tr>
<td>Efficiency</td>
<td>Review records and available data on progress of Lean Projects</td>
</tr>
<tr>
<td>Business/Strategic ROI</td>
<td>Review records and available data on progress of Lean Projects</td>
</tr>
<tr>
<td>Quality</td>
<td>Review records and available data on progress of Lean Projects</td>
</tr>
</tbody>
</table>

The identified underlying themes in the CLEAR framework formed the cornerstone of the literature review – the starting position being a review of Lean management in healthcare, before exploring specific literature around the key themes in more depth. The ultimate outcomes of Lean management, as defined in the CLEAR framework (shown in Table 4) was reviewed against available artefacts and measured data from GSH team.

1.5 Research assumptions

This study relied on qualitative data collected from semi-structured interviews and analysis of available artefacts such as training logs, performance improvement charts and Lean project outcomes. The accuracy of the information contained in these artefacts are outside of the researcher’s control and it is assumed that historically collected data was captured as accurately
as possible. The responses from interviewees are objective data and determining the validity requires contextual interpretation which forms part of the analysis and findings of the research. Furthermore, there is sufficient literature that shows that Lean management is applicable to the healthcare industry and that the benefits of Lean management will be achieved through effective, sustained implementation across the industry, especially in the public health sector.

At the onset of this research, the researcher assumes that data regarding implementation timelines, history, tracking of results and gains/losses since implementation will be made available for interpretation and inclusion in this study. It is further assumed that the staff at Groote Schuur, specifically key members of the leadership team, will make themselves available for interviews. Given that there might be high stakes for the GSH leadership team to ensure that Lean management is perceived as being successful, the researcher acknowledges the risk that information might be misrepresented, or tainted by personal opinions. It is the duty of the researcher to triangulate data between different sources and interpret the data in the light of other evidence. In severe instances, outlier information will be flagged as a point for further exploration outside of the scope of this research.

This research adopted the CLEAR framework as the theoretical framework. The study is deductive in nature with all of the data gathered from semi-structured interviews and secondary sources. The researcher used the theoretical framework (CLEAR) as guidance for the interview questionnaire, and applied available literature to interpret the data concisely and develop key findings.

1.6 Research ethics

The research was conducted within the guidelines set out by the University of Cape Town’s Graduate School of Business. Prior to the commencement of any fieldwork or engagement with members of GSH staff, ethical clearance from the Human Ethics board at the School of Medicine as well as ethical clearance from the Commerce faculty was obtained. Furthermore, approval from the Western Cape Health research committee was obtained to conduct research at GSH.
2. LITERATURE REVIEW

The focus area of the literature review was informed by the research topic and themes at hand. Therefore, the majority of the literature reviewed falls into three major categories, with some variation, or additional streams explored, however in lesser detail. The three major categories are: (1) Lean as a management philosophy and management system and its application in healthcare; (2) The difference between the concept of Lean leadership as opposed to Lean management and how that affects Lean performance in an organization; and (3) Critical environmental success factors required for the sustained benefit of Lean programmes.

The areas explored outside of these major themes include: assessment of performance in a continuous improvement environment; communications strategies and its effectiveness; the change management journey in organizations; and organizational goal setting and alignment theories.

2.1 Discussion

The Literature review starts by assuming the role of Lean management in any business environment – from there, the researcher seeks to understand where and how Lean has been employed in healthcare before unpacking Lean as a management philosophy and how it disseminates through the organizational levels, what the barriers to success are, and under which circumstances the programme is likely to flourish. Figure 1 shows the key themes explored that underpins Lean management deployment, specifically in healthcare.
2.2 Lean and its application in healthcare

There is a growing body of acknowledged research on Lean applications within healthcare that has been evolving from a populist translation of Lean in healthcare to a more robust and peer-reviewed research field focusing closely on Lean in healthcare and drawing some conclusions on established methods and benefits (Mazzocato, Savage, Brommels, Aronsson, & Thor, 2010). The majority of literature, books, and case studies available on Lean in healthcare emphasize the clear benefits and positive results achieved — how valid these results are, and whether they are reproducible in another setting is yet to be determined on a larger scale (D’Andreamatteo et al., 2015).

The earlier publications on Lean in healthcare showed predominantly positive results and merit for immediate implementation far and wide (Brandao de Souza, 2009). Many published works, however, were based on theory and not necessarily on active case studies and research. The biggest critique from industry role players at the time was that the majority of these articles were published by practitioners, consultants, or supporters of Lean and that the findings and recommendations were not necessarily unbiased. Jimmerson, Weber and Sobek (2005) published one of the most comprehensive, early adoption, case studies showing concrete results within a holistic environment. They highlighted the need for training and continuous leadership support in order to sustain positive results.
From the literature, it is clear that the initial views on Lean in healthcare was proposed as massively positive and a ground-breaking approach to unlock value for healthcare practitioners as well as patients – this view was heavily promoted by subject matter experts in publications such as *The Lean six sigma guide to doing more with less* (George, 2010), *Lean hospital* (Graban, 2008) and *Transforming Health Care* (Kenney, 2010). The majority of the earlier publications and research focussed on single case studies as the grounds for a theory to be developed and lacked evidence of generalization across the industry and across geographic and cultural borders.

As the research field expanded and the body of knowledge (and evidence) grew, researcher started identifying concerns or stumbling blocks to the proclaimed easy success that Lean has to offer healthcare. Waring and Bishop (2010) argues that Lean is in contradiction to the embedded socio-regulatory responsibility of healthcare professionals and that significant reorganization of boundaries are required in order for the principles to be effective. Given the highly-regulated nature of healthcare, it is unlikely that stand-alone implementations will drive wide-spread policy change and therefor, Lean will always remain superficial in the healthcare arena. This view is further supported by Carter et al. (2011) who argues that Lean is creating widespread employee disengagement in civil service and is inappropriate for application in professional bureaucratic environments.

However, most recent research and benchmarked case studies are delivering new insights and theories to the field and prompting a new way of thinking about Lean in healthcare. Daultani, Chaudhuri and Kumar (2015) conducted a selective literature review, focussing on Lean implementation in the National Health Service (NHS) in the UK, covering developments of the past decade (2005 – 2015) and have been able to identify key future directions to increase the success rate of Lean projects. Key to their findings were the need to internalize Lean project in hospitals as most projects are still led by external consultants and loses its impact the moment the consultants let go. In other words: Lean has to become a management system and embedded culture at the hospital to be truly impactful and sustainable. Furthermore, they (Daultani et al., 2015) argue that there is no one-size-fits-all approach to Lean in healthcare and that the tools, techniques and rigour required, greatly depends on the primary focus of the facility. This view is supported by D’Andreamatteo et al. (2015), who argues that the benefit of Lean in healthcare appears to be promising, there is yet to be sufficient research to draw the positive impact to a
conclusion. They (D’Andreamatteo et al., 2015) point out the need for the entire organization to be engaged in future studies, instead of simply assessing single projects in isolation.

The reviewed literature thus seems to suggest that Lean management in healthcare is (1) growing in popularity, albeit organically with no universally defined frameworks in place; (2) mature to a point where criticism and feedback is being absorbed back into the field; and (3) has evolved to a state where the importance of “whole-system” application is leading the discussion as the most effective way forward.

2.3 Lean leadership vs Lean management

The difference between Lean leadership and Lean management seems to vary depending on the author and context within which it is used. In some earlier articles, it seems to be used completely interchangeably. For the purpose of this research, the definition of Lean management as expressed by the Lean Enterprise Institute will be assumed as the most coherent and inclusive:

“Lean management is a series of practices that develops people to understand and own their problems, and aligns resources to achieve the purpose of the organization. Lean management engages everyone in designing processes to continuously solve problems, improve performance, and achieve purpose while consuming the fewest possible resources” (Lean Enterprise Institute, 2014, p.34)

Defining Lean leadership, on the other hand, is slightly more complicated and ambiguous with no clear academic definition identified. Roussel (2015) in her article, How I define Lean leadership, defined Lean leadership based on the role these individuals (Lean leaders) play in an organization’s Lean journey:

- Lean leaders are not necessarily in a position of authority – they are the people who are committed to making a difference.
- Lean leaders are the teachers; the early adopters that lead by example and encourages their peers to participate.
- Lean leaders convey the vision, play a key role in facilitating culture change, and are obsessed with measuring the results.

It is thus clear from the definitions alone, that Lean management can be described as the philosophy or management methodology of Lean; and that Lean leadership is the ongoing
activity from sponsors and supporters alike to drive the agenda of Lean within the organization forward by modelling the role and behaviour of a Lean leader.

Mate and Rakover (2016) highlights the need for ongoing and sustained support for improvement initiatives in healthcare. Although they do not specifically refer to Lean as the improvement initiatives, they refer to several of the Lean methodologies and principles and it is therefore assumed that their findings are relevant. Mate and Rakover (2016) identified key pillars of support that is most likely to underpin sustained improvement and positive results: the key being a systematic, whole-system approach that focusses on engaging and standardization of frontline managers’ workflow. From there, through the activities of frontline managers and support from executive management, dissemination to point-of-care and administrative/support staff. They suggest that the strategy behind improvement project is driven by executive leadership, but led by mid-level management and contact staff. Although Chay, Xu, Tiwari and Chay (2015) mostly agree with the above, they argue that Lean implementation frameworks are prone to be top-down and not very often bottom-up. This potentially results in an undefined level of disengagement at operational levels of the organization that could take several months to correctly diagnose and address.

Stanton et al. (2014) further supports this view by arguing that, although Lean in healthcare (or any setting for that matter), should lead to more empowered workers, it can potentially disempower staff and result in severe work intensification. This is understandable during the initial phase; however, they have found evidence that suggest that without astute leadership and a clear Lean strategy in place, powerplay and politics can result in mismanaged results and limited lasting benefits. They conclude that Lean in healthcare is extremely complex and heavily influenced by managerial strategies and leadership. This view is supported by Bliss (2009) who posits that Lean takes focussed effort and change at a managerial cultural level to develop the Lean leaders at the frontline, before lasting improvements can be expected.

Lean Management is found to be a well-defined body of knowledge that, at its heart, is focussed on continuous improvement plans and methodologies to be deployed within an organization. Normally approved by senior management and implemented by means of external consultants or specialists. (Mann, 2009), (Pointers, 2008), (de Koeijer, Paauwe, & Huijsman, 2014), (Barnas, 2017). Lean leadership, the more subtle and harder to define component of effective implantations, seems to be the missing link
In conclusion, from the reviewed literature a common thread suggests that traditionally, focus on Lean implementation has been from the top down. Limited sustained success is achieved in the majority of cases. The absence of sustained success can possibly be attributed to organizations focussing heavily on Lean management (principles, tools, processes) and not sufficiently on Lean leadership – the creation of a culture shift from within the entire organization, with programme sponsors and supporters across all layers of the workforce. Assessing an organization’s effectiveness in Lean implementation thus hinge on understanding whether there are sufficient Lean leaders – employees from all layers of the organization who have fundamentally bought into Lean management principles and practices and are advocates and supporters of the programme.

2.4 Critical environmental/organizational factors to ensure sustained Lean benefits

Lean management, as already stated, originated at Toyota in their car manufacturing facilities however, more recently, Lean management has found its way into the services- and healthcare industries. Lean management involve, not only a set of tools and techniques to reduce variation and minimize waste, but it changes the fundamental organization culture and behaviour (Stanton et al., 2014). Bhasin (2012a) posits that culture change (or lack thereof) is one of the key underlying drivers to Lean management failing, or not living up to its expectations in service industries.

On the furthest end of the spectrum, McCann, Hassard, Granter and Hyde (2015) describe the adoption of Lean, based on their three-year study as: “…Lean ideas were initially championed, later diluted and ultimately eroded.” (McCann et al., 2015, p1) They argue that the concept of Lean management was mobilized across the organization in an ambiguous way that ultimately resulted in the concept being rendered virtually meaningless. The study by McCann et al. (2015) is particularly interesting as it is one of the few published research articles that critically suggest that Lean management might not be working in the healthcare environment at all. It also suggests strongly that a coherent adoption program and culture change to embrace Lean holistically, would potentially unlock success.

This give rise to an entirely new managerial paradigm: Lean Values. Ingelsson and Mårtensson (2014) describe the importance of not only espousing Lean values, but also actively measuring the impact and level of engagement to ensure unambiguous deployment and adoption. The authors (Ingelsson & Mårtensson, 2014) stress the terminology transform instead of implement
since the latter suggest that the activity of Lean has a start and end, whilst the former suggest ongoing and continuous effort to transform the organization at all levels. The concept of Lean transformation implies a shift in paradigm for the organization.

Several challenges have been identified in recent research surrounding the implementation of Lean management in healthcare – although some of the challenges are not specific to the healthcare environment, the nature of the industry and traditional management styles elevate the extent to which these barriers are perceived. Radnor and Boaden (as cited in Stanton et al., 2014) list the most common challenges as:

- organisational readiness (buy-in and change management)
- embedding a culture of continuous quality improvement (ability to adapt)
- effective leadership to develop and communicate a clear strategy, and
- the availability of resources to support transformation.

More specifically, organizational politics in healthcare, bureaucracy and several regulatory bodies that prescribe standards, engagements and procedures, further hamper the ability of Lean management to drive substantial reform in healthcare (Legatt, Bartram, & Stanton, 2011). They (Legatt et al., 2011) go on to suggest that there is a direct correlation to the effectiveness of Lean management and an embedded high-performance culture. This view is supported in the work of Holden, Eriksson, Andreasson, Williamsson and Dellve (2015) who argues that although a high-performance culture an important underpinning, managing healthcare workers’ perception of Lean within the context of a high-pressure and -performance environment is also crucial.

There does not seem to be a strong body of research/evidence contradicting the environmental/organizational requirements to ensure Lean is sustained and remains beneficial. Although somewhat generic and at risk of casting the net too wide, Pentlicki (2014) summarizes the critical factors in a succinct manner:

- Transformation should be in a manner specific to the context of the organization
- Time and resource availability (lack of) present greatest challenge to sustained progress
- Resistance to change by management and staff
- Lack of proper and continuous training and over-use of consultants
- Misaligned views at senior levels of management
In summary, the critical factors to ensure sustained Lean management success can be broken into three categories (1) Change management both on the front of processes, goals and tools as well as managing perception and buy-in; (2) Continuous training and development of tools as well as training material to allow dynamic dissemination throughout the organization – hand-over from consultant to resident teams are often underplayed; and (3) Complete organizational alignment on expectations, priorities and goals to ensure that all levels of the organization is completely convinced and included in the transformation.

2.5 Organization wide factors: Goals, true north, alignment of strategy

The softer side of Lean: goal setting, strategy alignment, and defining success seems to be altogether vaguely defined in most of the reviewed literature. Although goal-setting and strategy is a main starting position, the literature pays little attention to these elements once the journey towards Lean transformation has begun. Instead, a strong bias towards measuring progress based on waste reduction and value stream mapping exist, however, not many authors venture into the underlying strategy for change management as part of Lean transformation. This in itself can prove to be a driving reason for theories of limited success, or inconsistent results observed in the industry.

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*Figure 2: The Toyota triangle depiction of the Toyota production system (Graban, 2008)*
Interestingly, Graban (2008) builds heavily on the Toyota triangle that forms the cornerstone of the Toyota production system (see Figure 2). This triangle places philosophy and culture as the foundation for human development in Lean management. Beckhard (as cited in Hoss & ten Caten (2013)) supports this approach and breaks it down further into a *sequenced approach* that starts with a long-term strategic commitment from leadership on both direction and development of people and teams, followed by change management that focus on attitudes and behaviours, standardizing workflow and putting measures in place to ensure continuous improvement and feedback. Eventually, the result is a changed culture where new ways of working is fully adopted.

A more pragmatic approach emerged from the work of Fine, Golden, Hannam and Morra (2009) who performed a case study review of five Canadian hospitals. They underpinned the change management on the four stages of change framework, shown in Figure 2.

![Figure 3: Four stages of leading change (Golden, as cited in Fine et al. (2009))](image)

Key to Fine et al's (2009) findings that resounded through all five of the reviewed cases were:

- Lean management disseminated throughout the hospital faster and more effectively if the CEO was fully supportive and worked closely with the localized Lean team, and
• Localized training and development to foster Lean leaders who act as facilitators within their working teams on continuous improvement and transformation.

From the literature, it emerged that the underpinning driver for successful Lean transformation lies in the transformation of the workforce – focusing on culture, attitudes and behaviours. Reviewing change management methodologies and processes are outside of the scope of this study, however, noting the potential pitfalls, specifically to Lean transformation is important. The below list has been collated from the works of Kissoon (2010), Papadopoulos, Radnor and Merali (2011), Fine et al. (2009) and Aij, Simons, Widdershoven and Visse (2013):

• Do not underestimate workforce issues – address and deal with them as they arise
• Constantly evaluate outcomes and assess against intent and philosophy
• In the highly hierarchical system of healthcare – be cognisant and sensitive to cultural issues
• Kill myths around Lean management being the *flavour of the month* or negative engagements that Lean results in job cuts early on in the programme.
• Expect an initial lag in engagement as Lean starts off as over and above normal workflow, before it gathers momentum and returns benefits to the teams.

A clear vision from the top down, change management plans that leverage involvement, training and champions across the layers of the organization, and the early elimination of fears and resistance to Lean is critically important to ensure a transformation process that gathers support and momentum in the organization. Ongoing communication and the assessment of progress against intent is often left unaddressed for too long and results in loss of momentum or stagnation of the process.

2.6 Internally perceived performance measurements

Lean management transformation is often seen as an *implementation* and not a *transformation* in the organization. Part of the underlying reasons for this general perception is the liberal use of specialists and consultants supporting the initial stages of the journey (Holden et al., 2015). This results in an misconception internally regarding the measurement of progress and tracking of results – often leading to only parameters within specific Lean projects to be measured and not the organizations’ transformation (Kaltenbrunner, Bengtsson, Mathiassen, & Engström, 2017). This is further complicated, according Kaltenbrunner et al. (2017), by the myriad of
different instruments for measuring Lean that is available – a view point supported by Minster (2010).

Although the aspiration and definition of Lean management measurements have crystalized over time, few capture it as succinctly as the below:

“*A Lean assessment is intended to examine an organization’s systems, behaviours, and culture, and in doing so identify strengths, opportunities for improvement, and the critical gaps that slow or inhibit a Lean transformation*” (Taninecz, 2011)

Snyder, Ingelsson and Bäckström (2016), however, found that the majority of measurements in use today is still focussed on performance measuring and not organizational culture and awareness. They (Snyder et al., 2016) found some evidence to suggest that the general awareness of the need to include *human elements* in a balanced scorecard exist, however, little evidence to support its implementation.

The literature indicates across the board that some progress has been made towards developing holistic measuring and assessment tools, however, the field is still in its infancy and currently several tools exist that do not cover the full extent of Lean management: Culture, performance, satisfaction (employee and customer), and empirical results.

### 2.7 Conclusion

During the literature review phase of this study, the researcher spent a significant amount of time searching for, and reading through, material relevant to the topic of Lean management. One of the clear threads that emerged throughout the literature, and possibly not articulated in the previous sections of the literature review, is the evolution of the interpretation of Lean. Lean started as a set of *tools* specifically relevant to manufacturing, developed into a slightly more holistic model lumped under *improvement projects/continuous improvement initiatives* and more recently Lean is interpreted as a *total system management approach* that not only embodies tools and techniques, but targets cultural/mindset changes throughout the entire organization. Lastly, the evolution of Lean into management philosophy also entails that Lean is ongoing transformation that starts with intent to pursue Lean management, but never reach and end-state of completion.

The CLEAR framework links to several of the literature review’s key findings summarized as:
• The setting of goals and organizational purpose and strategy in Lean is assessed by CLEAR and highlighted in the literature as a critical component of Lean management.

• Adoption of Lean tool and processes goes hand-in-hand with ongoing training and development, change management and education.

• The success of Lean projects relies on an ethos of Lean management being present in the organization and being fully supported at all levels.

• Lean routinization and staff satisfaction is strongly linked to avoiding work intensification and overload. Processes need to be transformed end-to-end, and not run in parallel to Lean management.
3. RESEARCH METHODOLOGY

This research aims to assess Lean implementation at Groote Schuur hospital by means of applying the CLEAR framework. Appendix B: Research Framework illustrates the researcher’s approach to conducting the study. The assessment was completed using mostly qualitative exploration and the case study method – where Groote Schuur, as an organization, was identified as the subject of the case. The researcher was also given access to performance-, training-, and assessments records from past Lean projects at GSH for inclusion in the study. Groote Schuur hospital embarked on a Lean implementation journey several years ago, and during that time, have implemented several stand-alone projects with differing levels of localized success.

In general, it has been found that the success of Lean implementation relies on organization-wide change management to be successful and sustained:

“To better realise the potential benefits [of Lean], healthcare organisations need to directly involve senior management, work across functional divides, pursue value creation for patients and other customers, and nurture a long-term view on continual improvement.” (Mazzocato, Savage, Brommels, Aronsson, & Thor, 2010, p.376)

It is for this reason that the entire organization was chosen as the subject, and the focus of the study skewed towards the elements of the CLEAR framework that specifically review organizational change and -support for Lean.

3.1 Research approach

Initially, an inductive research approach was considered for the purpose of this study, Patton (1980) argues that the use of inductive analysis is more appropriate for assessing patterns and themes that emerge from the data collected, rather than imposing them on the data before collection has even begun. Although the researcher aims to understand patterns and themes relevant to the case (especially surrounding the behaviour and attitude towards Lean management), the application of the CLEAR framework guides the researcher to themes already identified. A pure inductive research design is thus not appropriate. Adams, Khan and Raeside (2014) argues that inductive- and deductive approaches are not opposites of one another, but can be applied as complimentary styles, provided that sufficient empirical data exist to determine whether the researcher’s hypothesis regarding a specific theory can be deduced.
In the instance of this study, the purpose of the research was not to develop new theories and principles, but rather to assess a specific instance (Groote Schuur hospital) against an existing theory/process. Therefore, a deductive approach was better suited. Hyde (2000) states: “deductive reasoning is a theory testing process which commences with an established theory or generalisation, and seeks to see if the theory applies to specific instances” (p.83). In this research study, the researcher aims to test Lean implementation effectiveness at GSH against a pre-defined framework, the CLEAR framework. The relevance of a deductive case study to support/test a theory is further supported by Dul and Hak (2008):

“Although, strictly speaking a sufficient condition cannot be confirmed in a single case study, a failure to find rejections of the hypothesis in many different attempts (replications) provides confidence that the proposition might be generalizable to the theoretical domain…” (Dul & Hak, 2008, p78).

This study will form one replication of the application of the CLEAR framework on a hospital setting and thus add to the rigour in the body of knowledge surrounding Lean management in healthcare, and specifically, the reliability and validity of the CLEAR framework.

3.2 Research strategy

The researcher had access to both qualitative and quantitative data sources. The primary data collected by the researcher (semi-structured interviews) was qualitative in nature, whilst access was given to secondary data in the form of measured data from ongoing (already implemented) Lean projects, implementation- and training records across the hospital, as well as efficiency improvement measures against the goals set out on the hospital’s True North statement (see Appendix C: Groote Schuur True North)

Although both qualitative and quantitative data was available, a qualitative research strategy was applied, as supported by Terrel (2015) who argues that a mixed method strategy should only be considered if both qualitative and quantitative data is collected for the purpose of the research and applied simultaneously. The quantitative data was not collected as part of this study, but instead, interpreted on a qualitative basis to establish supporting evidence for information obtained during the interviews. Furthermore, this strategy (qualitative) was chosen due to its applicability in business research and in particular: analysis of an organizational state (Adams et al., 2014). In the instance of Groote Schuur hospital, the qualitative method allows
the researcher to synthesize collected data and present findings regarding the effectiveness of processes or programs within an organization (Saldaña, 2011). The particular advantages (relevant to this research) of using qualitative methods, have been clearly articulated by Leedy and Ormrod (2013, p.146):

- **Multifaceted Description**: They can reveal the complex, possibly multi-layered nature of certain situations, settings, processes, relationships, systems, or people.
- **Evaluation**: They provide a means through which you can judge the effectiveness of particular policies, practices, or innovations.

Qualitative research provides a level of richness within a process or environment that is sensitive to context (Tharenou, Donohue, & Cooper, 2007). The aim of this research was to assess and understand Lean implementation within context in a closed system – Groote Schuur hospital.

### 3.3 Research design

Case study-, Experimental-, and Survey research design was considered for this study. Experimental research design requires the researcher to have control over some of the concepts (variables) in order to measure the impact that has on dependant concepts or variables (Dul & Hak, 2008). Since the culture, leadership and Lean management initiatives was not within the researcher’s control, this was not an appropriate design methodology. Survey research design, in contrast, focusses more closely on questioning individuals on specific topics and describing their responses (Adams et al., 2014), however, does not adequately focus on a group setting.

The case study method was employed for this research, according to Yin (1994) this method is best suited for “how” and “why” research questions. Furthermore, when the investigator has limited (if any) control over events and when the focus of the research is on events within a real-life context, the case method provides a holistic method to the research study. This view is further supported by Saunders, Lewis and Thornhill (2016) who describes the case study method as a detailed investigation into a topic or event within a real-life setting. The researcher remains an outsider and do not purposefully influence the inter-relationships within the case setting.

The case study method was thus the most suitable for the research questions at hand, as Tharenou et al. (2007) summarizes: “a case study is not just a story or description; it is a
theoretically based attempt to understand and explain complex phenomena, embedded in context” (p.78).

### 3.4 Data collection methods

Interviews and focus groups are generally the most common data collection method in case study research (Gill, Stewart, Treasure, & Chadwick, 2008). However, Yin (2013) states a wider array of data collection methods applicable in case study research. The six main sources for case study data is specified as: Documentation, archival records, interviews, direct observation, participant-observation, and physical artefacts. Although each of these 6 sources carry their own data or evidence relevant to the integrity of the case study, the type of case, access to data, participants, and time will dictate which ones are employed.

This research consists mostly of qualitative data collected through semi-structured interviews with key role-players in Groote Schuur’s leadership team, facilitators of Lean, and members of staff. In addition, the researcher relied on information contained in artefacts from the management team showing progress against key measured KPI’s. This resulted in two main sources of information being present in the case:

- **Primary sources:** Semi-structured interviews with key role players, facilitators and *actors* in Lean.
- **Secondary sources:** Artefacts: Information available from training records, performance tracking, communication and progress of Lean throughout the organization.

Regardless of the source of data and the collection method used, the four key principles according to Yin (2013, p.105) to always adhere to are (1) attempt to use multiple, not single source of date, (2) Create a case study database, (3) maintaining a chain of evidence throughout, and (4) exercising caution and care when using data from electronic sources outside its intended context. Yin concludes his coverage on case study research by confirming that interviews are an essential part of case study research since most cases relate to a human interaction, environment, process, or system.

### 3.5 Research instruments

Primary data was collected using semi-structured interviews, in a face-to-face environment. The semi-structured nature allowed the researcher to follow a specific script and ensure that
key points pertaining to the CLEAR framework is covered during the interview, yet allowed the researcher the freedom to probe responses that seemed worthy to explore in more detail.

The questionnaire was designed to gather information pertaining to the elements of the CLEAR framework, Appendix D: Interview Questionnaire, shows the interview protocol and indicates the mapping of each question to the relevant CLEAR metric being assessed. The questionnaire was divided into two sections:

1) Open-ended questions requiring interviewees to respond based on their recollection of factual information as well as their perception of Lean management at GSH.
2) Likert scales to assess interviewees’ attitude and emotion towards Lean management at GSH.

The initial questionnaire and interview format was put to test in a pilot-study with a Lean practitioner in the FMCG field. The primary purpose of the pilot interview was to ensure that questions are open ended and solicit conversational responses, instead of simple yes/no answers. The interview protocol was amended post the pilot to eliminate identified issues. Furthermore, the researcher conducted three pilot interviews with staff from GSH to ensure that the team is familiar with the terminology and language use, before data collection commenced. Lastly, as part of ensuring consistency in the interpretation of responses, the researcher developed a check-sheet (Appendix E: CLEAR framework Conceptual framework Coding Plan (Level 1)Appendix E: ) that formed the definition criteria for level 1 coding.

3.6 Sampling

Given the size of GSH and the number of people employed there, the target population size was overwhelming and not practical for this research. For that reason, convenience sampling was the only approach, within the time and cost limitations of this research, that could practically be executed. Defining and selecting the sampling units was determined by the research question – the focus was on effectiveness of Lean implantation and the perceived benefits thereof.

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2 Discussed further in section 3.8.
3 The target population in this case is defined as the leadership team at GSH, members of staff who form part of Lean implantation teams (current or past), and members of staff working in areas where Lean activities have been applied in the hospital.
Creswell (2005) suggest that the minimum sample size for case study research should be between three and five. In this instance, the researcher has access to the organization’s Lean implementation team consisting of fifteen staff members, one member of the Lean facilitation team from the Lean Institute Africa, two members of the GSH support team, as well as access to selected members (>10 individuals) of past Lean project teams. This study aims to reach a sample frame of 20 individuals. The research relied on non-probability, convenience sampling.

Table 5 shows a summary of the population and indicates the target sample size from each group within the relevant population. Groote Schuur is a teaching hospital with specific permission granted to researchers before engagement with the teams can begin. The researcher assumed that being granted access to the team would also ensure a fair level of success in securing the required response rate from each group.

<table>
<thead>
<tr>
<th>Population group</th>
<th># Members</th>
<th>Target sample</th>
<th># Achieved</th>
</tr>
</thead>
<tbody>
<tr>
<td>GSH Leadership team</td>
<td>7</td>
<td>5</td>
<td>4</td>
</tr>
<tr>
<td>Facilitators/External</td>
<td>2</td>
<td>2</td>
<td>2</td>
</tr>
<tr>
<td>GSH Staff</td>
<td>&gt;15</td>
<td>7</td>
<td>6</td>
</tr>
<tr>
<td>Members of Lean Team</td>
<td>&gt;20</td>
<td>8</td>
<td>7</td>
</tr>
</tbody>
</table>

3.7 Research criteria

Case study research, in general, has limited generalizability due to pertaining only to a single case. Through repeated application of the same methodology on different settings, a generalizable research set can be accomplished. This research, however, focussed on a single case scenario and therefore, focus and attention was given to ensuring reliability and validity. The researcher employed several methods to ensure the authenticity of data, and the dependability and confirmability of findings. This section describes the techniques applied.

Golofshani (2003) suggests that cross-verification (triangulation) with several data sources and responses from a variety of interviewees will result in a valid proposition being established. Yin (2011) supports this view and stresses the need to ensure adherence to evidence in qualitative studies, this can be achieved through interpreting collected data and drawing conclusions in reference to that data. The data analysis and interpretation will thus draw heavily
on the data collected during interviews, in conjunction with available data already on record at GSH. Yin refers to the use of pre-existing data in the statement below:

“The collected objects can reduce the problems and challenges of reflexivity. These objects were created for some reason other than your inquiry and cannot be said to have been influenced by your inquiry.” (Yin, 2011, p.149)

Maxwell (2009) further suggests that validity in qualitative research can be strengthened by using comparison – explicitly comparing results and opinions amongst and across different groups within the study. In this research, sufficient sampling within two of the target groups (GSH management and Members of Lean teams) have been achieved to allow for a sufficient level of comparison to be made.

Reliability in case study research refers the repeatability/consistency with which a repeated process produces similar results on all occasions (Bell, 2010). In the instance of this research, the standardised interview questionnaire will be used for all primary data collection. The interviews will all be conducted by the same interviewer (the researcher) within a relatively short time-frame. To minimise transferring the researcher’s own biases to the findings, triangulation between primary and secondary data sources (as already described) will be done to establish reasonable causal relationships between interviewees’ responses and recorded/measured historic data.

As suggested by Richards (2009), a consistency check was performed on the coded responses of two, randomly selected, interview transcripts several days apart from when it was coded and interpreted the first time. The result of the second round of coding was compared to the initial coding and compared for consistency and found to be resulting in the same interpretation and conclusion.

Riege (2003) strongly suggest that external validity for case study research is required to establish credibility and potential transferability. The CLEAR framework that formed the basis for this study has already been applied to external cases and multiple case studies have been drawn as part of the development of the framework. Although, external validity has not explicitly been stated, it is assumed that further application and use of the CLEAR framework to document other Lean healthcare initiatives builds on the external validity and transferability of the concepts.
3.8 Data analysis methods

The researcher developed an in-depth coding scheme, as suggested by Campbell, Quincy, Osserman and Pedersen (2013), prior to engaging with any of the interview transcripts. The coding scheme is based on the reviewed literature and the elements of the CLEAR framework being assessed. The purpose of the scheme is to ensure pre-defined behaviour/opinions that characterise each of the elements of the CLEAR framework was clearly defined and accurately assessed from the interviewees’ responses. Appendix E: shows the elements of the CLEAR framework being assessed in this study and the characterizing behaviours/opinion/attitudes that the researcher was trying to identify. These characteristics formed the basis for level 1 code identification.

The data analysis of interviews was done in a five-step process, as suggested by Sunday (n.d.):

- **Organize the data**: Transcribe the interviews and clean the data to remove unnecessary conversation leading into and out of the interview that is not relevant to the data collection.

- **Coding Plan**: The coding plan/theme identification formed part of the conceptual model that was already developed prior to data collection. (See Appendix E: CLEAR framework Conceptual framework Coding Plan (Level 1)).

- **Sort the data into the framework**: This step is essentially coding and organizing each interview into the above coding plan and the supporting conceptual framework.

- **Second order analysis**: Identify recurring themes and patterns. Identify clusters of responses and underlying themes.

- **Axial coding/Descriptive Analysis**: This stage involves forming connections between the different stages of coding and understanding/interpreting the connection between various pieces of collected data.

The data analysis relied on manual coding by the researcher. All interviews have been audio recorded and later transcribed into a standard template that allowed for comparison of level 1 and level 2 coding themes against the characteristics defined prior to commencing with the interviews.

Included in the questionnaire were several scaled questions that required the interviewee to provide a Likert-scale rating as a response. These responses will be grouped and visually presented (using graphing techniques) to analyse patterns or commonality between different
groups of respondents. Although the Likert scale data will not be statistically analysed, it will allow underlying patterns of culture and attitude towards Lean management to be identified.

Lastly, the collected artefacts from GSH - mostly in the form of daily check-sheets and project performance against targets - was used to corroborate (or dispute) findings from the interviews, and where possible, used to triangulate responses from different groups of interviewees and the factual data collected by project teams over time.

3.9 Limitations

Qualitative research has two major flaws (Johnson, n.d.) to be aware of: (1) Subjectivity of the researcher when conducting an interview or gathering data, and (2) qualitative findings cannot be generalized to other, similar environments. The latter was of less a concern in this research as the focus was on a single research site with the aim of assessing that site itself.

The output quality of qualitative research is heavily dependent on the skill level of the researcher and his/her ability to correctly interpret data within the context of the topic being researched. In this instance, the researcher has prior experience of Lean management and have been involved in transformation projects, performance assessment projects, and training on Lean management in both the manufacturing and healthcare environments. There is thus a low risk associated with the researcher’s skill level within the context of Lean management.

Furthermore, qualitative research can be influenced by personal bias or preference of the researcher and must be acknowledged upfront and accepted to a certain extent as part of the research process - avoiding the impact that personal bias and opinion has on the research, would in itself present a limitation. There is no personal gain for the researcher to have any positive bias in this study, and therefore, the limitation is negligible.

Lastly, the validity of the Case method in academic research has been challenged in the past, however, Flyvbjerg (2006) published a well-positioned argument to the contrary that has been generally accepted in the research field. Flyvbjerg concludes:

“…that a scientific discipline without a large number of thoroughly executed case studies is a discipline without systematic production of exemplars, and that a discipline without exemplars is an ineffective one. Social science may be strengthened by the execution of more good case studies” (p.1).

The use of semi-structured interviews as the main data collection method has its limitations:
• Interviewer bias on behalf of the interviewee – depending on how the interviewee relates to the interviewer, there might be positive (or negative) bias in their responses.

• Poor articulation on behalf of the interviewee – although the interviewee might be very clear on what they are trying to describe, if poorly articulated, the meaning and underlying tone can be lost to the interviewer.

• Poor recollection – some of the questions in the interview can relate to events that happened several years ago and thus, poor recollection of the detail might limit the richness of data gathered.

Bias and poor articulation can be overcome by the researcher by corroborating key findings from interviews with alternative sources of data and pieces of evidence.
4. RESEARCH FINDINGS

This section presents the results/findings of the study conducted on Lean management implementation at Groote Schuur hospital. The main research questions How effective has Lean management implementation been at GSH focused on Lean management at an organizational level, and therefore, details surrounding specific project results were not measured and assessed. The researcher did however interpret results and measurements from ongoing Lean projects to support/dispute findings that stem from the data collected during interviews.

Throughout this chapter, findings from the collected data and interviews are interpreted by the researcher and supported with verbatim statements made by interviewed respondents in the Exhibit boxes. Where appropriate, further support/information is provided from the external facilitator’s point of view, shown in External Facilitator boxes.

This analysis follows the flow of the CLEAR framework (see Appendix A: The Clear Framework), supported by the defined themes of section 1.4:

- Local environment and Context – Organizational background at GSH.
- Lean transformation – Organization-wide factors
- Lean transformation – Project factors
- Intermediate outcomes – Organizational
- Ultimate outcomes – Organizational and patient

The target was to perform 20 semi-structured interviews across various layers of the hospital’s structure (as described in section 3.6, Table 5). A total of 22 interviews were conducted. The first 3 interviews were not included in the research findings since they were used as a pilot to test and adjust the interview questionnaire, before continuing.

In the sections to follow, each of the factors of the CLEAR framework was assessed individually and rated against the conceptual frameworks of Appendix E: CLEAR framework Conceptual framework Coding Plan (Level 1). The researcher’s assessment and rating is supported with evidence from the interviews together with input and opinions from the Lean facilitation team (internal as well as external).
4.1 Local environment and context: Organizational background

The first two pillars of the CLEAR framework provide an overview of the hospital being examined and the context within which it operates. This section covers the elements of the CLEAR framework within the Local Environment and Context pillars (elements 1 – 16).

Local Environment

Groote Schuur is a government hospital that forms part of the greater Western Cape public healthcare system – from this point of view, there is limited factors surrounding purchaser pressure, payment methods, and competition in the traditional private healthcare context. These factors should rather be interpreted in context of the public health care system. There is no competition as such, but there is immense pressure from customers (patients) and the Department of Health on improving the level of service and patient experience at the hospital.

Context

At provincial level, the Western Cape healthcare system is made up of five layers as shown in Figure 4. Groote Schuur falls into L3 – Tertiary and Central hospitals. The role of this hospital, apart from offering trauma and surgery facilities, is to offer specialized outpatient functions (radiology, Obgyyn, oncology, optometry etc). Apart from the hospital’s function as healthcare provider, GSH is also a renowned training hospital and research hospital attracting many visiting researchers and medical students.
The reality of the hospital’s day-to-day activity is a continual increase in patient load as a result of failure in primary healthcare services, weak referral pathways and a lack of care-coordination with external healthcare providers. This situation is further exacerbated by an increase in the severity of patient conditions.

GSH attended to about 50 000 admitted patients and more than 350 000 out-patients during the 2016/17 reporting year; performed 27 000 operations and delivered nearly 3 000 babies. The hospital’s 975 beds were 85% occupied during the same period. The hospital is run by a staff compliment of 3 500 members, of which roughly 2 200 are medical staff, the rest being technical, support, admin, and maintenance staff. Overall, the hospital’s management team is responsible for an annual budget of R2.5bn.

Culturally, public health facilities are characterized by bureaucratic leadership styles with a very distinct top-down approach either from local management, the Department of Health or government itself – GSH is no different from this. The hospital’s prior experience with quality improvement is heavily linked to compliance in the healthcare environment and has been focused on ongoing quality improvement against compliance rather than patient experience.
improvements, the hospital thus had very limited exposure to Lean management principles prior to the commencement of the LIA relationship in 2014.

The organization is heavily set in its ways and the absorptive capacity of staff is medium to low due to people needing a lot of coaching to grasp new approaches (outside of the normal role) and start using them. Although the hospital has a strong information infrastructure, historically it was focused on compliance (such as the introduction of the National Core Standards that all healthcare facilities in South Africa have to comply with) rather than improvement. Public Health face ongoing pressure on budgets and availability of (skilled) human resources and as such, no significant slack resources are available at GSH. This also results in a low level of workforce flexibility within the hospital.

The establishment of the hospital’s vision and goals is currently ongoing and being aligned with strategic-, departmental and provincial goals.

The hospital’s leadership team recognizes the challenges they face, in particular: shortage of skilled staff, a strong entitlement culture at the hospital, poor communication between different hierarchies in the hospital, and a resisting attitude towards change. One can argue that the first two of these challenges are somewhat inherent to public healthcare, whilst the third is true for any organization or sector – resistance to change is human nature and this needs to be carefully managed to be overcome successfully.

4.2 Lean transformation: Organization-wide factors

Examining the transcribed interview responses, and using the theoretical framework shown in Appendix E: , the researcher assessed GSH’s performance and progress against elements 17 – 31 of the CLEAR framework (Appendix A: The Clear Framework). The findings will be discussed under each of the elements below.

**Purpose: True North**

Assessment: Ongoing.

The entire interview sample could describe the hospital’s True North statement, albeit in varying levels of detail. The goals and what each of the pillars entail does not seem to be clearly defined to operational levels and left most of the respondents unable to articulate their role in delivering the hospital’s True North ambition. Although the True North (GPS) is clearly
communicated, there is lack of understanding of the meaning and interpretation of the goals in the hospital.

Exhibit 1 highlights some of the comments made by interviewees that articulated both the high level of understanding/awareness of what the True North is, and also the undefined link back to how it is executed in daily workflow and behavior.

**Exhibit 1: True North statements**

“*The GPS is a name given to a number of ideas/tools/strategies to ensure that the hospital improves the way they work, minimize waste and with patient centeredness as the core. Wellness of staff and minimizing financial and human resource waste. This can be extended to the hospital’s vision of leading innovative healthcare*” (E13)

“I understand the GPS (True North) - it is all to do with innovation and the vision and the mission of the hospital and is also focusing on quality care, forward planning and empowerment, but I’m not yet sure what I need to do differently” (O7).

External Facilitator 1 sheds some light on the possible underlying cause for the missing link between what is being measured and how the staff can influence that through their daily work.

**External Facilitator 1: True North**

*True North has been in the making for a few years, however it took very long to get there. John’s Toussaint’s visit in 2017 together with the executive coaching process emphasized the need for True North to be defined.*

*There are still some open questions on the defined objectives and measurements - whether there is buy-in to the True North objectives and measures is not certain yet. Once it becomes a reality (cascading of TN is still ongoing) questions will be raised that will lead to another round of clarification of the TN measurements.*
Lean goals
Assessment: Ongoing

Overall, the goals of the hospital are clearly defined and well understood by, and communicated to the staff. Interviewees across all groups could easily identify with the hospital’s vision and mission and overall goal set. Probing to understand what the role of Lean is within delivering the hospital’s mission and vision yielded less definitive responses. The general opinion is that Lean is focused on reducing waiting time throughout the hospital and, in some isolated instances, reference was made to reduction of waste. Upon further probing it became clear that there is no well-defined link between the hospital’s goals and Lean goals.

None of the interviewees were able to articulate clearly the link between patient centered, innovative healthcare and the Lean projects that they are busy with. Better quality of service was mentioned from time to time, but again, based solely on reducing waiting time and in some instances, improving physical patient flow/movement through the hospital.

External Facilitator 2: Lean goals

The GPS has been made progress on the TN objectives, but whether the TN objectives are well understood throughout the hospital is not clear to me. This may be partly due to the history of how Lean has evolved from a Lean improvement projects approach. That has slowly started changing towards an organization wide approach.

Alignment
Assessment: Ongoing

The CLEAR framework reviews alignment in the organization from two angles:

- **Lean alignment with hospital vision/goals:** During the course of the interviews and engagement with GSH staff and management, the researcher was unable to uncover any prior set of hospital vision/goals, other than the True North statement and goals that was developed and cascaded recently as part of the hospital’s Lean management journey. There is thus a strong relationship and alignment between the hospital’s vision and goals, and that of Lean management at GSH.
Alignment is only happening now after John’s visit and will require at least another 6 months to cascade substantially through the organization.

- **Departmental alignment with Lean goals:** This area requires more alignment with the hospital as a total entity. Within departments where Lean management has been ongoing, the department’s workflow and approach to problems is aligned with the Lean goals, however, in areas where Lean has not yet fully been established, the alignment is lacking and teams still feel that Lean management is an alternative to the way they worked before, but not necessarily a standardized way of working going forward. Given that Lean is journey and that GSH started with a model cell before rolling out to the wider hospital, this partial alignment is to be expected at this stage.

**Exhibit 2: Alignment statements**

“The GPS started parallel to Lean - driven by Innovative healthcare and the management system around the Lean journey which has now come together in True North and the GPS.” (E-18)

“Part of what the team measures is the True North metrics. (Mortality rate for instance) Lean projects should line up to delivering True north objectives.” (S-19)

“As the OPD team, we are involved in several projects. We are part of the big GSH GPS.: (O-01)

“Lean management is not always the way to solve a problem. You might be able to solve it in another way, before having to apply Lean.” (S-02)

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4 GSH was first introduced to John Toussaint (CEO Catalysis) in 2015 when John was in South Africa as keynote speaker at the Lean summit. Since 2017, GSH is collaborating with John who is currently coaching members of the executive team. John visited GSH in September 2017 and provided feedback and guidance on how GSH should take Lean management forward.
Scope of Lean activities
Assessment: Lacking/requires improvement

The scope of Lean activities at GSH is very limited to certain areas and specific improvement projects only. Within these limitations, there are also departments where no formal projects are being run and where teams are not exposed to the process first hand.

Furthermore, at leadership Level, Lean is perceived as a project being rolled out to the hospital and that the impact and effect will only be at operational level without impact on standardized work and processes at leadership.

- **Units using Lean**: Limited departments in the hospital are using Lean.
- **Lean projects**: Focused on reducing waiting time and waste of resources – at operational level, only waiting time have been addressed with some resource related projects (water and energy) being completed by the facilities team.
- **Breadth vs depth of deployment**: The Lean journey at GSH is ongoing and the breadth of deployment is not yet operational across the hospital’s departments. Where Lean has been deployed, there is a lack of depth in most projects as the true root-causes are only now being uncovered and resolved through use of the 7C’s (Appendix F: The 7C tool) and PDCA tools.

External Facilitator 4: Scope of Lean

*Lean is established in four or five units in the hospital, not sure to what extent Lean covers the whole hospital. Probably only a third have heard of GPS and Lean and only 5-10% have an understanding of what it is all about. People are encouraged to start doing Lean projects, but it is at random and uncoordinated. It’s difficult to say to which extent it has spread through the hospital. My impression is that the depth of deployment is limited and people are in the first stage i.e. Team improvement level (their own work processes).*
Pace of Lean activities

Assessment: Ongoing

The implementation of Lean management at a new site normally starts with a model cell. This is to allow introduction of the concepts in a controlled population, manage change and customize/develop relevant tools and processes to fully support the initiative.

In the case of GSH, the model-cell was the OPD department and after one year, rollout begun, but has been progressing very slowly. The result is that staff have disengaged and do not clearly understand that Lean management is part of the hospital’s strategy and leadership philosophy going forward. The slow pace at which projects have moved, coupled with the bureaucratic nature of decision making and change management within government sectors has resulted in skepticism amongst staff. The progress of Lean and the pace at which activities move is also linked to the perception of the various heads of departments’ involvement and drive behind implementation.

External Facilitator 5: Pace of Lean activities

The pace is slow, if not very slow. Partly because the training component is not fully in place. There have been various attempts to get basic training materials for frontline teams ready. In the early years, individual team training and coaching happened, but trying to scale-up with the internal training and development team did not work. Currently, training is back with LIA but not sufficient to support hospital of this size.

At this stage, it would appear as if projects are picking up momentum, especially as more teams come on board and more projects in the wider hospital is starting to yield results. Unfortunately, Lean is still seen as a task-set over and above the normal workload and not as a way of being more efficient with staff time as well.

Exhibit 3: Pace of Lean activities statements

“Here in our department we are picking up momentum, but it is because of our leader. In other departments things are very slow and people are frustrated.”

(S-01)
“The main projects were in OPD and it was stuck there for a long time, focused on projects only and not focused on a management philosophy, it was quite isolated.” (E-18)

“It took us about 6 months, but once we got something achieved, the next step became so much easier and the negative energy dissipated.” (E-03)

**Coordination of Lean activities and resources**

Assessment: Ongoing

Previously, Lean activities were coordinated by external consultants in collaboration with hospital management. It is only for the past 4 months that the central Lean team has been established and focus is now starting to shift towards creating a central project database and tracking and coordinating all projects across the hospital from a central point.

**External Facilitator 6: Coordination of Lean activities and resources**

In the past, there were confusion around different initiatives at GSH and this possibly diluted progress and impact. GPS is now seen as the dominant initiative and is widely supported. The Lean support office was only established in 2017 – it was not as well coordinated as it needs to be, especially in the early years. That is now changing.

Furthermore, there has been (over the last 2 years) a management development program led by the CEO – this is very compatible with Lean leadership, however, used different general leadership terminology - people saw this as something different from the GPS.

**Development of Lean Tools**

Assessment: Ongoing

Originally the A3 problem solving method was deployed at GSH, however, over time, the 7C method was developed to specifically cater for the needs and capabilities at GSH hospital. Furthermore, standard Lean tools – PDCA, 5-Why analysis, and process/patient flow mapping is established and developed for use by the teams. Daily management check-sheets and visual representation has also started being standardized with work ongoing currently to standardize
the data collection method. Templates require further simplification as staff feels that there is some duplication and that areas of the data collection are redundant.

*Exhibit 4: Development of Lean tools statements*

```
“A3 was found to be too complex and overwhelming, so the 7C’s was developed. PDCA is used as well as part of the process.” (E-03)

“The DMS score sheet is not very easy to use - too complicated and too many questions – it comes across as repetitive.” (S-08)
```

The tools listed above and the progress to date, however, constitutes only a small portion of the Lean tools that is required in a mature Lean management system. There is still a long way to go before the development and adoption of Lean tools will be fully established at GSH.

*External Facilitator 7: Development of Lean tools*

```
In terms of most people at GSH’s experience they feel that they have done well and in many ways, I agree with that. The HR department is now using 7C’s and it disseminated there organically. The 7C’s has helped to get people started and it is an important and positive development. The thing is that this is only the first level of problem solving and many levels of deeper problem solving and systemic tools which are not yet in use or discussed because GSH is still in the early stages of getting this going.

It is important that it is understood that these comments are from the bigger picture perspective of Lean and what constitutes a mature Lean management system. Very few people at GSH have had much exposure to that.
```

*Adoption of Lean philosophy and values*

Assessment: Ongoing

Based on the summary of earlier elements of the CLEAR framework, sufficient evidence has been found during the interviews to establish that there are pockets of fully committed teams to the Lean philosophy, but at the same time, there are also teams who have not yet been fully exposed and as a result, fail to see any benefit that can come from adopting Lean principles.
The Leadership program initiated by the CEO has quite a major and positive impact. The perception and understanding of it (the leadership program) is that it is intended to modernize the senior leadership style to modern away from the traditional government organizational leadership style. It started and progress is being made especially with the senior management. Coaching with John Toussaint has helped a lot.

Regardless of an individual member’s (or a team’s) adoption of Lean philosophy and values, the entire interview sample agreed that there is a need for creating value for patients by applying resources better and eliminating waste.

Exhibit 5: Adoption of Lean philosophy and values statements

“Before it was only two of us involved, but now the rest of the staff have started their own projects, using the Lean principles to address the problems they face – we see small incremental improvement all the time.” (S-09)

“I don’t think Lean is the total only solution and shouldn’t be seen as the be all and end all. Sometimes it is just not going to work and we have to acknowledge that.” (O-11)

Ongoing assistance and support by facilitators and consultants

Assessment: Fully established

Historically, Lean management at GSH was supported by external facilitator (LIA) in conjunction with the hospital’s senior leadership team. More recently, with the establishment of the Lean office and dedicated on-site support, the responsibility for day-to-day support has shifted to an internal resource with LIA playing a guiding and consulting role on the program overall, rather than on specific projects.

External Facilitator 9: Ongoing assistance and support

External facilitation has been involved since 2014 with dedicated support put in place since July 2017 – it took too long, but at least it is now in place.
There haven’t been many other inputs, other than PhD students and studies performed over the years. John Toussaint’s role is important for the leadership team, and so is the role of Catalysis and books (or material) as examples that is cascaded to the teams as this forms a key part of the ongoing support and development of the team.

**Change management model**

Assessment: Lacking/requires improvement

The Lean journey at GSH has been unfolding and developing as it evolved from a project initiative to a daily management system and ultimately into a management system for the hospital as a whole.

*External Facilitator 10: Change management model*

The plan in 2014 was to start in OPD with a model cell/pilot project and the objective was to demonstrate significant improvement as a success story that will drive the initiative forward.

In 2015, the focus was on building systems and measurements to visualize performance. Attempted to work with HR and Training and Development to start developing material, but with limited success.

From 2016 focus was more on managers with a coaching and development group once a week on a small, but core group of people – the aim was to give some sense of what coaching was about and also working with senior management. At the time, it was a conscious effort to pull out of the frontline work and focus on management systems.

The issue is you obviously firstly encourage the hospital to take ownership at all levels and as the external consultant, you don’t have the final say (and shouldn’t have) on what is prioritized. This means things don’t always happen in the way that you as external consultant may think will work best.

Given the history, Lean management at GSH started in isolation at first and only recently developed into a holistic leadership approach. The result is that a clearly defined change
management model was not in place initially, and seems to still be lacking at this stage. The leadership team is aware of this and have made reference to the need to communicate and launch Lean across the entire hospital.

*Exhibit 6: Change management model statements*

<table>
<thead>
<tr>
<th>Statement</th>
</tr>
</thead>
<tbody>
<tr>
<td>“If you want Lean to be part of your daily work plan, and for Lean to become a way of life we need to work harder at bringing people on board.” (O-06)</td>
</tr>
<tr>
<td>“Lean is still seen as project based - the teams have not seen the transition between Lean as a project and ongoing management process/philosophy.” (E-13)</td>
</tr>
<tr>
<td>“GPS and Lean needs to be launched across the hospital instead of small localized events.” (E-13)</td>
</tr>
</tbody>
</table>

**People: Personnel selection, support and retention**

Assessment: Ongoing

This section of the CLEAR framework has been covered in discussions in previous sections already, below a short summary:

- **Train people:** Training and the availability of training material to teams has been flagged as a concern and area for development.
- **Coaching individuals and teams:** Until recently, coaching was done mostly by external facilitators and limited internal coached from individuals who participated in the original model cell of Lean. The establishment of an internal support office for Lean at GSH allows for more coaches within the teams to be trained.
- **A3 deployment:** The A3 tool was replaced by the 7C’s specifically for GSH – it is widely cited by the team as a valuable tool and is being used in all Lean projects in the hospital.
- **Support, recognize, and reward achievement:** Support is provided by external facilitators/consultant from LIA as well as the in-house team (recently established). Recognition is mostly through internal newsletters and communiqué. Currently, no reward system for achievement is in place.
**External Facilitator 11: People: Personnel selection, support and retention**

These things are happening, but in a limited and ad hoc way through the coaching development program and A3 deployment. People doing projects are getting exposure, but it is not as part of a particular HR people development plan.

**Process**

Assessment: Ongoing

Throughout the hospital, teams are fully aware of the goals of Lean and the hospital’s True North with an acute focus on eliminating waste and improving patient and personnel experience. The process of identifying waste and applying Lean principles to reduce, or identifying what constitutes an improved patient experience is still in its infancy with the majority of the projects focusing on reducing waiting time and/or movement between departments.

**External Facilitator 12: Process**

Generally speaking, process management is weak. People have some understanding of the process, particularly in areas where work has been done, however, there is a much better understanding of eliminating waste, than improving flow.

There is a big emphasis on patient flow and bed management in the hospital, but this is mostly fire-fighting activities and not based on a management system to make patients flow through the whole process.

The challenge is that the Heads of departments hold the control over their wards/departments. When they get pushed to move their patients along, their perception is that it is not always good for clinical outcomes. It’s a difficult issue and complex in a hospital of this size. (Even at unit level, admissions/eye clinic etc where the flow is mostly under management control, it is not well understood.)
**Education and training**

Assessment: Lacking/requires improvement

Across all departments and all levels of the organization, teams were in agreement that training and education around the use of tools, the application of Lean, and what the end result should look like is severely lacking. The message about Lean and its meaning at GSH has been rolled out inconsistently and people are now engaging on the topic via the grapevine resulting in increased anxiety to some, miscommunications, and in general a lack of clear alignment.

*External Facilitator 13: Education and training*

```
GSH has not been able to get that (training) up and running. It’s not as if no education and training have happened, just much slower than anticipated.
```

The research found no clear evidence to support a structured education and training plan covering the various layers in the organization and functional leads of each department.

*Exhibit 7: Education/Training statements*

```
“I did not receive any particular training from the hospital’s side on the skills required for gathering data and supporting the Lean projects.” (S-19)

“Four months after I joined hospital they mention Lean to me, but it was in passing and not linked to an expectation of the way thing work at GSH.” (S-16)

“I underwent the training course from LIA and then at supervisor and above level they were involved in projects and mentoring to get individuals involved in their area in smaller parts/components of the projects.” (S-10)
```
Communication about Lean

Assessment: Fully established

External Facilitator 14: Communication about Lean

There is an internal newsletter that serves as the general means of communication about Lean in the hospital. It is now necessary to have more communication and more consistent communication to gain the required momentum across the hospital.

Communication about Lean and the GPS is visible in most areas around the hospital. Several of the interviewed staff mentioned the monthly Grotties newsletter and the updates on Lean projects and teams published there. Among the interview sample, no lack of communication was found. Given that the researcher interviewed Lean participants, there is the risk that communication is not targeting teams who are not aware yet and thus more consistent communication is required as part of the training and education program throughout the hospital.

Exhibit 8: Communication statements

“There is the GSH newsletter that goes out to everybody - Lean is mentioned from time to time.” (O-11)

“…communication have been in the Grotties newsletter. True north and GPS is printed and displayed in all departments.” (E-03)
Problem solving

Assessment: Ongoing

The teams are generally fully aware of the tools available to them, and in most instances, were able to cite examples of how Lean tools and projects have yielded positive results – whether in their own department of elsewhere in the hospital that they are aware of.

External Facilitator 15: Problem solving

This is as well developed in the teams where it is present as one can hope for at this stage of the Lean journey.
Using the tools and solving problems autonomously is still a concern to many of the interviewed respondents, even some of the operations managers have expressed their reluctance to use the tools simply because they are not always sure if they are doing the right thing.

**Exhibit 10: Problem solving statements**

<table>
<thead>
<tr>
<th>Statement</th>
<th>Reference</th>
</tr>
</thead>
<tbody>
<tr>
<td>“Teams start to tell each other what to do and what it is all about – normally people are excited to get involved.”</td>
<td>(O-05)</td>
</tr>
<tr>
<td>“Looking at some of our projects, they didn't start as a Lean project, but rather as a problem and when we discussed it with our manager we started using the 7C's to try and solve it.”</td>
<td>(O-06)</td>
</tr>
</tbody>
</table>

**4.3 Lean project factors**

The next pillar in the CLEAR framework is concerned with Lean transformation at a project level (elements 32 – 39) – not the assessment of project outcomes and performance against goals, instead, assessing the Lean management approach to forming of projects teams, tools, reward and recognition, and ongoing support.

**Leadership support and participation**

Assessment: Ongoing

Overwhelmingly, the interviewed respondents feel that their immediate management as well as more senior layers of the organization (where applicable) is fully immersed in Lean management and fully support the teams in implementing Lean processes in their departments.

**External Facilitator 16: Leadership support and participation**

The fact that LIA is still there and a full-time team has been appointed, underpins leadership’s support to the program. The participation of senior management in the executive coaching with John is further commitment, buy in and sponsorship from the leadership.

One of the challenges is getting leadership to the Gemba enough, however, commitment and support is fully there.
This is however contradicted with some of the responses and statements made during the interviews, where interviewees express a moderate level of frustration with support to unblock certain hurdles that will allow to speed up the process. Furthermore, participation in Lean projects by leadership seems to be lacking – participation by leadership was not mentioned by any of the interviewees and even when explicitly asked, there were no confirmed response of senior management being part of Lean project teams.

Exhibit 11: Leadership support and participation statements

```
“Sometimes when you approach management you have to go through a lot of channels to get going on a project. If you can have a direct route and faster approval, the team will be more motivated.” (O-01)

“Yes, there is no lack of support/buy in from my leadership, but they are not visible and part of the team.” (S-09)

“Leadership’s time to be available and present at project level is not there - mostly due to restrictions on time availability.” (S-10)
```

Central improvement team
Assessment: Ongoing

The central improvement team for Lean activities at GSH was only recently put in. At the time of this research, the team was still settling into their new roles and defining the scope of their activities and level of engagement with the team.

External Facilitator 17: Central improvement team

```
The central improvement team is still very new. Under the circumstances they are doing well, but both recruits in the team are still learning and gaining experience with Lean management and implementation. Ideally, this should be augmented with a more experienced team member.
```

During the course of the interviews, it was mentioned several times by various interviewees that there was a lack of support available on a day to day basis, however, with the forming of the central improvement team, a huge step change in access, guidance and coaching has been experienced. This is being perceived as an extremely positive step to support Lean and assist
the teams in including Lean management in their daily routines, however concern was raised
several times that the support is not sufficient given the size of the hospital.

Previously, the IMU (Information management unit) supported the teams with data collection
and presenting into graphical format. Although a central office is now in place, some teams still
refer to this new team as IMU – feedback was tested to ensure that the interviewee was referring
to the central Lean team when referring to IMU.

Exhibit 12: Central improvement team statements

<table>
<thead>
<tr>
<th>Statement</th>
<th>Reference</th>
</tr>
</thead>
<tbody>
<tr>
<td>“We have a lot of support from our manager and the IMU unit. Staff who were part of the first projects are also willing to assist newer teams and we now have a permanent Lean team to call on.” (O-05)</td>
<td></td>
</tr>
<tr>
<td>“At first, we had some anxiety around computer skills - we are from the old-school, hardly used computers. The IMU team helps and we can call Garth for help.” (S-09)</td>
<td></td>
</tr>
<tr>
<td>“Lean projects are run by team at the Innovation hub, but two people is not enough.” (S-16)</td>
<td></td>
</tr>
</tbody>
</table>

**Daily management system**

Assessment: Ongoing

This section of the CLEAR framework requires more in-depth analysis of specific Lean projects – as already stated, that is outside of the scope of this research. The interview questionnaire gathered information regarding the use, availability, and accessibility of Lean tools and thus the researcher can posit a view on the below elements.

*External Facilitator 18: Daily management system*

- **Standard work:** Very little mention was made to standardized work. This was only observed in one of the areas (eye clinic) which is also one of the longest running Lean projects and thus most established, but not representative of the entire hospital.
- **Value stream mapping:** Some of the areas that are further advanced in implementation of their Lean projects have a very limited understanding of the value stream mapping and the process flow of work (patients) through their department. The value stream map/process flow is displayed in the team areas.

- **A3 Deployment:** This tool has been customized for GSH to the 7C’s – it is widely cited as the most effective Lean tool and all team members interviewed referred to its use in their department.

- **Visual progress boards:** Visible in most areas – tracking progress on defined project metrics against a set target or ambition benchmark.

- **Regular huddles:** Some teams have regular huddles, however, several hurdles around staff availability, time constraints and shift patterns were cited as inhibitors to regular team huddles.

- **PDCA:** This tool is used as part of the 7C methodology. All interviewed staff members were confident and comfortable to explain the process and instances where it has been used.

### Exhibit 13: Daily management system statements

“Participation and time keeping is a big problem. People are not showing up for the morning huddle and doesn’t seem to be committed.” (S-09)

“Tools help come to the root of things. Whenever you have a problem you make use of the 7C and PDCA and you can see there's results.” (S-08)

“We use the 7C's and the PDCCA. The graphs help a lot and the white boards that we use to put of the graphs and findings.” (O-05)

“Daily team checklist is important and the tracking against putting SOP’s in place to resolve issues permanently.” (S-09)

“We don’t use them in everyday problem solving, only in the Lean project.” (S-04, referring to 7C’s and PDCA).

“Trying to improve patient services, we mapped out (the) patient flow and realized where the time is wasted.” (O-06)
Lean team size and resources

Assessment: Lacking/requires improvement

Currently there does not seem to be a clear strategy in determining the size of Lean teams. The minimum resources required and the functional representation to support the initiatives is not well defined and left to the facilitator or coach to decide. In some instances, team allocation is done by leadership or picked by the external facilitator. All interviewed respondents believed Lean projects are identified by leadership and that team members are identified and assigned to the team.

External Facilitator 19: Lean team size and resources

GSH people to a large extent think of the GPS as project teams, and it might be that in some wards they do multiple projects and deliver varying levels of success. The standard work side of Lean teams is still in the very early stage of development, ie. The standard work of a team working within the daily management system as opposed to working against SOP’s.

Some individuals expressed concern around teams being too large and as a result having limited impact and control. This type of comment was mentioned in more than one department and consistently came from more mature/established Lean teams.

Exhibit 14: Lean team size and resources statements

“Teams are too big and too many participants with nobody in control. We need to reduce the team sizes.” (S-12)
**Lean team composition**

Assessment: Lacking/requires improvement

_External Facilitator 20: Lean team composition_

> The good news is that HR have had an interest all along and recently took off rapidly. Support services as well. The teams are not just in the primary value delivering processes anymore, support processes are being involved as well.

> One of the challenges remain that very few doctors are involved, there are also issues around frontline admin people not being adequately involved.

Organically forming teams to solve common, everyday problem is not yet demonstrated by any of the teams. All interviewees who form part of Lean teams have been assigned/selected by their management. From peoples’ understanding of Lean, it is evident that the aim is to bring multi-disciplinary teams together to solve problems, however, most teams are focused only on their part of the problem without taking up- and down-stream impact into account.

_**Exhibit 15: Lean team composition statements**_

> “Projects are handled as individual instances and not seen as a continuum of improving steps of the (total) process as a series of events in the patient’s life.”

(E-13)

**Lean tools and methods**

Assessment: Ongoing

The most regularly cited Lean tools being used at GSH is the 7C’s (customized version of the A3 method) and the PDCA tool. Very limited mention was made of the 5-Why method for determining the root-cause of a problem.

In the pockets where these tools are used, they seem to be applied regularly and consistently, however, several interviewees highlighted their lack of understanding of the tools and the correct application. The method of continuous improvement and Lean being an ongoing journey is generally expressed confidently by the respondents interviewed, however, only in
context to identified projects. Lastly, the teams’ mindset is not embracing Lean methods as the way to solved problems.

Exhibit 16: Lean tools and methods statements

“I had no training on Lean, I learnt from colleagues but I’m never sure if I’m doing the right thing.” (O-05)

“The mindset on how to approach problems with Lean methodologies is still the biggest challenge to overcome.” (E-18)

Rewards for accomplishments
Assessment: Lacking/requires improvement

The research did not explicitly explore the topic of reward for accomplishments in Lean with the interviewed staff. This question was only raised to the leadership team to understand whether there are any mechanisms for reward built into the Lean management strategy.

At this stage, there is no reward system in place. Recognition is given in the form of published results of the best performing team in the monthly hospital newsletter. At the time of the study, only one project’s results and the team involved had been published at an international conference.

External Facilitator 21: Reward for accomplishments

There is not a material rewards system. I support that; the moment material rewards are involved it creates complexities. There is a recognition system in the newsletter and some projects are presented to leadership, but more needs to be done to create recognition on a more ongoing and consistent way.

Compatibility with social structures and cultures
Assessment: Ongoing

In theory, there should be a high level of compatibility between the culture of the healthcare environment and continuous improvement initiatives. The GSH team seems to be dedicated and committed to supporting Lean management from a culture point of view.
In general, people in Healthcare are really there to do good – look out for the fellow man and very dedicated to their work. The nature of improvement work fits naturally into that. The problem is that there is quite a fire fighting culture that is not compatible with systematic continuous improvement. That is slowly changing and the leadership program put in place by the CEO has introduced a much more contemporary approach to management.

The social structured within the hospital presents a slightly different challenge. A large number of respondents, from various layers of the organization, felt strongly that the social structures within the hospital is restrictive to the successful execution of Lean projects in their respective departments/areas. The most commonly cited inhibitor was the lack of participation from the entire team that constitutes a particular work-flow process, with emphasis placed on the lack of buy-in from doctors specifically.

It was mentioned several times that doctors don’t see the value of Lean and that it is not part of their core function. In some isolated instances the doctors form part of the core team, but this seems to be the exception more than the norm, due to time constraints the researcher was unable to interview any of the doctors who form part of Lean projects.

**Exhibit 17: Compatibility with social structures statements**

“In the teams, some members take longer to participate as part of the team. Especially the doctors are always reluctant to join and don’t see the value. Not easy to convince them to participate.” (E-14)

“Doctors are not on board and it has been difficult to get them included.” (O-05)

“Sometimes when you approach management you have to go through a lot of channels to get going on a project. If you can have a direct route and faster approval, the team will be more motivated.” (O-01)
4.4 Intermediate outcomes: Organizational

Lean transformation is a journey within any organization – this section of the CLEAR framework assesses the intermediary organizational outcomes along this journey (elements 40 – 46) and focus specifically on changes in culture, behavior, workflow and levels of engagement with Lean.

Culture change
Assessment: Ongoing

Culture change is a slow process that required constant effort and attention to drive behavior, attitudes and mindset. Add to that the hierarchy and traditional norms of government institutions and the heavily engrained behaviors required in the healthcare environment, and the change is perceived as being even slower (Graban, 2008). GSH is no different from this reality and the impression is that the hospital is making progress in breaking down old ways of thinking and driving a modern and inclusive leadership style and approach to their operations.

External Facilitator 23: Culture change

The culture change is coming - it's slow, but GSH as an organization is more advanced than other government organizations that I know of in terms of contemporary management culture.

Provider/Staff satisfaction and engagement
Assessment: Ongoing

In general, from the interviewed sample, staff across all layers of the hospital’s team was very positive and engaged on the topic. Granted, the interviews were conducted within existing Lean teams (or in departments where Lean has been rolled out) and thus, there was a higher level of understanding of Lean and the impact on the department than what there would be in areas of the hospital where Lean is not yet established.

External Facilitator 24: Provider/Staff satisfaction and engagement

My impression is that for such a large organization, compared to some other government departments and hospitals, the staff at GSH are above average in terms of their attitude and positive nature. GSH is an academic hospital.
and have strong history - there seems to be a certain pride associated with being a GSH employee.

At this stage, there seems to be a lack of confidence to completely embrace and engage in Lean – this is to be expected in the early stages and should, through further training, development of material and experience, correct over time.

Exhibit 18: Provide/Staff satisfaction and engagement statements

“Staff are more involved and participate more which has a positive effect on our team engagement and support. We have weekly huddles as part of the Lean project.” (O-07)

“I’m not feeling confident that I understand the process well enough (yet) to operate autonomously in my department.” (S-16)

Increased Lean knowledge and skills

Assessment: Ongoing

Lean has been present at GSH hospital for some time, formally since 2014 with the first engagement with LIA. It is to be expected that the knowledge and skill level was very low, if not non-existent, at that time. Since then, several trainings (at various levels from leadership to operations staff) have been conducted and several projects have been executed at the hospital.

At present, Lean has not been rolled out to the entire organization and there are still several departments that have not been exposed first hand. The knowledge and skill in areas where Lean has been established is growing, however, the hospital as a whole still has a long way to go.

External Facilitator 25: Increased Lean knowledge and skills

The team have come a long way, but there is still far to go.
Lean routinization
Assessment: Lacking/Requires improvement

The majority of staff interviewed could not clearly articulate where Lean is being used outside of the specific projects and how the thinking methods and problem solving tools have become part of the routine. OPD and Pharmacy has been going the longest, these are also the areas where the researcher focused on interviews. It is to be expected that these two areas will be the best developed in the hospital based on the duration of exposure and Lean activities.

“We managed to sustain positive trends, but it involves commitment from the team. If someone from outside came and implemented, we did not sustain it, but when we did it with the team, we did sustain the improvements.” (E-03)

Sustainability of improvements and results is one of the key features of a fully integrated and routinized Lean management program. Across the areas interviewed, there are examples of positive results, but no evidence of long term sustainment. This can be, in part, attributed to not sufficient time lapsed to make a concrete conclusion, and in part to skills and knowledge vesting with individuals (champions) and not necessarily a fundamental change in the workflow.

External Facilitator 26: Lean routinization

Very weak across the hospital. In some ways, this is one of the biggest challenges – team meetings happen, but the routines are not well established. There is evidence of departments where the daily management system was working, until a key staff member was transferred and things has now fallen apart. This indicates that the initiative still relies on the pioneering individual and has not become routine in the department.

Dissemination of Lean inside the organization
Assessment: Ongoing

Internal dissemination of Lean has been very slow and mostly driven by roll out plans and not organically between departments and function. From the interviews, it seems that this is due to a lack of inter-departmental engagement and synergies, with the majority of the team’s focus being on their immediate environment. Where Lean has disseminated to other parts, it is mostly at the hand of coaches and the facilitator.
External Facilitator 27: Dissemination of Lean inside the organization

Internal dissemination has been slow and my perception is that not more than about a third of the hospital has been covered.

GSH has played a role in disseminating Lean management in healthcare to other organizations through hosting of workshops and participating in the Lean summit. This played a very positive role, but it is entry level Lean, not the more mature aspects of Lean.

Responsiveness capability
Assessment: Lacking/Requires improvement

Currently, the routinization, and deep level knowledge of the Lean tools is not sufficiently established to expect the teams to be able to have any sort of responsive capability within Lean management. During the interviews, the researcher was unable to assert whether any form of responsiveness exist within the Lean teams. Therefore, the external expert opinion is the only input for this element.

External Facilitator 28: Responsiveness capability

At value stream level putting teams together to solve systemic issues has not yet happened.

Responsiveness to deviation from norm - if the graph goes red, is there an effective improvement response? Generally, the answer is No. Not even at Unit/Frontline team level, Slight exceptions in EU, but the type of real time problem solving that Lean is aiming for is nowhere near well established.

Improved workflow
Assessment: Lacking/Requires improvement

The interviewed sample were mostly of the opinion that Lean has contributed to an improved workflow in their area – the researcher is concerned with this feedback for two reasons:

1) It seemed that the interviewees felt compelled to answer this in a positive way as to avoid being perceived as negative or not fully on board with the GPS and Lean Management at the hospital.
2) The researcher tried to remain neutral during the interview and therefore did not posit a definition framework for Improved Workflow. From the interviews, it became evident that interviewees equated improved workflow to better understanding and being more familiar with the Lean tools, and not necessarily to a fundamental change in the flow of people, resources, work and documents in the hospital.

This suspicion was further supported by the expert opinion in External Facilitator 29.

*External Facilitator 29: Improved workflow*

| Big step-changes in area layout and processes has not really happened. Very limited systematic workflow improvements e.g. in OPD there are some areas where workflow improved. Limited improvement in other departments. |

4.5 Ultimate outcomes: Organizational and patient

This section of the CLEAR framework requires evidence of improvements against efficiency, strategic ambitions of the hospital (business case and ROI), and measurable quality of service to patients and employee satisfaction. The interview questionnaire deliberately did not focus on this area, and thus the researcher will rely solely on the opinions mentioned by interviewees, together with the factual performance data (collected artefacts from GSH team) to form an opinion on the ultimate outcomes of Lean at GSH.

**Efficiency**

Assessment: Ongoing

There has been a huge focus at GSH to reduce patient waiting time - primarily in the OPD clinics and EU\(^5\) (Figure 5). In other areas, limited activities have focused on increased productivity and throughput by means of optimizing patient flow (eye clinic), or by altering the internal processes from a batched approach to a more continuous flow (pharmacy).

\[^5\] This graph was provided by the GSH team, at the time of this research, the data was already more than 12 months outdated, however, this was the last recorded information available.
On the operational side, some projects have shown positive results relating to energy and water consumption although reduction here started prior to the initiation of Lean. A more concrete example of positive results achieved is the project related to issuing of ID cards where the average waiting time reduced from >20 days to less than 48 hours (Figure 6).
Figure 6: Reduction in average waiting time for ID Cards

Business or strategic case (ROI)

Assessment: Ongoing

The strategic importance for GSH to continue their GPS journey is undeniably understood and supported by management and teams alike. Currently, the only measure as part of their True North that looks at cost or return on investment is the Cost per Patient-day measure.

The PDE (Patient day equivalent) is a standardized measure for cost per patient day at the hospital. It is not clear whether inflation is being adjusted for in the measurement over time and from the graph shown in Figure 7, the cost per patient-day equivalent is going up instead of down. There is a time-lag expected between implementation of an improvement initiative and measurement of the result, however, from the graph it is not clear whether the improvements are still lagging, or whether no impact can be measure.
Quality Assessment: Ongoing

In Healthcare, the two biggest objectives are quality of care and cost effectiveness – these objectives can be found in one form or another in any hospital environment globally – the measure that is put in place to assess the objective can vary widely. In the case of GSH the following measures form part of the True North objectives:

Adverse incidents: Includes both in-process adverse incidents and refusal of hospital treatment (RHT). The latter is not always in the hospital’s control. Initially this data was not presented as trends over time and the true progress (or lack thereof) was not clearly known. More recently, the data for the past two years have been presented in timeline trends and for the first time it became evident that Adverse Incident (excluding RHT’s) has been improving over the past year or so (Figure 8) from a high of >120 incidents in May 2016 down to below 40 incidents in August 2017. Ironically, the Quality department and manager has not been uninvolved in the GPS initiative – so results are not necessarily linked to Lean.
Figure 8: Adverse incidents and RHT reported at GSH

**Organizational Risk:** Commonly used in Healthcare is medical legal cases (there are other risks as well, but this is a big and potentially costly risk). Currently, there is no clearly defined and measurement data available.

**Mortality Rate:** The argument is that GSH is a tertiary hospital and therefore, should have higher mortality rate when compared to regional and district hospitals. In general, the mortality rate at GSH has been going up, but there is no clear link between the mortality rate and Lean at this stage. Currently, preventable and unpreventable deaths are measured together, however, the interpretation of this trend requires more analysis before a reliable interpretation is possible.
Lastly, there is a lag between implementing GPS practices and their effects, especially in large organizations the lag can be to be at least two years. In general, the implementation is still in its early stages and not enough time has elapsed to expect a significant impact at this stage.

4.6 Likert-scale interview responses

Section two of the interview questionnaire was aimed at assessing respondent’s attitude towards Lean management, their opinion on change management, and the availability of training and tools to ensure they can effectively embrace Lean management. The remainder of this section will present the findings from the Likert scale question in a graphical format, split by interview groups: All respondents, Senior management, Operational management, and Nursing & Support staff.

In the graphs to follow, the data contained in Table 6 is presented by subset of respondents. The vertical line indicates the range of responses recorded, whilst the horizontal tick-mark indicates the most frequent response within that group.
Table 6: Questionnaire responses - section 2 (Likert Scale)

<table>
<thead>
<tr>
<th></th>
<th>Question</th>
<th>Most Frequent</th>
<th>Low</th>
<th>High</th>
</tr>
</thead>
<tbody>
<tr>
<td>11</td>
<td>To what extent do you think Lean is a good idea?</td>
<td>10</td>
<td>5</td>
<td>10</td>
</tr>
<tr>
<td>12</td>
<td>To what extent do you like working according to the Lean principles?</td>
<td>9</td>
<td>5</td>
<td>10</td>
</tr>
<tr>
<td>13</td>
<td>To what extent do you think the way Lean was introduced and implemented in your hospital was done in the right and proper way?</td>
<td>5</td>
<td>5</td>
<td>10</td>
</tr>
<tr>
<td>14</td>
<td>To what extent do you believe training and tools were provided during the role out of Lean at this hospital?</td>
<td>8</td>
<td>2</td>
<td>10</td>
</tr>
<tr>
<td>15</td>
<td>To what extent has working with Lean contributed to better work flow?</td>
<td>9</td>
<td>1</td>
<td>10</td>
</tr>
<tr>
<td>16</td>
<td>To what extent do you feel empowered to operate autonomously in problem solving?</td>
<td>9</td>
<td>5</td>
<td>10</td>
</tr>
<tr>
<td>17</td>
<td>To what extent do you feel are the existing Lean tools (5S, A3’s, Gemba huddles etc) used in everyday workflow?</td>
<td>8</td>
<td>2</td>
<td>10</td>
</tr>
<tr>
<td>18</td>
<td>To what extent has Lean caused you stress/frustration in the workplace?</td>
<td>8</td>
<td>2</td>
<td>9</td>
</tr>
<tr>
<td>19</td>
<td>To what extent do you feel included and empowered to promote Lean in other parts of the organization?</td>
<td>9</td>
<td>2</td>
<td>10</td>
</tr>
</tbody>
</table>

All respondents

Figure 10 shows the response from the entire sample set – it is interesting to note that although there is a large range of responses present, the most frequent response to all of the questions are towards the upper end of the scale indicating a positive attitude towards the elements measured, however, the severe spread of responses indicates a low level of agreement across the respondents.

There is an obvious outlier, question 13: To what extent do you think the way Lean was introduced and implemented in your hospital, that it was done in the right and proper way? This question’s most frequent response is a 5-rating indicating a possible issue to explore further in the analysis regarding implementation and communication of Lean management at the hospital. Also, interesting to note is the response to question 18: To what extent has Lean caused you stress/frustration in the workplace? The most frequent response to this question is an 8-rating. Potentially signally a failure in effective change management and support to staff to ensure that Lean is not perceived as a negative and stressful addition to their normal work load.

Question 11, 13 and 15 adapted from the work of Holden et al., 2015
Senior Management/Leadership:
Dividing the interviewees based on function/seniority in the hospital changes the shape of the responses somewhat, especially at senior leadership level. Figure 11 shows the responses from the senior management team in isolation.

Firstly, the range of responses are much narrower and notably towards the upper end of the scale. Also interesting is that the leadership team was reluctant to score any of the questions a 10, except question 11: *To what extent do you think Lean is a good idea.* These responses can most likely be attributed to a better understanding of the strategy and awareness of Lean
management overall, a more realistic view of the hospital as an organization, and applying a more critical lens on progress to date.

It is to be expected that in a wider audience, spanning multiple levels in the hospital, that there will be individuals who have not been fully exposed to the strategic intent and communication around Lean management, and would therefore yield less favourable ratings to some of the questions. This is a key finding that the leadership team is aware of and have echoed throughout the interviews (see Exhibit 19).

Exhibit 19: Leadership team’s comments on communication

“Communication is ongoing and must still carry on to ground-level staff members. We acknowledge that it has not reached the entire hospital.” (E-14)

“Communication and training is critical to entrench Lean.” (E-03)

Secondly, the lowest performing question, even in the leadership team, is again question 13: To what extent do you think the way Lean was introduced and implemented in your hospital, that it was done in the right and proper way? This gives the researcher an indication that the extent to which change was managed and communication handled thus far is probably of concern and that it can potentially be an area to further explore and understand what the impact is on Lean’s effectiveness. Even here, the leadership team is aware of the shortfalls and have verbalized concern over the adoption of Lean and negative sentiment towards it (Exhibit 20).

Exhibit 20: Leadership team’s comments on Change management

“I can only comment on what I see on the floor - certain teams are very participative and have bought in. Other teams feel it's a waste of their time and don’t yet see the benefit (of Lean).” (E-13)

“The mindset on how to approach problems with Lean methodologies is still the biggest challenge to overcome.” (E-18)

Lastly, within the leadership team, question 19: To what extent do you feel included and empowered to promote Lean in other parts of the hospital? scored equally low to question 13. Although this response was not further probed with the leadership team, it is significant piece
of information to consider. One would expect the Leadership team to be fully engaged and empowered to promote Lean in every part of the organization without hesitation.7

Operational Managers:

The next group of respondents was the operational management layer of the hospital – effectively the first line managers who’s buy-in and support is probably the most critical to ensure operational staff adopt and apply Lean management in their daily routine. By default (in any organizational structure) this is the layer in the organization that requires the highest level of empowerment and support, and have the greatest influence in driving effective change management (Fine et al., 2009).

There is a strong sense from this group that Lean management can bring positive change to the hospital and the group, in general, feels somewhat empowered to operate autonomously in Lean projects, however, there is an undercurrent of doubt and uncertainty on how to make Lean management come alive outside of the projects and into the daily routines (see Exhibit 21).

Exhibit 21: Operational Managers’ responses to empowerment and support of Lean

| “Lean made a big difference in our department, especially when we look to where we came from, and the progress we see now.” (O-01) |
| “Lean is a logical tool for problem solving that makes sense and can be repeated once you understand how it works.” (O-17) |
| “I have not felt empowered to take control myself yet. Maybe once I’ve completed a project by myself I’ll be able to feel more in control.” (O-17) |

The key findings in the Operational management group (as shown in Figure 12) is again underpinning the need for change management and introduction of Lean to the teams in a more structured and supported way (question 13).

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7 Question 18: To what extent has Lean caused you stress or frustration in the workplace? Has not been posed to the senior management team.
Exhibit 22 shows some of the concerns expressed by the interviewees when providing their answers.

**Exhibit 22: Operational managers' responses to change management in their teams**

“If we want Lean to be part of our daily work plan, and for Lean to become a way of life we need to work harder at bringing people on board. We are getting there, but very slowly and others lose interest.” (O-06)

“I am not confident to talk to my team about Lean, what if I don’t know the answers? I have no standard material to use.” (O-17)

The operational managers’ group also highlighted the need for further training for themselves and their staff, question 14: *To what extent do you believe training and tools were provided during the role out of Lean at this hospital?* was given a 5 rating most frequently.

Exhibit 23 provides some insight into the general comments expressed by participants of this group.

**Exhibit 23: Operational managers' responses on training and development**

“We didn’t get a lot of training, and now, we are not sure whether we are missing out on something (that) we should know.” (O-01)
The high levels of stress/frustration brought by applying Lean management (question 18) is again evident in this group and is starting to become a common theme amongst all respondents.

**Nursing and Support staff:**
The last grouping of the responses focused on the nursing and support staff of the hospital – this is the layer that collectively constitutes the largest number of individuals, and one can expect that it is also where the greatest challenges lie. Rather unexpectedly, the most frequent responses in this subset of the population is seemingly more positively attuned than the operational managers’ subset.

The biggest concern, remains the concern around the change management, communication and training that accompanied the role out of Lean management to this group (question 13 & 14), and the associated frustration and anxiety that Lean management principles is causing in the workplace. This is consistent with the finding for all subsets of the total population.

![Figure 13: Interview responses to section 2 - scaled questions: Nursing and support staff](image)

4.7 Summary of findings

The tables below show a brief overview-summary of the assessment of GH against the CLEAR framework. The analysis chapter will be focused on the elements that was rated as
Lacking/Requires improvement, however, the reader must be cognizant of the fact that CLEAR is a whole-system framework and addressing elements individually is not the key to success. Lasting success requires focus on all areas in an integrated way.

At organizational level, the greatest area of improvement is within the scope of Lean activities, Change management models, and education and training (Table 7).

**Table 7: Summary of findings: Organization-wide factors**

<table>
<thead>
<tr>
<th>Lean Transformation</th>
<th>Organization-wide factors</th>
</tr>
</thead>
<tbody>
<tr>
<td>17 Purpose: True North</td>
<td>Ongoing</td>
</tr>
<tr>
<td>18 Lean goals</td>
<td>Ongoing</td>
</tr>
<tr>
<td>19 Alignment</td>
<td>Ongoing</td>
</tr>
<tr>
<td>20 Scope of Lean activities</td>
<td>Lacking/Requires improvement</td>
</tr>
<tr>
<td>21 Pace of Lean activities</td>
<td>Ongoing</td>
</tr>
<tr>
<td>22 Coordination of Lean activities and resources</td>
<td>Ongoing</td>
</tr>
<tr>
<td>23 Development of Lean tools</td>
<td>Ongoing</td>
</tr>
<tr>
<td>24 Adoption of Lean philosophy and values</td>
<td>Ongoing</td>
</tr>
<tr>
<td>25 Ongoing assistance/support by facilitators and consultants</td>
<td>Fully Established</td>
</tr>
<tr>
<td>26 Change management model</td>
<td>Lacking/Requires improvement</td>
</tr>
<tr>
<td>27 People: Personnel selection, support, and retention</td>
<td>Ongoing</td>
</tr>
<tr>
<td>28 Process</td>
<td>Ongoing</td>
</tr>
<tr>
<td>29 Education/Training</td>
<td>Lacking/Requires improvement</td>
</tr>
<tr>
<td>30 Communication about Lean</td>
<td>Fully Established</td>
</tr>
<tr>
<td>31 Problem solving</td>
<td>Ongoing</td>
</tr>
</tbody>
</table>

Looking at Lean management from the project level perspective (Table 8), the key areas to focus on relates to the size of Lean teams coupled with the available supporting resources, the composition of the teams, and putting in place a formalized mechanism for recognizing achievements.

**Table 8: Summary of findings: Lean project factors**

<table>
<thead>
<tr>
<th>Lean Transformation</th>
<th>Lean project factors</th>
</tr>
</thead>
<tbody>
<tr>
<td>32 Leadership support and participation</td>
<td>Ongoing</td>
</tr>
<tr>
<td>33 Central improvement team</td>
<td>Ongoing</td>
</tr>
</tbody>
</table>
The intermediary outcomes of GSH’s (Table 9) Lean journey points the researcher to further areas to explore and address in order to drive success. The biggest gap areas here are routinization of the Lean tools in the culture of the organization, allowing teams to autonomously respond to changes in measured results, and sustain improvements in workflow (both physical movement of people and resources as well as processes.)

**Table 9: Summary of finding: Intermediate outcomes**

<table>
<thead>
<tr>
<th>Intermediate Outcomes</th>
<th>Status</th>
</tr>
</thead>
<tbody>
<tr>
<td>40 Culture change</td>
<td>Ongoing</td>
</tr>
<tr>
<td>41 Provider/staff satisfaction and engagement</td>
<td>Ongoing</td>
</tr>
<tr>
<td>42 Increased Lean knowledge and skills</td>
<td>Ongoing</td>
</tr>
<tr>
<td>43 Lean Routinization</td>
<td>Lacking/Requires improvement</td>
</tr>
<tr>
<td>44 Dissemination of Lean - inside organization and to other organizations</td>
<td>Ongoing</td>
</tr>
<tr>
<td>45 Responsiveness capability</td>
<td>Lacking/Requires improvement</td>
</tr>
<tr>
<td>46 Improved workflow</td>
<td>Lacking/Requires improvement</td>
</tr>
</tbody>
</table>

Lastly, Ultimate outcomes (Table 10) for the organization was assessed. Given that True North and associated measures have only been in place since mid-2017, the research was unable to form a strong opinion on the performance to date. The reviewed measures, as discussed in more detail in the Findings chapter highlight some insights.

**Table 10: Summary of findings: Ultimate outcomes**

<table>
<thead>
<tr>
<th>Ultimate Outcomes</th>
<th>Status</th>
</tr>
</thead>
<tbody>
<tr>
<td>47 Efficiency</td>
<td>Ongoing</td>
</tr>
<tr>
<td>48 Business or Strategic (ROI)</td>
<td>Ongoing</td>
</tr>
<tr>
<td>49 Quality</td>
<td>Ongoing</td>
</tr>
</tbody>
</table>
5. ANALYSIS OF FINDINGS

The most emphasized element throughout this research, whether during the interviews, informal conversations, pre-engagement meetings, or from the Likert-scale response, was the apparent lack of sufficient change management and training as part of the Lean management journey at GSH. There is an overwhelming sense of *being left behind* expressed directly and indirectly by most of the staff interviewed.

Figure 14 shows the key elements from the CLEAR framework, as discussed in chapter 1.4, that will form the basis of the analysis discussion. Also, shown in Figure 14 is the link between these findings and the key underpinning theme identified earlier as part of the literature review.
The four areas identified all revolve around the same critical junction of Change management, proper training and communication to support the teams, ensuring that staff are engaged in the activities and not simply *going through the motions*, and lastly clearly linking the organizational goals to routinization of activities as part of daily management systems. A large degree of theoretical overlap exist between these four, the remainder of this section will briefly look at each and conclude with recommendations specific to GSH.

**Change Management**

It is evident that there is no clear change management program in place at GSH to drive the pace and sequence of the Lean management transformation at the hospital. This is a common pitfall identified in several previous research studies. D’Andreamatteo et al. (2015) touched on the point of *entire organization engagement* as part of the change management model, but offers little further in terms of what the model should encompass.

One can look at the suggestions of Radnor and Boaden (as cited in Stanton et al., 2014) for areas that need specific focus on elements of change management:

1. Change requires resources and support to be available in abundance, without sufficient support, organizations run the risk of diluting the initiative to the point of obsolescence.
2. Leadership needs to be fully aligned on the overall organization strategy and goals and communicate clearly and consistently the same message.

An example of where this played out is in the study of McCann et al. (2015) where they found that Lean management was mobilized across the organization in an ambiguous way that ultimately resulted in the concept being rendered virtually meaningless.

*Recommendation 1: Change management*

*GSH must focus on developing a change management model that clearly defines goals based on:*

- *Overall business Strategy*
- *Lean goals*
- *Milestones and areas in the hospital to be covered*

*Included in the change management should be measure around availability of resources to support Lean, pace of training and expected outcomes with*
clear countermeasures defined up front in cases where progress falls behind.

*If the change management of Lean transformation is not focussed on, it will disappear amongst the clutter of priorities, resource constraints and ongoing operational challenges that GSH face as a public healthcare hospital.*

**Training and education program**

As part of the change management model – focus and attention should be placed on training and development. There are several ways that this can be achieved, however, the literature suggests key factors to consider. Fine et al's (2009) research identified two key points: Firstly, localized training and development is required to foster Lean leaders within each department. They act as facilitators within their working teams on continuous improvement and transformation. This is underpinned by the second point: Lean management disseminated throughout the hospital faster and more effectively if the executive team was fully supportive and worked closely with the localized Lean teams.

*Recommendation 2: Training and education program*

The executive team of GSH is heavily involved in the transformation process, and interviewees across the board felt confident and positive about the executive teams’ involvement and intent on the strategic side. A shortfall raised several times, and supported by recognized literature, is the absence of the executive team being physically present at Gembas and participating in some of the projects directly. An area where a significant impact can be attained in a short period of time would to assign executive team members as coaches to teams in the hospital on specific projects and work side by side on Lean activities.

Based on the discussions with LIA and interviews with staff, training and ongoing education is seen as a critical enabler to allow Lean management to be successful at GSH. It serves two purposes that, as can be seen from the literature as well, links both staff engagement and morale as well as
Lean dissemination through the organization by means of empowerment, experience building and confidence.

The recently formed internal team at GSH should close some of the gaps in terms of support to teams and ongoing training/coaching, however, Lean training should be part of a structured, HR led, people development plan.

Development of standardized training material that is aligned to the organization’s Lean maturity and progress level needs to be developed and continuously reviewed to ensure it remains relevant.

Routinization and organizational goals

The data collected from the interviews as well as available measured results from the GSH teams have little evidence to suggest that Lean has been fully routinized in any of the departments as part of the daily management system towards delivering the hospital’s goals. This is not an uncommon occurrence during the early part of an organization’s Lean journey, as Mate and Rakover (2016) points out: the key to successful routinization and adoption of Lean is a whole-system approach that focusses on engaging with, and standardization of frontline managers’ workflow. Bliss (2009) also highlights that Lean takes focussed effort and change at a managerial cultural level to develop the Lean leaders at the frontline, before lasting improvements can be expected.

Recommendation 3: Routinization and organizational goals

As suggested by the literature, frontline manager’s need to be empowered and fully engaged on Lean management in order to drive culture change, adoption rate and behavior change within each of the departments. This links back strongly to the requirements already highlighted surrounding ongoing training and the development of training material in line with the progress on the Lean journey.

Clearly communicating the Lean goals, not only from an organizational-objectives point of view, but also defining milestone along the transformation journey is important and should be included as part of the change management model.
Firstly, this will allow GSH to track progress in different areas of the hospital and assess teams’ progress individually. Different teams will progress at a pace that is supported by sufficient training, coaching and available resources. Secondly, this will help dissipate the anxiety that staff members might feel about being left behind since they will also be able to clearly understand where they are along the journey and what comes next.

Currently, teams are following blindly, however this leaves the door open for skepticism, misunderstanding and frustration at leadership and operational level.

Staff Engagement

Through the course of this research it was not clear whether staff portray themselves as being fully engaged in the Lean transformation because they are fundamentally part of it, or whether they felt that it was what was expected of them.

Holden et al. (2015) suggest that a potential underlying reason for staff not being fully engaged can be linked to the liberal use of specialists and consultants supporting the initial stages of the journey. The early stages are normally characterized by specific projects in a model cell that is designed to show the potential benefit of Lean management to the organisation. The downfall, however, is that only project specific results are measured at this stage and not staff engagement and the organization’s transformation.

Furthermore, the work of Ingelsson et al. (2014) describe the importance actively measuring the impact of Lean on staff, and their level of engagement to ensure unambiguous deployment and adoption. Chay et al. (2015) mostly agree with the above, they argue that Lean implementation frameworks are prone to be top-down and not very often bottom-up. This potentially results in an undefined level of disengagement at operational levels of the organization that could take several months to correctly diagnose and address.
Recommendation 4: Staff engagement

The transition from mode-cell mode to full scale rollout at GSH is taking longer than what is conducive for effective for an organization-wide transformation. The result of this is that the communication, intent, and strategy of Lean management was not controlled and the internal dialogue of the hospital has been left to hearsay. Deployment strategies and level of training also seems to vary greatly between departments and the disparity seems tangible when engaging with the teams.

GSH needs to arrest the grapevine conversations and perceptions about Lean management and structure a calculated and controlled staff engagement plan that focusses on both engaging with staff, but also measuring/assessing attitude, energy and engagement levels.
6. CONCLUSION

The CLEAR framework is a holistic conceptual framework designed to guide case study research on Lean management in Healthcare. The framework presupposes that hospitals that have successfully implemented Lean management transformation programs will have a high level of advancement on the elements that the CLEAR framework assesses, and as a result, show relatively marked improvements in both intermediary outcomes as well as ultimate patient- and organizational outcomes.

In the case of GSH, the results show rather weak performance on all of the CLEAR elements with only a select few being fully established and operational. Based on the findings of this research the main research question: How effective has Lean implementation been at Groote Schuur hospital has thus been answered.

It is important to note that in an organization the size of GSH one can expect a significant time lag between changes being implemented, and sustained results being achieved. Given that the program is still in its infancy with True North only recently defined and the on-site support team being operational for little over three months, it is unrealistic to expect deep-level results to be sustained already. At individual team-level and on specific projects one can start seeing the impact already, but at organizational level it is still too early.

From a leadership point of view, GSH is moving in the right direction and has been aligning on True North and the organization’s goals, however how and what to measure still needs more defining. The close collaboration with Catalysis and John Toussaint, together with executive coaching by John puts a lot of emphasis on the commitment to the initiative. The hospital is engaging with, and learning from a globally recognized authority with real experience on how to apply Lean management in healthcare.
7. FUTURE RESEARCH OPPORTUNITIES

In this section, the researcher will briefly list areas of future research opportunities that will add to the rigour and knowledge base of Lean management implementation in healthcare.

1) **Hierarchy-sensitive model for change management and communication**

During this study, the researcher identified several areas of Lean management implementation that was not sufficiently covered by the available literature, and not sufficiently researched in the past to allow for a concrete and definitive approach to be applied. One of those areas is the lack of a defined change management model/framework for Lean in healthcare.

Future research opportunities within Lean in healthcare can, no doubt, add value to the body of academic knowledge by developing an implementation and dissemination framework to assist institutions and facilitators in handling change management and communication. This would be particularly valuable when considering the rigid hierarchical structure within the heavily regulated healthcare environment.

2) **Comparative case study between different departments in GSH**

This research focussed on GSH as a whole and did not distinguish between different areas/departments within the hospital. In a sense, the results of this study is the result for Lean management implementation at GSH.

Potential future research should consider a comparative multi-case study between two or more areas of GSH to gain a deeper and more granular understanding of staff behaviour and adaption to change – critically evaluating the drivers of differentiations (if any) between the departments.

3) **Reproduce the study at a later point in time**

This study engaged with a limited sample size, nineteen respondents in total, and thus the findings cannot be generalized to represent the entire organization. The outcome of the research is, however, consistent with the results achieved (and measured over time) in Lean projects at GSH and thus holds true to some extent. Repeating the study at a later point in time will allow the researcher to further correlate the effectiveness of Lean at GSH against the CLEAR framework.

4) **Development of a balanced scorecard to measure Lean transformation change management in healthcare**
Snyder et al. (2016) found some evidence to suggest that the general awareness of the need to include *human elements* in a balanced scorecard exist, however, little evidence to support its implementation. There is thus a gap in the literature and body of knowledge surrounding Lean in healthcare that can be further explored in an attempt to construct a balanced score card that encompasses the full extent of Lean management: Culture, performance, satisfaction (employee and customer), and empirical results.
8. BIBLIOGRAPHY


APPENDIX A: THE CLEAR FRAMEWORK

CLEAR lean hospital/health system conceptual framework (4/10/17) [1of2]

Local Environment
1. Purchaser Pressure
2. Payment methods
3. Competition
4. Local sources of expertise
5. Urban vs rural location

Adopting Organization

Context
6. Basic features (size, employed physicians, type of hospital, teaching status, system, network)
7. Culture
8. Extent of experience with quality improvement
9. Existing lean knowledge, skills, and experience
10. Absorptive capacity
11. Information infrastructure
12. Slack resources (e.g., money, time)
13. Workforce flexibility
14. Shared-risk payment contracts
15. Vision
16. Hospital goals

Lean Transformation
Organization-wide factors
17. Purpose: True North
18. Lean goals
19. Alignment
20. Scope of lean activities
21. Pace of lean activities
22. Coordination of lean activities and resources
23. Development of lean tools
24. Adoption of lean philosophy and values
25. Ongoing assistance/support by facilitators and consultants
26. Change management model
27. People: Personnel selection, support, and retention
28. Process
29. Education/training
30. Communication about lean
31. Problem solving
Lean project factors
32. Leadership support and participation
33. Central Improvement Team
34. Daily management systems
35. Lean team size and resources
36. Lean team composition
37. Lean tools and methods
38. Rewards for accomplishments
39. Compatibility with social structures and cultures

Ongoing Learning and Integration

CLEAR lean hospital/health system conceptual framework (4/10/17) [2 of 2]
APPENDIX B: RESEARCH FRAMEWORK

Support Findings with Evidence from Interviews, measured results and available artifacts from GSH.
# APPENDIX D: INTERVIEW QUESTIONNAIRE

## Assessing Lean management transformation at Groote Schuur hospital using the CLEAR framework

### Introduction

**Script:** Thank you for agreeing to participate in this interview today. My name is Jandre van Zyl, I am an MBA student at the GSB in Cape Town. As part of the outcome of my studies, I am required to complete a research project.

I am focussing my attention on Lean management in healthcare, and specifically the case here at Groote Schuur hospital. As discussed when we arranged this interview, you were nominated by the hospital management team to participate in the interview, which should take only 20 - 30 minutes of your time. Please see the informed consent document (Refer to separate page) explaining the purpose of the research and your participation.

If you have any questions, at any point, please do not hesitate to interrupt the process. The interview will be semi-structured.

### Context Questions from participant’s point of view

<table>
<thead>
<tr>
<th>Question</th>
<th>CLEAR Reference</th>
</tr>
</thead>
<tbody>
<tr>
<td>1 What is your current role here at GSH? (Please share your area of responsibilities and whether you are directly or indirectly responsible for a team.)</td>
<td>General info 17, 18, 19, 20, 21, 22, 47, 48, 49</td>
</tr>
<tr>
<td>2 Can you share a brief overview of your involvement in the GPS implementation, projects and/or current processes at GSH?</td>
<td>17, 18, 19, 20, 24, 47, 48, 49</td>
</tr>
<tr>
<td>3 Do you have a clear understanding of the GPS at Groote Schuur - how it fits in with your daily work plan? Please elaborate.</td>
<td>23, 25, 26, 28, 29, 30</td>
</tr>
<tr>
<td>4 What training/on-boarding and communication did you receive as part of the change management to support the GPS at GSH?</td>
<td>23, 25, 27, 28</td>
</tr>
<tr>
<td>5 What training and support do you (or your team) have access to on an ongoing basis to ensure the GPS remains effective at GSH?</td>
<td>27, 31, 44</td>
</tr>
<tr>
<td>6 Are you aware of instances where GPS principles and tools disseminated through the organization to departments/teams who have not yet been exposed to it formally?</td>
<td>26, 30, 39, 40, 41, 47, 48, 49</td>
</tr>
<tr>
<td>7 Do you think more change management, support or training is required to make Lean even more successful?</td>
<td>23, 28, 34, 35, 36, 37</td>
</tr>
<tr>
<td>8 What tools/processes do you have access to to assist with effectively applying the GPS daily? Are they sufficient?</td>
<td>26, 30, 32, 40</td>
</tr>
<tr>
<td>9 Do you feel that senior leadership have sufficiently supported Lean project teams?</td>
<td>34, 41, 43</td>
</tr>
<tr>
<td>10 Please share an example of how GPS management principles has affected your daily routine and workflow.</td>
<td>34, 41, 43</td>
</tr>
</tbody>
</table>
The next section are merely statements regarding Lean, I would like for you to respond on a scale of 1 - 10. 1 being very badly/low and 10 being extremely good/high.

<p>| | | |</p>
<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>11</td>
<td>To what extent do you think Lean is a good idea?</td>
<td>17, 18</td>
</tr>
<tr>
<td>12</td>
<td>To what extent do you like working according to the Lean principles?</td>
<td>19, 24, 43</td>
</tr>
<tr>
<td>13</td>
<td>To what extent do you think the way Lean was introduced and implemented in your hospital was done in the right and proper way?</td>
<td>26, 29, 30</td>
</tr>
<tr>
<td>14</td>
<td>To what extent do you believe training and tools were provided during the role out of Lean at this hospital?</td>
<td>26, 27, 28, 29</td>
</tr>
<tr>
<td>15</td>
<td>To what extent has working with Lean contributed to better work flow?</td>
<td>41, 43</td>
</tr>
<tr>
<td>16</td>
<td>To what extent do you feel empowered to operate autonomously in problem solving?</td>
<td>27, 31, 42</td>
</tr>
<tr>
<td>17</td>
<td>To what extent do you feel are the existing Lean tools (5S, A3’s, Gemba huddles etc) used in everyday workflow?</td>
<td>24, 42, 43, 44, 45</td>
</tr>
<tr>
<td>18</td>
<td>To what extent has Lean caused you stress/frustration in the workplace?</td>
<td>41, 46</td>
</tr>
<tr>
<td>19</td>
<td>To what extent do you feel included and empowered to promote Lean in other parts of the organization?</td>
<td>40, 44; 45</td>
</tr>
</tbody>
</table>

**Closing Question/invitation to contribute**

20 Before we close this interview - is there anything else related to Lean management, implementation, training, outcomes or results that you would like to share? Good or bad, I am particularly interested in your opinion on what you think can be done better/more of.

**Close the interview**

**Script:** Thank you once again for agreeing to participate in this study and for being so honest with your comments and information.

If you have any further questions or concerns regarding this interview at any time, please do not hesitate to contact me using the information provided.
### Local Environment

<table>
<thead>
<tr>
<th></th>
<th>Purchaser Pressure</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>2</td>
<td>Payment Methods</td>
<td></td>
</tr>
<tr>
<td>3</td>
<td>Competition</td>
<td></td>
</tr>
<tr>
<td>4</td>
<td>Local sources of expertise</td>
<td></td>
</tr>
<tr>
<td>5</td>
<td>urban vs rural location</td>
<td></td>
</tr>
</tbody>
</table>

GSH is a government hospital and thus, these elements of the CLEAR framework is less relevant and for the purpose of this study, not explored.

### Context

<table>
<thead>
<tr>
<th></th>
<th>Basis features (size, employed, physicians, type of hospital)</th>
<th>Described in Section 4.1</th>
</tr>
</thead>
<tbody>
<tr>
<td>7</td>
<td>Culture</td>
<td>Resistant to change, relatively long tenure workforce across all areas of the hospital.</td>
</tr>
<tr>
<td>8</td>
<td>Extent of experience with quality improvement</td>
<td>Implicit in the Healthcare environment is a strong focus on compliance in quality</td>
</tr>
<tr>
<td>9</td>
<td>Existing lean knowledge, skills, and expertise</td>
<td>Limited to projects completed in the past—limited areas of the hospital</td>
</tr>
<tr>
<td>10</td>
<td>Absorptive capacity</td>
<td>Teaching hospital, often the learning ground for new technology, approaches or processes and thus a relatively strong absorptive and adaptive</td>
</tr>
<tr>
<td>11</td>
<td>Information infrastructure</td>
<td>Central information management unit exist, but not dedicated to supporting Lean.</td>
</tr>
<tr>
<td>12</td>
<td>Slack resources (money, time)</td>
<td>Described in Section 4.1</td>
</tr>
<tr>
<td>13</td>
<td>Workforce flexibility</td>
<td></td>
</tr>
<tr>
<td>14</td>
<td>Shared-risk payment contract</td>
<td></td>
</tr>
<tr>
<td>15</td>
<td>Vision</td>
<td>See Appendix E</td>
</tr>
<tr>
<td>16</td>
<td>Hospital goals</td>
<td>See Appendix D</td>
</tr>
<tr>
<td>Organization-wide factors</td>
<td>Lacking/Requires improvement</td>
<td>Ongoing</td>
</tr>
<tr>
<td>---------------------------------------------------------------------------------------------------------------------------------</td>
<td>-----------------------------</td>
<td>------------------------------------------------------------------------</td>
</tr>
<tr>
<td>17 Purpose: True North</td>
<td>Not defined - little or no awareness.</td>
<td>Defined, some awareness, not clearly communicated.</td>
</tr>
<tr>
<td>18 Lean goals</td>
<td>Not defined - little or no awareness.</td>
<td>Defined, poorly communicated, or referenced frequently.</td>
</tr>
<tr>
<td>19 Alignment</td>
<td>No sense of alignment between Lean projects and goals of the hospitals or Lean goals and the departmental objectives.</td>
<td>Hospital Goals/vision aligned to Lean, some departmental alignment, with evidence of areas not aligned.</td>
</tr>
<tr>
<td>20 Scope of lean activities</td>
<td>Limited to minimal units/areas and only pre-defined projects.</td>
<td>Pockets of adoption and support and application on daily problem solving, but not consistent throughout.</td>
</tr>
<tr>
<td>21 Pace of lean activities</td>
<td>Very slow, limited progress without external influence.</td>
<td>Starting to build momentum, requires constant focus and takes energy and time away from the team.</td>
</tr>
<tr>
<td>22 Coordination of lean activities and resources</td>
<td>Isolated and singular projects - executed by external consultants working with GSH project team.</td>
<td>Coordinated within specific departments by the manager, not synchronised with the wider organization.</td>
</tr>
<tr>
<td>23 Development of Lean tools</td>
<td>Only standard tools available in generic format.</td>
<td>Some customized tools available - not widely adopted.</td>
</tr>
<tr>
<td>24 Adoption of Lean philosophy and values</td>
<td>No conviction at operational level, unclear on goals and ambition to achieve.</td>
<td>Divided opinion with pockets of support and buy-in to the potential benefits and delivering of goals.</td>
</tr>
<tr>
<td>25 Ongoing assistance/support by facilitators and consultants</td>
<td>No support available after initial engagement/implementation</td>
<td>External support only (Consultant); infrequent.</td>
</tr>
<tr>
<td>Change Management Model</td>
<td>People: Personnel Selection, Support, and Retention</td>
<td>Process</td>
</tr>
<tr>
<td>-------------------------</td>
<td>-----------------------------------------------</td>
<td>---------</td>
</tr>
<tr>
<td>Lacking/Requires Improvement</td>
<td>Limited change management model/initiative with some milestones defined</td>
<td>Limited training, support and coaching available, handled ad hoc, tools inconsistently used.</td>
</tr>
<tr>
<td>Ongoing</td>
<td>Limited change management model, clearly defined milestones and progress reporting with countermeasures should progress fall behind.</td>
<td>Internal coaches in some areas with strong evidence of tools being used and understood. Training either by facilitation or as part of project work.</td>
</tr>
<tr>
<td>Fully Established</td>
<td>Fully defined Change management model, clearly defined milestones and progress reporting with countermeasures should progress fall behind.</td>
<td>Access to coaches in all teams with full understanding of the use of tools, standardized on-boarding for new members.</td>
</tr>
</tbody>
</table>

Ref. Questions

4; 7; 9; 13; 14

5; 6; 14; 16

4; 5; 8; 14

4; 13; 14

4; 7; 9; 13

6; 16
<table>
<thead>
<tr>
<th></th>
<th>Lean project factors</th>
<th>Ref. Questions</th>
</tr>
</thead>
<tbody>
<tr>
<td>32</td>
<td>Leadership support and participation</td>
<td>3; 4; 9</td>
</tr>
<tr>
<td>33</td>
<td>Central improvement team</td>
<td>5; 7; 8</td>
</tr>
<tr>
<td>34</td>
<td>Daily management system</td>
<td>10; 12; 15</td>
</tr>
<tr>
<td>35</td>
<td>Lean team size and resources</td>
<td>2; 20</td>
</tr>
<tr>
<td>36</td>
<td>Lean team composition</td>
<td>2; 20</td>
</tr>
<tr>
<td>37</td>
<td>Lean tools and methods</td>
<td>6; 8; 14; 17</td>
</tr>
<tr>
<td>38</td>
<td>Rewards for accomplishments</td>
<td>N/A</td>
</tr>
<tr>
<td>39</td>
<td>Compatibility with social structures and cultures</td>
<td>2; 7; 18</td>
</tr>
<tr>
<td>Intermediate Outcomes</td>
<td>Ref. Questions</td>
<td></td>
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<tr>
<td>-----------------------</td>
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<tr>
<td><strong>40</strong> Culture change</td>
<td>Leaning towards modern leadership style in inclusive environment. Managerial team's mindset is open to change. Fully established Lean leadership culture and evidence of staff positively embracing the GPS.</td>
<td></td>
</tr>
<tr>
<td><strong>41</strong> Provider/staff satisfaction and engagement</td>
<td>No engagement or interest throughout the organization. Lax approach to attempt change. In general receptive and engaged, immersive attitude in areas where rollout has taken place. Staff fully engaged with process, principles, daily management and ongoing activities. High level of staff confidence and satisfaction.</td>
<td></td>
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<tr>
<td><strong>42</strong> Increased lean knowledge and skills</td>
<td>No knowledge of Lean present anywhere in the organization except at leadership. Some teams have been exposed in a structured method. Evidence of terminology being used and applied. Gully running autonomous teams throughout the hospital with integrated daily management.</td>
<td></td>
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<tr>
<td><strong>43</strong> Lean Routinization</td>
<td>Not established anywhere in the hospital without constant influence from coach/facilitator. Isolated examples of success with evidence that improvements are sustained over a period of time. Part of daily operations - problems are analysed and addressed through application of the appropriate tool. Outcomes are positive and sustained.</td>
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<tr>
<td><strong>44</strong> Dissemination of lean - inside organization and to other organizations</td>
<td>No instances of dissemination within the organization. Slowly move through the hospital, requires constant input from coaches, facilitators and management. Fully fluid throughout the organization - teams engage and interact organically and share best practice.</td>
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<tr>
<td><strong>45</strong> Responsiveness capability</td>
<td>No strong cause and effect relationship between events and measurements. Ability to problem solve exceptions is lacking. Teams are able to interpret results on measurements and generally attempt to solve problems that arise, but not without significant coaching. Ability to anticipate impact of events on routines and visual performance measures and course correct rapidly.</td>
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</tr>
<tr>
<td><strong>46</strong> Improved workflow</td>
<td>No distinct improvement in workflow changed that directly affect True North goals (patient experience, efficiency and quality). Isolated pockets of improved workflow for staff - limited patient impact. Cause and effect link to True North goals not established. Severe and distinct changes to layout, processes and programs with direct link to True North measures and results.</td>
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<table>
<thead>
<tr>
<th>Ultimate Outcomes</th>
<th>Ref. Questions</th>
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<tbody>
<tr>
<td><strong>47</strong> Efficiency</td>
<td>No consistent evidence of reduction in Cost and waste; increase in productivity and throughput. Some measures in place, not clearly aligned to True North. In process of being aligned. Fully established goals, measured frequently, and correction taken as needed to ensure goals are met.</td>
</tr>
<tr>
<td><strong>48</strong> Business or Strategic (ROI)</td>
<td>No Clear strategic and business measure in place. Some measures in place, not clearly defined and ambiguous in nature. Goal set in development phase. Fully established goals, measured frequently, and correction taken as needed to ensure goals are met.</td>
</tr>
<tr>
<td><strong>49</strong> Quality</td>
<td>No consistent evidence of improved care processes and patient experience/outcomes/safety. Some measures in place, not clearly aligned to True North. In process of being aligned. Fully established goals, measured frequently, and correction taken as needed to ensure goals are met.</td>
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APPENDIX F: THE 7C TOOL

What are the 7Cs?

A **Concern** can be any small problem preventing work being done right first time on time.

The **Customer** is the person to whom the work goes next and/or the person for whom the work is being done. If possible, write their real name down.

In **Current Condition** write the information about the circumstances of the concern before improvement started. Use facts & figures where possible.

The **Cause(s)** are the reason(s) why the problem occurs. Be specific.

The **Countermeasure(s)** are what you think can be done to improve the work.

The **Corrective Action(s)** are the actions you are going to take to implement the countermeasures.

**Check** is how you are going to confirm that the problem has been resolved by consistently meeting the target you have set over a specified period of time.
<table>
<thead>
<tr>
<th>Title:</th>
<th>Date Start:</th>
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<tbody>
<tr>
<td>Owner:</td>
<td>Coach: Date Compl:</td>
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<table>
<thead>
<tr>
<th>What is the Concern?</th>
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<table>
<thead>
<tr>
<th>Who is (are) the (internal, external &amp; end) Customer(s)?</th>
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<table>
<thead>
<tr>
<th>What are the facts &amp; figures about the Current Situation?</th>
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<table>
<thead>
<tr>
<th>What is (are) the Cause(s)?</th>
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</thead>
</table>

<table>
<thead>
<tr>
<th>What is (are) the Countermeasure(s)?</th>
</tr>
</thead>
</table>

<table>
<thead>
<tr>
<th>What Corrective Action(s) are you going to take? By when?</th>
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<tr>
<th>How (with measurable target) &amp; when are you going to Check that it worked?</th>
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APPENDIX G: GSH VISION AND MISSION

GSH VISION:
LEADING INNOVATIVE HEALTH CARE

GSH MISSION:
Groote Schuur Hospital will remain a beacon of service excellence by striving to develop leaders who will build a culture of continuous improvement through problem solving in order to improve person centred quality health care

OUR VALUES: C²AIR²

OUR BEHAVIOURAL PRINCIPLE:
‘I will respect you and you will respect me’

OUR MOTTO: Servamus—We serve