

An Assessment of the Practicability of Lean Accounting in Healthcare Sector: Evidence from Anambra State, Nigeria.

Iliemena, Rachael O.

Department of Accountancy, Nnamdi Azikiwe University, Awka, Anambra State.
State.r.iliemena@unizik.edu.ng

Goodluck,

Happiness Chibuzor Department of Banking and Finance, Federal Polytechnic Oko, Anambra State
hapichibuzor@gmail.com

Amedu,

Jimoh Michael Department of Accountancy, Edo State Polytechnic Usen, Edo State
Amedu.jm@esitmusen.edu.ng

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Abstract

The search for new accounting paradigms has led to important discoveries in applied research and several accounting methods. This study is a review of the practicability of lean accounting in the Nigerian health care sector and the challenges to the adoption of lean implementation assessment as management control technique. The problem of this research is centered on the scarcity of extant literature on the subject area in the face of recent and constantly growing need for lean accounting and lean management. Again, the ambiguous notion of lean being strictly meant for the manufacturing (automobile industry) pose a serious threat. Primary data were generated with structured questionnaires administered to the top managers and accounting staff in the selected healthcare systems within Anambra state, Nigeria. Karl Pearson product moment correlation coefficient and Analysis of variance (ANOVA) was used to test the Null hypotheses at 5% level of significance. Findings show among others; that lean accounting practices yield profit maximization and that lean accounting can be effectively applied in the healthcare services of Anambra state. The study recommends that Healthcare organizations implement lean accounting and accounting staff, directors and top managers be trained to get acquainted with lean accounting and implementation techniques so as to get them well informed on Lean accounting issues and practices.

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I. INTRODUCTION

The motive for the introduction of lean management system generally include the need

to increase productivity, reduce cost and waste, increase flexibility, create more value for consumer, increased results, cash flows and the simplification of management and accounting

process. It is advancement in cost reduction techniques which operates to eliminate wastage of resources. Lean accounting does not require the traditional management accounting methods like standard costing, budgeting, through-put accounting, back-flush accounting, cost plus pricing and financial reports. Until 2006, the methods of lean accounting were not clearly defined because they had been developed by different companies. Lean accounting is an offshoot of lean manufacturing that seeks to eliminate waste from a company's capital resources by applying lean manufacturing principle to the company's financial functions[3]. Lean accounting is sometimes written to have originated from Toyota production system whose initial development was undertaken by Taiichi Ohno and Shigeo Shingo[18].

The need for continuous improvement in healthcare system has risen to the need for adoption of lean accounting system recently. The application of lean thinking in health care lies in eliminating waits times, repeat visits, errors and inappropriate procedures on patients[23] (customers). As an organization becomes more mature with lean thinking and methods, they recognize that the combined methods of lean accounting creates a lean management system designed to provide the planning, operational and financial reporting and motivation for change required to prosper the company's on-going lean transformation[12].

Although recently journals and conferences have published works with focus on lean accounting practice and education. It is however noted that the success of the lean transformation depends on them being applied to the entire sector of the economy which includes the healthcare sector. Lean accounting remains a relatively new concept in Anambra state healthcare sector. Although it was adopted in 2014 generally to be used in healthcare system, Educational system and manufacturing companies. But most healthcare system operators and workers since 2014 to date seem to have little or no knowledge of it. Even those that have the knowledge may

not want to apply it due to poor understanding of its overall practicability and benefits. The primary objective of this study is to assess the practicability of lean accounting in healthcare systems. Specifically, the study aimed to;

- i. Assess the relationship between lean accounting and profit maximization in health care sector.
- ii. Ascertain the extent to which lean accounting techniques can be effectively applied in healthcare services.
- iii. Examine the extent to which cultural and technical factors affect the effective adoption of lean accounting in the health care sector.

1.2. Research Questions

The study sought to answer the following questions:

- i. What is the relationship between lean management and profit maximization in the healthcare sector?
- ii. To what extent can lean accounting techniques be effectively applied in healthcare services?
- iii. To what extent do cultural and technical factors affect the effective adoption of lean management in the healthcare sector?

II. LITERATURE REVIEW

Conceptual framework

A. Concept of Lean Accounting

The name "lean" was coined to describe Toyota business during the late 1980s by a research team headed by Jim Womack, PhD, at MIT'S International motor vehicle program[21]. The purpose of lean accounting is to support the lean enterprise as a business strategy, which seeks to move from traditional accounting methods to a system that measure and motivate excellent

business practices in the lean enterprise meaning that it breaks the rules of traditional accounting and management methods that is based on mass production thinking to lean thinking [7]. Lean accounting motivates long term lean improvement through lean focused information and measurement [11]. Lean accounting helps clear strategy for using their newly acquired lean skills to benefit the company financially and non-financially [11]. Lean accounting is however different from the standard costing system even though standard costing is seen as one of the ways to cut down production cost in manufacturing concerns [9]

Lean Accounting on its own is a general term used for the change required to companies accounting, control, measurement and management process to support lean operations and lean thinking. Accounting as a primary source for decision making is crucial for the success of lean transformation process thus raising the need for lean accounting [13]. Lean accounting techniques emerged from the United States in Japan [19].

For the purpose of this study, Lean management refers to the management system of applying Lean principles to operations by adopting lean implementation, and Lean Accounting refers to attempts to derive monetary management information based on Lean principles and service values.

B. Benefits of Lean Accounting.

Most establishments are ignorant of the fact that lean accounting saves cost and control series of operational costs. In a system where lean is in practice, activity time is maximized while each stage of its practice highlights the value being created by the particular activity. The management of companies is deeply embedded in the company processes that the practice of lean accounting allows mastery of the organizational goal-process, thus, leaves management with emphases on relevant activities. The adoption of lean practices brings processes under control operationally and

eliminates most of the traditional accounting and control system transactions requirements [11]. Lean accounting provides accurate, timely and understandable information to motivate the lean transformation throughout the organization and for decision making [4]. Lean accounting lead to increase customer value, growth, profitability and cash flow. It eliminates waste from the accounting process while maintaining thorough financial control [4]. Lean accounting motivates long term lean improvement through lean focused information and measurement [11]. It is further asserted that Lean accounting helps clear strategy for using their newly acquired lean skills to benefit the company financially and non-financially.

C. Lean Accounting practicability in healthcare sector

There has been a misconception that lean accounting practices can only be applied in the manufacturing sectors. Lean accounting can be used operationally by managers to focus on removing waste, reducing throughput cycle time, and improving productivity [24]. Lean is a system that is suitably designed for every type of business both manufacturing and service industries. Even though it is not aimed at cost reduction, it is a way to save time, achieve efficiency while simultaneously simplifying the accounting system and process. Lean treatment is a system of techniques and activities for running the healthcare services and operations moving from an old way of thinking to lean thinking. Different organizations that have adopted lean sometimes customize the system with specific names and applications that suit their organization. The techniques and activities differ according to the application at hand but they have the same underlying principles; the elimination of all none value adding activities and waste from businesses [20], whether healthcare sector, manufacturing sector or any other. It is therefore a system which can be generally applied to any industry or sector without a diminishing effect on the accruing benefits. These industries may stem from private and public organization, institutions, firms,

groups, states or individuals. Lean companies cannot neglect the legally mandatory set of financial statements but may look for an accounting system that is capable of measuring operational improvements and allows the company to keep operational and financial control of the business [16]. Lean implementation has been seen to be successful where there are blueprint tools and strategies for successful implementation before adoption. These as pointed out by Lean Enterprise Inc. [20] can be established through the purpose, process and people determination process. Lean implementation makes lean accounting practicable. We developed the model in fig 1 as the practicable model for implementation of lean and the follow-up accounting in healthcare sector. Lean implementation in healthcare sector can take the steps as inundated in fig 1. These are discussed below;

Purpose: What patient problem will the healthcare provider solve to achieve its own purpose of prospering? This is by way of carrying out patient diagnoses, and carrying out laboratory tests where necessary to identify the specific problem that needs to be solved to achieve the corporate objective. This is indicated in the model in fig 1. When problem identification is adopted as the first step to patient administration, service time will be reduced, it will zero opportunity for trial-and-error, thereby prevent wastage of scarce resources. Purpose driven service leads to successful patient administration.

Process: How will the healthcare provider access each major value stream to make sure each step to patient administration is valuable, capable, available, flexible and that all steps to patient treatment are linked by flow and pull. When purpose is known, there is then the need to evaluate the entire system to the patient treatment to figure out activities which make patients spend longer time before assessing each valuable process. This will lead to eliminating identifiable non-value adding activities and processes (see fig. 1). In Chukwuemeka Odumegwu Ojukwu University

Teaching Hospital Awka, for instance, patients claimed they spend upto 4 – 7hrs trying to assess health services while most of their time are wasted in wait and other non-value adding activities. This is however noted to be shorter in privately owned hospitals (2 – 4). This is where lean becomes very useful by eliminating non-value adding activities as delay in health care administration can lead to loss of patient (death, patronage, income or reputation).

People: How can the healthcare organization ensure that every important process to patient treatment has someone responsible for continually evaluating that value stream in terms of purpose of the healthcare services and lean process? At this stage there is need for internal control systems which when installed enhances tracking each patient's movement through the processes. This could be by assignment of Monitors to continually assess the administration processes, time, effectiveness and necessarily the capability of the responsible staff to properly deliver without compromising either the organizational objective or the purpose of the patient administration as established in the purpose. Re- evaluation of processes will enhance greatly in measuring efficiency and effectiveness [see fig 1]. It will help to identify deviations from purpose, avoid process abuse and unnecessary duplication of administration and processes. There is also need to institute penalties for the people handling each process where inadequacy is identified. However, staff training is a prerequisite to better intimate and educate staff on the modalities of lean practice and thinking (fig 1).

D. Lean implementation in Nigerian Healthcare sector

The Nigerian health care sector is structured in such a way that patients are not properly attended to. Patients sometimes spend hours in the hospitals in wait for their health care givers. This is mostly obtainable in government general hospitals which are known for patient mismanagement. Uncountable numbers of lives are lost in Nigerian general hospitals annually, with most deaths occurring in the process of

waiting to get medical attention. Even the departmental arrangements and distances between offices make it almost impossible for follow-ups to know what happens to a patient after medical services have been administered to the patient who is also the customer. Patient satisfaction is supposed to be the key component in healthcare management but profit. It is very necessary for structural adjustment to accommodate lean accounting which will enable the simplification of patient process and care administration, reduce patient wait time by understanding what adds value and eliminating wastes. Lean adoption involves having multi-skilled teams taking care of the patient and an active involvement of the patient in the process [21]. This will not only save patients life but doctors and patients wait time will be entirely eliminated.

The adoption and implementation of lean accounting involves the following steps as accentuated by [17] ;

4.

1. Conducting lean training: Here the basic lean principles, methods and tools are inculcated. The basic idea will be to facilitate widespread use of lean tools and to create a base for initial practical work for those trained in lean will train others and that training will gradually disseminate across the organization.
2. Initiating pilot projects: it involves testing and initiating some pilot projects using lean tools and methods. The idea is to let people try the ideas in organization and create some quick results. The primary focus of pilot project was to engage frontline staff in indentifying problems and to involve them in the improvement of work.
3. Implementing the changes: This is all about driving the change process which is the outcome of step 2 to fully involve the employees. This stage is also a problem solving stage which is referred to the Rapid Improvement Event (RIE).

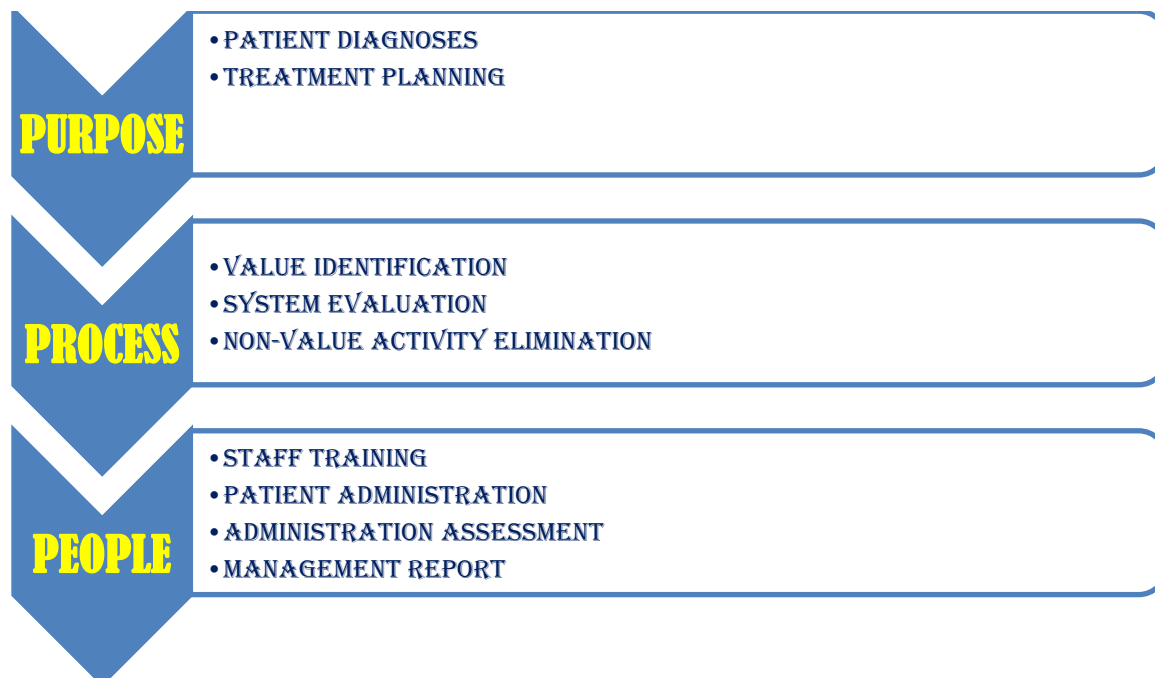


Fig 1: Rachael's Health care Lean-implementation model

E. Lean accounting application in healthcare

The implementation of lean reduces available work to the barest minimum. Activities which could have taken hours to execute are found to consume less time than without lean, this also minimizes the accounting process and makes the accounting work. Lean accounting process begins with recording of value-adding services and the financial quantification. These records of services at every stage of the health care are pooled together to provide managers with decision oriented information regarding the organizational performance. Lean accounting is however, different from the conventional accounting process as it does not include time wasted in non-value activities in the accounting process. Example, if a patient spent 7 hours in the hospital in attempt to assess healthcare. In lean implementation, standard time would have already been set for each process. Now, assuming the service process for the particular problem were three different consultations. This can be hastened by allowing the three consultants administer their treatmentssimultaneously, this will make the actual time utilized in patient administration to come down to 2hrs, eliminating queue time and wait time. As the Heath care givers would be paid based on number of patients and patient hour, they would certainly work efficiently to attend to more patients within the shortest of time. The lean accounting system would only capture the 2hrs actually utilized in patient treatment as the productive time for both income purposes and staff benefits, while the 5hrs will not be captured. The essence of internal control system here would be to eliminate the 5hrs wasted time as this could lead to losses (patient death, bad publicity etc). The emphasis lies on total time it takes to complete administration and the effectiveness of the process administered. Lean accounting can follow through these stages; the entire activities are analyzed to be sorted into value and non-value adding activities, accounting emphasizes are placed on quantifying the value adding activities, services not relevant for financial reporting are extracted

from the accounting system while the remaining activities should be standardized to ensure continuous and uniform flow of the accounting system. Health care givers using lean practices can develop customized accounting reports while success is measured with lean parameters.

Theoretical framework

This study is anchored on the **theory of constraints**. The theory of organizational constraints [1] refers to an organizational approach to change focusing on the optimization of profits. According to the proponents of the theory, each organization inevitably faces at least one constraint in its quest for improving its profitability. Applying this theory to this study, we view the organization as informed on the benefits of lean accounting but certain constraints exist which prevent the organizations from the adoption and implementation of lean accounting which will ultimately lead to higher profits. These constraints may include lack of genuine knowledge and initiative to understand the relationship between the effectiveness of lean management and the potential factors that may hamper this process, and internal factors as well as externally generated constraints, including non-production constraints such as market demand and the ability of the Internal team to translate market information into an organizational return [5], [10]. Therefore, as employees seek to improve the overall profitability of a firm through lean management and accounting, they should remain aware of the potential challenges that may limit their success [6].

Empirical Studies

Ref[1] discussed the current state of implementing lean production in healthcare. His study focused on lean definition in healthcare, implementation process, barriers, challenges, enablers and outcomes of implementing lean production methods in healthcare .A comprehensive search of the literature concerning the implementation of lean production in healthcare was used to generate a

synthesis of the literature around the chosen research questions. The findings was that lean production in healthcare mostly used as a process improvement approach focuses on three main area: defining value from the patient point of view, mapping value streams and eliminating waste in an attempt to create continuous flows.

Ref [8] evaluated the application of lean accounting on the health care system of Nigeria and to find out if there are factors militating on the application of lean accounting in health care services.. The researcher made use of primary data and the findings shows that the public health care system is enjoying due to the application of lean accounting in their accounting system and that cultural, organizational and technical factors are the main factor that impede the implementation of lean accounting in healthcare sectors.

Ref [16] examined how lean accounting approach is applied by a manufacturing company in their accounting system. Findings showed the state of art in costing techniques used by companies to adopt lean manufacturing practices. Ref[18] aimed to perform a literature review on lean management philosophy, identifying its main points and checking compatibility between this philosophy and management accounting models. The papers most specific goal was to identify product valuation methods and the performance assessment methods suitable for use with lean philosophy. With literature review methodology, results obtained allowed the conclusion that regarding product valuation only value stream costing follows all lean principles; product valuation using activity-based costing does not agree with lean management goals.

Ref [15] studied the application of lean manufacturing to improve the performance of health care sector in Libya saying it's a complete elimination of waste, target of any qualified system. The result achieved showed positive significant improvements in the overall performance of the system, which allowed being

more productive (generating more profits), flexible, and with high quality service.

Ref [23] see an obvious application of lean thinking in healthcare sector as eliminating delay, repeated encounters, errors and inappropriate procedures. Similarly, [2] advocates lean thinking in healthcare giving with an example of how lean management principles can be applied to health care process through the use of the six sigma methodology which in many ways resemble the lean production techniques .Several case stories on lean thinking initiatives in healthcare sector can be found in [14]. In a recent publication by the institute of healthcare improvement, two health care organizations in the US showed positive impact on productivity, profitability, cost, quality and timely delivery of services after having applied lean principles throughout the measuring of lean initiative organization. [21] advocate the application of lean thinking in the medical systems. They argue that the first step in implementing lean thinking in medical care is to put the patient in the foreground and include to me and comfort as key performance measures of the system.

Summary of Literature/Gap

At the end of the literature review, the researcher was able to identify that about 90% of studies on lean accounting practices were based on developed economies. The percentage of empirical research done in Nigeria had more emphasis on the manufacturing concerns while some of these studies are also considered out of date. The aspect of lean practices being a developing subject need to be constantly updated especially in developing countries like Nigeria; most specifically the healthcare sector where the damages and delays in processes put human lives at stake.

III.METHODOLOGY: The study adopted a simple survey research method which deals with gathering information about variables rather than information about individuals from a sample of the population. Basically, there are 229

registered healthcare systems in Anambra state from 2012-2018 as published by the Prohealth HMO Ltd Health for wealth. However due to the inability of the researchers to cover the whole registered healthcare system in Anambra, the researchers were constrained to select 17 healthcare system which formed our population and sample. Questionnaires were administered to mainly accounting staff, hospital directors and Top Managers, arranged in 5-point Resin Likert scale ranging from strongly agree (5) to strongly disagree (1). Even though some other category of

staff (Consultants) and patients were interviewed, their responses only formed further considerations for conclusion and recommendations. This is because the subject area is clearly beyond their knowledge and could be misleading to test hypotheses beyond on their responses. Inferential and descriptive statistics were adopted while Karl Pearson product moment correlation coefficient and Analysis of variance (ANOVA) were used to test the Null hypotheses at 5% level of significance.

IV. ANALYSES AND DISCUSSIONS

4.1 Data Presentation

Table 4.1. Administration of Questionnaires

S/N	Questionnaire	Frequency	Percentage (%)
1	Copies returned	60	100
2	Copies not returned	0	0
	Total	60	100

Source: Researchers' field work

This table shows the questionnaires distributed among the respondents in Anambra state, 60 Questionnaires were distributed and all were returned, this is represented in percentage as 100%.

Table 4.2 Distribution of Respondent According to Hospital Ownership structure

	Ownership	Frequency	Percentage (%)
1	PUBLIC	34	56.7
2	PRIVATE	26	43.3
	Total	60	100.0

Source: Researchers' field work and computation

Table 4.2 shows the distribution of the respondent by hospital sectors 34 is for Public sector while 26 is for private sector making a percentage of 56.7% and 43.3% .

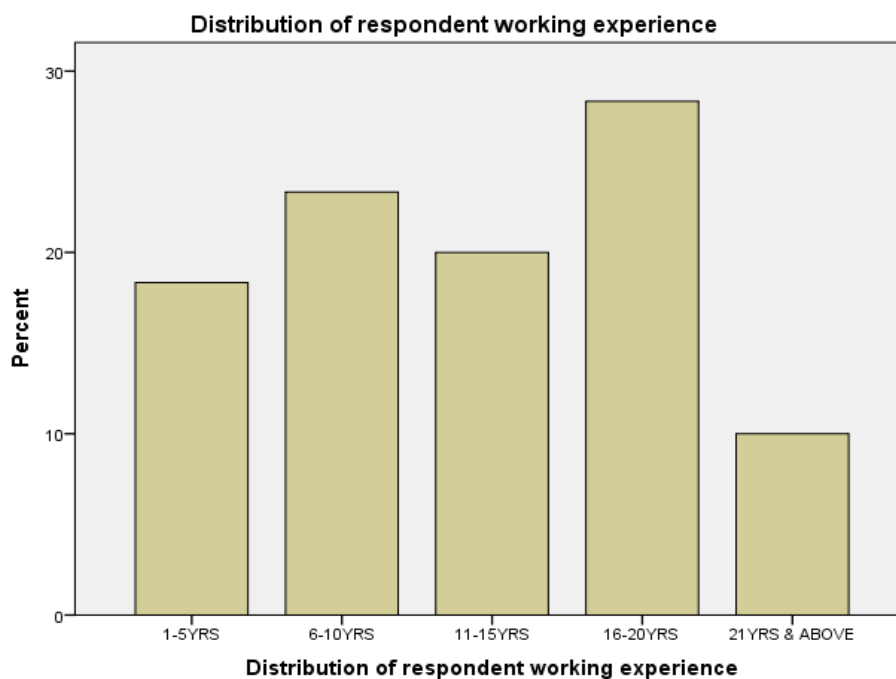


Fig.2. Distribution of respondents work experience and percentage representation

Fig 2 shows the respondent work experience for both sectors, the respondents between who have just 1-5years work experiences in their respective health institutions,both public and

private sector, formed 18.3%, 6-10 years experience formed 23.3%, 11-15 yearswork experience were 20.0%,16-20 years formed 28.3% and 21 years & above represents 10.0%.

Test of Hypotheses

Hypothesis One:

H₀: There is no significant relationship between lean accounting and profit maximization in the healthcare system of Anambra State.

Table 4.3.: Correlation Statistics between Lean Accounting and Profit Maximization of Anambra State Health Sector.

Lean Accounting	Profit Maximization
Pearson Correlation-	.646
Sig.	.009
N	60

Source: Researcher's Computation using SPSS Version-23.

Table 4.3disclosed that that there is positive significant relationship ($r = +.646$; $p = .009 < 0.05$) between lean accounting and profit maximization in Anambra State Health care sectors, and this association or relationship is

strong at 65%. We therefore, reject the null hypothesis and make inference that there is significant positive relationship between lean accounting practices and profit maximization in healthcare sector.

Hypothesis Two:

H₀: Lean accounting techniques cannot be significantly applied effectively in the Healthcare services of Anambra state.

Table 4.4: *F-Test (ANOVA) Comparison of respondents' mean ratings on effective application of lean accounting in Anambra state health care services.*

	Sum of Squares	Df	Mean Square	F	Sig.
Between Groups (Combined)	.957	1	.957	2.605	.020
Within Groups	21.296	58	.367		
Total	22.253	59			

Source: Researcher's Computation using SPSS Version-23.

Table 4.4 signifies that there is positive insignificant correlation ($r = 2.605$; $p = 0.02 < 0.05$). Consequently, the null hypothesis

(H₀) that Lean Accounting cannot be effectively applied in the Health care system of Anambra State is rejected.

Hypothesis Three:

H₀: Cultural and Technical Factors have no significant effect on the adoption of lean management in the Healthcare system of Anambra state.

Table 4.5: *Correlation Statistics between cultural and technical factors, and Lean management in Anambra State Health Sector.*

	Sum of Squares	Df	Mean Square	F	Sig
Between Groups (Combined)	.237	1	.237	.120	.731
Within Groups	114.697	58	1.978		
Total	114.933	59			

Source: Researcher's Computation using SPSS Version-23.

Table 4.5.Indicates that there is positive correlation ($r = .237$ or 23.7%) between cultural and technical factors, and lean. therefore, we accept the H₀ that Cultural and Technical factors have no Significant effect on the effective practice of Lean management in Healthcare System of Anambra State.

Results and Discussions

The results of our analyses reveal that lean accounting practice has significant positive relationship with profit maximization in

healthcare sector. In order words, the application of lean practices leads to increased performance. This is in agreement with the study of a number of researchers [23], [15]. Studies carried out by [23] investigated lean thinking in healthcare a study of two healthcare organizations in USA. They found out that the application of lean thinking in their healthcare sector has positive impact on profitability, productivity etc. similarly, [15] studied its application in Libya which showed also a positive impact on the

profits made that is productivity, flexible and a high quality of services

rendered. Furthermore, on whether it can be efficiently applied in healthcare services of Anambra State, results showed a positive significant correlation judging from the ANOVA table computed which agreed with the study of [8] being the only Nigerian researcher on the area. From his work, it was found that it can be effectively applied in public healthcare sector. Lastly, our study found that Cultural and Technical factors are not the main factors affecting the effective adoption of lean accounting in Anambra state healthcare system. This negates one of the findings of [8] that cultural and technical factors are among the factors that impede the effective implementation.

V. Conclusion and recommendations

Adoption of lean accounting in healthcare sector is highly practicable in improving profit potential, enhancing efficiency and effectiveness, and reduction of patient losses (death, patronage etc). However, lean practice is at a very minimal level in Anambra state as

revealed by our study. This study has been able to rule out the possibility of cultural and technical factors as the major impediments to lean practice in Anambra healthcare services. This may be due to other reasons which may include low awareness level as observed.

As a way forward, the Researchers' recommend that Healthcare organizations should train their accounting staff, hospital directors and top managers on the application of lean accounting practices and lean implementation strategy modeled by this work (Rachael's health care lean implementation model, fig 1). Since cultural and Technical factors are not the main factors affecting the effective adoption of Lean accounting in healthcare system, it should be cautiously applied as there maybe underlying factors which is beyond the scope of our study. Furthermore, healthcare organizations should pay more attention to reduction in patient wait time and adopt payment of caregivers based on number of patients effectively treated within a given time. Thereby, eliminate waste of limited time and material resources as a means of keying into federal government sustainable development agenda.

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Appendices

Appendix 1: List of Registered Healthcare system in Anambra state, Nigeria.

Names of Healthcare Systems in alphabetical order
Abazie hospital Nkpor.
Ace Specialist hospital Onitsha.
Anachiebe Specialist hospital and Maternity
Assumpta Clinic and Maternity Awka

Augustine Mozie hospital Ogbunike
Apex Specialist Medical Centre Uga
All saints hospital and maternity Agulu
Augustine Mozie hospital Ogbunike
Apex Specialist Medical Centre Uga
All saints hospital and maternity Agulu
Alanazunwa Tradomedical Oyi
Awka medical center Udoka housing estate
Beluchukwu Memorial hospital Nimo
Beacon hospital and Maternity Awka South
Beke Memorial hospital Nimo
Bell Lifestyle Nig.Ltd Onitsha North.
Bethsaida Specialist hospital Awka
Baba Oyo Herbal clinic Onitsha South
Bethsider hospital Nnewi
Bex Memorial hospital Ltd idemili
Chiekebe Memorial hospital Onitsha North.
Chukwunonso hospital and Maternity Nanka
Chibuzo hospital and Maternity Ekwulobia
Chinaza hospital and Maternity Nkpor
Chinaza hospital and Maternity Umuianachi
Chioma Specialist hospital and Maternity Nnewi
Christ the king specialist childrens hospital Onitsha
Cottage hospital comprehensive health centre
Chidera Model hospital Uga.
Chikason Mannion Specialist hospital and Maternity Nnewi.
Chimaobi hospital and Maternity Nnewichi
Chimex Specialist hospital Nnewichi.
Comprehensive health centre Achina.
Crown hospital Nkpor.
Dr .O .C herbal hospital and laboratory Onitsha
D Beneat Special Natural clinic and Diagnostic centre
Delta hospital and Maternity Onitsha.
Dike Medical centre Awka.
Diocesan hospital Otolo.
Divine hospital and Maternity Awka.
Di onye Memorial hospital Ekwulobia.
Dinma Specialist hospital Nnewi.
Dr. Joe Nwilo Heart center.
Egbuna Adojia hospital Onitsha
Enugu ukwu General hospital
Evolution hospital Onitsha
Ezinne hospital Onitsha
Everest hospital Onitsha
Ekwulobia general hospital
Ezirim hospital and Laboratory Obosi

Edmunds Specialist hospital Okpoko
Emelike hospital and Maternity Onitsha south
Federal Polytechnic OkoMedicialcentre.
Federal Collage of Education Technical umunzemedicialcentre
Foundation hospital and Maternity,Nnewi
First hospital and Maternity umuokpuAwka
First Graceland hospital Enugwuukwu
Felly Medicial Centre Amawbia
Federal staff clinic Awka
Felix Okolo Memorial hospital Nnewi
Faith Eye clinic
Felly Medical center AguataAnambra State
General hospital Onitsha
Gods Established Specialist hospital
God Estate Specialist hospital Onitsha
Golden Specialist hospital Onitsha
Goodnews hospital Ogbunike
Goodnews hospital and Maternity Ogbaru
Guiness Eye hospital Onitsha
Gozie specialist hospital Onitsha
Global health link international Fegge Onitsha
He Reigns clinics, Igboukwu
His Glory hospital Awka
Holy Rosary Specialist hospital Onitsha
Harmony Specialist hospital, Awka south.
Isaac Chira Memorial hospital and Maternity Awkuzu
Ivy Foundation hospital and Maternity OdumeObosi
Izunna hospital and Maternity ltd Awka
Immaculate hearts hospital and Maternity Nkpor
Immaculate hearts hospital and Maternity Idemili North
Ifebi medicinal hospital Awka North
Ifeanyichukwu Specialist hospital, Maternity and children's centre ,idemili South
Intensive care hospital, Onitsha South
Ikedife hospital Otolonnewi
In the beginning it was not so hospital, Onitsha South
Ifechukwu hospital and Maternity Onitsha
Infant Jesus hospital and children's clinic Onitsha
Infant Jesus hospital and children's clinic Onitsha North
Iyienu specialist hospitalOgidi
Jireh eye clinic Awka
Jordan hospital and maternity Onitsha
King David hospital Nise
Kanayo hospital & Maternity Onitsha south
Life specialist hospital Nnewi
Leeds hospital Onitsha
Loyolo Hospital Ozubulu

Lisdom Laboratories
Libra Medicinal Laboratory Services
Mezie specialist hospital and Maternity
MillivetMedicial Diagnostic Laboratory
Mother of Christ Specialist Medicial Laboratory
Madonna hospital Nnewi
Madonna hospital Awka
Macbeson hospital Onitsha
Mega Diagnostic Laboratory Nnewi
Mercy Specialist hospital and Maternity Onitsha North
Messiah foundation hospital and maternity
Mmaculate hearts hospital and Maternity Nkpor
Muodebe and Company limited
Menax hospital ,Onitsha North
Mezie hospital and Maternity ,Onitsha South
Mercy specialist hospital and Maternity
Madonna hospital and Maternity
Menax hospital woliwo Onitsha South
New hope hospital and laboratory Ltd
Niger Optical Services company Onitsha south
National MedicialcentreNkpologwu
New hope hospital and Dialysis ltd Onitsha South
New hope Medical centre Onitsha North
New hope hospital Onitsha
Nigerian health specialist hospital Onitsha
NnamdiAzikiwe Teaching hospital Nnewi
New era specialist hospital Nnewi
Nigerian health specialist hospital Onitsha
NnamdiAzikiwe University Medicial Center Awka
NnamdiAzikiwe University teaching hospital(NAUTH) Nnewi north
NnamdiAzikiwe university Medical center
OnyemaechiTradomedical Natural home Awada Onitsha south
Orumba general hospital EkwulobiaUmunze road
Obijacksonchildrens hospital Okija
Ogbunike Maternity Ogbunike
Ogechukwu hospital and Maternity
Ogwueleka hospital and Maternity Nnewi
Our Lady of Loudres hospital ihiala
OjioforSpecialist,Nnewi South
Obinwanne hospital and Maternity Nkpor
Ofu obi Comprehensive healthcare Nanka
Ogechukwu hospital Igboukwu
Obiomaspecialist hospital and Maternity
Odinamma hospital Nnewi
Odumegwuojukwu university teaching hospital
Oko community hospital

Okoye hospital Awka
Olyala hospital and Maternity Enugwu- ukwu
Omega physiotherapy and Back pain Clinics
Ogwueleka hospital and Maternity Nnewi-North
Okpala hospital and M aternityenugwu-ukwu
Onuora hospital and Maternity Amikwo
Peoples hospital and Maternity Onitsha
Peoples hospital and Maternity Ogbaru
Prince city hospital Ogidi
Pioneer international Specialist hospital
Paragon hospital and Maternity Onitsha South
Peoples hospital and maternity
Portion of God surgical Nig. Ventures E375 Bridge head market Onitsha
Raliance hospital and Maternity Onitsha South
Royal cross Specialist hospital and Maternity Onitsha North
Regina Ceali hospital and Maternity Awka North
Reliance hospital and Maternity Onitsha
Rise clinic Adazi-Ani
Rose of Sharon Specialist hospital Nnewichi
Rembo specialist hospital Uragu
Rock foundation hospital Awka
R.N Afunugo Memorial hospital Awka
Ralph Medical Laboratories
Royal specialist hospital idemili North
Rushgreen Maternity hospital and clinic Onitsha
Royal cross Specialist hospital and Maternity Onitsha North
St Augustines hospital Oko
St Mary hospital Ekwulobia
Saint Marys hospital Nteje
Shalom foundation specialist hospital Onitsha
Saint marys hospital Oyi
St Joseph hospital
St Micheal hospital and Maternity Obosi
St Micheal hospital and Maternity Onitsha North
St Lukes hospital, Ekwulobia
St Lukeshospital, Onitsha
St Newgatehospital, ikorodu street
St Victoria Specialist hospital Ekwulobia
St Charles Borromeo hospital Onitsha South
St Francis Specialist hospital Awkaetiti
St Annes hospital and Maternity Nkpor
St Catherine hospital and Maternity Umunze
St Lukes hospital Nnewi
St Joseph hospital AdaziNnukwu
St Fatima hospital Awka- Etiti
St Catherine hospital Ekwulobia

Silgrey Royal hospital and Maternity Awka
Salvation hospital and Maternity Onitsha
Symbol Specialist hospital Nnewi
St Basil medical Laboratories Nanka
St Lwanga hospital
St pauls University College Clinic Awka
St Augustine hospital and Maternity
St Luke hospital
St lucy hospital okpolo
St lukes hospital Nnewi
The Childrens hospital Nnewinchi
Toronto hospital limited, Onitsha North
Trinity hospital, Unubi
Trinity hospital Awka
Tiens computer lab test and computer treatment
The light specialist hospital Umudim
The childrens hospital Nnewi North
The childrens hospital
Ugochukwu hospital and Maternity Nkpor
Udechukwu Memorial hospital and Maternity Nkpor
Ukandu hospital Ekwulobia
Urban hospital and Maternity Abagana
UmuanoDebtal and Maxillo facial hospital Onitsha
Venik Specialist Hospital Onitsha North
Victory hospital
Vicdonax hospital Nnewi North
White chapel Specialist hospital and Maternity Onitsha
Zibia hospital Umunze
Zenith hospital and Maternity Ekwulobia
303 FAR MRS Onitsha
14 FER MRS Onitsha General hospital

Source: Prohealth HMO Ltd

Appendix 2: Studied healthcare systems

Chukwuemeka Odumegwu Ojukwu University Teaching hospital
Regina Ceali Specialist hospital Awka
Ifebi Medical hospital Awka
Nnamdi Azikiwe Teaching Hospital Nnewi
Christ the King hospital Awka
Rock foundation hospital Awka
Sefton Specialist Medicial Centre Awka
Bethsaida hospital Awka

Silgrey Royal hospital and Maternity Awka
R.N Afunugo Memorial hospital Awka
Symbol Specialist hospital Nnewi
King David hospital Nise
Life Specialist hospital Nnewi
Trinity hospital Awka
All Saint hospital and maternity Agulu
Madonna hospital Awka
Ikedife hospital otoloNnewi