

UNIVERSITY OF PARDUBICE

**FACULTY OF ECONOMICS AND
ADMINISTRATION**

MASTER THESIS

PATRICK, APPIAGYEI

2018

UNIVERSITY OF PARDUBICE

FACULTY OF ECONOMICS AND ADMINISTRATION

**Change Management and its Tools used in Public Sector
Corporations**

Patrick, Appiagyei

Master Thesis

2018

DISSERTATION ASSIGNMENT

(PROJECT, ART WORK, ART PERFORMANCE)

First name and surname: **Patrick Appiagyei**
Study program: **N6202 Economic Policy and Administration**
Identification number: **E15809**
Specialization: **Regional Development and Governance**
Topic name: **Change management and its tools used in public sector corporations**
Assigning department: **Institute of Business Economics and Management**

R u l e s f o r e l a b o r a t i o n :

To examine the application of change management and the lean concept in public healthcare services, identify the healthcare units or departments the lean concept is applied, the lean tools applied, the successes achieved as well as the challenges encountered and to come out with a model for a systematic, effective and efficient way of implementing the lean concept in a public healthcare.

Structure:

- Characteristics of change management.
- Definition of the Lean concept and its tools and techniques apply in the public sector.
- Analysis of lean tools and techniques mostly use in the public sector healthcare, the departments/unit mostly applied, the outcomes and implementation challenges.
- Discussion the findings of the lean concept implantation in the public sector healthcare and development of a proposed model for lean implantation.
- Formulation of conclusion and recommendations.

Scope of graphic works:

Scope of work report

(scope of dissertation): **aprox. 50 pages**

Form of dissertation elaboration: **printed/electronical**

Language of dissertation elaboration: **English**

List of specialized literature:


Burke, W. W. (2013). Organization change: Theory and practice. Sage Publications.

Burnes, B. (2004). Managing Change: A Strategic Approach to Organizational Dynamics. Pearson Education Limited, UK.

Hodges, J. and Gill, R. (2014). Sustaining Change in Organizations. Sage.

Hayes, John. The theory and practice of change management. Palgrave Macmillan, 2014.

Kotter, J.P., and Schlesinger, L.A. (2008). Choosing Strategies for Change. Harvard Business Review.



Tutor for dissertation:

Ing. et Ing. Barbora Zemanová, Ph.D.

Institute of Business Economics and Management

Date of dissertation assignment: **1 September 2017**

Date of dissertation submission: **30 April 2018**



doc. Ing. Romana Provazníková, Ph.D.
Dean

L.S.



doc. Ing. Marcela Kožená, Ph.D.
Department Manager

In Pardubice, dated: 1 September 2017

DECLARATION

I hereby declare:

This thesis was prepared separately. All the literary sources and the information I used in the thesis are listed in the bibliography. I got familiar with the fact that the rights and obligations arising from the Act No. 121/2000 Coll., Copyright Act, apply to my thesis, especially with the fact that the University of Pardubice has the right to enter into a license agreement for use of this thesis as a school work pursuant to § 60, Section 1 of the Copyright Act, and the fact that should this thesis be used by me or should a license be granted for the use to another entity, the University of Pardubice is authorized to claim a reasonable contribution from me to cover the costs incurred during making of the thesis, according to the circumstances up to the actual amount thereof. I am aware that my thesis will be accessible to the public in the University Library and via the Digital Library of the University of Pardubice in agreement with the article 47b of the Act No. 111/1998 Coll., on Higher Education Institutions, and on the Amendment and Supplement to some other Acts (the Higher Education Act), as subsequently amended, and with the University Pardubice's directive no. 9/2012.

In Pardubice on April 30, 2018

Patrick Appiagyei

ACKNOWLEDGEMENT

I thank the Almighty God so much for His grace, favour and protection throughout this thesis work.

Undertaking this program has been a truly life-changing experience for me and it wouldn't have been possible to complete without the support and guidance that I received from many people.

I am thankful to my supervisor, Ing. et Ing. Barbora Zemanova PhD for her assistance, guidance and support throughout the process of this thesis. I would not have achieved the completion of this study without her utmost support.

I dedicate thesis work to my mother-in-law, Mrs Janet Apraku. Known only briefly but loved and missed, has been a constant source of support, encouragement and has made an untold number of sacrifices for me. She is a great inspiration to my life.

Nobody has been more important to me in the pursuit of this than the members of my family. I would like to express my heartfelt gratitude to my cousin Daniel Adu, my parents and all my siblings whose love and guidance are with me in whatever I pursue. They are the ultimate role models. Most importantly, I wish to thank my loving and supportive wife, Philomina Appiagyei and my two wonderful children, Nana Kyei Afoakwa Appiagyei and Adomba Akua Achiaa Appiagyei, who provide unending inspiration, love, and understanding during this period that I have been away from them.

I would also like to acknowledge my colleague, Solomon Gyamfi as the second reader of this thesis, and I am gratefully indebted to his very valuable comments on this thesis.

I gratefully acknowledge Mr. & Mrs. Toseafa and Jana Pekarova for their continuous support and guidance throughout the program.

ANNOTATION

The lean concept is now seen to be a form of revolution for quality, effective and efficient means to healthcare delivery, but there are critics on the likelihood of applying the concept in public services context of which the public healthcare is no exception and hence the need for this study. This thesis aims to examine the application of change management and the lean concept in public healthcare services, identify units or departments the lean concept is applied, the lean tools applied, the successes achieved as well as the challenges encountered. For the purpose of this research and in order to achieve the aim of the thesis, content analyses of published articles on lean in public-sector healthcare from Google Scholar database were selected based on a purposive sampling approach. The findings from this study have shown the lean concept effectiveness in improving the Public-sector healthcare delivery. Kaizen, VSM, Six Sigma, 5S, and JIT are the most widely used lean tools and techniques, the emergency, the surgery, and laboratory units are the most common areas lean is applied in the healthcare system. Reduction in lead time, reduction in waiting time, and reductions in the cost of operations are performance outcomes mostly derived.

KEY WORDS

Change Management, Lean Concept, Public-sector, Healthcare, Lean Tools and Techniques.

NÁZEV

Řízení změn a jejich nástroje používané ve společnostech veřejného sektoru

ANOTACE

Lean koncept je nyní považován za formu revoluce pro kvalitní, efektivní a efektivní prostředky k poskytování zdravotní péče, existují však kritici ohledně pravděpodobnosti uplatnění konceptu v kontextu veřejných služeb, jehož veřejná zdravotní péče není výjimkou, a tudíž potřeba pro tuto studii. Cílem diplomové práce je prozkoumat aplikaci managementu změn a konceptu štlhlé práce ve veřejných zdravotnických službách, identifikovat jednotky nebo oddělení, na kterých se

uplatňuje koncepce štlé technologie, používané štlé nástroje, dosažené úspěchy a problémy, s nimiž se setkáváme. Pro účely tohoto výzkumu a za účelem dosažení cíle diplomové práce byly vybrány analýzy obsahu publikovaných článků o zdravotní péči veřejného sektoru z databáze Google Scholar na základě účelového přístupu k odběru vzorků. Zjištění z této studie ukázaly, že štlá koncepce efektivnosti při zlepšování poskytování veřejné zdravotní péče ve veřejném sektoru. Kaizen, VSM, Six Sigma, 5S a JIT jsou nejčastěji používané štlé nástroje a techniky, nouzové, chirurgické a laboratorní jednotky jsou nejčastějšími oblastmi, které se uplatňují ve zdravotnictví. Snížení doby realizace, zkrácení doby čekání a snížení nákladů na operace jsou většinou odvozeny výsledky výkonnosti.

KLÍČOVÉ SLOVÁ

Řízení změn, Lean Concept, Veřejný sektor, Zdravotní péče, Lean Tools and Techniques.

TABLE OF CONTENT

DECLARATION	v
ACKNOWLEDGEMENT	vi
ANNOTATION	vii
KEY WORDS	vii
LIST OF FIGURES	xii
LIST OF TABLES	xii
LIST OF ABBREVIATIONS	xiii
1. INTRODUCTION	1
1.1 Introduction	1
1.2 Background	1
1.3 Statement of the problem	3
1.4 Aim of the thesis	4
1.5 Research Questions	5
1.6 Objectives	5
1.7 Thesis Overview	5
2. CHANGE MANAGEMENT AND THE LEAN CONCEPT	7
2.1 Introduction	7
2.2 The Phenomenon of Change	7
2.3 Overview of Change Management	11
2.3.1 Readiness of Change	16
2.3.2 Managing Change in Public-Sector	19
2.3.3 Resistance to Change	22
2.3.4 Resistance in the Public-Sector	24
2.3.5 Models to Change Management	27

2.4.0 Lean Concept.....	32
2.4.2 Lean Implementation in Public-Sector.	40
2.4.3 Lean in Healthcare	41
2.4.4 Lean Implementation Challenges in Public- Sector	42
3. RESEARCH METHODOLOGY	45
3.1 Introduction	45
3.2 Research Method	45
3.3 Research Approach	45
3.4 Data Collection and Data Source	46
3.5 Population and Sampling Method	46
3.6 Data Analysis	47
5.7 Significance of the study.....	48
3.8 Limitation of the study	48
4. ANAYSIS OF LEAN TOOLS/TECHNIQUES IN PUBLIC SECTOR HEALTHCARE.....	49
4.1 Introduction	49
4.2 Analysis of Public Lean Healthcare	49
4.3 Summary of Findings	57
5. DESCUSSION OF FINDING	61
5.1 Introduction	61
5.2 Lean Tools and Techniques.....	61
5.3 Comparative Analysis of Tools and Techniques.....	63
5.4 Units/Departments.....	64
5.5 Performance Outcomes	65
5.6 Comparative Analysis of the Outcomes.....	67
5.7 Implementation Challenges.....	67

5.8.0 Proposed Eight Steps Ladder of Lean Healthcare Implementation Model.....	69
5.8.1.0 Pre-Implementation Phase	70
5.8.1.1 Planning	70
5.8.1.2 Communication and sensitization	70
5.8.1.3 Education and team training	70
5.8.1.4 Project selection	71
5.8.2.0 Implementation Phase	71
5.8.2.1 Staff training	71
5.8.2.2 Problem definition tools.....	71
5.8.2.3 Improvement tools	72
5.8.3.0 Post-Implementation Phase	72
5.8.3.1 Lean Assessment, Monitoring, and Sustainability.....	72
5.9.4 Logic and Features of the Proposed Model	73
5.10 Further Area for Research.....	74
6. CONCLUSION.....	75
6.1 Introduction.....	75
6.2.1 General Conclusions	75
6.2.2 Conclusions on the Research Aim	75
7. RECOMMENDATIONS.....	78
7.1 Introduction	78
7.2 Recommendations	78
REFERENCES	80

LIST OF FIGURES

Figure 1: Main ideas of the Toyota Way	33
Figure 2: Lean Tool/Techniques used in the Public Healthcare Lean Implantation.....	57
Figure 3: Units/Departments the Lean Applied in the Public Healthcare	58
Figure 4: Performance Outcomes from Lean Implementation in Public Healthcare	59
Figure 5: The Proposed Eight Steps Ladder of Public-sector Lean Healthcare Implementation Model.....	69

LIST OF TABLES

Table 1: Change management models	27
Table 2: Definition of TPS and Lean.....	35
Table 3: Common tools and techniques used in Lean Concept	37
Table 4: Summarized Application of Lean in the Public Sector Healthcare	50

LIST OF ABBREVIATIONS

5S – Sort, Set, Shine, Standardize, Sustain

APSC – Australia Public-sector Commission

BPR – Business Process Re-engineering

DMAIC – Define, Measure, Analyze, Improve and Control

IHI – Institute for Healthcare Improvement

JIT – Just -In -Time

KPI - Key Performance Indicators

NHS - National Health Scheme

OCM – Organizational Change Management

OPCE – Office of the Commission for Public Employment

OPD – Out Patient Department

PDCA – Plan, Do, Check, Act, Plan

SIPOC – Suppliers, Inputs, Process, Outputs, and Customers

SMED – Single Minute Exchange of Dies

SMS – Specimen Management System

SPC – Statistical Process Control

TQM – Total Quality Management

TPM – Total Productive Maintenance

TVM – Time Value Map

UK - United Kingdom

USA – United States of America

VSM – Value Stream Map

VSM – Visual Management System

1. INTRODUCTION

1.1 Introduction

This chapter begins with a brief insight of change management and the lean concept. There follow descriptions of the statement of the problem, the aim of work, with research question and objectives, and the structure of the thesis.

1.2 Background

Change is unavoidable whether organizations are ready for it or not (Todnem By, 2007). Quality and performance of education, government and business sector is a major determinate of a nation's well-being. Therefore, public-sector plays a vital role in the growth and development of an economy by undertaking public service responsibilities at the national level. The efficient functioning of government machinery is imperative for the maintenance of social and economic well-being or demand progress of a country to revive, revolutionize or transform government agencies (Fernandez & Rainey, 2006). Prior to 1980s, most public-sector organizations were functioning in a situation that Graetz et al. (2002) describes as "protected ... against a backdrop of relative security, stability and predictability" and therefore maintains that majority public and private sector organizations did not recognize an explicit aim to subscribe to a specific organizational goal of change. This, as a result, brought about of perception of ineffectiveness and inefficiency of the public organizations across the world. This notion began to change around the twentieth century. This is because these classical public services bureaucracies could only happen in a stable and slow-changing environment (Brown & Osborne, 2012). As put forward by Brown & Osborne, (2012), there have been a lot of factors that have brought changes to the environment and the key changes including but not limited to the following:

- Global economic changes which meant that Public-sector organization could no longer rely on incremental growth and had instead to focus on the efficient and effective use of increasingly scarce resources;
- A consequent growth of a managerial, rather than administrative, approach to the provision of the public service, often called New Public Management or NPM;
- Changes in the expectation as citizens became more sophisticated, requiring a great focus on choice and quality in the provision of the public service.

To ensure effective and efficient performance organizations in the public-sector, it is very vital for the sector to adapt itself to the work values, ethics, and culture in the private sector

organizations such as good strategies, work cultures and changing the negative mindset about change and try to accept it.

Change Management, an approach to management which was originated as result of change-related difficulties which managers of organizations have been facing as a result of a transformational change which is not well understood. This type of change, unlike developmental and transitional change, is very complicated and it is the change that is commonly happening in organizations currently (Anderson & Anderson, 2010). A successful management of change is fundamental for public-sector organizations to overcome the recent highly competitive and continuously evolving global environment (Todnem By, 2005). Change management can support a variety of change projects, including initiating a new process, new systems, updated structures, or technology in the establishment of a new working culture or set of values in any area (Burnes, 2004).

Citizens' demands for efficiency and effectiveness in service delivery from the public-sector have risen over a decade now and therefore, it has become necessary for the public-sector to find a way to improve (Denhardt & Denhardt, 2000). The pressure to improve public service performance has brought about many opinions from industrialists, management consultants and policymakers for the transfer of industrial practices into the public-sector (Radnor et al., 2012; and Radnor & Walley, 2008). Public-sector trying to improve efficiency has been adopting the concepts and methodologies used in the private sector of late. The management of the public-sector is considering the increasing interest in "lean" concept long used in the private sector organizations (Bhatia & Drew, 2006).

Lean thinking has become increasingly spread, especially in healthcare and in other public-sector organizations like the police, military, social services and other government agencies. Lean is a combination process and socio-technical system with the primary objective of value creation and waste minimization in operations. Bhatia & Drew (2006) with similar view state that: "From the repair of military vehicles to the processing of income tax returns, from surgery to urban planning, lean is showing that it cannot only improve public services but also transform them for the better". Radnor et al. (2012) also opine that lean tries to set up organizational processes for waste minimization and productivity improvement based on the use of specialized tools and techniques linked with initiating a culture of continuous improvement. The lean concept has eliminated the perception that quality of public services is being compromised by the

cost of rendering those services (Bhatia & Drew, 2006). A literature review about the application of these concepts and methodologies by the public-sector reveals that 51% out of the 165 publications centered on the use of lean and 35% stated their use in the healthcare services. This, however, confirms that health care services use more of the lean concept than any other area of public service (Radnor et al., 2012).

1.3 Statement of the problem

Change has been a constant for organizational development, especially in the private sector. This has brought about the emergence of the lean management concept which has been the major driven tool for improvement in production in the sector. The controversy now relates to whether the lean concept is applicable in the public-sector especially in the healthcare system where it involves services. This is because the lean concept came up to improve production in the manufacturing sector, especially in the automotive industry.

Notwithstanding this controversy, there are others who champion its application in the healthcare setup and opine that placing the patient at the forefront during the application should be the initial step and adding time and comfort as prime performance indicators of the system (Healthcare in Sweden, 2007). According to IHI White Paper (2005) about the lean management concept's application in the healthcare, it states that "the lean principles can be indeed, already are being successfully applied to the delivery of healthcare". Despite the numerous differences between the healthcare and the manufacturing, there are also some similarities between them in respect of the processes of achieving functions and dispensing value to patients or customers. Both sectors have the aim to eliminate waste in terms of time, supplies, money, goodwill and others in discharging their tasks (IHI White Paper, 2005).

Lean as has established by Toussaint & Berry (2013) is a novelty concept of management that has demonstrated its applicability in healthcare setup and offers hope for enhancing quality and efficiency without compromising costs in carrying out the best patient care. They further argue that instituting lean management is a strenuous journey of embarking on endless improvement processes in the healthcare setup. Similarly, Kim et al., (2006) also put an emphasis on the lean application possibility in the healthcare and stress on the concept's ability in ensuring a high quality and efficient delivering of health care service to patients and that health care sector should expect similar high-level success derived by manufacturing and industries from the concept.

A study that was undertaken by Mazzocato et al. (2010) reviewed 112 articles in respect of lean application in health care confirms that all the articles unanimous give an account of a successful lean application in healthcare. Time-saving and timeliness of service, cost reduction or improvement of productivity as well as mistake reduction, increase staff and patient's satisfaction and lessen mortality are benefits associated with the lean application (Mazzocato et al., 2010).

Despite all the evidence expressed by some authors, other writers still raise doubt on the likelihood of applying lean in public services context of which the public healthcare is no exception. The public-sector is guided by 'needs and not demands' and therefore lean is needed to fine-tune it. It is further argued that public services are largely funded by the public and therefore the possibility of providing services based on consumers' needs is limited (Johnson & Jobson, 2013). Moreover, the syndrome of 'people are not automobile or production shop' which is still in the minds of people in the public service makes it difficult for the concept to be applicable (Kim et al., 2006; Fillingham, 2007; Kim et al., 2007; Creasey, 2007; & Minukas & Ulosevich, 2015). The lean concept has been tagged with the perception of being 'cutting and layoffs in disguise'. Hence, the argument is that, if the concept is applied in the public service there would be a possibility of laying off public services staff which as a result has the tendency of creating unemployment for governments (Kim et al., 2006; Casey et al., 2009). On the contrary, many authors have also proven with numerous practical examples of the application of the lean concept in the public healthcare which has resulted in unprecedented benefits to both patients and staff through a speedy care and conducive working environment (Johnson & Jobson, 2013).

This study is of great significance, not least because matters allied to whether the lean concept can be successfully applied to public healthcare service is of considerable global interest as well as everybody's concern. However, it is also vital to find out the specific lean tools used and the departments in the public health care applied if indeed the lean concept is applicable in this sector. Moreover, a study in this area now helps to come out with relevant answers about the perception of change management and the lean concept in the public-sector.

1.4 Aim of the thesis

The aim of the thesis is to examine the application of change management and the lean concept in public healthcare services, identify the healthcare units or departments the lean concept is

applied, the lean tools applied, the successes achieved as well as the challenges encountered and to come out with a model for a systematic, effective and efficient way of implementing the lean concept in a public healthcare.

1.5 Research Questions

- What is the evidence that lean concept is applicable in the public healthcare services?
- What departments in the public healthcare services is the lean concept most often applied?
- What are the typical lean tools mostly used by the public healthcare services?
- What are the successes and management challenges associated with its application?

1.6 Objectives

- To explore the understanding of change management and the lean concept used in the private sector.
- To ascertain whether the lean concept is applicable in the public healthcare services.
- To identify the departments or units in the public healthcare which have mostly applied the lean concept and the lean tools applied.
- To outline the successes and the challenges of the application of the lean concept in the public -sector healthcare service.
- To propose a systematic, effective and efficient way of implementing the lean concept.

1.7 Thesis Overview

The first chapter is an introduction to the research which includes the background to the study with respect to change management and lean concept. This chapter further outlines the aim, the research question, research objectives and the thesis structure.

Chapter two provides a literature review of this research. It reviews the meaning of change and change management, the readiness of change, managing change in the public-sector, resistance to change in public-sector and models to change management. It also reviews the Lean concept and its tools, lean in public healthcare and lean implementation challenges.

Chapter three outlines the methodological choice for this study. The research method and approach of the study are clarified. The data collection method used in this study, sampling method, the approach undertaken to analyze the data, and limitation of the study are outlined.

Chapter four outlines the literature analysis of the lean application in the public-sector healthcare. The analysis was done to cover all the research objectives. It further provides the research findings resulted from the analysis.

Chapter five also outlines the discussion of the finding based on the research questions of this thesis work. It contains the lean tools used, healthcare departments/units, performance outcomes, and implementation challenge. It also contains the proposed public-sector healthcare implementation model and its features.

Chapter six outlines the researcher's conclusion base on the research aim and questions.

Chapter seven is the final chapter of this thesis and it outlines the researcher's recommendations base on the findings of the study.

2. CHANGE MANAGEMENT AND THE LEAN CONCEPT

2.1 Introduction

The literature review is structured in a broader context to more specific. The first section presents the general overview of the phenomenon of change. Change management then explains and further elaborates on the readiness of change, managing change in the public-sector, the resistance of change in general and resistance of change in the public-sector, and ends with the highlighting on some models of change management. The third section centers on the lean concept and the lean tools used. It goes on to place an emphasis on lean implementation in public-sector and specifically deals with the lean healthcare and finally finishes it with the lean implantation challenges.

2.2 The Phenomenon of Change

Change is recognized in all human endeavour be it in business, vocation or personal life. How businesses are being carried out are totally changing as a result of globalization, privatization, and liberal government policies and therefore for businesses to gain feet in the quick changing and competitive environment, it is very necessary for all to be aware what and how to manage change. Melchor (2008) stresses that: “*Change is historical, contextual and processual*”. Butler, 2003 (as quoted in Melchor, 2008: p9) also states that: “*Change is historical because it interconnects horizontally through past, present and future time, is contextual because it interconnects vertically through different levels of society and is processual because it interconnects process and action*”.

Organizational development is basically based on change. Organizational difficulties and challenges are mostly resolved by change. Competition, modern technology, mergers and amalgamations of businesses, development, product quality maintenance, improving employees’ efficiency and fast growth, new business reorganizations, innovations, advanced leadership styles and new management concepts and methodologies are some of the major sources of organizational challenges of late (Madsen et al., 2005).

Change is an outstanding characteristic of organizational civic and personal life. Implementation of planned change enables goal achievement, progress and the elimination of crisis for organizations. Change helps to solve numerous crucial treats as those associated with policy,

governance, rule of law, philosophy, and distribution of information, rights, and resources, challenges of efficiency, effectiveness, quality, and competitiveness, and treats to shared values, understanding and cooperation. Normally, change is important to adjust past failures and to achieve learning and improvement and therefore failure to initiate change as a result of organizational learning can cause repeated failure. (Lewis, 2001).

As put forward by Clinton (1994: p167) in his inaugural speech to the United States: *“The price of doing the same old thing is a whole lot higher than the price of change”*. Thus, change is very crucial because it gives ways for growth, development, increasing recourses, and seizing a moment that if missed may have negative consequences. Organizations which are rigid in the course of initiating change and not able to take action efficiently and effectively in bringing innovative ideas into use soon enough may be incapable to utilize the benefit of even the best ideas and therefore lose their competitiveness.

Change is part of everyday life of an organization with respect to an operational level and strategy level Sande et al. (2015). Obudo (2015) also opines that change is an ineluctable endless process that shows the continuous path of performance of an organization so as to ensure an elaborate preparation, effective execution and persistent assessment of plan that is being taken place. Piercy et al. (2012) argue that, because public-sector organizations must provide the increasing needs of a different range of customers while facing the chance of reduced funding and little chance of income generation, the concept normally applied in the private sector are now adapting into the daily public-sector practices. Change in the context of contemporary organizations as elaborated above needs to be well defined. According to Kanter et al. (1992: p279): *“Change involves the crystallization of new possibilities (new policies, new behaviours, new patterns, new methodologies, new products or new market ideas) based on the reconceptualised patterns in the institution. The architecture of change involves the design and construction of new patterns, or the reconceptualization of old ones, to make new, and hopefully more productive actions possible”*

Usually, organizational change theory and practice are appropriately examined in term of three perspectives, the radical; the normative and the coercive. The rational (or ‘rational-empirical) include the use of data and analysis to explain opportunities/issues and problems and to develop

strategies/approaches/solutions. The normative or 'normative-reductive' includes the formation of organizational norms and the guidance of organizational members to change their acceptances, orientations and behaviours. It originated from liberal education and humanistic psychology. The coercive or 'political-coercive' includes kindle or otherwise, leadership, compulsion or manipulation to accomplish the aims of the agents with power within or over the organization. Political, religious and military are its forbearers (Junge et al., 2006).

Continually, organizations go through a process of organizational change. While the general meaning of „change“ is defined as just a new state of things, different from the old state of things, organizational change is more difficult to define. There have been several attempts by scholars to analyse how and why organization change.

Scholars in many disciplines have wanted to analyze how and why organizational change. According to Van de Van & Phole (2004), change is the pivot of organizational development because, it is vital in individual careers, teamwork, organizational strategy making and the advancement and downturn of corporations. The name „organizational change“ by itself alone gives a clue that, it is a change in organizational activities that is being described. However, this statement alone does not explain in detail the kind of activities that are subjected to change. Change is an imminent endless course of action that defines the continuous organizational direction and performance to guarantee thorough formulation, effective implementation and long-term assessment of strategy happening in an organization.

Organizational change or development could have numerous understandings for different organizations in similar phrases as described already. Change is daily developments or happenings, but it is not every change that attracts the concentration and pushes organizational leaders or managers to initiate action and therefore change is all about us, but many of its targets remain cynical about its impact and importance. However, when organizational change is mentioned, then we are referring to the level of differences that make a vital or meaningful impact on the way people think about their organizations. *“Organizational change can be defined as an alteration of a core aspect of an organization’s operation”* (Kelly et al., 2007: P4). According to them, the core aspects include the structure, technology, culture, leadership, goal or personnel of an organization. Organizational change may also be understood as a state of

transitioning from the present state to an unforeseeable future one, towards which the organization is directed.

Organizational change is caused by a proactive or reactive feedback to the interactions from the external environment or internally in the organization. Leaders effect proactive change in the organization as a feedback to an opportunity seen as a result of their evaluation of external or internal factors. Reactive change is a feedback to the external environmental factors or inside of the organization that have happened before but not the future anticipated factors (Hodges & Gill, 2014).

Change that happens in the organizations is largely unplanned and gradual. Planned organization change, particularly on a large scale, affecting the whole system is uncommon, and not routine. Change that happens in an organization can be fast or slow. As a way of effecting change in the organization, the change could be either revolutionary or evolutionary. The former is immediate, dramatic and forced down from above and cause a severe overhaul of the organization resulting in a modified or a totally new mission, strategic change, leadership and culture, is uncommon and the latter is gradual and a collaborative approach by management and employees (Burke, 2013). Organizational change is also viewed by Gilley et al. (2009) as either “*episodic or continuous*”. Change that is seen as rare and sometimes radical is episodic and when it is seen to be incremental, emergent, and endless then, it is continuous. Scholars agree the rate of change is increasing, whether endless or radical.

There are diverse ways by which employers approach organizational change. Some employees have the perception that change can provide room for continuous learning and growth, while others consider a change to be a threat. Adapting to a successful change helps to build a higher sense of eagerness for developing opportunities for learning and improvement. On the contrary, frustration, anxiety, uncertainty and isolation in respect of employees safeguarding their jobs and positions or grades are results of poor adaptation of change (Holt *et al.*, 2007). It is important for scholars and change leaders to be aware of the high level of readiness of employees to help management try to apprehend the high level of individuals’ beliefs, intentions and mindset during initiation of change programmes.

Because of the unidentified threats that come along with crucial competition, organizational managers and leaders are now eager to find out how to continuously survive in business and stay competitive. Several scholars and change agents propose that it is important for an organization to change its policies, approaches, culture, systems, and processes to compete. (Cummings & Worley, 2005). Change that happens in an organization may be small or large, substantial leap or gradual. However, it needs a proper consideration because of its resultant effect on the organizational performance, growth, goodwill, competition and continuous survival.

2.3 Overview of Change Management

Technology and other marketplace drivers have thoroughly modified the very nature of change two decades ago (Anderson & Anderson, 2010). In reaction to such pressures and confronted with a more complex operating environment, public-sectors have been changed by adopting managerial principles grouped under the title of New Public Management (NPM) (Brown et al., 2003). They further stress that, to respond to the treats of the global economy and the rising public demand for minimal but more reactive government by the public-sector, it has become a necessity for public-sector organizations to be transformed. Although change was formally an accommodated transactional event and simple to manage, it has now become more open-ended, radical, complicated, personal and endless. The new change that has come up is ‘Transformational’ and it is very complicated and common happening in an organization. Almost all of the change-related problems difficulties confronting leaders of late are as a result of a transformational change not being understood and therefore given rise to the field of “Change Management” (Anderson & Anderson 2010). For organizations to overcome the recent highly competitive and endlessly changing global environment, a successfully management of change is required. (Todnem By, 2005).

Change happens in many types and sizes, getting a spark from either internal or external stimulus, in which change has to react to. Because of the mentioned reason, an organization cannot survive the same way it has been unless a change happens. The aforementioned reasons can differ from improving processes to company integration (Newton, 2007). Whatever the reason is, people in charge of implementing the change in practice must acknowledge the starting point; why the change is needed, the goal; what to achieve with the change; and the impact; and people the change will be directly affected.

Change management study has acknowledged the function of contextual factors of organizational change but precisely, not in the public organization context. However, public-sector change management concern has gotten much consideration. Attentions have been drawn to organizational change in the various categories of public organizations like health care organizations, local government organizations and the central government organizations in recent studies (Voet, 2014). It's worth to note that change management involves the activities, procedures or methods employed to manage change that affects people in the organization (Creasey, 2007).

Change management is a concept that describes the change that happens at the individual and organizational level (Pieterse et al., 2012). Connelly, (2016) describes change management be the activities that involve in managing change, a skill or an area of competence; a concept that comprises of ideas, approaches, systems as well as other tools; and the procedure of tracking a change that happens in computerized systems. In managing organizations to enhance productivity, service delivery and the general performance, change management is a necessity (Obudo, 2015). Todnem (2005) also opines that organizational change is crucial and as such, its management is becoming the mostly needed managerial skill. Hiatt and Creasey, (2007: np) in their article define change management as: *“Change management is the process, tools and techniques to manage the people-side of business change to achieve the required business outcome, and to realize that business change effectively within the social infrastructure of the workplace”*.

Change management as a process describes the problems that arise in an effort to evaluate or assess its impact in an organization. In an attempt of organizations assessing or evaluating the impacts of change may temporarily freeze portions of their processes at any particular time if these processes are attesting to fail, even though there would be still a possibility to correctly assess the impact on change. The individual attitudes that are affected by change can be assessed by the application of formal and informal discussions (Sarantakos, 2005).

The Office of the Commissioner for Public Employment – OPCE (2012) proposes five good principles of change management in an organization that could help during the change process. Organizational change is measured, intended and planned, founded on deliberation with

appropriate people and accomplished at the reasonably time interval; ambiguous, steady and based on the concept of human resource management; it must be an endless communication between the appropriate individuals in a suitable and timely manner, giving timely information of the results and the need for those decisions; complaint with vital strategies and procedure; including the appropriate enterprise agreements; or monitor, evaluate and it should be based on best practice.

Hayes (2014) posits that there were over twenty different change theories in relation to change. However, further studies helped to find four absolute types, and these are:

- Teleological theories: the assumption of purposefulness and adaptiveness of organizations and change are conferred as a gradual cycle of goal formulation, implementation, evaluation and learning;
- Dialectical theories: describes the ability to deal with opposing goals among various stakeholders and clarify stability and confrontational change and managing the balance of power between the opposing entities;
- Life cycle theories: describes the how change is perceived as a process that advances through an appropriate series of phases that are progressive, with an impression that each phase adds a something to the result, and related;
- Evolutionary theories: explains that change advances through an endless sequence of differences, assortment and retention.

Managing change has been mostly applied to business management and museum management though, it has not treated as the same level of consideration in the public management literature. However, it is amazing as the private and the public organizations are being confronted by the challenge of transforming in order to withstand in “the transitions taking place in the world society”. Customers are appealing for more services and of the better quality in the private sector context and as result organizations as a matter of urgency changing their operations as quickly as possible to meet the needs their customers and prevent taken over by their competitors. Similarly, citizens await more from governments in the public-sector causing public organizations to improve its structures and procedures to act effectively to those demands (Melchor, 2008). In this context, Melchor, (2008: p13) defines managing change as: “*Managing*

change refers to the way of dealing with the intended or unintended consequences of a reform program". However, as part of design and implementation process of a policy initiative, managing change is included.

Leadership is widely accentuated as one of the bases of organizational change implementation. However, most of the change management literature have given much attention to change leadership (Voet, 2014). A distinction was drawn between change management and leadership as: *"Change management refers to the process of change: the planning, organizing and directing, of the processes through which change is implemented, while leadership is aimed at the motivation and influence of employees"* (Voet, 2014).

Management of organizational change recently is not proactive but reactive, irregular and ad hoc with a recorded failure of 70 % of all change initiatives introduced (Todnem By, 2005; Todnem By, 2007; Cinite et al 2009; Rosenberg & Mosca 2011; & Strauss, 2015). In view of this, Strauss (2015:np) states that: *"The problem with such a high failure rate is that not only will be missing the mark result in lost opportunities, but there are will also be wasted resources, and cynicism, as a result"*. He explains further the seven reasons why these failures occur in organizational change initiative as follows: lack of communicating as to why the change is needed; differing change agendas by change implementers; Insensitivity on the part of change initiators to involve all stakeholders and making its known to them the challenges and stress associated with change; Lack of effective leadership to lead the change; Lack of commitment of the part of management.; Lack of planning for initiating the change and Poor processes in relation to implementation.

Kotter (2013) also opines that organizations that have adapted to the micro and macroeconomics forces recently as a result of organizational change have achieved competitive advantage over their competitors and has yielded those organizations with a steady situation in the future. Kotter (1996) further opines that many organizations have failed in an attempt to embark on change management, hence, wasted resources and leaving employees being frustrated. To affirm the discussion and in agreement with Strauss (2015), Kotter (2013) identifies eight errors which have been meaningfully contributed to the problems of managing change and these are: when there is more complacency in the organization; failure to develop unambiguous and firm systems; understanding the power of the vision; lack of effective communication in the organization –

underestimating the significance of communication; inability to address problems effectively and timely when they arise; too much concentrating on long-term achievements and forgetting short-term gains; acknowledgement of change success quickly than it is realized; and the inability decisively present changes in the organizational corporate culture.

Kotter (1996) also outlines the consequences of which these errors create for an organization and these are: new strategies aren't implemented well; acquisitions don't achieve expected synergies; re-engineering takes too long and costs too much; downsizing doesn't get costs under control; quality plans failing to achieve the expected result. Kotter (1996) further argues that these mistakes are avoidable. These mistakes can be eradicated through realization and experience. In order to correct these errors, Kotter (2013, 1996) proposes the following:

- There should be a proper initiation of the change management practices and strategies;
- All purchases must be scheduled to be in meeting with the planned outcomes;
- Re-structuring should happen as the shortest possible time to ensure effectiveness and efficiency of the change as well as aligning closely with the change;
- Shedding of employees should be done in a controlled, effective and efficient manner; and
- There should a conscientious effect in selecting quality programmes so that the organization will realize the planned outcomes.

Sharing similar view with Kotter (2013, 1996), Aitken & Higgs (2010: p38) point out that: *“Although it is clearly difficult to implement change effectively, there is a growing volume of evidence which indicates that success is more likely if: change is understood as a complex leadership, management and follower phenomenon; change approaches and process genuinely involve all of those impacted by the change and change leaders have all capabilities necessary to lead the implementation of change in complex and volatile settings, in a more involving manner”*.

Hayes (2014: p26) also points out that as a concept, managing change is perceived: *“as a purposeful, constructed and often contested process that involves attending to seven core activities: recognizing the need for change and starting the change process; diagnosing what needs to be changed and formulating a vision of a preferred future state; planning how to*

intervene in order to achieve the desired change; sustaining the change; implementing plans and reviewing progress; leading and managing the people issues and learning”.

However, recent organizations can survive by adhering to the current management approaches featured by attribute generally referred as vision; current ethics; quality attitudes; stakeholder focus; speed orientation; innovativeness; flat structures; cross-functionality; flexibility; global focusing; and networking (Kotter, 1996). In supporting the assertion made by Kotter (1996) on how organizations can successfully implement change, Office of the Commissioner for Public Employment - OPCE (2012: p3) also expresses an opinion in the public-sector context and states: *“In public services, the complexity of change is high as it equally deals with the transformation of complex patterns of interaction and relating. Successful change management practices in public service organizations should therefore take account of unpredictability, uncertainty, self-governance, and emergence”.*

2.3.1 Readiness of Change

It is well accepted that if organizations want to progress change is needed. Though it is rationally recognized that progress means change, not everyone in the organization is ready and willing, or indeed able, to embrace the change. On the contrary, it is widely believed that most people in organizations would resist change.

It is argued that readiness is one of the crucial factor entailed in employees’ primary backing for change initiative. Even though the concept of readiness may have been already introduced, the basis for it as a rare build-up has been entrenched within many theoretical models of the process through which change revealed (Holt et al., 2007). Employees’ perception that the organization is not prepared for the change and hence, lack of change acceptance is the motivational factor of unsuccessful change has become a debate. However, organizations should boast of a certain level of readiness before initiating any change (Cinite et al., 2009). As (cited in Mathew et al., 2014: p854) by Madsen et al. (2005), *“...employee’s readiness for change and employee’s relationship with their managers was the strongest predictor of readiness for change”.* To initiate a change in an organization, it is necessary to understand and establish readiness for change of employees and of their organizations. It is essential for the implementation of any attempt on organizational change to have employee’s acceptance and cooperation (Mathew et al., 2014).

Prochaska & Velicer (1997) opine that change recipients' readiness and willingness are paramount to the successful and effective implementation of changes or change processes. Without the change recipients' willingness, those involved or affected by the change will display resistance and the change is bound to fail. Involvement of those affected by the organizational changes will facilitate buy-in and develop a sense of willingness to change themselves and embrace the change journey. Increased levels of individual or organizational readiness to embrace change facilitate an effective initiation of the changes. The level of willingness to embrace change may differ on the basis of the situational factors of the change event.

The willingness of the change recipients to support change is influenced by what they evaluate and consider as the benefit and the cost of maintaining a certain conduct and the as well as the costs and benefits of change. The Readiness of individual to change means that he/she portrays an active and positive minded that can be described as readiness to back and self-assurance subsequent to such a change initiative (Luthans et al., 2007). There should be a variation in the extent of readiness on the basis of the situational features of the event leading to the change (Holt et al., 2010).

The message for the change is the ideal tool for creating readiness for change among member of the organization. Readiness message generally involves two matters: (a): the reason why the change is needed - thus the differences between the desired end-state – the current state and (b): the individual and collective efficacy (the notion to change) of parties to whom the change is affected (Burke et al., 2008). Hultman (1998: p95) as (quoted in Burke et al., 2008) stressed that: *“Readiness is manifested in either active initiating of change or cooperation with it. [...] Readiness is not the opposite of resistance since an absence of resistance doesn't necessarily means a readiness of change”*.

Considering the significance of readiness for change in respect of a successful implementation of organizational change, it has developed a unique concept. Regardless of its development as a unique concept, a readiness of change still not clearly defined (Heinrick, 2004.). He further states that: *“Readiness of change has been broadly defined as the social, technological and systematic ability of an organization to try a new thing and to change”*. (Heinrick, 2004: p34).

Hodges & Gill (2011) also posit that readiness of change is the organization's member's beliefs, attitudes and intention in respect of which changes are required and the ability of the organization to initiate those changes successfully. They further opine that employees' recognition of the organization, the psychological bonding between an individual and his or her organization have an important positive impact on organizational readiness for change. Advancing solid employees' connection with the organization is the focal point in facilitating effective change. Hodges & Gill (2011) further note that, to make success more hopeful, organization should embark on readiness of change assessment with the following indicators: the need for change should be destemmed in relation to the difference between the recent state and the expected state; the notion of people in connection with the suggested change as the right change needed; the morale of people in the organization has been raised as to have believed that the change is achievable; the change has the backing of all major stakeholders the organizational members rely on and the question of 'what is in for me/us' (cost and benefit analysis) has been dealt with. Moreover, more précised ways for assessment has been initiated in regard to a readiness of change by Hodges & Gill (2011) and these are:

- Trustworthy leadership: the capability of top-level managers/leaders to be trusted and have credibility with others;
- Capable Champions: the organization's ability to entice and maintain champions
- Trusting followers: stakeholders' readiness to back the change;
- Involved middle manager: middle-level managers' ability to effectively connect the intended change by leaders with rest of the organization;
- Innovative culture: the organization's ability to create standards of innovative and inspire innovative activity;
- Accountability culture: the organization's ability cautiously steward resource and successful conform to scheduled deadlines;
- Effective communication: the organization's ability to effectively communicate vertically, horizontally and with customers;
- Systems thinking: the ability of an organization to reason and recognize the internal and external interdependencies of the boundaries of an organization.

Most of the organizational concerted activities that happen internally are often a mixture of the activities of the various organizational members and therefore, through their action, the organization will either accept or reject change. The study done by (Holt et al., 2007) on readiness for change in both the public and private sector managers indicated the under mentioned persuasive readiness factors, isolated empirically:

- Discrepancy - the notion that a change was essential;
- Efficacy - the notion that the change could be initiated;
- Organizational valence - the notion that the change would be organizationally useful;
- management support - the notion that the organizational managers were dedicated to the change; and
- Personal valence - the notion that the change would be individually useful.

Being aware as to whether individuals in an organization feel the relevancy of the change happening, management supports the change, the ability to initiating of change successful and the notion that the change was personal beneficial would prompt them to have the required consideration for the change. The outcome of a study done by Cinite et al. (2009) in Canadian public- sector organizations reveals that there are two types of organizational actions that are firmly associated with the employees' perception that organization is prepared for the change. These are the poor communication practice with the organization in relation to the explanation of the outcome, benefit and reason for the change and also the impact of the change perceived to have on their work.

From the above discussions, it is clear that the most significant traits in any organization that ensures an effective and efficient change is the state of readiness of its staff to embrace and accept change. However, to achieve the state of readiness of employees there is a great need for senior management to create a rallying vision to galvanize and convince employees to embrace the change.

2.3.2 Managing Change in Public-Sector

The pressure from citizens for demanding efficiency from the public-sector has caused the sector to experience some major changes in recent years, and these changes look set to continue. However, it has become very difficult for public-sector managers to successfully manage these

changes. Managing change successfully enhances the emotional, psychological and social well-being of employees, promote innovation and upsurge productivity. When change is not well managed, it could be upset for some employees or would result in making employees feel insecure about their job and therefore resist it (APSC, 2013). Uncertainty, chaos and indecisiveness that normally happen in public-sector organizations are mainly caused by the pressure for change and increased productivity from citizens (Kiel, 1994). Kiel (1994: p2-3) stresses that: *“Implementing new work methods inevitably adds to the disorder as organizations learn the new processes and systems. Managers experience uncertainty as they learn how to administer the unfamiliar work and service delivery systems”*. Furthermore, Kiel (1994: p3) stresses that: *“The public clamour for “continuous improvement” in government performance means that work processes must constantly be altered, reordered, and improved. As soon as some semblance of order in work methods has been attained, they must again be changed”*.

In order for the public-sector to manage change effectively and efficiently, communication, leadership commitment and collaboration and stakeholders’ participation are critical factors that should be considered. This, however, means that during the change process, an effective communication must be established in order to ensure that individuals affected by the change are well addressed in advance to motivate them for the adoption of the change. This could be done through workshops, seminars and offering training programs. Public-sector organizational culture should be improved in order to stimulate the success of change management. For an organization initiating a transition from its current state to the planned unforeseeable future through a change management process, the introduction of systematic and ground change that is controlled and consciously implemented are involved (Obudo, 2015).

Many studies currently discuss the various models and frameworks of which most of them used Lewin’s model steps of change as a basis to explain how organizations can initiate change and identify the contributing factors for successful implementation. Notwithstanding the differences that exist in these models and framework, there are some incredible similarities among them (Fernandez & Rainey, 2006). Fernandez & Rainey (2006) point out that eight influential factors that will assist public-sector managers to successfully manage change and these are cited below:

- Ensure the need: the verification of the reason why the change is needed in the public-sector is very crucial as well as intensive participants and stakeholders' engagement through conclusively communication as possible.
- Provide a plan: change implementers in public organizations must initiate a plan or strategy for change implementation and ensure that the new visions or ideas are transformed into a course of action or strategy with goals and a plan for accomplishing it.
- Build internal support for change and overcome resistance: Change leaders must try hard to develop internal support and reduce resistance through an extensive involvement throughout the change process and other means like allowing criticism, threats and compulsions, persuasion, inducements and rewards, compromises and bargaining, guarantees against personal loss, psychological support, ceremonies and other efforts to build loyalty.
- Ensure top-management support and commitment: it is very crucial for top-management to provide support and their commitment to the change process. It is equally important to have a single change agent or "idea champion" to lead the transformation. The cooperation of the top-level career civil servants and politically appointed executive is needed to provide the necessary support.
- Build external support: political leaders and other external stakeholders support for the change is very paramount for successful managing of change. The support from these leaders comes in the form of imposing statutory changes and to control the flow of important resources to the public organizations.
- Provide resources: for change to be implemented successfully, there should be a required amount of resources to support the process as change is said to be expensive or without trade-offs. As resources are one of the vital factors for enhancing public services and hence bring about change, any public-sector organization which wants to embark on planned organizational change must prepare to invest a sufficient amount of recourse to accomplish the change process.
- Institutionalize change: members of the organization must integrate the new policies or ideas into their daily routine in order to appreciate the change and to become part of the organizational culture.

- Pursue comprehensive change: in order to manage change successfully, comprehensive and cohesive strategy for the change accomplishes subsystem congruence in needed. Effecting the changes in some of the systems leaving the other will defeat total organizational transformation goals.

Coram & Burnes (2001) are of the view that, there has not been any specific or precise way of managing organizational change and therefore public-sector organizations have to adopt an approach to change which consolidates all the cultural and organizational needs and to acknowledge and provide feedback to employees fear and concerns.

2.3.3 Resistance to Change

Modernization has caused some organizations to continuously embark on change and at a rapid pace. To comprehend such changes successfully, there a for employees' collaboration, since any resistance on their part can hinder the success of the change initiative (Thomas & Hardy, 2011). Resistance is argued to be a defense mechanism to uphold the status quo and therefore, it is not surprising for individuals or employees to resist change.

However, it is not surprising for the recipients of change resist because resistance itself is a defense mechanism to maintain the status quo. Resistance toward change refers to the attitude shown by the change recipient in order circumvent a planned organizational change (Hughes, 2006).

Change is perceived to be difficult and therefore people resistance to it is an intensely entrenched belief in the lifespan of every organization. It is, however, written in manuscripts of corporate organizations, management manuals, reports, workbooks and journals, articles and magazines of organizations. The concept of organizational change resistance started to get attention and questioning its existence after its basis was laid down by Coch & French (1948). Resistance has essentially considered to be negative and still considers as a basic component entrenched in the change loop. It is often assumed resistance as an obstacle to change though, there are a lot of debates which stress the good aspect resistance portrays in an organization also exit in scientific articles (Ijaz & Vitalis, 2011). Resistance to change is meant to be an emotional and behavioural feedback by the afflicted employees to actual or imagined threats to a laid down work routine (Brown, 2017). O'Connor (1993: p30) describes resistance as: "*slow motion response to meet*

agreements or even a complete refusal to cooperate with change. In an organization, resistance is opposition or withholding of support for specific plans or ideas. It can be either intentional or unintentional, covert or overt”.

According to Bolognese (2002), the meaning of the word resistance is much broader in scope than how it is being described. However, the revision of old literature places an emphasis on three different concepts of resistance as a *“cognitive state, and emotional state and as a behavioural state”*.

However, the revision of past empirical study shows three different emphases in the conceptualization of resistance as a cognitive state, as an emotional state, and as a behaviour. He further argues that the perception that employees’ resistance can be dealt with cognitively and proposes that negative thought or belief about the change exist. Cited in his article, Watson (1982) suggests that: *“what is often labelled as resistance is, in fact, only reluctance”*. Moreover, he explains resistance in behavioural terms, nevertheless proposes that another state foreshadows it as a psychological state call un-readiness. Graetz et al (2006: p284) also state: *“Although the meaning of resistance to change is intuitively clear how resistance translates into practical change dissension is unclear”*. Agócs (1992: p918) also opines that: *“resistance can include a wide range of behaviours, including refusal to engage in joint problem solving, refusal to seek common ground, the silencing of advocates for change, sabotage, the use of sanctions and a general lack of cooperation”*.

In any organizational change initiative, the considerable challenge comes with the awareness that managing change includes managing the reactions to that change (Andriopoulos & Dawson, 2009). They further elaborate that; employee resistance should not simply be dealt with as an impediment to be overcome but as a treasured source of knowledge and critique of the change program. Resistance is a very important concept which must be given full attention during organizational change programmes. Resistance can, therefore, be said to be a reaction response to change initiatives which is normal and is possible to be managed effectively.

Robbins (1998) posits that resistance could serve to evaluate the commitment of the change initiators; when resistance is founded on genuine viewpoints crucial truths could be possibly known, recognized and considered by the change implementers if they desire the change to be

successful; negative impressions that have not been approved by the change implementer in an organization or ideas that might be expectedly attract reactions to external events can be eliminated by the help of resistance; and employees' sentiments and vigor during moments of severe pressure are often caused by resistance. When resistance prevents employees from adapting to change and organizational progress, then it turns out to be negative.

2.3.4 Resistance in the Public-Sector

As change is said to be inexorable to the public-sector organizational growth so do resistance. Any time change is announced, it brings about emotional reactions of employees because of the uncertainty. However, as already mentioned above, employees' resistance to change generally accepted norm that exists in both private and public-sector corporations (O'Connor, 1993; Dent & Goldberg 1999; & Robbins, 1998).

Doherty and Horne (2002,) identify some reasons why public service employees resist change. Some of these reasons are:

- Accepting the bureaucratic "habits" regarding delegation, strict laws, systematical regulation;
- Problems caused by the multiplicity of authoritative levels, public liability, accountability and reporting;
- Propensity to endorse upwards decision-making. The struggles with method and approaches that aim to improve discipline;
- Relationships that are led by numerous stakeholders' different interests;
- Incompatible interests, plans, coalitions, reward forms and rate;
- It is very difficult to obtain financial assistance for managing change;
- Financing is limited to hiring experts because of the cumbersome bureaucracy for approval to speed.

Doherty & Horne (2002) further explain the reasons for resistance to change by some individuals in the public-sector. They opine that many organizations public-sector persistently functions within “mechanical” means – executing their functions in a methodic fashion, emanating from massive level resistance to change. They maintain that individuals in this sector find it arduous to deliver information to managers and leaders notwithstanding the decentralization that exist in the decision-making process. They further maintain that individuals in the public-sector normally resist organizational change since most of the managers in this sector overemphasize the effects of the changes they have implemented. It is vital to stress that not all individual in this sector resist change. Individuals who are very old to learn, those who possess limited educational qualification and not self-confidence, not certain of their value to the organization and are circumspect about the value of continuous training and not experienced staff which are controlled by aged workers are most likely to resist change.

Adding to the aforementioned factors, Victorian Public-Sector Commission (2015) also elaborates on some simpler ways of thinking about resistance and which may be in three levels:

- Level 1- I don't get it: this describes a situation where resistance emanates from a lack of information, a distinct way of clarifying significant data, a lack of exposure to a critical piece of information, or confusion over what certain pieces of information mean;
- Level 2- I don't like it: In this situation, the resistance is felt as an emotional response. This is usually compelled by fear of losing face, status, control or their job and financial security. Resistance established on fear is deeply entrenched resistance and will take substantial effort to assist people to move from;
- Level 3 – I don't like you: In this situation, the resistance does not relate to the changes themselves, but to the people who are advocating the changes (change initiators). This resistance may be based on a lack of trust; the individual and what they say is not seen as credible. Or else the resistance could be based on an unsettled acrimonies resentment or a personality clash completely unrelated to the changes-past or present.

According to Mathew et al. (2014), resistance to change describes the causes that hinder successful change which include; middle management fear of losing authority, employees' fear

of losing their jobs, skepticism about project result, and feeling uncomfortable with the new working environment. Resistance to change emanates just because of management inability of initiating reward schemes, training and development, industrial relation and other board human resources process that will strengthen the change process and help individuals in welcoming it as their own (Essays -UK. 2013).

In dealing with resistance to change, Victoria Public Sector Commission (2015) argues that it is, however, prudence to apply different approaches since one-way approach does not fit all. In line with this perspective, Victoria Public Sector Commission (2015) and Kotter & Schlesinger (2008) propose the following approaches: education and communication – educating and informing people ahead of time before change is initiated is among the best ways to do away with resistance and then, communicate with them and educate them, so that they know the rationale and need in change efforts; providing a place for conflict - creating enabling environment for principled dissent-forums in which criticisms to present or proposed changes can be voiced, acknowledged, and, where practical, taking into consideration when drafting organizational strategies and change actions; providing opportunities - for involvement, either through planning stages or as part of a pilot-‘involvement breeds commitment’; support - including creating key skills needed to acknowledge the changes and providing empathetic stimulation that exhibit an understanding of the concerns; negotiation - concluding an agreement that in exchange for acknowledging certain aspects of the change, there can be compromised on other aspects; and explicit and implicit coercion - in this approach, speed is the crucial factor, and this approach should be only used as the last resort.

It is, however, obvious that if the organization is not ready for change, it will automatically create resistance by the employees. The change leader is responsible for making the organization ready for change, which should also be their target instead of trying to overcome the resistance (Self, 2007). It is essential for the change initiator to make an effort to understand the people affected by the change and the potential impact on them. The change leader must clarify how the impact will be, to acknowledge and provide as much help as possible to those that may be affected (Smollan, 2011 and Self, 2007).

2.3.5 Models to Change Management

Change management models review needs to be given a considerable attention as it set the arena for change interventions in organizations, whether private or public. Willcocks & Mason (1987) point out to the fact that, there are numerous approaches to the change that affect people in an organization and Burnes (1996) also places an emphasis that there hasn't been any best way to manage an organizational change. There are many models and theories that that have been proposed by many scholars for the effective and efficient execution of change in both public and private organizations. Many scholars have defined the term model in a various way but the one by Tichy (1983: p38) appears to be simple and straightforward. He states that: *“the use of the term “model” refers to a set of assumptions and beliefs which together represent reality”*. The table 1 below shows some selected change management models and the rationale behind them.

Table 1: Change management models

Author and year	Name of Model/Theory	Stages/processes	Rationale
Kurt Lewis (1947)	Lewis' three-step model	Freezing Move and Unfreezing	The model portrays the consequence of forces that either improve or hinder change. To be precise, while driving forces encourage change, restraining forces prevent change and therefore change will happen as a result of one combined strength force outweighs the joint strength of the contrasting set of forces (Kritsonis, 2005).
Lippitt R, Watson J & Westley (1958)	Lippitt's Phases of Change Theory	Diagnose the problem; assess the motivation and capacity for change; assess the resources and motivation of the change agent; define progressive stages of change; ensure	The model is an expansion of Lewis' Three-Step Change Theory. The roles and responsibilities of the change agent are the focal point of this theory as against the evolution of the change itself. The process should be guaranteed a persistent information exchange

		the role and responsibility of the change agent is clear and understood; maintain the change through communication, feedback, and group coordination; gradually terminate from the helping relationship.	throughout (Kritsonis, 2005).
Robert H. Waterman JR, Thomas J. Peters & Julien R. Phillips (1980)	McKinsey's 7-S Framework	Shared Value Structure Systems Style Staff Skills Strategy.	The model offers a précised and a fixed representation of the seven core components of an organization and shows the level of interconnectedness and points out the most vital areas requiring change (Anderson & Anderson, 2010).
James O. Prochaska & Carlo Di Clement (1983)	Prochaska and DiClemente's Change Theory (Transtheoretical)	Pre-contemplation Contemplation Preparation Action Maintenance	The model of change behaviour was first developed for health patients to demonstrate their journey to change certain health behaviour. However, it is now generally accepted model other than healthy patients. The model describes a universal process of change and its series of stages when a change occurs. Advancing through the stages is not a linear but rather cyclical. Thus, many people initially relapse on their change effort and therefore do not sustain their progress in the first instance favourably (Kritsonis, 2005).
David Nadler	Nadler and	Task; People; The formal	Effecting change on a part of an

<p>& Michael Tushman (1986)</p>	<p>Tushman's congruence model</p>	<p>organization; and the Informal organization</p>	<p>organization can negatively have an impact on the other part and therefore, this model comes in to identify that impact within the organization and to come out with a solution to fix it (Gough, 2009).</p>
<p>Murphy Dalziel & Stephen C. Schoonover (1988)</p>	<p>Dalziel and Schoonover Model</p>	<p>organizational readiness; change-team roles; and the implementation process</p>	<p>This model basically involves various elements which change leaders have to consider and manage to ensure a successful change process. Change initiators have to prepare the organization for change, get the right mix of skills at a place and then develop an action plan to ensure successful change to happen (Dalziel & Schoonover, 1988).</p>
<p>Kanter, Stein, & Jick (1992)</p>	<p>Kanter et al Commandments for Executing Change</p>	<p>Analyse the organization and its need for change; Create a vision and a common direction; Separate from the past; Create a sense of urgency; Support a strong leader role; Line up political sponsorship; Craft an implementation plan, Develop enabling structures; Communicate, involve people and be honest; Reinforce and institutionalize change</p>	<p>The model was developed to expand the Lewin's three step model as it was considered to be simple, founded on the assumption basically that, organizations are steady and immobile and also change is resulted from concentrated effort and therefore happens in one direction at a time. The focal point of this model is grounded on the idea that change is "multi-directional and universal and that it occurs in every direction at once and is an endless process. (Kanter et al., 1992)</p>

<p>John Kotter (1995)</p>	<p>Kotter's Eight- Step Model</p>	<p>Establish a sense of urgency, form a guiding coalition; Create a vision; Communicate the vision; Empower other to act; Plan for and create short-term wins; Consolidate improvements and produce more change; and Institutionalize new approaches</p>	<p>The model basically focuses on the significance of developing clear and achievable visions using a suitable team for the change, whose role is to communicate visions, ideas, achievements and failures within the organization. Employees' behaviour of resisting change can be managed by this model. "The model proposes the significance of leadership and vision, forming guiding coalitions, communicating, motivating and empowering others, and anchoring new ways in the organization's culture" (Gilley et al., 2009 & Kotter, 1995)</p>
<p>David Ulrich (1998)</p>	<p>Ulrich's Seven Steps Model</p>	<p>Lead change, Create a shared need; Shape a vision; Mobilize commitment; Change systems and structure; Monitor progress, and Make change list</p>	<p>This model advances the significance of leadership and vision, establishing leading coalitions, communicating, motivating and others, and presenting refined ways in the organization's culture. It describes the key roles of change leaders in the organization and how they will be delivered to employees (Gilley et al., 2009)</p>
<p>Roger Gill (2002)</p>	<p>Gill's Model of Leadership for Change</p>	<p>Vision; Values, Strategy, Empowerment Motivation Inspirational</p>	<p>The model suggests that the leadership of successful change needs vision, strategy, establishment of a culture of sustainable shared values that assist the vision and the strategy for change, and empowering, motivating and inspiring those involved and affected (Gill, 2002).</p>

Raymond Caldwell (2003)	Caldwell fourfold classification change agent model	Leadership Management Consultancy Team	This model stresses the importance of the versatile and complicated roles change agents perform in organizational change while emphasizing the significance of conceiving change intervention within organizations as a process that is needed to coordinate and manage effectively (Caldwell, 2003).
Dean Anderson & Linda Ackerman Anderson (2010)	Anderson & Anderson Nine-Phase Change Process Models for Leading Conscious Transformation.	Prepare the Lead the Change; Create Organizational Vision, Commitment, and Capacity; Assess the Situation to Determine Design Requirements; Design the Desired State; Analyze the Impact; Plan and Organize for Implementation; Implement the Change; Celebrate and Integrate the New State a culture of sustainable shared values that assist the vision and the strategy for change, and empowering, motivating and inspiring those involved and affected (Gill, 2002) and Learn and Course Correct.	The model serves as a whole guideline for getting an organization from its present state to its expected future success. The nine phases serve as a generic process of how change is initiated in an organization over time. It incorporates the change strategy component of content, people, and process (Anderson & Anderson, 2010).

Source: Authors own work

In the table above, it is established that there have been a lot of change models since the development of the Lewis' model. It is, however, important to note that, Lewin's model is the foundation of change management models, upon which the other models are built up. Lewin's model was criticized of its simplicity and therefore, Lippitt's Phases of Change Theory, McKinsey's 7-S Framework, Prochaska and DiClement theory, Kanter et al Commandments for Executing Change and the other earlier models were developed for the sole purpose of expanding Lewin's three-step model. These models were also criticized for their more emphasis placed on the roles played by the change agent at the expense of evolution of change.

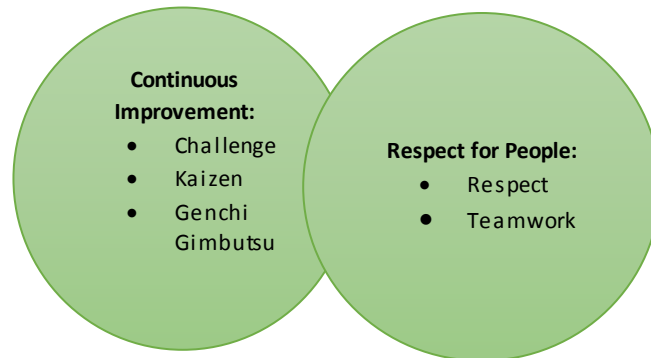
Improving on the early models, Kotter, Ulrich, Caldwell and Anderson and Anderson built up more comprehensive, multi-step models that inculcate leadership, employee involvement and commitment, monitoring, rewards and others. However, their critics lie on the failure to acknowledge the intricacy of change, basic ideas of achievement that if one pursues the right steps in order, inability to acknowledge the human, and absence of readiness for resistance. It is imperative to conclude that, all the models follow a similar line and therefore need almost the same actions. However, it is important for change leaders to have the option to pursue the model(s) that best fit the type of change being initiating in the organization.

2.4.0 Lean Concept

Lean Thinking or Lean Production is an application that has its origin from the manufacturing and applied as a way of improving production process whereas a process is a system sequence of action that results in the customer's satisfaction by producing a particular output (Mazzocato et al., 2010). Lean production was initially disclosed by Krafcik (1988) in his effort to describe what makes Toyota extremely successful and profitable than its Western competitors. The word "Lean" was applied as contrary to "Buffered" which was meant as the main features of Western production systems (Drotz & Poksinska, 2014). Formerly, studies about Toyota Production System (TPS) involved the explanation of a specific tools and methods like Just-in-Time (JIT), Kanban and Single-Minute Exchange of Dies (SMED) (Schroer et al., 1985; & Schonberger, 1982), but none of these tools and methods recognized the whole management system at Toyota (Holweg, 2007). A preliminary point was therefore set by Womack et al. (1990) for viewing lean as a concept, and the research has continued to establish the knowledge of principles and practices behind Toyota's success. Toyota acknowledged the guiding principles of their

management system, respect for people and continuous improvement in 2001, each of which is associated with some specific values as shown in Figure 1 (Toyota Way, 2001).

Figure 1: Main ideas of the Toyota Way



Source: Adapted from Toyota Way (Toyota Way, 2001).

Respect for people involves respect for individuals and their differences, as well as the personal and professional development of the employees as team members, *while continuous improvement* describes the idea of always aim for improvements to minimize waste and raise value for the customer (Krijnen, 2007). Primarily, Lean is to continuously task the current manner of how organization operates and to create ideas for improvements. *Kaizen* basically stands for *improvement* in Japanese and is generally applied to define continuous improvement operations developed on employee involvement. *Genchi Gimbutsu* (Go-and see) stands for a leadership approach in which the manager always acquires information by visiting the production floor and initiating decisions founded on the acquired information.

Robinson et al. (2012) and Waring & Bishop (2010) also posit that the main idea to the lean concept is to endlessly enhance processes by eliminating ‘waste’ (Muda in Japanese). This waste is expanded in seven areas, including transportation, inventory, motion, waiting, overproduction, over-processing and defect (Waring & Bishop, 2010). Schonberger (1982) states that employees in Japanese factory apparently would consider the following a source of resource waste:

- Idle materials constitute waste of scarce material resources
- Storage areas required for idle materials constitute a waste of limited space
- Making parts, subassemblies or final product carelessly a wastes both material and energy resources.

This concept which originated from Japanese manufacturing companies has gotten a worldwide attention through its success in Toyota Motor Corporation. Its application has cut across many sectors including automotive, construction, legal, health, computing, electronics, machinery, and product of consumer goods among others (Abdulmalek & Rajgopal, 2007). As its popularity rises over the last several years, many scholars have dived and studied the concept of lean. As a result, many definitions of lean have been given in the literature. The Lean concept and its application is being described with five principles which are founded on the idea that processes make up organizations. These principles, are as follow:

- The customer's value should be specified
- The value stream for each product/service providing that value should be identified and, challenge all of the wasted steps.
- The product flow should be continuously made. The standardized process should be inculcated into the best practices making them run efficiently and hence, giving more time for continuous improvement.
- There should be an introduction of the 'pull' between all steps where continuous flow is difficulty and focus on customer's demand.
- There should be a proper management which focuses on continuous improvement so that non-value adding activity will be eliminated from the value chain in order to enhance efficiency and effectiveness in customers' demand.

These principles are geared towards only waste and therefore confine the scope of lean. Basically, Muda was among concepts: Muda, Mura and Muri. Muri means 'excessive strain', which is meant to portray injuries and strain-free working environment for workers which in effect minimizes absenteeism. Mura which means 'unevenness' ensures stable demand that makes smooth process flows. As uneven demand rises, process variation also rises and hence, process efficiency will be achieved (Robinson et al., 2012).

Table 2: Definition of TPS and Lean

Definitions of TPS	
Monden (1983)	TPS is basically aimed to produce the needed units, within the needed time as well as the needed quantities in order to eliminate that needless middle and finished product inventories. Quantity control, quality assurance, and respect for humanity are basically the sub-goals of realizing the aim of reducing cost (waste elimination). These are achieved through four main concepts: JIT, automation, flexible workforce, and capitalizing on worker suggestions and 8 additional systems.
Ohno (1988)	The basis of TPS is the outright elimination of waste. The two pillars needed to support TPS are JIT and automation. TPS can be described as an effort to make goods as much as possible in a continuous flow.
Shingo & Dillon (1989)	The Toyota Production System is characterized by 80 percent waste elimination, 15 percent production system and only 5 percent kanban.
Liker, (2003)	The Toyota Way can be simply described according to its basic pillars that support it and that are: “Continuous Improvement” and “Respect for People”.
Definitions of Lean	
Womack and Jones (2003)	The concept offers a way to identify value, line-up value-creating activities within finest series, and make activities with breaks anytime someone demands them and performs them effectively.
Radnor et al. (2012)	Lean is said to be an operational activity of management founded on the concept of continuously improving processes either maximizing value of the customer or minimizing non-value adding activities

	(Muda), process variation (Mura), as well as unfavourable work conditions (Muri).
Shah and Ward (2007)	Lean production is described as an integrated socio-technical system that has the primary aim of removing waste by reducing supplier, customer, and time variability internally.
Scherrer-Rathje <i>et al.</i> (2009)	Lean is said to a managerial concept with a primary aim of pinpointing and removing non-value activities throughout a product's whole value stream, spreading beyond the organization to cover the company's supply chain network as well.
Liker & Rother, (2011)	Targeting the customer and the value stream is the primary aim Lean concept. It can be said that lean aims for perfection by continually removing needless processes through problem-solving.
Ahlstrom (2007)	Lean is simply, a problem-solving concept for continuous routine improvement.
Rooney & Rooney (2005)	Lean refers to an operational system that improves value added, essentially lessens support and ensures that waste is eliminated in all processes along the value stream.

Source: Author's own work

Even though different researchers have different definitions of lean, they all point out to the same concept of simply improvement of processes by the elimination of all wastes and adding value from the customer's perspective. It may, however, conclude that lean thinking is simply a management concept that consists of the elimination or reduction of waste and concentrating on value-added processes in an organizations' operations. To be more specific, Lean means, an integrated socio-technical system which seeks to increase value and decrease costs by removing waste and continuously improving the business through a culture of problem-solving and a set of mutually reinforcing operational and managerial tools and practices.

2.4.1 Lean Tools

There are many tools that are associated with the lean concept. Applying the lean concept helps to enhance the phase sequence that is led to the operational excellence, a continuous improvement and the removal of waste. More precisely, the effect of using lean add significantly to the operating performance of business processes and the application of leans tools allows the improvement of results (Álvarez et al., 2009). The table 3 below lists some of the commonly cited tools with a brief description of their purpose.

Table 3: Common tools and techniques used in Lean Concept

Lean tools/techniques	Purpose
Poka Yoke	Primarily, Poka-Yoke is aimed to prevent defects from happening. Poke Yoke is a quality technique which its process ensures elimination of error. Error-proofing is a significant element of lean concept because, defects are considered to be a vital waste contributor (Breyfogle, 2007).
Visual management	Based on the idea that what cannot be seen cannot be fixed, visual management is about displaying problems, standards and targets to the entire team or workforce so that problems can be solved, and gains can be made promptly (Radnor, 2010).
Just-In-Time (JIT)	Just-In- Time is a core component of lean and originated by Toyota. Inventory is considered as waste in the lean concept. JIT aims at reducing inventory waste in order to ensure that materials are received and received when they are needed. (Jim, 2015).
Total Quality Management (TQM)	It is continuous improvement approach which ensures that product quality is achieved at its optimum. It uses participative management and addresses customer needs and demands to ensure production process and timeline are aligned (Jesal, 2016).
Business Process Re-engineering (BPR)	BPR is <i>“the fundamental rethinking and radical redesign of business processes to achieve dramatic improvements in critical, contemporary measures of performance, such as cost, quality, service and speed”</i> . The

	idea of BPR is to focus on redesigning processes around the value they provide and move away from technology and automated work, which have become instinctive efficiency choices (Hammer & Champy, 1993: p32).
Kaizen	It is called Continuous Improvement and it focuses on small incremental steps towards improvement. Kaizen is not about the rate of improvement, but rather the momentum of improvement (Slack et al., 2010).
Lean Six Sigma	It a methodology that focuses on the removal of waste and time variations in order to achieve customer satisfaction in respect of quality, delivery and cost by using the DMAIC approach. Process improvement, customer satisfaction and attainment of an improved financial result is the primary aim of this technique. (Salah et al., 2010).
Takt Time	Simply put, Takt Time is the computation of the highest time spent to meet customer demand. It is considered as being the ‘Heartbeat’ of the customer. Its formula for computation is by dividing the available production time by the rate of customer demand (Patange, 2013).
5S	It structured mechanism of creating standardization. ‘Housekeeping’ is its basic objective for keeping everything in order to reduce time wasted looking for things and to improve visibility at a glance. 5S consists of: sort, straighten, sweep, standardize and sustain (Breyfogle, 2007).
Standard Work	All work should be standardized and unambiguous. It is this standardization of work that provides a platform for continuous improvement (Spear & Bowen, 1999)
Changeover reduction	The concept refers to the reduction of ‘set up time’ to the absolute minimum (Lead Time). Simply put, the time from the last piece of one batch to the first piece of the next batch (Breyfogle, 2007)
Demand management	Manipulating demand and managing capacity to 38 allow for ‘flow’ (Bicheno, 2004)
PDCA	Also known as the Deming cycle, PDCA is an acronym for the continuous improvement cycle of ‘Plan, Do, Check, Act’ where ‘plan’ refers to understanding the problem and plan to accomplish it, ‘do’ refers to implementation of a pilot/proposed solution, ‘check’ means to check

	(measure) the effectiveness of the piloted solution and ‘act’ means to implement the solution fully. It detects and fixes problems to their root cause (Patange, 2013).
Total Productive Maintenance	This tool is mainly used as a system for forecasting the maintenance needs of equipment in order to reduce the breakdown of a machine during the production process. It enhances Overall Equipment Effectiveness (OEE), which involves availability, performance, and quality (Patange, 2013).
SMED (Single Minute Exchange of Dies)	This is a machine setup and design system that helps to reduce setup times. It aims at providing a 1-minute changeover and originated by Shigeo Shingo. (Patange, 2013).
Metrics-Based Process Mapping	It is special tool normally apply to “drill down” from a Value Stream Map permitting the improvement teams to apprehend and examine data relating to the waste removal and improvements processes (Martin & Osterling, 2012)
Kanban	It is a technique that ensures inventory replacement by using cards or bins. After using up the material supplied, this card is sent to a workstation for materials to be replenished. It is a pull system where inventory movements are only done the time a downstream process demands material from an upstream process. Pulling of product through a production process is its meaning in Japanese (Breyfogle, 2007).
Flow Chart	It is part of lean uses visuals to represent a process to enhance better comprehension of the process as well helping to identify improvement opportunities (Stephen, 2001).
Heijunka	It enhances efficient use of resources, inventory reduction and high-cost elimination that leads to processes flexibility (Leite & Vieira, 2015).
Fishbone diagram (Ishikawa diagram)	It is a visual and analysis tool as part of a problem-solving process that provides a systematic way of looking at defects and the causes that create or contribute to those defects. This diagram helps to organize the causes that contribute to a certain problem during an event or process (Park, 2003).

Author’s own work

According to the research done by Leite & Vieira (2015), the four most used tools in the service sector of which the public-sector falls within are value stream mapping (VSM), Production balancing (“Heijunka”), Just-In-Time (JIT) and standardization and 5s.

2.4.2 Lean Implementation in Public-Sector.

The lean application got a worldwide attention through manufacturing, but the success achieved in this area has caused its application to other areas, the public-sector is one of these. The operational and strategic activities confronting the public-sector and the manufacturing sector and other private are different, however, their organizational goals and objectives have some similarities and, therefore, the method of achieving them should be no different (Dorsch & Yasin, 1998). The context of the public-sector could be defined as one of an ‘impatient electorate’ expecting better education, healthcare, pensions and transport. At the same time, the need for value for money is “*under the spotlight as never before*” (Bhatia & Drew, 2006: p97).

Governments and public-sector corporations are now under a high pressure to be efficient in their operations. The applications of Lean in the service industry have demonstrated the applicability of the concepts of flow, process, waste and value. The same concepts matter in public services and it is natural to suspect that the public-sector could also benefit from Lean. Typically, fiscal constraints have been addressed through workforce reduction, hiring freezes, and cuts in programs funding (Schiele & McCue, 2011& Price et al., 2011). On the same line of opinions about the transference of private sector management practices such as Lean to the public-sector as, Ghobadian et al. (2009: p1519) stresses that: “*predicated on the belief that the public-sector can learn from the private sector, that choice between providers is inherently beneficial to the consumer of the service either in terms of the cost or quality of that service, that services should focus upon responsiveness to consumer need rather than being producer led*”. The authors stipulate a high degree of skepticism over the success of such reforms in incorporating such practice despite a lack of scholarly evidence to support this view.

Lean Thinking argues that “real programmatic efficiency is driven by improvement initiatives that focus on the way that work is designed and managed, with the intention of streamlining processes, eliminating waste, and improving upon the general effectiveness of the various tasks that are completed as per the customer’s perspective” (Schiele & McCue, 2011). Similarly, Radnor & Walley (2008) posit that lean has been identified as a way of achieving cost reduction,

quality improvement, improved customer satisfaction and improved responsiveness. However, review of publications has made it clear that the evidence of the application of the lean concept in the public-sector with the prospect of making better public services is minimal. On the contrary, it is proven by many scholars, organizations in this sector can gain greater efficiency in their processes and services by considering and implementing lean practices (Suarez Barraza et al., 2009). Even though its application differs from each corporation, there have been the adaptation and adaptation of the lean concept in many different public- sector corporations. However, the healthcare seems to have the significant application of lean concept, although there is no reason that it could not be applicable in the wider public-sector (Radnor & Walley, 2008). With the recent successes of Lean in the health sector, hopes are high that the same principles can bring similar results in all public services and all levels of governments.

The lean concept has the potential for process improvement in the operations healthcare organizations which would yield significant performance outcomes within the sector (Radnor et al., 2012: p371). They further stress that: *“However, as our findings show lean is indeed context-dependent, although not in the commonly assumed sense: the perception that Lean is a manufacturing concept that is hard to apply in a service context is clearly wrong. Instead, it is the adaptation from a private to a public- sector context that poses the greater challenge”*

2.4.3 Lean in Healthcare

A research was done to determine as to whether lean is applicable in the UK and Sweden health service focused on how performance measurement system called the ‘floe model’ was designed to point out key performance indicators that measure changes towards lean. The result of the study, however, revealed that lean is applicable in healthcare settings and that the flowchart model is suitable tools for following up these initiatives (Radnor & Walley, 2008). Furthermore, a study commissioned by UK National Audit Office on ‘Business Process Improvement reveals that 51% of the articles found were on ‘Lean’ and 35% of those were in the Health Services, making it the common process improvement methodology with healthcare system recently (Radnor, 2011). The lean implementation in the healthcare settings, especially should eliminate all the needless processes as well as the un-valued procedures like the duplication formats and places for recording patients detail, movement of patients from one ward

to the other, needless time waiting for doctors and consultations, and discharge processes no coordinated resulting in an unnecessary long stay by patients (Robinson et al., 2012)

There are proofs discovered through kinds of literature which shows the acceptance of the lean all across public services, especially the healthcare, particularly since 2005. Historically, there have many opinions on the lean concepts' in the healthcare systems proposing that around 2001 and 2003 was the time UK and USA started the lean application into their healthcare system respectively (Robinson et al., 2012). After its application in UK and USA, a number of academic literature have risen with *“over 90 publications found in ten countries from 2002 onwards referring to the use of lean in healthcare”* Brandao de Souza (2009: p122) (cited in Robinson et al., 2012: p190).

The lean implementation does not gear towards a huge investment; however, it offers healthcare organization a substitute approach to achieve improvement with relatively small investment. Lean Healthcare Practice is described as the cultural development of hospital associated with raising the satisfaction of patients and other interest groups and everyone participates in pointing out and minimize waste. Put differently, it is an approach which focuses on improving efficiencies and granting the needed time for healthcare delivery (Shazali et al., 2013). Radnor et al. (2012) in their article, cited numerous healthcare facilities that have applied the lean concept in various healthcare delivering processes with the approaches and tools or techniques applied.

2.4.4 Lean Implementation Challenges in Public- Sector

Application of the lean concept though has been established to fit in the service, it possesses some implementation challenges to the sector. The deficiency that exist in process standardization in the service sector has been the major setback in lean implementation in the sector. Sarkar (2009) opines that identifying processes in the service is problematic since these processes are not clear as compared to the processes in production. Furthermore, it is very challenging for organizations to work with these processes to reduce waste as a result of their magnitude and the difficulty in nature and therefore, processes should be recognized to monitor the performance constantly. Furthermore, Grove et al. (2010) discuss the challenge of process variability in the health visiting service. Finding fixed processes were very difficult and therefore made it hard to use the value stream mapping and different interest groups were present who failed to back Lean principle.

Additionally, several other Lean challenges linked to people exit, which lead to difficulty of processes. Sarkar (2009) puts forward that lean implementation approach should be all-inclusive. There should be a broader engagement of all members of the organization during the lean process. This comprises of strategic changes as a result of the hierarchy's obstacles. It is important to motivate the low-level employees within the organization since they are the ones working in the operation, who can identify the waste easier. Aherne (2007) also adds that staff empowerment and training is the major challenge that confronts the healthcare when implementing the lean concept. In addition, employees are unable to monitor the process because of their inability to evaluate the time required for different work items as there is ambiguity in task accomplishment (George, 2003). This occurs since workers have control over their structure of jobs, which is the purpose why processes are difficult to describe in the service industry.

However, it should be known to workers that operating by standardizing processes will offer them further liberty and motivation, as well as they will accept information about change management (George, 2003). Sarkar (2009) explains the significance of managing employees' behaviour and conduct since Lean implementation hinges on their attitude in daily work; therefore, there is a need to avoid their mistakes in processes. Employees of NHS UK confronted difficulties because of the absence of effective communication and leadership. There was no collaboration between the middle and lower level management of the organization because there wasn't strategic planning on how to implement the concept (Grove et al., 2010). Aherne (2007) with a similar view adds that in NHS UK, the difficulty was to acquire the backing from the government and backing for the program from the management. Besides these, in service processes, the interaction of people has more significance, so they should not be treated as machines. For example, it is less complicated to reduce setup time on a machine than to reduce the time of a call for sales employees (George, 2003).

Though the principles of the lean production concept are applicable in the service sector, its implementation should be done differently since the operating processes are not the same. The lean concept is basically targeted to eliminate non-value-added resources that do not provide value to the customer. It is relatively easy to identify waste in the manufacturing context since it is visible. It only takes an observation to detect or identify waste in the manufacturing sector by

tools like the Value Stream Map, Root Cause Analysis and so on. On the contrary, waste identification is difficult since processes are often not visible in the service sector.

3. RESEARCH METHODOLOGY

3.1 Introduction

The research held with regards to this thesis was an applied one, but not new. Rather, many pieces of previous academic research exiting with respect to the lean concept in the healthcare systems with particular emphasis on public-sector healthcare. As such, this research takes the form of a new research but on an existing research subject. This chapter describes the research methodology used to carry out this thesis which includes the research method, the approach, data collection and source, population and sampling, data analysis and also the significance of the study as well as the limitation of the study.

3.2 Research Method

For purpose of this research objectives, a qualitative research is held. The primary feature of the qualitative research is that it is largely suitable for small samples, while its results are not measurable and quantifiable. Its primary benefit, which also forms its primary difference with quantitative research, is that it gives an absolute explanation and examination of a research topic, without restricting the scope of the research and the essence of the participant's feedbacks.

Notwithstanding its benefit, the effectiveness of the kind of the research is largely based on the skills and abilities of the author's personal judgment and interpretation. Furthermore, it is dangerous for the results of quality research to be perceived as a reflection of the opinions of a larger population because of its appropriateness for small samples size (Bricki & Green, 2007).

3.3 Research Approach

For the purpose of the work, inductive research approach was used. This research approach, primarily, aims to permit findings of research to move out from regular, controlling or intrinsic raw data without necessarily given regards to the restraints imposed by structured methodologies. Additionally, to ascertain the relationships between the research objectives and the findings obtained in order to ensure the transparency and defensibility between these relationships. Furthermore, to come out with a model or theory about the underscoring form of experiences that are apparently found the text data. Even though an inductive research approach is not powerful as some other approaches with regards to model and theory development, it gives a simple and clear perspective for obtaining findings connected to targeted evaluation questions (Thomas, 2006).

3.4 Data Collection and Data Source

For the purposes of this work, a secondary data was used. It is the type where the data has already been gathered by someone other than the researcher. It gives a variable choice for researchers who have a limited time and resources. It uses the same empirical exercise that applies to the principles of research under the primary data. The flexibility, effectiveness and convenience it provides is its main advantage. It offers an opportunity to have to access and utilize huge datasets with a high quality is also a good side of this approach. However, the reliability and accuracy of this data sometimes become questionable and also the issues of authenticity and copyright issues also arise (Johnston, 2017). The literature that is published in the Google Scholar database regarding the lean application in the public- sector healthcare was used.

The search of publications was performed by selecting literature production in Google Scholar database by the string “Lean application in the Public- Sector Healthcare”. The search was done in May 2015 and a total of 217 potential articles were found. Afterwards, a screening of the articles found was done by checking article topics and reading abstracts for the purpose of eliminating those that did not fit within the scope of the research leaving 96 articles. A further thorough reading of texts was done and an additional 35 articles that did not contain information to identify the name, department and place country of the facility that the lean concept was applied were excluded. A final exclusion of 27 articles was done and it affected all the articles that their publication date did not fall within 2006 and 2017 resulting in a total of 34 articles that were used for this work.

3.5 Population and Sampling Method

For the purpose of this work, purposive sampling approach was used. Purposive sampling is an approach which is more effective when the researcher wants to review a particular intellectual domain with informed skills within. It is non- probability sampling and also applicable to both qualitative and quantitative research approach (Tongco, 2007). A review of literature can be elaborated based on purposive sampling approach in which articles that are connected closely to the topic of the research under reviewed. For this work, the selected articles reviewed were largely centered on the application of the lean concept in the public-sector healthcare services. Using the electronic databases for searching scientific articles is the most effective method. There are varieties of databases from which articles can be searched and, therefore, it is

imperative on the part of the researcher to select the ones that most suitable for the purpose of the research topic and objectives (Mostafa et al., 2013). The “Google Scholar” was the database used for the selection of the articles for this work. The population of the research was all the publications on the lean concept application in the healthcare services. However, for the purposes of achieving the research aim and the objectives, the sampling was based on the following:

- I. Publications on lean concept in the public healthcare, because the thesis was done on only lean application in the public- sector context.
- II. Publications that contained the name of the facility, place/country of the facility and the department in which the lean concept was applied, so that a thorough background check could be done as to whether the facility is public-sector funded.
- III. The publications that fall within 2006 and 2017, so that the current set of tools and techniques used by the lean concept and the impact on the public healthcare could be identified.

3.6 Data Analysis

This thesis used a qualitative content analysis. As put forward by Bauer, (2007) it is “*a research technique for making replicable and valid inferences from texts to the contexts of their use*”.

Thus, the researcher employs analytical constructs or rules of inferences, to proceed from the text to the response to the research question. According to White & Marsh (2006), a qualitative content analysis must possess four basic elements which are as follows:

- I. Sample text, in respect of selecting what is appropriate;
- II. Utilizes text, in respect of differentiating words and prepositions and utilizing quotes and illustration;
- III. Contextualize what is being read in regard to what is known about the situation encompassing the text; and
- IV. Have precise research questions in mind.

This research work, however, stratified all the four principles.

5.7 Significance of the study

This study is significant in three ways:

- There is a lot of publication about change management, however, relatively little about change management in the public-sector.
- There are few studies done on lean concept implementation in the public-sector
- There is a paucity of research about lean concept implementation in the healthcare, particularly within the public-sector context.

3.8 Limitation of the study

There was a limitation of quality management resource in the library as well as the online databases because most of the publications were too general as they fail to detail out the names and location of the healthcare facilities the lean concept has been applied, the specific tools or techniques used and the implementation challenges.

The initial plan of this research was to contact the management of healthcare facilities being reviewed to validate the authenticity of the information in the publications but due to time limitation of the study, the researcher was not able to do that but only focused on the information in the publications. Furthermore, the researcher could have used more than one database for the data collection, but the researcher only focused on only one database, Google Scholar, due to time limitation thereby limiting the scope of the research. Moreover, time limitation did not allow the researcher to apply the model to a facility and therefore, the model still remains a novelty.

Content analysis using the secondary data from publications were used for this study. However, this research would be relatively strong if the authors provided more detailed data or information on the steps taken to achieve the improvement with the lean (pre-implementation, implementation, and post-implementation). This is because most of the publications placed much emphasis on the outcomes of the lean than the processes leading to those outcomes.

4. ANALYSIS OF LEAN TOOLS/TECHNIQUES IN PUBLIC SECTOR HEALTHCARE

4.1 Introduction

In this section, the researcher reveals some of the real examples of the lean application in different departments as an analytical study of lean healthcare practices in several public-sector healthcare around the world.

4.2 Analysis of Public Lean Healthcare

Spear in his research about lean application in Pittsburgh Regional Healthcare, stated that: *“In less than three years, using techniques adapted from the Toyota Production System, the Pittsburgh Regional Healthcare initiative slashed the number of reported central line-associated bloodstream (CLAB) infections by more than 50 %”* (Spear, 2005:p2).

Considering the words of Spear (2005), it is evident to the fact that, despite the implementation process in service is complicated, there are several process improvements that can be achieved with lean. These improvements could come in the form *“time-savings and timeliness of service, cost reductions or productivity enhancements and several quality aspects including reduction in errors or mistakes, improved staff mistakes”* (Mazzocato et al., 2010: p337).

Understanding lean healthcare practice is very crucial in hospitals by making it known the tools used in the processes of implantation and also, the benefit that these tools generate. Table 3 is the summarized analytical study of lean implementation in healthcare across different units or departments in hospitals around the world, the tools applied, and the benefits generated by the hospitals.

Table 4: Summarized Application of Lean in the Public Sector Healthcare

	Author	Facility	Department	Tools Used	Result
1	Kim et al. (2006)	University of Michigan Hospital –, USA	Patient Care Units	VSM Process Improvement Kaizen Error Proofing	<ul style="list-style-type: none"> • Decreased lead time • Reduced referral
2	Maier-Sperdelozzi et al. (2006)	Continuing Care Service – New England	Patient Discharge Process	VSM Standardization Error Proofing VMS Kaizen Poka yoke JIT 5S Six Sigma	<ul style="list-style-type: none"> • Quality, effectiveness & efficiency care delivery • Improved data reporting system • Increased patients' satisfaction • Reduced staff workload
3	Persoon et al. (2006)	SUNY Health Science Center Brooklyn, NY, USA	Laboratory	One Piece flow Kaizen Lead Time Reduction Waste Elimination VSM Continuous flow Process Improvement	<ul style="list-style-type: none"> • Decreased lead time • Reduced overall time patient spent on care • Enhanced workplace standardization. • Improved turnaround time
4	Ben-Tovim et al. (2007)	Flinders Medical Centre, Australia	Emergency, Medical and Surgical	Process Improvement Waste Elimination Lead Time Reduction Standardization Patient Flow Root Cause Analysis	<ul style="list-style-type: none"> • Decreased cost of operation, hence increased investment • Increased patient's admission • Reduced the length of medication time.
5	Fillingham (2007)	Bolton Hospitals NHS Trust, UK	Entire Hospital	Process Improvement Continuous flow Visual management VSM	<ul style="list-style-type: none"> • Decreased manual work • Decreased lead time. • Decreased mortality rate.

				Waste elimination Standardization 5S	
6	Kim et al. (2007)	University of Michigan Hospital USA	Radiation Oncology	Process improvement Continuous flow VSM Waste elimination Kaizen Standardization	<ul style="list-style-type: none"> • Reduced healthcare delivery processes • Improved general clinical care
7	Kelly et al. (2007)	Western Hospital Australia	Emergency	Patient Streaming	<ul style="list-style-type: none"> • Reduced overall patients time spent on care. • Decreased lead time.
8	Ieraci et al. (2008)	Bankstown Hospital, Australia	Emergency	Patient Streaming	<ul style="list-style-type: none"> • Decreased lead time • Reduced waiting time for patient
9	Lodge & Bamford (2008)	Pennine Acute Hospitals NHS, UK	Radiology	Process improvement VSM Lead Time Reduction Standardization	<ul style="list-style-type: none"> • Reduced waiting for patients. • Decreased lead time.
10	Yu & Yang (2008)	John D. Dingle Veteran Medical Center in Detroit, Michigan –	Patient registration Unit	Six Sigma Root Cause Analysis VSM Process Improvement Standardization Pull System Control Chart Scorecard	<ul style="list-style-type: none"> • Decreased lead time • Enhanced work effectiveness and efficiency of staff • Reduced waiting time
11	Wennecke (2008)	Copenhagen University Hospital	Surgical operating theater	Kaizen Patient Flow Lead Time Reduction	<ul style="list-style-type: none"> • Increased productivity • Reduced waiting time • Decreased lead time • • Reduced cost of operations • Quality, effectiveness &

					efficiency care
12	Stanković (2008)	Pioneering laboratories in the United States -	Laboratory	Six sigma 5S VSM Kaizen Process Mapping Specimen Management System	<ul style="list-style-type: none"> • Increased patient satisfaction • Reduced cost of operations • Quality, effectiveness & efficiency care • Enhanced workplace standardization
13	Jacobson et al. (2009)	Vanderbilt University Medical Center, USA -	Emergency Medicine	Kaizen	<ul style="list-style-type: none"> • Enhanced problem identification
14	Dickson et al. (2009)	A Teaching Hospital in Midwest State, USA	Emergency	Kaizen Process Mapping VSM	<ul style="list-style-type: none"> • Increased patient throughput • Increased patient's satisfaction • Reduced cost of operations.
15	Buesa (2009)	Histology laboratories (histolabs) - USA	Laboratory	5S JIT Six Sigma	<ul style="list-style-type: none"> • Reduced turnaround time • Reduced error levels • Reduced overtime • Increased productivity
16	Casey et al. (2009)	Veterans Health Administration Urology clinics, USA	Ambulatory Care/Out Patient	Flow chart Kaizen Heijunka JIT	<ul style="list-style-type: none"> • Reduced patients' flow time • Reduced clinical operation time • Reduced cost of operations. • Reduced inventory cost • Improved general clinical care
17	Eller (2009)	St Luke's Episcopal Hospital, USA	Emergency	Patient Streaming	<ul style="list-style-type: none"> • Decreased lead time • Reduced waiting time
18	Herring (2009)	NHS County Durham, UK	Medication and chlamydia screening	Kaizen Process Mapping Root Cause Analysis	<ul style="list-style-type: none"> • Reduced length of medication time • Reduced error levels

				5S JIT Lead Time Reduction	<ul style="list-style-type: none"> • Decreased lead time • Reduced staff and patients' motion • Enhanced workplace standardization
19	Isaacs & Hellenberg (2009)	Mitchell's Plain Community Health Centre	Patients Reception	Kaizen Root Cause Analysis 5Whys	<ul style="list-style-type: none"> • Enhanced workplace standardization • Enhanced problem identification • Reduced error levels
20	Ng et al. (2010)	Hôtel-Dieu Grace Hospital, Canada	Emergency	VSM JIT 5S Kanban	<ul style="list-style-type: none"> • Improved departmental flow • Decreased lead time
21	Rutledge et al. (2010)	Seattle Children's Hospital (Seattle, WA), Washington, USA	Laboratory Operations	Visual Control Single Piece Flow Standardization 5S PDCA	<ul style="list-style-type: none"> • Increased productivity • Enhanced work effectiveness and efficiency of staff • Reduced turnaround time • Enhanced workplace standardization • Reduced cost of operations
22	Trilling et al. (2010)	Proton Therapy Center of Institute Curie – Orsay, France	Radiotherapy	5S VSM Kaizen PDCA	<ul style="list-style-type: none"> • Enhanced workplace standardization • Decreased lead time • Increased annual treatment sessions
23	Grout & Toussaint (2010)	Theda Care Hospital, Appleton, Wisconsin – USA	Medication	Jidoka Poka-Yoke	<ul style="list-style-type: none"> • Reduced waiting time • Reduced error levels • Reduction in overall patients' time spent on care • Increased patient satisfaction • Increased return on

					<ul style="list-style-type: none"> investment • Reduced cost of operations.
24	Karstoft & Tarp (2011)	Odense University Hospital (OUH), Denmark –	Radiology	Kaizen, VSM, 5S, SMED	<ul style="list-style-type: none"> • Decreased lead time • Increased annual treatment sessions • Decreased staff workload
25	Newell et al. (2011).	Acute Care Hospital, Midwest	Inpatient Medication Delivery	Kanban	<ul style="list-style-type: none"> • Increased patient's satisfactions • Reduce waiting time • Quality, effectiveness & efficiency care • Reduced healthcare delivery processes • Enhanced work effectiveness and efficiency of staff.
26	Iannettoni et al. (2011)	University of Iowa Hospitals and Clinics	Esophagus	Kaizen	<ul style="list-style-type: none"> • Reduced cost of operations • Reduced waiting time • Enhanced workplace standardization.
27	Schwarz et al. (2011)	Centre Hospitalier Emil Mayrisch Clinic, Luxembourg	Surgical Unit	VSM, Pull System, SMED	<ul style="list-style-type: none"> • Reduced length of medication time • Enhanced workplace standardization
28	Smith et al. (2012)	Albermarle Home Care (AHC)	Patient Care Unit	Kaizen, PDCA, Gemba, 5s, VSM	<ul style="list-style-type: none"> • Enhanced staff morale. • Reduced cost of operations • Decreased lead time • Increased annual treatment sessions. • Reduced cost of operations.
29	Carter et al. (2012)	Komfo Anokye Teaching Hospital	Clinical Operations	VSM, Root Cause Analysis	<ul style="list-style-type: none"> • Increased problem identification

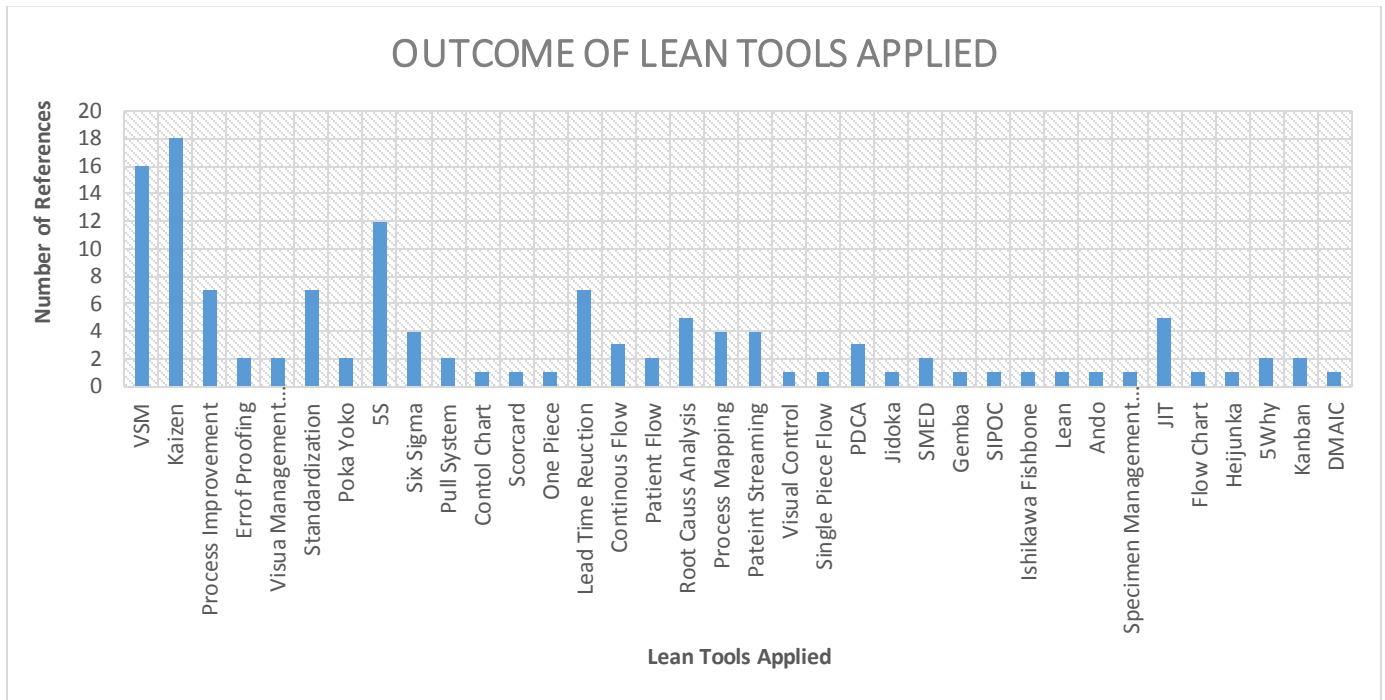
		(KATH) in Ghana		Kaizen Lead time Reduction SIPOC 5Why Ishikawa fishbone diagrams	<ul style="list-style-type: none"> • Enhanced staff morale • Decreased lead time
30	Mazzocato et al. (2012)	Astrid Lindgren Children's Hospital, Sweden	Emergency	Lean	<ul style="list-style-type: none"> • Reduced work ambiguity. • Reduced waiting time • Enhanced staff morale • Enhanced patients/staff data tracking.
31	Isaac-Renton et al. (2012)	Virology Laboratory in Canada	Laboratory	5S, Kaizen VSM Ando	<ul style="list-style-type: none"> • Reduced waiting time • Increased patient throughput • Increased annual treatment sessions.
32	Amedee et al. (2012)	Ochsner Medical Center, New Orleans, USA	Patient Transfers	Kaizen	<ul style="list-style-type: none"> • Enhanced patients record and data tracking • Enhanced quick patient transfer • Decreased lead time • Enhanced quick clinical decision-making.
33	de Koning et al. (2013)	Red Cross Hospital - Beverwijk, Netherlands	Entire Hospital	Six Sigma TVM VMS VSM 5S Line Balancing	<ul style="list-style-type: none"> • Reduced cost of operations • Reduced waiting time. • Reduced error levels • Quality, effectiveness & efficiency care.
34	Bhat et al. (2014)	Medical College hospital in India	Health Information Department (HID)	DMAIC Lead Time Reduction	<ul style="list-style-type: none"> • Reduced process cycle time • Reduced waiting time • Reduced ques length

Source: The author's own Analysis

4.3 Summary of Findings

The literature review identified 36 different lean techniques or tools in the application of the lean healthcare. As it is shown in figure 2, there are different kinds of lean tools or techniques. The tools or techniques mostly applied by the facilities were VSM, Kaizen, 5S, Process Improvement, Standardization, Lead-Time Reduction, and Root Cause Analysis JIT. However, Kaizen is the most frequently tool referenced. Almost half of the techniques or tool, thus 17, were referenced once.

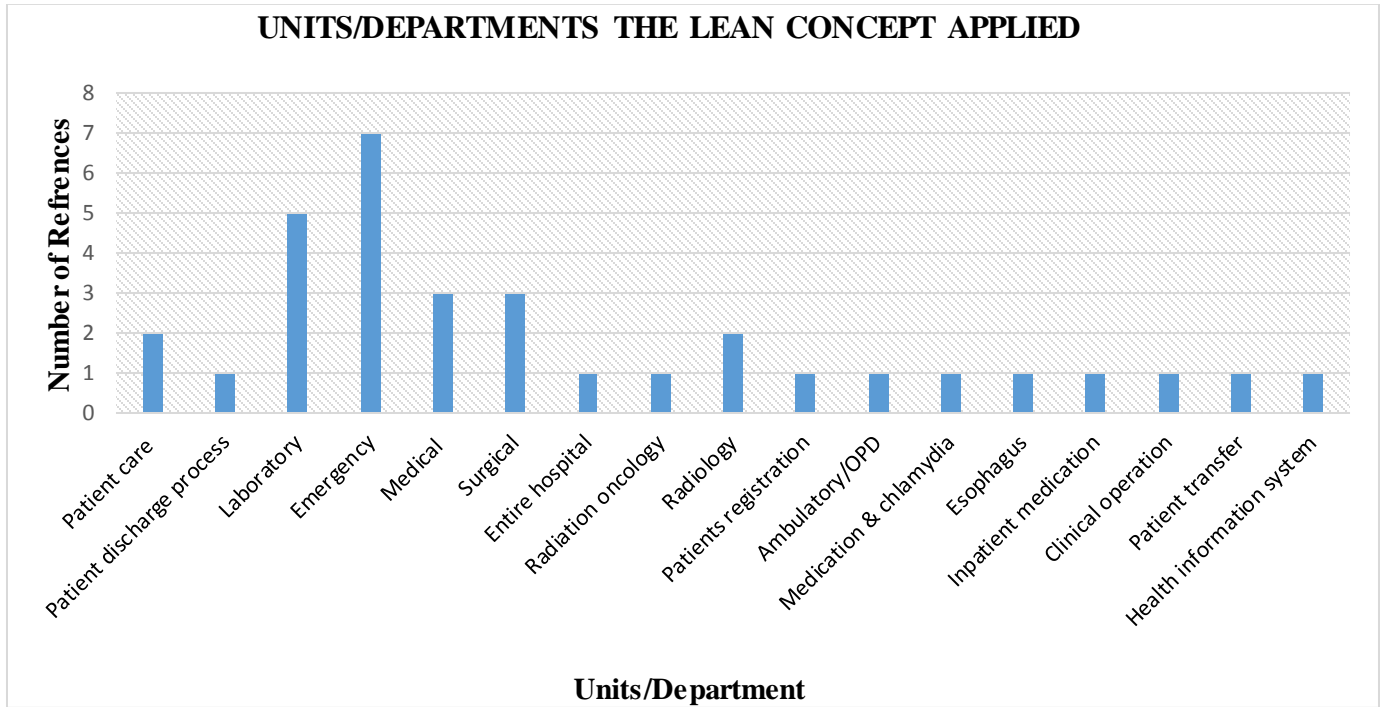
Figure 2: Lean Tool/Techniques used in the Public Healthcare Lean Implantation



Source: The author’s own work

Furthermore, the literature survey revealed 17 different departments or units in the healthcare setup where the lean concept was applied, and these are shown in figure 3 below. Patient care unit, laboratory unit, emergency unit, medical unit, and surgical unit are the most units or departments that the lean concept was applied, being the emergency unit the most frequently cited followed by the laboratory unit. About 13 of these units or departments were referenced once.

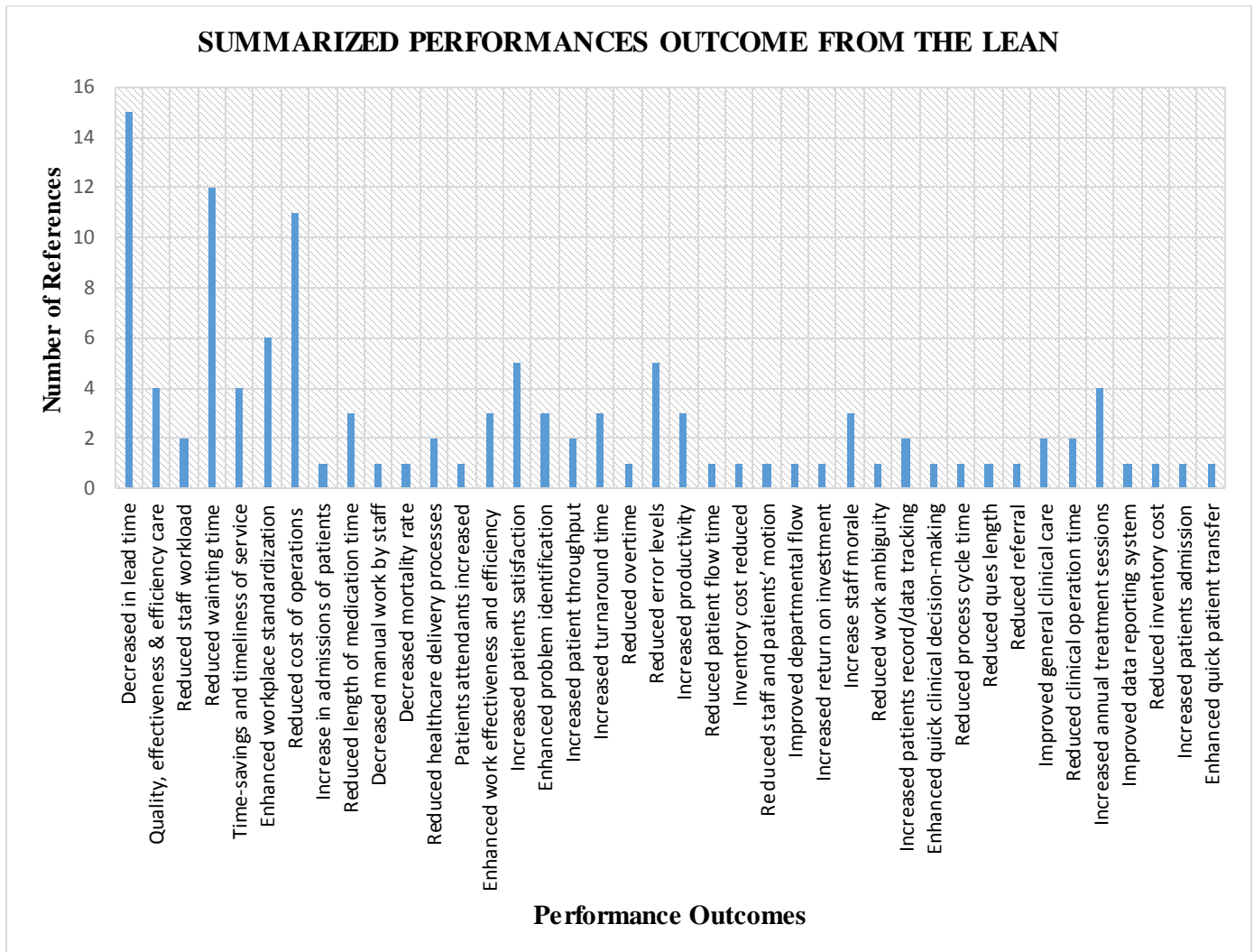
Figure 3: Units/Departments the Lean Applied in the Public Healthcare



Source: The author’s own work

Figure 4 below shows the incredible performance outcomes which the articles reported, as a result of the lean application. As can be seen, these performances have been categorized under 40 performance headings. Out of these headings, decreased lead-time, reduced waiting time, enhanced workplace standardization, time-saving and timeliness service, reduced cost of operations, reduced error levels, and increased patient satisfaction are the most performance outcomes which were recorded and reported by the articles reviewed. Decreased lead-time, reduced waiting time and reduced cost of operations are the most frequently performance outcomes cited respectively. Almost half of the performance outcomes, thus 18, were referenced once.

Figure 4: Performance Outcomes from Lean Implementation in Public Healthcare



Source: The author own work

Notwithstanding the spectacular performances recorded with respect to the lean implementation in the various public healthcare facilities, there were also numerous challenges which were confronted by the various facilities and reported by some of the articles viewed. For the purpose of this research, only the challenges that emanated from the introduction of change into the healthcare facilities will be dealt with. The argument that people are not an “automobile” and as such, each patient is unique makes workers pre-empt the lean concept in healthcare system since the concept is applicable in manufacturing setups (Kim et al., 2006; Fillingham, 2007; Kim et al., 2007; & Casey et al., 2009).

The problem of *Initiativitis* in the healthcare system have resulted in insufficient time for any concept and idea to take root or grounded and become established before the next comes along diverts the necessary resources and staff attention. This is because too many improvement methodologies, programmes or fad has experimented in too short a time scale (Fillingham, 2007).

Some stakeholders understanding that lean concept primary goal is to increase patient's turnover and hence compromising patient safety make them reluctant to cooperate its implementation (Casey et al., 2009).

Implementing and sustaining lean management change involves a substantial cost that requires leadership and management support and commitment. Such cost involves hiring leaning consultants, developing in-house lean expertise and paying staff to participate in workshops and the loss of clinical hours by front-line staff deter healthcare management from instituting the concept (Bhat et al., 2014 & Ng et al., 2010).

One major challenge in the lean implementation concept in the public healthcare system is the fact that management is given responsibility on continuous improvement issues that gear toward a common objectivity and it is intended to increase the awareness of such approach across all public healthcare system (Trilling et al., 2010).

The difficulty in managing the culture of change especially on the part of elderly/older staff makes lean concept implementation very strenuous (Karstoft & Tarp, 2011).

The discrepancies between job tasks, licensing constraint and competence give rise to resentment among healthcare staff in respect of content and professional development and reluctant or ill-feeling with inter-professional collaboration result to a limitation to have a flexible team for implementation. Furthermore, workers or staff perception of being monitored by the lean concept is also a drawback for its implementation (Grout & Toussaint, 2010 and Mazzocato et al., 2012).

The misperception that lean is just "cutting and layoffs in disguise" makes employees or staff sabotage its effective and efficient implementation (Kim et al., 2006; Wennecke, 2008 and Casey et al., 2009). Proper analysis of documentation of the situation/problem before the lean introduction makes it difficult for a meaningful measurement of the implementation outcomes (Rutledge et al, 2010 and Mazzocato et al, 2012).

5. DESCUSION OF FINDING

5.1 Introduction

In the previous chapter, the data analysis and interpretation of the results were presented. In this chapter, the results obtained through the qualitative study will be presented. Each of the data set obtained in the previous chapter is discussed as well as the proposal made therefrom.

5.2 Lean Tools and Techniques

Base on the results shown in chapter 4, a discussion on the application of lean concept and tools or techniques in the public healthcare, the units or department involved, the performance outcomes as well as the challenges confronted as a result of the lean project implementation. It appears in the articles that there is an inconsistency in the meaning of the lean concept and therefore, there should be a common definition as to what is lean and what is not lean in order to intensify research and to ensure that future research is well examined (DelliFraine et al., 2010).

Lean, Kaizen, and Six Sigma concept are used interchangeably by most scholars without paying attention to their primary meanings and purposes. Kaizen is a Japanese word which stands for "Continuous improvement" or "Change for the better". Kaizen is a journey of improvement and therefore as being cited by some scholars as a specific tool is a misconception. Lean is primarily a waste elimination concept. Six Sigma is also a combination of tools and approaches that are basically for the reduction in defect and variability or inconsistency (KII, 2015 & Wennecke, 2008). Kanban, Ishhikawa, 5S, and SIPOC are not tools but techniques as usually described by some authors, are applicable as measuring tools for other techniques (Gomesa, 2016).

The study revealed that Kaizen was the most referenced tool or techniques by the scholars. According to Suarez Barraza et al, (2009), Lean-Kaizen implementation in the public service yields an unprecedented and measurable improvement and its sustainability is assured over time. Many writers reveal that applying such a combined approach, Lean-Kaizen, resulted some significant improvement in the various units/departments Smith et al. (2012); Carter et al. (2012); Isaac-Renton et al. (2012); Karstoft & Tarp (2011); Trilling et al. (2010); Ng et al. (2010), Casey et al. (2009); Dickson et al. (2009); Casey et al. (2009); Herring (2009); Isaacs & Hellenberg (2009); Wennecke (2008); Stanković (2008); Kim et al. (2007); Persoon et al. (2006); & Maier-Sperdelozzi et al. (2006). Value Stream Mapping tool (VSM), was the second most referenced techniques by scholars, being applied alone or applied in conjunction with other

techniques. VSM is an effective tool that uses the combination of personnel, material, and information flows needed to eliminate non-value-added steps Gomesa (2016) & Manos (2006). Most of the scholars that referenced its application revealed that the VSM was applied in conjunction with other tools, some of such writers de Koning et al. (2013), Carter et al. (2012) Schwarz et al. (2011), Trilling et al. (2010); Ng et al. (2010); Dickson et al. (2009); Yu & Yang (2008); Lodge & Bamford (2008), Persoon et al. (2006); & Kim et al. (2006).

Notwithstanding, applying VSM alone results in impressive performance outcomes which include identifying waste and obstacles that hinder the smooth processes of patients' care. Other benefits found were its ability to foster a faster and controlled patient flow by lessening waste and reducing waiting time (Schwarz et al., 2011). Furthermore, the study showed that VSM is largely applied as a tool in the implementation of Lean-Kaizen and Lean-Six Sigma (de Koning et al., 2013; Stanković, 2008; Yu & Yang, 2008; & Maier-Sperdelozzi et al., 2006).

5S is another most referenced tool that was applied. This tool is simple, however, its application yielded better performances in accomplishing lean healthcare objectives. Applying 5S is significant for making processes known and to set out the way the change journey (Gomesa, 2016).

JIT, Root Cause Analysis, and Six Sigma were also cited by many of the scholars. JIT application in conjunction with others also helped to achieve the public lean healthcare goals, with less cost of operations, workflow improvement among others. Root Cause Analysis is one of the effective tools which its application identifies the deepest cause of a problem in order to find the solution to eliminate or reduce its occurrences (Carter et al., 2012 and Isaacs and Hellenberg, 2009). The Six Sigma which was also cited by many of the scholars works together with the lean to enhance healthcare performance. Six Sigma was cited as the most applied technique in the study done by Gomesa (2016). It is suggested that combining lean and Six Sigma together to form Lean/Six Sigma approach works well and its resultant effectiveness from this application is impressive in healthcare delivery (Gomesa, 2016). D'Andreamatteo et al. (2015) confirm in their study that lean/Six Sigma is the most effective joint implementation improvement technique that has proven its successes in healthcare delivery. The approach was implemented by de Koning et al., (2013); Buesa, (2009); Stanković, (2008); Yu & Yang, (2008) & Maier-Sperdelozzi et al., (2006). However, like the VSM, Six Sigma can be applied alone.

Process Improvement, Standardization, Lead Time Reduction, DMAIC, Patient Flow and Patient Streaming are themselves not usually described as lean tool but processes, steps and procedure arriving or achieving so some healthcare goals were cited by some scholars as tools or techniques used in one or more stages of the lean implementation projects, some of which writers were Bhat et al., (2014); Carter et al., (2012); Rutledge et al., (2010); Eller (2009); Kelly et al., (2007); and Ieraci et al. (2008). Some tools were also cited once by some scholars which also helped to improve the healthcare improvement process one way or the other, some of which were 5Whys, Heijunka, Flow Chart, Ando, Specimen management, Visual Control among others. According to Mazzocato et al. (2012), Lean was applied as a whole concept without given reference to any specific tool or technique to improve healthcare delivery.

5.3 Comparative Analysis of Tools and Techniques

In the light of the study undertaken by Mayatra et al. (2015); Sundareshan & Swamy (2015) and Krishnan & Parveen (2013) on the tools and techniques applied in both service and manufacturing industries, it was found that TQM, TPM, JIT, Kaizen, VSM 5S, Process Improvement Standardization, Benchmarking, Kanban, and SPC were the most common applied tools respectively. As this study has found that Kaizen was the most applied tool, likewise, Krishnan & Parveen (2013) in their study also revealed that Kaizen was the most used tools in the service industry. Interestingly, in Krishnan & Parveen (2013) study kaizen was never mentioned in the manufacturing industries under their review. It is worth noting that although the lean concept is generally applicable to all industries regardless of their, there are some of the tools and techniques which are effective in both industries but there are others which are effective in the manufacturing industries but their effectiveness in the service industries is relatively less because of the differences that exist in production processes. Broadly speaking, comparing this study to the aforementioned authors' review, it is clear to conclude that, Kaizen, VSM, 5S, Process Improvement, JIT and Standardization found in this study are among the most used tools and techniques generally applied in the lean concept.

5.4 Units/Departments

One of the areas the study seeks to unveil were the units or departments where the lean concept is largely implemented in the public healthcare services. As shown in figure 3 in chapter 4, the emergency was the most cited units or department by most of the writer. According to Chan et al (2014), Jacobson et al. (2009), Ben-Tovim et al. (2007) and Ng et al. (2010), there is an increasingly demand for improvement in the emergency department since it has been facing numerous challenges ranging from overcrowding, access block, high cost of operation to increasing demand from patients and therefore, a radical restructuring of the patients flow be implemented. The application of the lean concept achieved significant results by improving patient satisfaction by reducing the patient spent in the emergency department (Mazzocato et al., 2012; Ng et al., 2010; Eller, 2009; Dickson et al., 2009; Jacobson et al., 2009; Ieraci et al., 2008; Kelly et al., 2007 & Ben-Tovim et al., 2007)

Laboratory was another department cited by most of the scholars as shown in figure 3. The laboratory is one of the sensitive department in the healthcare practice, but it has been confronting a number of challenges. This has put pressure on public healthcare manager to improve quality and provide text timely while reducing costs and errors (Rutledge et al., 2010; Buesa, 2009 and Persoon et al., 2006). The study revealed that all the scholars reported positive results from the implementation in the various laboratories and, therefore, the objectives of the lean healthcare to improve laboratory service was realized (Isaac-Renton et al., 2012; Rutledge et al., 2010; Buesa, 2009 and Persoon et al., 2006). The medical and surgical departments were also cited by some of the scholars. The need for healthcare practice to be improved is not new and therefore, it is essential for the healthcare practitioner to reduce errors, reduce the skyrocketing cost of operations and delays in primary healthcare for patients have marked past and still continues to do in recent times. Against this premise that the lean concept was introduced to the surgical and medical units and this was reported by the writers that the objectives were met (Schwarz et al., 2011; Karstoft & Tarp, 2011, Grout & Toussaint, 2010; Herring, 2009; Wennecke, 2008 & Ben-Tovim et al., 2007).

Furthermore, the study revealed a number of the department/units which the lean healthcare was implemented, some of which was cited once or twice by some of the writers. Among these were Patient Discharge Process unit, Patient Care unit, Radiation Oncology unit, Patient Registration unit, Ambulatory/OPD unit, Medication, and Chlamydia unit and others. According to the

reported writers such as Smith et al. (2012), Herring (2009), Casey et al. (2009) and Kim et al. (2007) state that the lean concept served the purpose upon which it was applied in those units or department.

According to Bhat et al. (2014), the concept was applied in the Healthcare Information Service department for the purpose to improve the registration processes of patients visiting the facility. It was subsequently revealed in the article that the effect lean of the lean healthcare implantation was positive, hence, served its purpose. Interestingly, among the articles reviewed only one reported that the implementation was done in the entire hospital facility. According to the writer, Fillingham (2007), though the implementation was challenged with some problems, however, its purpose was not defeated

Similarly, D'Andreamatteo et al. (2015) study also show that Surgery and emergency units were the most cited units in the healthcare the lean has been applied and yielded incredible results. Furthermore, it was also revealed by Arrieta-Posada & Giraldo Betancur (2014) in their review that the general hospital, emergency unit, laboratory unit, operating theater, pharmacy unit and nursing unit were the most area of which the lean concept is commonly applied. In conclusion, it is evident that the Lean healthcare practice has been implemented in the public healthcare within various departments /units in the healthcare facility. The study also revealed that initial implementation of the concept is appropriate when the implementation is done in a pilot base. Furthermore, the emergency unit, surgery unit, laboratory unit are the areas in the healthcare facility the lean concept has mostly applied and demonstrated its effectiveness.

5.5 Performance Outcomes

The study seeks to find out the performance outcomes and the possible challenges emanated from the lean concept after the implementation in the areas concerned with the various public healthcare facilities. It was found that the level of evidence of performance outcomes reported by the various scholars after the implantation was positive. As shown in figure 4, almost half of the articles reported that the implementation was targeted to reduce lead time, thus, the time needed to complete a unit of service for a patient. Reducing lead time focuses on removing waste in time that results from non-value-added activities (Al-Araidah et al., 2010). For example, according to Herring, (2009) and Eller, (2009) and Persoon et al., (2006), patients lead time was lessened by 9 days thereby increasing the value to clients by 99%, the average time spends with the patients at

the emergency room was reduced by 45 minutes, and 80% of chemistry results in less than 1 hour for 11 consecutive months respectively.

The second most area of concern the article reported to address with the implementation was to reduce the waiting time for patients to receive healthcare. As it is found in figure 4, most of the articles reported a significant reduction in the waiting time after the post-implementation assignment. Bhat et al., (2014) and Yu & Yang, (2008) state that, there was a 94% reduction in wasting time and the program resulted in a drastic reduction in average waiting time from 42.3 minutes prior level to 6.55 minutes respectively. It has become a global concern of the high rocketed cost of operations in the public healthcare delivery for decays. The study has shown that there is a positive relationship between the application of the lean concept and the cost of operations of public healthcare delivery. Most of the articles reported significant cost savings front the lean concept for the healthcare facilities. According to de Koning et al., (2013), an estimated amount of €200,000.00 savings was made by the hospital within a couple of months. Casey et al. (2009), also reported that a clinic saved \$88,000.00 and \$10,000.00 from office supply charges and return of excess stock with a shortest possible time respectively. They further reported that there was a reduction in the value of outstanding inventory cost by \$700,000.00 within a year. Thus, lean has demonstrated its effectiveness in reducing the high cost of operations in the public healthcare services.

Apart from the aforementioned performance outcomes, there were a number of them which some of the articles reported. Some of the performance outcomes that the concept has demonstrated its effectiveness in addressing them are enhancing workplace standardization, patient satisfaction, ensuring the quality of healthcare delivery, improving turnaround time, reducing error levels, reducing staff workload and most importantly decreasing mortality rate as reported by Fillingham, (2007).

From the above discussions, it worth to conclude that the outcomes are pictured from two perspectives. The first perspective relates to the performance of the healthcare and examples are increased in patients' satisfaction, reduction in error quality healthcare delivery among others. The second relates to the performance of the development of employees and working environments like improved work efficiency, enhanced workplace standardization and others.

5.6 Comparative Analysis of the Outcomes

There are other studies by some scholars who have found similar performance outcomes regarding the lean implementation in both service and manufacturing industries. According to a review done by D'Andreamatteo et al. (2015), a total of 167 articles documented for the study more than 50% referred to increased productivity and cost-effectiveness followed by cost savings and customers/patients and staff satisfaction. Additionally, Sundareshan & Swamy (2015) also indicate in their comprehensive review on lean concept implementation in different industries that waste reduction, reduction in cost of operations and inventory, effectiveness, improved quality and cycle time were the most improvement outcomes mostly referred to respectively. It's worth therefore, to conclude, reduction in lead time, reductions in the cost of operations, reduction in waiting time, increase in patients'/customers' satisfaction, reduction in errors levels, quality service delivery, and employees' safety and satisfaction are general the mostly the areas the lean concept has proven its effectiveness.

5.7 Implementation Challenges

Notwithstanding the significant performance outcomes of the lean concept as demonstrated in the public healthcare delivery, there were some challenges which some of the writers reported during the implementation. Although most of the scholars did not report any challenge, the few who did, mostly reported the challenges that were resulted from the changes that lean concept brought to the healthcare felicitities which were largely focused on staff resistance. As Grout et al. (2010) state: "*ThedaCare's implementation of Collaborative Care™ was not executed without resistance*". Considering the words of Grout & Toussaint, (2010), it is indisputable that the lean concept is suitable for improving public healthcare delivery, but its implementation cannot be done without confronting an initial resistance if not managed well.

The culture of doing things the same way in this sector due as result of strict bureaucratic principles which the public healthcare is no exception makes persuading individuals to embark on the lean journey very difficult. In addition, the perception that the result of a successful lean implementation may lead to the employees' removal or reassignment of their responsibilities. Furthermore, people are not "automobile" and that each patient is unique, and that public managers operating within a limited budget allocated to them by governments make the managers reluctantly commit the needed resources for the lean implementation. These are issues that lead to the resistance of the lean concept (Kim et al., 2006; Kim et al., 2007; Fillingham,

2007 Wennecke, 2008; Casey et al., 2009; and Ng et al., 2010). In an attempt for the public-sector healthcare to improve healthcare delivery, the sector has seen a lot of improvement methodologies that have been experimented in too short a timescale. This has made some managers and staff of the public-sector healthcare resist the lean concept implementation as they consider it to be one those methodologies (Fillingham, 2007).

The study has revealed that public-sector healthcare lacks a clear and systematic approach to implementing the lean concept in the public healthcare and therefore, there is no uniformity in implementing the lean concept. Although there has been much publication in books and articles proposing systematic guidelines for lean healthcare implementation, most of their assertions are not factual and therefore cannot be adhered to (Brandao de Souza, 2009). Virginia Mason Medical Center, an acute care hospital in Seattle is the pioneers in the lean healthcare and its implementation. Its lean implementation processes and guidelines have become the prime example upon which most private and public healthcare facilities follow in lean healthcare implementation (Grout & Toussaint, 2010; Radnor & Walley, 2008 and Kim et al., 2006).

There would be a likelihood of resistance to lean initiative in an attempt of the public healthcare adopting the Virgin Mason Medical Center's implementation guidelines holistically without considering some critical issues that are distinctive features of the public-sector. For example, policies, funding, managerial system and even the employees' mindset within the sector are different from those in the private sector therefore, all implementation guidelines in the public-sector healthcare should focused on addressing the aforementioned issues to ensure a reduction the resistance levels if not eradicating them. Against this background that, the researcher proposes a public healthcare lean implementation model that stipulates systematic guidelines to implement lean successfully and to ensure all misconceptions are addressed.

Although this model is developed on the researcher's experience from the literature review in chapter two, the proposed model will give some important contributions. Firstly, it will offer a solution to the uniformity of public-sector lean healthcare implementation guidelines so that lean implementers in this sector will follow a uniform and systematic process to achieve a successful lean initiative. Moreover, it will help to address the issues such as misconceptions on the lean concept by public-sector workers to reduce the level of resistance to ensure a successful lean implementation.

5.8.0 Proposed Eight Steps Ladder of Lean Healthcare Implementation Model

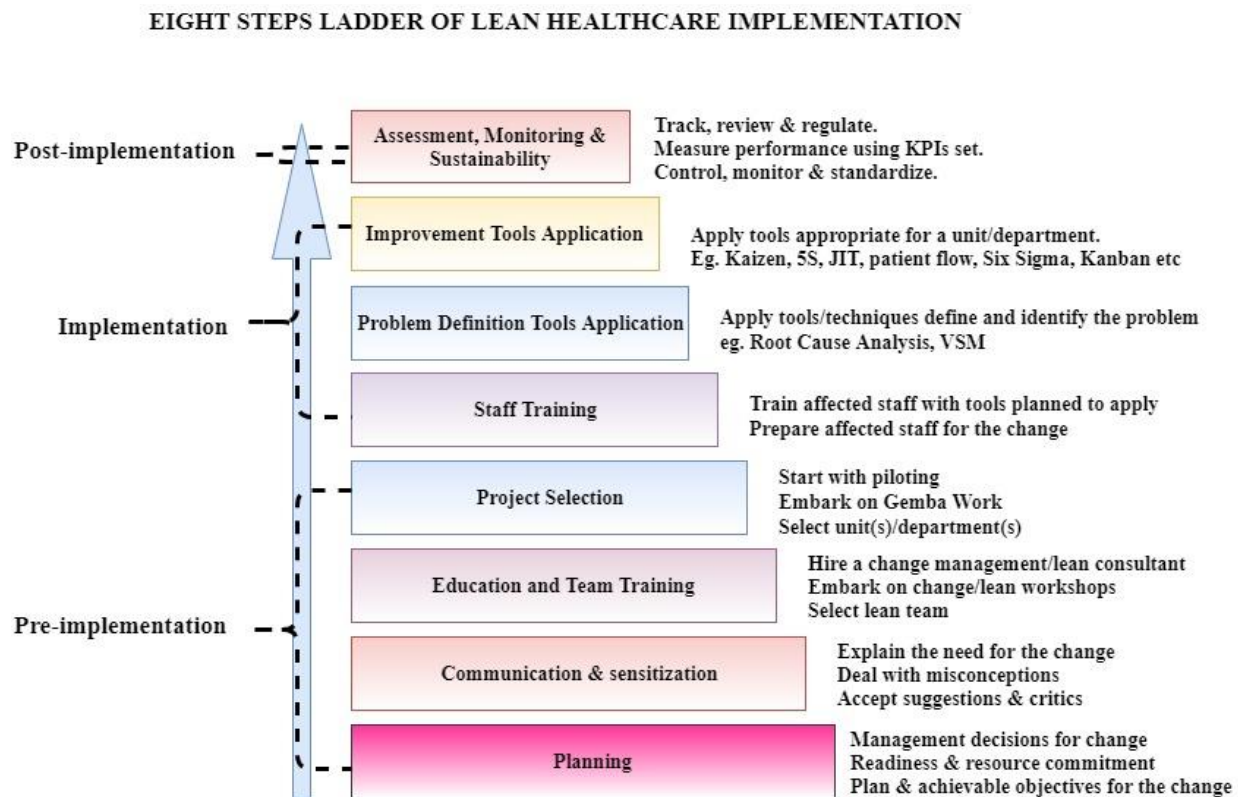
For a successful lean concept implementation in the public healthcare, there should be systematic guidelines that seek to address the issue that result in resistance. There are three phases of which each phase has some activities to carry out under it.

Pre-Implementation Phase: Activities – planning, communication and sensitization, education and team training, and project selection.

Implementation Phase: Activities – staff training, problem definition tools/techniques application, and improvement tools/techniques application.

Post-Implementation Phase: Activities – assessment, monitoring and sustainability.

Figure 5: The Proposed Eight Steps Ladder of Public-sector Lean Healthcare Implementation Model



Source: Author's own work.

5.8.1.0 Pre-Implementation Phase

This is the kickoff phase and it should rely on an effective and efficient starting of the implementation in order to achieve a resistance-free implementation. It involves four steps which are detailed below:

5.8.1.1 Planning

Lean implementation should begin with a collective management decision and readiness of the institution for the need to embark on the journey of change. The preparedness of Management and leadership to commit the needed resource (time and money) for the lean project is paramount at this stage. There should be a well-crafted lean policy and achievable lean objectives put in place by management. Management commitment to involving itself in the lean project is critical to the success of the project implementation.

5.8.1.2 Communication and sensitization

Generally, instituting change journey in the public-sector of which the healthcare service is no exception is an extremely difficult task as it has the tendency of facing numerous resistances.

Public-sector employees have a misconception about the lean concept as they perceive it to be “cutting and layoffs in disguise”, “People are not automobile syndrome”, and “monitored concept” among others make the project to face a strong opposition (Casey et al., 2009, Kim et al., 2007 and Kim et al., 2006). However, this intended resistance can be significantly reduced by management effort to embark on a comprehensive communication and sensitization throughout the entire facility. Inform all staff about why the change is needed, listening to their suggestion, questions, and grievances. Then, management should be timely and effectively address all the individual concerns that may be arises from the consultations. The benefits and costs associated with the change should be made known to all the change recipient by the change agents or management as well as motivating and enticing them to own the project.

5.8.1.3 Education and team training

Management should hire a change management and lean expert consultant who will take the leading role in the education and the training the change and the lean implementation project. Management should organize workshops for all the staff so that every staff member gets some fair ideas about change management and lean concept and its significance. This would further reduce the anticipated resistance of the concept’s implementation among the staff. Following the

general staff workshops, management then selects a lean implementation team and specially trained for the project.

5.8.1.4 Project selection

The scope of lean implementation largely involves committing a huge amount of resources (time and money). Hence, it's prudent for management to initially embark on pilot-based implementation in order for management to determine its success before extending to the entire facility. Thus, this would lessen the burden of investing hugely at the initial stage so that should there be any implementation challenge, it might not largely affect the facility.

Management together with the lean team should then embark on "Gemba Walk" in the entire facility to identify the problems to be addressed and proceed to select the unit(s) to start the implementation. Once this is done, the team has to develop a master plan for the lean project and the plan should, therefore, involve both schedules and a budget. The team then proceed to develop KPIs that conform to the management objectives already set and then start an initial measurement of the current state of the facility's performance.

5.8.2.0 Implementation Phase

This is the execution phase and it focuses on staff training, problem definition and performance improvement at all levels of the facility and the steps are detailed below:

5.8.2.1 Staff training

This step requires the team to train the rest of the workforce to be affected by the change in the lean tools that are planned to apply and the implementation process as well as the planned schedules. This will make the workforce to understand and familiarize themselves with the lean project thereby preparing them for the change.

5.8.2.2 Problem definition tools

Following the staff training, the team should start defining the problems at hand. Firstly, the team should apply a root cause analysis technique to identify the origin of the problems. This will help to determine what caused the problems, why they happened and try to find out what to be done to eliminate or reduce the likelihood of their occurrence. This tool could, however, be used in conjunction with other roots like the 5whys, Drill Down, Cause and Effect Diagram etc.

Next to the root cause analysis is the application of the value stream mapping (VSM) to visualize and comprehend the flow of patients, materials, and information. Primarily, VSM involves all the actions needed to finalize a specific process(s). The resultant effect is to identify improvement mechanisms needed to institute in order to eliminate or reduce waste(s).

5.8.2.3 Improvement tools

This step requires the application of the actual improvement tools so as to ensure service delivery in a quality, effective and efficient manner. These tools should primarily engineer the elimination of all wastes from the processes and to ensure that continuous improvement goal is achieved. The application of these tools can be done either concurrently or sequentially depending on the unit or department in question. It is important to state that lean is not a traded program therefore, that cannot be bought or hired off the shelf and simply installed (Holden, 2011). In other words, there are no specified lean tools to be applied at this point and therefore, depending on the circumstances confronting by a particular facility and the unit(s) or department(s), any of the improvement tools can be used at a particular time.

For example, the team that has decided to begin from the emergency unit could start thinking of a way to have a well-organized and efficient running emergency room, need to ensure everything is put at the right place, cleaned and ready for use can start applying the 5S and proceed to the other tools. According to the review done, Kaizen, 5S, Standardization, lean time reduction, process improvement, JIT, Six Sigma, patient flow continuous flow, patient streaming, Kanban and visual management are the most frequently used improvement tools that can be used depending on the unit(s). However, there are other numerous tools that could be used in addition to the above-mentioned ones.

5.8.3.0 Post-Implementation Phase

This is the final phase and it plays a critical role in completing and sustaining the implementation in order to ensure continuous improvement it involves Lean assessment, monitoring, and sustainability.

5.8.3.1 Lean Assessment, Monitoring, and Sustainability

The team should track, review and regulate the implementation project to ensure the performance and progress to ensure that the implementation follows the established plan. Once it is done, any process recommendation of inhibitory action for any unanticipated occurrences and to make

know any influencing factor in the project implementation. This process is carried out by using the scoreboard that contains the lean KPIs set in the implementation plan to measure the actual project accomplishment and comparing with the re-implementation measurement results. To ensure a long-term sustainability of the lean implementation, it is critical to institute a strong and effective controlling and monitoring mechanisms. The absence of these mechanisms may lead to employees' attempt to return to the pre-lean implementation era. Once the team notice objectives are met, the team should complete the project, the process must be capitalized, standardized and shared to allow its gains to be locked before embarking on another project (Mostafa et al., 2013).

5.9.4 Logic and Features of the Proposed Model

The primary idea behind this proposed lean healthcare implementation model as project-based implementation has reflected the models by Anderson & Anderson (2010); Caldwell (2003); Roger Gill (2002); Kotter (1995); (Kanter et al. (1992) & Dalziel & Schoonover (1988) work. One of the objectives of this thesis work is to develop a simple, but effective lean implementation guideline for public-sector healthcare for effective lean outcomes of a healthcare delivery. The steps make the lean implementation to be done in a systematic or sequential manner from the pre-implantation phase to the post-implementation phase. The organization of lean implementation into a suitable sequence was propounded by Ahlström (1998). Another advantage of the systematic approach of lean implementation using the combined monitoring and controlling process is to ensure that outcomes of each element in the three phases are done in accordance with the healthcare goals.

The aim of the proposed lean healthcare model is to address the challenges in the implementation of the lean healthcare in the public-sector healthcare that results in a significant level of resistance by public-sector healthcare leaders and employees. The five underlined features of the proposed model are as follows:

- Developing a simple but effective and self-explanatory public healthcare lean implementation guidelines.
- Developing a model that depicts a simple and clear structure which coordinates the phases and steps of lean implementation and the tools/techniques to use at each step or phase.

- Developing a model to build lean experts/implementers team to improve success in public-sector lean healthcare implementation.
- Developing a model that enhances lean implementation monitoring and controlling to ensure sustainable lean outcomes.
- Developing a model that systematically addresses all implementation challenges that bring resistance by the public-sector healthcare employees for a successful lean implantation.

The implementation phase basically involves human factor while the remaining phases take care of tools and techniques for a sustainable continuous improvement. Information and knowledge about lean have become an essential part of the lean implementation processes and that have been taking care of in the pre-implementation phase of the model. This phase ensures a continuous learning of the lean concept, particularly, for the implementation team and also improves the process control. The second phase takes care of the actual application of the various tools and techniques to ensure waste elimination and hence, improve processes. For the sustainable continuous improvement levels of performance should be measured to verify the result before setting new standards that helps for continuous improvement.

5.10 Further Area for Research

Some of the limitations mentioned in chapter three will create opportunities for future research. However, the proposed model still evokes for expansion and field application. For future study, the researcher recommends an action of proving the validity the proposed model and to exploit all the guided step in the model in a typical healthcare facility. Since the majority of the healthcare facilities reviewed in this study were found in the developed countries, a future research could be carried out to find out whether public healthcare systems in the developing countries have been adopting the lean concept.

Furthermore, a future research area could be conducted by means of a comparative study of lean implementation in the service industries including healthcare and the manufacturing industries to compare the implementation processes and the tools/techniques for deeper understanding.

6. CONCLUSION

6.1 Introduction

The preceding chapter discussed the findings and the proposed model. This chapter will cover the final conclusion drawn from this study by the researcher. This section is divided into two parts, the general conclusion of the study and the conclusion on the research aim.

6.2.1 General Conclusions

Governments all over the world are under pressure to serve their citizens with better service including healthcare. It is an opened secret that citizens are expecting to witness some changes in the way the public services are delivered. Citizens are demanding value for money from the services the public-sector organizations deliver to them. This has caused the public-sector managers to adapt to the current organizational change that has been the backbone of the organizational successes in the private sector.

In the quest for the public-sector to improve processes in order to ensure quality, effectiveness and efficiency service delivery to citizens, the lean concept long used by the private sector has been widely adopted. The lean concept, although it was originally known to be applicable in the manufacturing sector has shown its effectiveness in the service sector including the healthcare. The lean concept aims at helping organizations to eliminate waste from processes which enable the value-added activities smoothly processed.

Lean is now known to be applicable in the public-sector, however, it has not been fully employed to maximize its benefits to the public-sector organizations. The lean concept is now seen to be a form of revolution for quality, effective and efficient healthcare delivery. For a decade now, healthcare organizations have been increasingly adopting and adapting the lean concept and have seen significant benefits from its implementation. The concept is proven to reduce waste that is pervasive in the healthcare systems. Even though some authors and experts have argued the difficulty of the concept's implementation in the healthcare systems, it has demonstrated its ability to help healthcare organizations to improve processes and outcomes and increase satisfaction among patients, providers and employees.

6.2.2 Conclusions on the Research Aim

Although critics are right to infer that "Patients are not automobile" and that medical care is delivered in an exceptional complex organization with numerous interacting processes like the

manufacturing industry, the findings from this review have shown the concept's effectiveness in improving the public healthcare delivery. Lean concept for enhancing processes and public-sector healthcare organizations has resulted in many successes but with some challenges.

There numerous tools and techniques that the healthcare organizations employ to assist the lean concept to achieve its aim of eliminating waste and improving processes. The finding of this study shows that Kaizen, VSM, Six Sigma, 5S, JIT, Kanban, SMED, Process improvement, Lead Time Reduction, Root Cause Analysis are the most widely applied lean tools and techniques in the public-sector healthcare delivery as previously discussed.

It is found that the emergency and the surgery, and laboratory departments are the most areas in the healthcare systems that have witnessed most of the lean concept implementation. These departments are considered to be the heart of the medical care and have been facing numerous challenges like overcrowding, access blocks, screening errors and a high cost of operations among others, hence, increasing demand for improvement.

It is an open secret that defects/mistakes, waiting, transportation, over-production, over-processing inventory and motion are the most common waste identified in the healthcare which the lean concept targets to eliminate. It is, however, not surprising that reduction in lead time, reduction in waiting time, reductions in the cost of operations, increase in patients' satisfaction, reduction in errors levels, quality healthcare delivery, enhanced workplace standardization, improved work efficiency and effectiveness, and employees' safety and satisfaction are the performance outcomes mostly cited in the review.

Lean is not just tools or techniques and therefore it is important to change the organizational culture in the public-sector in order to attain a long-term sustainable outcome. Most of the public-sector healthcare organization which have made an effort to implement some of the lean tools and techniques still do not fully understand the challenges and effort needed for the lean concept. A human factor is an essential component of the lean concept. In light of Sundareshan and Swamy (2015) review done on lean implementation in various industries including the healthcare, the most identified barriers for the lean implementation are management involvement, employees' involvement, communication, lack of training and cultural issues. Interestingly, all the aforementioned barriers relate to the human factor. The misconceptions of

lean concept strongly limit or impede the lean implementation process and lessen the anticipated outcomes for the healthcare organization.

7. RECOMMENDATIONS

7.1 Introduction

This is the last chapter of this thesis. The preceding chapter discussed the research conclusion drawn from the study. This chapter will cover the researcher's recommendations based on the findings.

7.2 Recommendations

With the researcher's understanding and knowledge in the lean concept implementation, together with the review of literature on change management and the lean concept in the public-sector in chapter 2, the researcher proposes recommendations to public-sector healthcare organizations on how change and lean concept can be managed and implemented successfully in order to derive the full benefits of the concept. However, findings of the lean concept implementation in various public-sector healthcare facilities were presented and discussed the future implementation by proposing an implementation model to simplify and ensure successful lean implantation in chapter 5. To ensure a successful change and lean implementation in the public-sector the thesis recommends that:

- Management in public-sector must know the importance of instituting change and try to persuasively communicate the change to the employee(s) through a continuous and systematic process of discussions with all the interest groups as well as members of the organization who will be affected by the change.
- There is the need for the public manager to have a comprehensive change management and communication plan which spells out all the vital processes and guidelines to ensure readiness for the change and hence, reducing the magnitude of resistance level.
- Given the significance of the lean concept, there is the need for political leaders and external stakeholders give a higher priority in terms of funding that could be allocated to research projects that will solve issues connected with the Lean introduction in healthcare in order to ensure an easier cross-national learning and dissemination of findings.
- It is important for political leaders and other external stakeholders in the public-sector to support the change by making policies and programmes and also imposing statutory changes that support the current organizational change and the commitment to support the healthcare organization the needed resources for the change.

- Healthcare managers must note that there is no specific or defined way of implementing lean in the healthcare. In an attempt of implementing lean, management must not simply copy from the private sector but rather adapt and develop an approach that fits in public healthcare context and allow the staff to own the approach.
- To address this resistance which is largely caused by the human element, there is a need to introduce a model, roadmap or a framework that spells out systematic guidelines for the implementation processes as proven by the study done by Mostafa et al. (2013).

REFERENCES

- Abdulmalek, F. A., & Rajgopal, J. (2007). Analyzing the benefits of lean manufacturing and value stream mapping via simulation: A process sector case study. *International Journal of production economics*, 107(1), 223-236.
- Abrahamson, E. 2000, "Change without Pain", *Harvard business review*, vol. 78, no. 4, pp. 75-79.
- Aherne, J. (2007). Think lean: Joe Aherne explains the advantages of educating healthcare staff in the principles and practices of lean thinking. *Nursing Management (Harrow)*, 13(10), 13-16.
- Ahlstrom, J. (2007). Using the 5S Lean Tool for health care. *Health Care*. Wipfli.(www.wipfli.com/Wipfli/Impact_Magazine/Industry_Archive/Health_Care/General/200703HCA_5S_Lean_Tool_for_Health+Care.htm).
- Ahlström, P. (1998). Sequences in the implementation of Lean production. *European Management Journal*, 16, 327-347).
- Aitken P. and Higgs M. (2010): *Developing Change Leaders: The Principles and Practices of Change Leadership Development*: Routledge.
- Al-Araidah, O., Momani, A., Khasawneh, M., & Momani, M. (2010). Lead-Time Reduction Utilizing Lean Tools Applied to Healthcare: The Inpatient Pharmacy at a Local Hospital. *Journal for Healthcare Quality*, 32(1), 59-66.
- Álvarez, R., Calvo, R., Peña, M. M., & Domingo, R. (2009). Redesigning an assembly line through lean manufacturing tools. *The International Journal of Advanced Manufacturing Technology*, 43(9-10), 949-958.
- Amedee, R. G., Maronge, G. F., & Pinsky, W. W. (2012). Improving the transition of care in patients transferred through the Ochsner Medical Center Transfer Center. *The Ochsner Journal*, 12(4), 318-322.
- Anderson, D., & Anderson, L. A. (2010). *Beyond change management: How to achieve breakthrough results through conscious change leadership*. John Wiley & Sons.
- Andriopoulos, C., & Dawson, P. (2009). *Managing change, creativity and innovation*. Sage.

Agócs C., (1997), Institutionalized Resistance to Organizational Change: Denial, Inaction and Repression, *Journal of Business Ethics*, Vol.16, pp.917-931.

Arrieta-Posada, J. G., & Giraldo Betancur, E. A. (2014, May). Lean Health Care, a look through its tools, an approach from the literature. In Proceedings of 25th Annual Production Operations Management Society (POMS) Conference, May. 2014. Production and Operations Management Society (POMS).

Australian Public Service Commission (APSC), (2013). Chapter 6: Managing for change. Retrieved on 15th March, 2017 at - <http://www.apsc.gov.au/about-the-apsc/parliamentary/state-of-the-service/state-of-the-service-2013-14/sosr-2013-14/theme-two-effectiveness/chapter-6>.

Bahensky, J. A., Roe, J., & Bolton, R. (2005). Lean sigma—will it work for healthcare. *J Health Inf Manag*, 19(1), 39-44.

Barton, H. (2013). ‘Lean’policing? New approaches to business process improvement across the UK police service. *Public Money & Management*, 33(3), 221-224.

Bauer, M. W. (2007). Content Analysis. An Introduction to its Methodology—By Klaus Krippendorff from Words to Numbers. Narrative, Data and Social Science—By Roberto Franzosi. *The British Journal of Sociology*, 58(2), 329-331.

Beer, M. & Nohria N. (2000). *Breaking the Code of Change* (colloquia Series). Harvard Business Press.

Ben-Tovim, D. I., Bassham, J. E., Bolch, D., Martin, M. A., Dougherty, M., & Szwarcbord, M. (2007). Lean thinking across a hospital: redesigning care at the Flinders Medical Centre. *Australian Health Review*, 31(1), 10-15.

Bhat, S., Gijo, E. V., & Jnanesh, N. A. (2014). Application of Lean Six Sigma methodology in the registration process of a hospital. *International Journal of Productivity and Performance Management*, 63(5), 613-643.

Bhatia, N., & Drew, J. (2006). Applying lean production to the public-sector. *The McKinsey Quarterly*, 3(1), 97-98.

Bicheno, J. (2004). *The New Lean Toolbox: Towards Fast, Flexible Flow*, 3rd ed., PICSIE Books, Buckingham.

- Bliss, D. (2009). Lean in healthcare-wow. *Frontiers of health services management*, 26(1), 39.
- Bolognese A. F. (2002). Employee Resistance to Organizational Change. Retrieved on 19th November- <http://www.newfoundations.com/OrgTheory/Bolognese721.html>.
- Brandao de Souza, L. (2009). Trends and approaches in lean healthcare. *Leadership in health services*, 22(2), 121-139.
- Breyfogle, F. W. (2007). Lean tools that improve processes: an overview. *BPTrends*.
- Bricki, N., & Green, J. (2007). A guide to using qualitative research methodology.
- Brown G. (2017) Resistance to Change in an Organization's Structure and Culture. Retrieved on 4th November, 2016-<http://smallbusiness.chron.com/resistance-change-organizations-structure-culture-16622.html>.
- Brown, K., & Osborne, S. P. (2012). *Managing change and innovation in public service organizations*. Routledge.
- Brown, K., Waterhouse, J, and Flynn, C. (2003) Change Management Practices - Is A Hybrid Model A Better Alternative For Public-sector Agencies? *International Journal of Public-sector Management* 16(3):pp. 230-241.
- Buesa, R. J. (2009). Adapting lean to histology laboratories. *Annals of diagnostic pathology*, 13(5), 322-333.
- Burke, W. W. (2013). *Organization change: Theory and practice*. Sage Publications.
- Burke, W. W., Lake, D. G. and Paine, J. W. (2008). *Organization Change: A Comprehensive Reader*. John Wiley and Sons.
- Burnes, B. (1996). No such thing as... a "one best way" to manage organizational change. *Management decision*, 34(10), 11-18.
- Burnes, B. (2004). *Managing Change: A Strategic Approach to Organisational Dynamics*. Pearson Education Limited, UK.
- Caldwell, R. (2003). Models of change agency: a fourfold classification. *British Journal of Management*, 14(2), 131-142.

- Carter, P. M., Desmond, J. S., Akanbobnaab, C., Oteng, R. A., Rominski, S. D., Barsan, W. G., & Cunningham, R. M. (2012). Optimizing Clinical Operations as Part of a Global Emergency Medicine Initiative in Kumasi, Ghana: Application of Lean Manufacturing Principals to Low-resource Health Systems. *Academic Emergency Medicine*, 19(3), 338-347.
- Casey, J. T., Brinton, T. S., & Gonzalez, C. M. (2009). Utilization of lean management principles in the ambulatory clinic setting. *Nature clinical practice urology*, 6(3), 146-153.
- Chan, H. Y., Lo, S. M., Lee, L. L. Y., Lo, W. Y. L., Yu, W. C., Wu, Y. F., & Chan, J. T. S. (2014). Lean techniques for the improvement of patients' flow in emergency department. *World journal of emergency medicine*, 5(1), 24.
- Cinite, I., Duxbury, L. E., & Higgins, C. (2009). Measurement of perceived organizational readiness for change in the public-sector. *British Journal of Management*, 20(2), 265-277.
- Clinton W. J. (1994). Public Paper of the President of the United States. Government Printing Office.
- Coch, L., & French Jr, J. R. (1948). Overcoming resistance to change. *Human relations*, 1(4), 512-532.
- Coghlan, D. (1994). Managing organizational change through teams and groups. *Leadership & Organization Development Journal*, 15(2), 18-23.
- Connelly M. (2016). Change management Coach. Retrieved 16th December, 2016-
<http://www.change-management.com/Prosci-Defining-Change-Management.pdf>.
- Coram, R., & Burnes, B. (2001). Managing organizational change in the public-sector-Lessons from the privatization of the Property Service Agency. *International Journal of Public-sector Management*, 14(2), 94-110.
- Creasey, T. (2007). Defining change management. Prosci and the Change Management Learning Center.
- Creasey,T, (2009). Defining Change Management. Procl Tutorial, an article about definition of Change Management. . Retrieved on 13th November, 2016 a- <http://www.change-management.com/Prosci-Defining-Change-Management-2009.pdf>..

- Cummings, T., & Worley, C. (2005). *Organizational Development and Change*, Ohio, South-Western.
- D'Andreamatteo, A., Ianni, L., Lega, F., & Sargiacomo, M. (2015). Lean in healthcare: A comprehensive review. *Health policy*, 119(9), 1197-1209.
- Dalziel, M. M., & Schoonover, S. C. (1988). *Changing ways: A practical tool for implementing change within organizations*. New York, NY: American Management Association.
- de Koning, H., Does, R. J. M. M., & de Mast, J. (2013). Lean Six Sigma. *Kwaliteit in bedrijf*, 21(8), 10-13.
- de Souza, L. B and Pidd. M. (2011). Exploring the barriers to lean health care implementation. *Public Money & Management*, Vol. 31, No. 1, 59-66.
- DelliFraine, J. L., Langabeer, J. R., & Nembhard, I. M. (2010). Assessing the evidence of Six Sigma and Lean in the health care industry. *Quality Management in Healthcare*, 19(3), 211-225.
- Denhardt, R. B., & Denhardt, J. V. (2000). The new public service: Serving rather than steering. *Public administration review*, 60(6), 549-559.
- Dent, E. B., & Goldberg, S. G. (1999). Challenging "resistance to change". *The Journal of Applied Behavioral Science*, 35(1), 25-41.
- Dickson, E. W., Singh, S., Cheung, D. S., Wyatt, C. C., & Nugent, A. S. (2009). Application of lean manufacturing techniques in the emergency department. *The Journal of emergency medicine*, 37(2), 177-182.
- Doherty, T., & Horne, T. (2002). *Managing public services: Implementing changes*. London, UK: Routledge.
- Dorsch, J. J., & Yasin, M. M. (1998). A framework for benchmarking in the public-sector: literature review and directions for future research. *International Journal of Public-sector Management*, 11(2/3), 91-115.
- Drotz, E., & Poksinska, B. (2014). Lean in healthcare from employees' perspectives. *Journal of health organization and management*, 28(2), 177-195.

Dukes, R. L., Portillos, E., & Miles, M. (2009). Models of satisfaction with police service. *Policing: An International Journal of Police Strategies & Management*, 32(2), 297-318.

Eller, A. (2009). Rapid assessment and disposition: applying LEAN in the emergency department. *Journal for Healthcare Quality*, 31(3), 17-22.

Emiliani, M. L. Grasso, L., Stec, D., and Stodder, J. (2007). *Better thinking, better results*, 2nd ed. Kensington, Conn.: The CLBM, LLC.

Fernandez, S., & Rainey, H. G. (2006). Managing successful organizational change in the public-sector. *Public administration review*, 66(2), 168-176.

Fillingham, D. (2007). Can lean save lives? *Leadership in health services*, 20(4), 231-241.

George, M. J. (2003). *Lean Six Sigma for Service: How to Use Lean Speed and Six Sigma Quality to Improve Services and Transactions*. [e-book.] McGraw-Hill, New York.

Ghobadian, A., Viney, H., & Redwood, J. (2009). Explaining the unintended consequences of public-sector reform. *Management Decision*, 47(10), 1514-1535.

Gill, R. (2002). Change management--or change leadership? *Journal of change management*, 3(4), 307-318.

Gilley, A., Gilley, J. W., & McMillan, H. S. (2009). Organizational change: Motivation, communication, and leadership effectiveness. *Performance Improvement Quarterly*, 21(4), 75.

Gleick, J. (1987). *Chaos: Making a New Science*, Sphere Book Ltd, London.

Gomesa, A. M. (2016). Study On Techniques And Tools Used In Lean Healthcare Implementation: A Literature Review. *Brazilian Journal of Operations & Production Management*, 13(4), 406-420.

Gough Varity (2009). Part 3: Organizational change - which model should I use? Retrieved on 2nd December, 2016- <https://www.trainingzone.co.uk/lead/culture/part-3-organisational-change-which-model-should-i-use>.

Graetz, F., Rimmer, M., Lawrence, A., & Smith, A. (2002). *Managing organizational change*. Queensland: John Wiley & Sons Australia Limited.

- Graetz, F., Rimmer, M., Lawrence, A., & Smith, A. (2006). *Managing organizational change*. John Wiley & Sons.
- Grout, J. R., & Toussaint, J. S. (2010). Mistake-proofing healthcare: Why stopping processes may be a good start. *Business Horizons*, 53(2), 149-156.
- Grove, A. L., Meredith, J. O., Macintyre, M., Angelis, J., & Neailey, K. (2010). UK health visiting: Challenges faced during lean implementation. *Leadership in Health Services*, 23(3), 204-218.
- Halling, B., & Wijk, K. (2013). Experienced barriers to lean in Swedish manufacturing and health care. *International Journal of Lean Thinking*, 4(2).
- Hammer, M., Champy, J., & Le Seac'h, M. (1993). *Le reengineering* (Vol. 93). Paris: Dunod.
- Hayes, J. (2014). *The theory and practice of change management*. Palgrave Macmillan.
- Heinrick, T. (2004). *Resistance to Change - Does Age Matter?: Predicting Negative Attitudes Towards Organizational Change*. Turnshare Ltd.
- Herring, L. (2009). Lean experience in primary care. *Quality in primary care*, 17(4), 271-275.
- Hiatt, J. and Creasey, T. (2011). The definition and history of change management. Retrieved on 13th November, 2016 at - **URL:** <http://www.change-management.com/tutorial-definition-history.htm>.
- Hines, P., Martins, A. L., & Beale, J. (2008). Testing the boundaries of lean thinking: observations from the legal public-sector. *Public money and management*, 28(1), 35-40.
- Hodges, J. and Gill, R. (2011). *Sustaining Change in Organization*. SAGE.
- Hodges, J. and Gill, R. (2014). *Sustaining Change in Organizations*. Sage.
- Holden, R. J. (2011). Lean thinking in emergency departments: a critical review. *Annals of emergency medicine*, 57(3), 265-278.
- Holt, D. T., Helfrich, C. D., Hall, C. G., & Weiner, B. J. (2010). Are you ready? How health professionals can comprehensively conceptualize readiness for change. *Journal of general internal medicine*, 25(1), 50-55.

Holt, D.T., Armenakis, A.A., Feild, H.S. & Harris, S.G. 2007, "Readiness for Organizational Change: The Systematic Development of a Scale", *Journal of Applied Behavioral Science*, vol. 43, no. 2, pp. 232-255.

Holweg, M. (2007). *The genealogy of lean production*. *Journal of operations management*, 25(2), 42, 2nd ed, Simon & Schuster, London.

Huerta Melchor, O. (2008), "Managing Change in OECD Governments: An Introductory Framework", *OECD Working Papers on Public Governance*, No. 12, OECD publishing, © OECD. doi:10.1787/227141782188.

Hughes, M. (2006). *Change Management: A critical perspective*. London Chartered Institute of Personnel and Development. Indiana University.

Iannettoni, M. D., Lynch, W. R., Parekh, K. R., & McLaughlin, K. A. (2011). Kaizen method for esophagectomy patients: improved quality control, outcomes, and decreased costs. *The Annals of thoracic surgery*, 91(4), 1011-1018.

Ieraci, S., Digiusto, E., Sonntag, P., Dann, L., & Fox, D. (2008). Streaming by case complexity: evaluation of a model for emergency department fast track. *Emergency Medicine Australasia*, 20(3), 241-249.

Ijaz, S., & Vitalis, A. (2011). Resistance to organizational change: Putting the jigsaw together. *International review of business research papers*, 7(3), 112-121.

Institute for Healthcare Improvement (2005). *Going Lean in Health Care*. IHI Innovation Series white paper. Cambridge, MA. (Available on www.IHI.org).

Isaac-Renton, J. L., Chang, Y., Prystajek, N., Petric, M., Mak, A., Abbott, B., ... & Stott, J. (2012). Use of Lean response to improve pandemic influenza surge in public health laboratories. *Emerging infectious diseases*, 18(1), 57.

Isaacs, A. A., & Hellenberg, D. A. (2009). Implementing a structured triage system at a community health centre using Kaizen. *South African Family Practice*, 51(6).

Jacobson, G. H., McCoin, N. S., Lescallete, R., Russ, S., & Slovis, C. M. (2009). Kaizen: a method of process improvement in the emergency department. *Academic emergency medicine*, 16(12), 1341-1349.

Jesal S. (2016). 6 Wonderful Lean Manufacturing Tools and Techniques (Latest). Retrieved on 15th March, 2017 - <https://www.educba.com/lean-manufacturing-tools-techniques/>.

Jim C. (2015). Lean Manufacturing Tool: Just – In- Time. Retrieved on 15th March, 2017- <http://www.planettogether.com/blog/lean-manufacturing-tools-just-in-time>.

Johnson, A., & Jobson, T. (2013). Swedish healthcare lean (ing) towards efficiency-A case study of Swedish public health centres.

Johnston, M. P. (2017). Secondary data analysis: A method of which the time has come. *Qualitative and quantitative methods in libraries*, 3(3), 619-626.

Joosten T., Bongers I. and Janssen R. (2009). Application of lean thinking to health care: Issues and observations. *International Journal for Quality in Health Care*, Vol. 21, No. 5, pp. 341–347.

Junge, K. Kelleher, J. Hadjivassiliou, K. (2006) Think Paper 1: What is the scope for organizational change in the public-sector in Europe? *Organizational change for citizen-centric eGovernment*. Version No.

Kanter, R. M., Stein, B. A. & Jick, T. D. (1992). *The Challenge of Organizational Change*. New York: The Tree Press.

Karstoft, J., & Tarp, L. (2011). Is Lean Management implementable in a department of radiology?. *Insights into imaging*, 2(3), 267-273.

Kelly, A. M., Bryant, M., Cox, L., & Jolley, D. (2007). Improving emergency department efficiency by patient streaming to outcomes-based teams. *Australian Health Review*, 31(1), 16-21.

Kiel, L. D. (1994). *Managing chaos and complexity in government: A new paradigm for managing change, innovation, and organizational renewal*. Jossey-Bass.

KII (2015). What is the difference between Kaizen, Lean & Six Sigma? KAIZEN INSTITUTE
<https://in.kaizen.com/blog/post/2015/09/11/what-is-the-difference-between-kaizen-lean--six-sigma.html>

Kim, C. S., Hayman, J. A., Billi, J. E., Lash, K., & Lawrence, T. S. (2007). The application of lean thinking to the care of patients with bone and brain metastasis with radiation therapy. *Journal of Oncology Practice*, 3(4), 189-193.

Kim, C. S., Spahlinger, D. A., Kin, J. M., & Billi, J. E. (2006). Lean health care: what can hospitals learn from a world-class automaker?. *Journal of Hospital Medicine*, 1(3), 191-199.

Kollberg, B., Dahlgaard, J. J., & Brehmer, P. O. (2006). Measuring lean initiatives in health care services: issues and findings. *International Journal of Productivity and Performance Management*, 56(1), 7-24.

Kotter, J. P. (1995). Leading change: Why transformation efforts fail. *Harvard Business Review*, No. 73(2).

Kotter, J.P. (1996). *Leading change*. Boston: Harvard Business School Press.

Kotter, J.P. (2013). *Leading Change, With a New Preface the Author*. Harvard Business School Press.

Kotter, J.P., and Schlesinger, L.A. (2008). *Choosing Strategies for Change*. Harvard Business Review.

Krafcik, J. (1988). Triumph of the lean production system. *Sloan Management Review*, Fall, pp. 41-52.

Krijnen, A. (2007). *The Toyota way: 14 management principles from the world's greatest manufacturer*.

Krishnan, V., & Parveen, C. M. (2013, July). Comparative study of lean manufacturing tools used in manufacturing firms and service sector. In *Proceedings of the World Congress on Engineering* (Vol. 1, pp. 3-5).

Kritsonis, A. (2005). Comparison of change theories. *International journal of scholarly academic intellectual diversity*, 8(1), 1-7.

- Leite, H. D. R., & Vieira, G. E. (2015). Lean philosophy and its applications in the service industry: a review of the current knowledge. *Production*, 25(3), 529-541.
- Lewis, L (2001). *Organizational Change: Creating Change Through Strategic Communication*. John Wiley & Sons
- Liker, J., & Rother, M. (2011). Why lean programs fail. Knowledge Center of Lean Enter
- Liker, J.K. (2003). *The Toyota Way - 14 Management Principles from the World's Greatest Manufacturer*.
- Lodge, A., & Bamford, D. (2008). New development: using lean techniques to reduce radiology waiting times. *Public Money and Management*, 28(1), 49-52.
- Luthans, F., Avolio, B. J., Avey, J. B., & Norman, S. M. (2007). Positive psychological capital: Measurement and relationship with performance and satisfaction. *Personnel psychology*, 60(3), 541-572.
- Madsen, S. R., Miller, D., & John, C. R. (2005). Readiness for organizational change: Do organizational commitment and social relationships in the workplace make a difference?. *Human Resource Development Quarterly*, 16(2), 213.
- Maier-Sperdelozzi, V., Thompson, A., Hossfield, P., & Abby, S. (2006). Applying Lean Principles to a Continuing Care Patient Discharge Process. In 18th Annual Society for Health Systems Conference.
- Manos, T. (2006). Value stream mapping-an introduction. *Quality Progress*, 39(6), 64.
- Martin, K., & Osterling, M. (2012). *Metrics-based process mapping: identifying and eliminating waste in office and service processes*. CRC Press.
- Mathew, G., Sulphey, M. M., & Rajasekar, S. (2014). Organizational performance and readiness for change in public-sector undertakings. *African Journal of Business Management*, 8(19), 852.
- Mayatra, M., Chauhan, M. N., & Trivedi, M. P.(2015) A literature review on implementation of Lean Manufacturing Techniques. *International Journal Of Advance Research, Ideas And Innovations In Technology Of Fac*.

Mazzocato, P., Holden, R. J., Brommels, M., Aronsson, H., Bäckman, U., Elg, M., & Thor, J. (2012). How does lean work in emergency care? A case study of a lean-inspired intervention at the Astrid Lindgren Children's hospital, Stockholm, Sweden. *BMC health services research*, 12(1), 28.

Mazzocato, P., Savage, C., Brommels, M., Aronsson, H., & Thor, J. (2010). Lean thinking in healthcare: a realist review of the literature. *Quality and Safety in Health Care*, 19(5), 376-382.

Melchor, O. H. (2008). *Managing Change I OECD Governments: An Introductory Frame Work*. OECD Working Paper on Public Governance NO. 12.

Mills, J. H, Mill, J. A, & Dye K. (2008). *Understanding Organizational Change*. Routledg.

Minukas M. and Ulosevich, (2015). 5 Barriers to Lean in Government. Learn Enterprise Institute. Retrieved on 15/12/2017
<https://www.lean.org/LeanPost/Posting.cfm?LeanPostId=393>.

Monden, Y. (1983). *The Toyota Production System*. Productivity Press, Portland, OR.

Mostafa, S., Dumrak, J., & Soltan, H. (2013). A framework for lean manufacturing implementation. *Production & Manufacturing Research*, 1(1), 44-64.

Newell, T. L., Steinmetz-Malato, L. L., & Van Dyke, D. L. (2011). Applying Toyota production system techniques for medication delivery: improving hospital safety and efficiency. *Journal for Healthcare Quality*, 33(2), 15-22.

Newton, R. (2007). *Managing Change Step by Step: all you need to build a plan and make it happen*. Harlow: Pearson Prentice Hall Business.

Ng, D., Vail, G., Thomas, S., & Schmidt, N. (2010). Applying the Lean principles of the Toyota Production System to reduce wait times in the emergency department. *Canadian Journal of Emergency Medicine*, 12(1), 50-57.

Obudo, D. M. (2015). Factors Influencing Management of Change In Public-sector In Kenya. *Strategic Journal of Business & Change Management*, 2(1).

O'Connor, C. A. (1993). Resistance: The repercussions of change. *Leadership & Organization Development Journal*, 14(6), 30-36.

Office of the Commissioner for Public Employment-OCPE, (2012). Change Management in the NTPS: Better Practice Guide, a Guide for Managers. Northern Territory Government. Retrieved on 14th November, 2016-

[https://ocpe.nt.gov.au/data/assets/pdf_file/0007/245527/CHANGE MANAGEMENT IN THE NTPS Better Practice Guide FINAL.pdf](https://ocpe.nt.gov.au/data/assets/pdf_file/0007/245527/CHANGE_MANAGEMENT_IN_THE_NTPS_Better_Practice_Guide_FINAL.pdf).

Ohno, T. (1988). The Toyota Production System: Beyond Large-Scale Production. Productivity.

Pandya, V. P., Patel, U. V., Kanabar, B. R., Joshi, I. V., & Kadri, A. M. (2015). Evaluation of implementation of “5S Campaign” in urban health center run by municipal corporation, Gujarat, India. *Int J Community Med Public Health*, 2(3), 217-222.

Park, SH. (2003). Six Sigma for Quality and Production Promotion. Tokyo: Lean Sigma Institute, Asian Productivity Organization.

Patange V. C (2013). 12 Essential Lean concepts and tools. Retrieved on 15th March, 2017 - <http://www.processexcellencenetwork.com/lean-six-sigma-business-transformation/articles/12-essential-lean-concepts-and-tools>.

Persoon, T. J., Zaleski, S., & Frerichs, J. (2006). Improving preanalytic processes using the principles of lean production (Toyota Production System). *American journal of clinical pathology*, 125(1), 16-25.

Piercy, N., Phillips, W. and Lewis, M. (2012) Change management in the public-sector: The use of cross-functional teams. *Production, Planning and Control*. pp. 1-12. ISSN 0953-7287.

Pieterse, J. H., Caniëls, M. C., & Homan, T. (2012). Professional discourses and resistance to change. *Journal of Organizational Change Management*, 25(6), 798-818.

Poksinska, B. (2010). The current state of Lean implementation in health care: literature review. *Quality Management in Healthcare*, 19(4), 319-329.

Price, M., Mores, W., & Elliotte, H. M. (2011). Building high performance government through Lean Six Sigma: A leader's guide to creating speed, agility, and efficiency. McGraw Hill Professional.

Prochaska, J. O., & Velicer, W. F. (1997). The transtheoretical model of health behavior change. *American journal of health promotion*, 12(1), 38-48.

- Prochaska, J. O., Velicer, W. F., Rossi, J. S., Goldstein, M. G., Marcus, B. H., Rakowski, W., ... & Rossi, S. R. (1994). Stages of change and decisional balance for 12 problem behaviors. *Health psychology*, 13(1), 39.
- Radnor, Z. (2010). Transferring lean into government. *Journal of Manufacturing Technology Management*, 21(3), 411-428.
- Radnor, Z. J., Holweg, M., & Waring, J. (2012). Lean in healthcare: the unfilled promise? *Social science & medicine*, 74(3), 364-371.
- Radnor, Z. (2011), "Implementing lean in health care: making the link between the approach, readiness and sustainability", *International Journal of Industrial Engineering and Management*, Vol. 2 No. 1, pp. 1-12.
- Radnor, Z., & Walley, P. (2008). Learning to walk before we try to run: adapting lean for the public-sector. *Public money and management*, 28(1), 13-20.
- Rafferty, A.E. & Simons, R.H. 2006, "An Examination of the Antecedents of Readiness for Fine-Tuning and Corporate Transformation Changes", *Journal of Business and Psychology*, vol. 20, no. 3, pp. 325.
- Rahbek Gjerdrum Pedersen, E., & Huniche, M. (2011). Negotiating lean: the fluidity and solidity of new management technologies in the Danish public-sector. *International Journal of Productivity and performance management*, 60(6), 550-566.
- Robbins, S.P. (1998). *Organizational behaviour* (8th Edn.). Englewood Cliffs, New Jersey: Prentice Hall.
- Robinson, S., Radnor, Z. J., Burgess, N., & Worthington, C. (2012). SimLean: Utilising simulation in the implementation of lean in healthcare. *European Journal of Operational Research*, 219(1), 188-197.
- Rooney, S. A., & Rooney, J. J. (2005). Lean glossary. *Quality Progress*, 38(6), 41-47.
- Rosenberg, S., & Mosca, J. (2011). Breaking down the barriers to organizational change. *International Journal of Management and Information Systems*, 15(3), 139.

Rouse, M. 2009. Organizational Change Management (OCM). An article about the definition of OCM. Retrieved on 13th November, 2016 at -

<http://searchcio.techtarget.com/definition/organizational-change-management-OCM>.

Rutledge, J., Xu, M., & Simpson, J. (2010). Application of the Toyota Production System improves core laboratory operations. *American Journal of Clinical Pathology*, 133(1), 24-31.

Salah, S., Rahim, A., & Carretero, J. A. (2010). The integration of Six Sigma and lean management. *International Journal of Lean Six Sigma*, 1(3), 249-274.

Sande, O. A., Walela, K. B., & Wamukoya, O. (2015). Change management and performance of public secondary schools in Siaya subcounty. *International journal of scientific & technology*, 4(4), 162-174.

Sarantakos, S. (2005). *Social research* (3rd Edn.). New York: Palgrave Macmillan.

Sarkar, D. (2009). Challenges of Service Lean Implementation. *Six Sigma IQ*, Retrieved on 3rd December, 2016 <http://www.processexcellencenetwork.com/lean-six-sigma-business-transformation/columns/challenges-of-service-lean-implementation>.

Scherrer-Rathje, M., Boyle, T. A., & Deflorin, P. (2009). Lean, take two! Reflections from the second attempt at lean implementation. *Business horizons*, 52(1), 79-88.

Schiele, J. J., & McCue, C. P. (2011). Lean thinking and its implications for public procurement: Moving forward with assessment and implementation. *Journal of Public Procurement*, 11(2), 206.

Schonberger, R. J. (1982). Some observations on the advantages and implementation issues of just-in-time production systems. *Journal of Operations Management*, 3(1), 1-11.

Schroer, B. J., Black, J. T., & Zhang, S. X. (1985). Just-In-Time (JIT), with Kanban, manufacturing system simulation on a microcomputer. *Simulation*, 45(2), 62-70.

Schwarz, P., Pannes, K. D., Nathan, M., Reimer, H. J., Kleespies, A., Kuhn, N., ... & Zügel, N. P. (2011). Lean processes for optimizing OR capacity utilization: prospective analysis before and after implementation of value stream mapping (VSM). *Langenbeck's archives of surgery*, 396(7), 1047-1053.

- Self, D. R. (2007). Organizational change-overcoming resistance by creating readiness. *Development and Learning in Organizations: An International Journal*, 21(5), 11-13.
- Shah, R., & Ward, P. T. (2007). Defining and developing measures of lean production. *Journal of operations management*, 25(4), 785-805.
- Shazali, N. A., Habidin, N. F., Ali, N., Khaidir, N. A., & Jamaludin, N. H. (2013). Lean healthcare practice and healthcare performance in Malaysian healthcare industry. *International Journal of Scientific and Research Publications*, 3(1), 1-5.
- Shingo, S., & Dillon, A. P. (1989). *A study of the Toyota production system: From an Industrial Engineering Viewpoint*. CRC Press.
- Slack, N., Chambers, S., & Johnston, R. (2010). *Operations management*. Pearson education.
- Smith, G., Poteat-Godwin, A., Harrison, L. M., & Randolph, G. D. (2012). Applying Lean principles and Kaizen rapid improvement events in public health practice. *Journal of Public Health Management and Practice*, 18(1), 52-54.
- Smollan, R. (2011). Engaging with resistance to change. *University of Auckland Business Review*, 13(1), 12.
- Spear, S. J. (2005). Fixing health care from the inside, today. *Harvard business review*, 83(9), 78.
- Spear, S., & Bowen, H. K. (1999). Decoding the DNA of the Toyota production system. *Harvard business review*, 77(5), 96-106.
- Stanković, A. (2008). Developing a Lean consciousness for the clinical laboratory. *Journal of Medical Biochemistry*, 27(3), 354-359.
- Stephen B. (2001). *Map, Measure & Improve: 3 Types of Flowcharts for Process Mapping*. Retrieved on 15th March, 2017 - <http://www.processexcellencenetwork.com/lean-six-sigma-business-transformation/articles/process-mapping-with-flowcharts>.
- Strauss S., (2015). Top 7 Reasons Why Organizational Change Fails. TINYpulse Retrieved on 15th November, 2016 at <https://www.tinypulse.com/blog/top-7-reasons-why-organizational-change-fails>.

Strauss Steve, (2015). Top 7 Reasons Why Organizational Change Fails. TINYpulse. Retrieved on 16th November, 2016 at <https://www.tinypulse.com/blog/top-7-reasons-why-organizational-change-fails>.

Suarez Barraza, M. F., Smith, T., & Mi Dahlgaard-Park, S. (2009). Lean-kaizen public service: an empirical approach in Spanish local governments. *The TQM Journal*, 21(2), 143-167.

Sugimori, Y., Kusunoki, K., Cho, F., and Uchikawa, S. (1977). Toyota production system and Kanban system: Materialization of just in time and respect for human system. *International Journal of Production Research*, Vol. 15, No. 6, pp. 553-564.

Sundareshan, S. D., & Swamy, D. R. (2015). A Literature Review on Lean Implementations—A comprehensive summary. *International Journal of Engineering Research and Applications*, 5(11), 73-81.

Sutevski D. (2009). 28 Factors or Causes Of Resistance To Change: Use These 28 Possible Sources of Resistance to Change to Prepare your Company for Smooth Implementation of the Change Process. Retrieved on 7th January, 2017-
<http://www.entrepreneurshipinbox.com/223/factors-that-causes-resistance-to-organizational-change/>.

Thomas, D. R. (2006). A general inductive approach for analyzing qualitative evaluation data. *American journal of evaluation*, 27(2), 237-246.

Thomas, R., & Hardy, C. (2011). Reframing resistance to organizational change. *Scandinavian Journal of Management*, 27(3), 322-331.

Tichy, N. M. (1983). *Managing strategic change: Technical, political, and cultural dynamics* (Vol. 3). John Wiley & Sons.

Todnem By, R. (2005). Organizational change management: A critical review. *Journal of change management*, 5(4), 369-380.

Todnem By, R. (2007). Ready or not.... *Journal of Change Management*, 7(1), 3-11.

Tongco, M. D. C. (2007). Purposive sampling as a tool for informant selection. *Ethnobotany Research and applications*, 5, 147-158.

Toussaint, J. S., & Berry, L. L. (2013). The promise of Lean in health care. In Mayo Clinic Proceedings (Vol. 88, No. 1, pp. 74-82). Elsevier.

Toyota Way (2001). Corporate Philosophy. Retrieved on 2nd December, 2016-
http://www.toyotaglobal.com/company/history_of_toyota/75years/data/conditions/philosophy/toyotaway2001.html.

Trilling, L., Pellet, B., Delacroix, S., Colella-Fleury, H., & Marcon, E. (2010, February). Improving care efficiency in a radiotherapy center using Lean philosophy: A case study of the proton therapy center of Institut Curie—Orsay. In Health Care Management (WHCM), 2010 IEEE Workshop on (pp. 1-6). IEEE.

Van de van, A. H. and Phole, M. S. (2004). Handbook of Organizational Change and Innovation. Oxford University Press.

Van Tonder, C.L. 2004. Organizational change: Theory and practice. Pretoria. Van Schaik.

Victorian Public-Sector Commission, (2015). Dealing with Resistance to Organizational Change. Retrieved on 13th November, 2016 at <http://vpsc.vic.gov.au/html-resources/organisational-change/dealing-with-resistance-to-organisational-change/>.

Voet, J. V. (2014). The effectiveness and specificity of change management in a public organization: Transformational leadership and a bureaucratic organizational structure. European Management Journal, Volume 32(Issue 3), 373-528.

Waring, J. J., & Bishop, S. (2010). Lean healthcare: rhetoric, ritual and resistance. Social science & medicine, 71(7), 1332-1340.

Watson, T. (1982). Group ideologies and organizational change. Journal of Management Studies, 7P (3), 259-275.

Wennecke, G. (2008). Kaizen--LEAN in a week: how to implement improvements in healthcare settings within a week. MLO: medical laboratory observer, 40(8), 28-30.

White, M. D., & Marsh, E. E. (2006). Content analysis: A flexible methodology. Library trends, 55(1), 22-45.

Willcocks, L. P., & Mason, D. (1987). Computerizing work: People, systems design and workplace relations. Paradigm.

Womack, J. P. and Jones, D. T. (2003), Lean thinking: banish waste and create wealth.

Womack, J. P., Jones, D. T., Roos, D. (1990). The machine that changed the world. New York: Rawcon Associates.

Young, F. Y. (2014). The Use of 5S in Healthcare Services: a Literature Review. International Journal of Business and Social Science, 5(10).

Yu, Q., & Yang, K. (2008). Hospital registration waiting time reduction through process redesign. International Journal of Six Sigma and Competitive Advantage, 4(3), 240-253.