OPERATIONS EFFICIENCY IMPROVEMENTS IN A DE-MONOPOLIZED MARKET

A Case Study at a Cement Firm in Zambia

By

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ABSTRACT

The Cement manufacturing sector in Zambia recorded operations Low overall equipment efficiency and High production cost at the time the market environment was changing from monopoly to de-monopolisation market environment. These parameters in operation excellence indicates inefficient functional level strategy operations. Thus, this study was initiated to analyse the causes for functional operations inefficiencies in order to establish ways of eliminating operations inefficiencies at functional level as well as to identify changes that needed to be made in order to create a sustainable manufacturing competitive advantage in a de-monopolised markets as opposed to continuing with inefficient monopoly practices. A case study methodology was conducted at one of the leading Cement manufacturing firm by studying systems, internal performance reports, conducting interviews and revealing published literature on the causes of inefficient operations at functional level operations strategies with a focus on Manufacturing and Marketing. Thereafter, a list of possible causes was compiled and translated into a questionnaire. The questionaire was administered in a non-probabilistic judgmental sampling format to operation strategy directors, managers and front line supervisors. A combination of qualitative and quantitative analysis method on findings was applied using SWOT clock^{TM}, Monte Carlo Simulations and Pareto Analysis respectively. The results were that functional level operations inefficience is the effect of unbalanced strategy linkage between manufacturing and marketing operations. This was so because existing operations strategy formulation literature focused on prescribing what to do than prescribing how to do it, hence the causes that lead to unbalanced linkage between the manufacturing and Marketing functions during the strategy formulation as well as implementation phases were not being detected. The conclusion was that the root pitfall for unbalanced functional linkage is low collaboration, between and within the manufacturing and marketing operation functional teams. Therefore, the 'JMP Collaborative-Model' fig. 12 has been developed in this research to eliminate low collaboration between functional level strategy in the demonopolised market.

Key Words: Functional ,Manufacturing, Marketing, Operations strategy, Operations efficiency, De-monopolised, Competitive market.

I dedicate this piece of work to my children; Yanila Marvin *(Field Marshall Jr),* Manasseh Jagger *(The Last Samurai) and* Lusuno Mutale *(The little princess)* for motivation to build emotional fortitude during the writing and rewriting and re-rewriting for more than 20hrs per day non stop on countless days. *W*ith respect, I also dedicate this work to REng Chaali Kalebuka my classmate and the only first straight graduating University of Zambia Masters in Engineering Management within 2 years at the commencement of the programme and all first attempt Engineering Masters graduates in various Universities.

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TABLE OF CONTENTS

LIST OF TABLES AND FIGURES

LIST OF ABBREVIATIONS

ACF	African Competition Forum
CAPEX	Capital expenditure
CEO	Chief Executive Officer
CFO	Chief Financial Officer
WCM	Class manufacturing target
CPM	Collaborative Production Management
CCPC	Competition and consumers protection commission
CPI	Continuous process improvement
EFA	Exploratory factor analysis
HODs	Head of Departments
HOS	Head of Section
JMP	Jagger Marvin Phiri
KPIs	Key performance Indicators
RF	Reliability Factor
OEE	Overall equipment efficiency
MBAs	Masters in Business Administrations
MTBF	Mean Time Between Failures
MC	Monte Carlo
MCSim	Monte Carlo Simulations
OE	Operational excellence
PPP	Private Public Partnerships
P/PC	Production versus production capability
PROHESY	Process Oriented Performance Headed Strategy
RISE	Resilience, Integrity, Safety and Engagement
S&OP	Sales and Operations Planning
SPSS	Statistical Package for the Social Sciences
SEM	Structural equation modelling
SSA	Sub-Sahara Africa
SWOT	Strength, Weakness, Opportunity and Threat
RCA	Root cause Analysis
UL	Unbalanced Linkage

PREFACE

This research work was carried out during my Masters Studies at the University of Zambia. This is required as a partial fulfilment towards the award of the Masters of Engineering in Engineering Management. The research topic was chosen in line with my study courses, 'Operations Strategy', an analysis of functional level operations strategy in a case study of the cement manufacturing industry.

CHAPTER 1: INTRODUCTION

1.1 Background to the Study

Operations efficiency is a functional level strategy mandate in the three stage levels hierarchy of organisational strategy. The three levels are Corperate level strategy, Business level Strategy and Function level strategy, (Barnes, 2008). The organisation operations inefficiencies can occur if they don't work together efficiently as they are interdependent in achieving business strategy objectives.

The cement industry key functional operations comprises of Manufacturing, Marketing and Shared Services (Finance and Procurement). There are challenges that exist in attaining functional level operations efficiency which impact negatively on organisation competitive advantage. In this research, Manufacturing and Marketing functional level strategies are the centre of discussion because they have driving direct impact on organisation competitive advantage in a de-monopolised market. The Cement manufacturing industry was chosen as a case study of operations efficiency analysis and improvement in a de-monopolised market. De-monopolised market is a market which has not always been competitive but is changing into a competitive market from monopoly arrangement. In this dissertation, the word competition is used inter changeably with the word de-monopolisation. Thus, the word de-monopolisation in this study is changing market environment from monopoly to competition. The term was adopted because there was still more Cement Manufacturing plants to enter the previous monopolised industry in Zambia at the time of this research in 2014.

In as much as there is some coverage on operations excellence (OE) challenges, there is insufficient coverage on cement manufacturing industrial excellence, (ICONICS, 2010). The identification of actions for improving operational efficiency is still one of the organisations' top executive objectives, (Unit, 2004). Some factors affecting the Strategic role of manufacturing and competing through manufacturing functions are known, (Al-Rasby, 2016), (Wheelwright, 1985). Operational excellence is the thrust for continuous improvement in all areas of business process performance while ensuring that

this performance equals or exceeds that of “best in class” organizations, (Greulich, 2010).

In monopoly markets, the players enjoy brand loyalty and huge profit margins which compensate for all system operations inefficiencies. In highly competitive markets, it is a necessity to be cost effective and customer centric. This cannot be achieved when functional operations strategies are inefficient. The equipment reliability Factor (RF) or overall equipment effectiveness (OEE) and production cost are among world class manufacturing (WCM) measurable indicators of internal operations efficiency levels. The impact of external factors which influence production cost beyond factory control such as power tariffs and cost of production raw materials or maintenance resources and services cannot be undervalued on how they negatively impact organisation financial performance. Nevertheless, external factors’ impact can be mitigated with internal functional efficient operations.

In the case of the Zambian Cement Manufacturing, a negative financial performance record amidst changing market environment from monopoly to demonopolisation was reported, hence a need to analyse and evaluate the level of efficiency at functional level operations strategies was necessitated, because monopoly is generally charactised with inefficiencies and wastage hence the focus of this research on analysing and evaluating operations efficiency with respect to market transformation from monopoly to competition. The purpose was to findout the causes for inefficiencies in order to design or recommend operations strategy system changes that should be adopted to improve operations efficiently suitable for sustainable competive advantage or edge in the dynamic competitive business environment referred to as de-monopolised market.

1.1.1 Monopoly versus De-Monopolised Market

Monopolised market is a market dominated by one or a few players gaining first-class possession or control of a trade, commodity, or service and the market maybe also sold out, that is a market with readily available customers waiting for the products. In this type of market, trading-off the equipment reliability and the cost of maintenance for high production throughput in effort to meet customer demands is still a sustainable

profitable business decision as equipments can be quickly purchased and replaced cheaper compared to relative cost of downtime in missed potential production revenues.

De-monopolised market or a competitive market is when there are many producers competing to provide consumers with the goods and services needed. In a competitive market, no single producer or consumer can dictate the market and hence the market might not be so sold out but soft, which is characterised by reduced profit margins either due to average selling price (ASP) or Volumes sold. Therefore, making decisions that neglect other functional level operations objectives maybe unprofitable to the business.

Thus, in as much as the implementation of World class Manufacturing (WCM) or Operations Excellence (OE) best practices implementation is not an easy process, it is highly recommended in order to sustain efficient operations in the competive environment.

1.1.2 The Case of Operations Efficiency in Zambia

The research data on the Zambian Cement industry confirmed that change in market environment is evident on operations efficiency. Since October 2009, when Zambezi Portland Cement was commissioned (Advisor, 2009). The establishment of US$40 million worth Zambezi Portland cement brought competition to the monopoly in the cement manufacturing industry which prevailed between the year 2009 and the year 1949 when Chilanga Cement, now called Lafarge Zambia, was established (Lafarge, 2016).

The immediate indicators by the Cement company were low overall equipment efficiency (OEE) or RF and high production cost against improvements in production sales volumes (Lafarge, 2013). The Company's turnover grew by 14% to ZMW 1,132 million from ZMW 992 million in 2012 driven by high volumes, pricing actions and sales mix. Nevertheless, the Company's operating costs were higher than the prior years. The production cost increase was attributed high maintenance costs due to the industrial performance challenges faced during the year and an increase in input costs driven by the increase in fuel cost, (Lafarge, 2013). Low OEE and high production cost are indicators

of inefficient operations, in line with world class manufacturing indicators and operations strategy, (Fekete, 2013), (OEE, 2018) (Wheelwright, 1985).

In the year 2014 the Cement market posted an advacement into competitive market, even though sales volumes increased and the manufacturing operations efficiency was low (Lafarge, 2014). The volume growth in the cement market was underlined by a record cement sales at 1.2 million tonnes, which was 4 percent higher than the previous year, 2013, (Lafarge, 2013). Inspite of the Industrial performance significant improvements in Mean Time Between Failures (MTBF) and Kiln Reliability (RF), there was a draw back on external factors such as power quality issues, especially at Ndola, which prompted frequent kiln start-ups and contributed to higher manufacturing plant costs. The trend continued in the year 2016 Lafarge Zambia faced Manufacturing inefficient operations challenges and a solidified competitive market environment which affected significantly financial performance in terms of reduced profits, which were only been cushioned by market sales volumes as a result of increased construction works in the country, (Lafarge, 2016). The the key evident note is that manufacturing had operation inefficiencies and the market competition was getting stiffer, thus this sustained the research work for operations efficiency improvements with a focus on Manufacturing and Marketing in the advert of market environment transformation to be analysed.

The challenges highlighted on the Zambian cement performance were manufacturing operations inefficiencies evidenced by high production costs and low equipment availability with advanced competive market. Consistently the Sales efforts in terms of sales revenue were been negatively affected by internal operations inefficiencies, that is low OEE, high cost of fuel and external factors such as power tariffs or unreliable power supply (Lafarge, 2013), (Lafarge, 2014). Consequently, the net profit margins were also reducing. The bottom line of business was getting lower. It is acceptable that competition is here to stay but inefficient functional operations have to be addressed to sustain business even at breakeven, that is profit zero point, or regain some profit margins by addressing inefficient operations to avoid loses and sustain a competitive advantage in a de-monopolised market.

The cement sector five-year financial between the year 2010 and the year 2017, showed a trend in profit reductions with relative major deeps recorded whenever a new

competitor entered the markets, (Lafarge, 2014), (Lafarge , 2017). In the year 2009 Zambezi Portland entered the market and profit margins went down to 141,768 Million Kwacha rebased (Lafarge, 2010). The company changed strategy from mass production of quality Mpmvu cement to customer centric with innovation and introduced another Cement brand called Superset Cement which was an innovative response to block makers and profits started trending up until the year 2014 (Lafarge, 2014) with profit margins of 423,919 MZMW after tax, this was the peak, highest profit record and again another competitor Dangote Cement Zambia, entered the market in the year 2015 (Daily-mail, 2015) and profits plunged to 77,397 MZMW after tax in the year 2016 with the lowest broken record in the year 2017 of 18,938 MZMW after Tax (Lafarge , 2017). The down trend on profits after 2014 and challenges in regaining in profits was attributed to a innovative strategy response on external customer product need, Superset, without an internal sustainable functional operations strategy adjustment.

For a Consecutive 5 years period high production cost came up as a negative draw back and sales volumes as a positive cushion on annual performance due to increased infrastructure development in Zambia and export market, but difficulty local competition market was pushing the pricing down, whereas the cost of production was relatively high, which affected overall profit margins. Since the coming in of Competitors, from 2009, the strategy evolution was more focused onto commercial transformation with emphasis on marketing and innovative product offer. Product pricing was regarded as unsustainable competive lever and reduction in production cost was one major internal operations strategy adjustment, which posed a threat of weaking production capability, (Lafarge , 2017). It is realistic that the possible causes of internal operations inefficiencies were not given the attention they deserved equal to the impact they had on organisation performance. Regardless of the cement leader having business's leverage on Group expertise to create value proposition specific to customer needs and world class manufacturing best practices (Lafarge, 2016).

As a result, this research was focused on finding out what led to functional level operations inefficiencies at Manufacturing and Marketing functions in line of World class manufacturing principles and operations strategy theory competing through manufacturing (Fekete, 2013), (Wheelwright, 1985). The manufacturing inefficiencies factors are more internally and less external driven. Whereas effects on marketing/sales

operations inefficiencies are less internally and majorly externally driven. In problem solving, it is recommended to focus on what you can control than what you cannot control. Thus, Cement Manufacturing companies should eliminate internal weakness in order to respond effectively on external influence such as competition.

Little research has been done to analyse the underling factors for inefficient manufacturing operations in the cement industry in Zambia and hence the focus for this research was to find the factors that lead to operations inefficiences and determine the possible solutions. The identification of this factors for this inefficiencies, as well as finding ways of avoiding them was important in this dissertation to enable sustainable cement manufacturing competitive advantage in de-monopolised markets (Hayes, 1984), (Porter, 1980), (Harrison, Feb., 1999).

1.2 Statement of the Problem

Manufacturing and marketing Functional level operations inefficiency in Cement manufacturing industry in Zambia, has been deduced as the problem facing the industry. The Low equipment Reliability and high cost of production are performance indicators in line with WCM and OE that demonstrate effects of operations efficiency. This was validated by records in the annual reports between the year 2009 and 2016, (Lafarge, 2010), (Lafarge, 2011), (Lafarge Africa PLC, 2015) and (Lafarge, 2016) .

The problem statement was sustain with reference to the the P/PC imbalance theory and was authenticated by the record increases in production volumes of cement clinker from rated annual average of 2000 tons per day (tpd) to 2183 tpd annual average at the case study firm. The extra 183tpd, translates into the performance factor improvement of 9%, i.e. PF of 109%, verses a consistently lower equipment reliability factor (RF) or Equipment Availability of 89.04% (Internal report, 2014). The attained RF is below 96% RF world class manufacturing target (WCM) (CAMISEA , 2007). The average maintenance cost was above budget by over 5%, from internal records. Sometimes the factory ran out of the cement inventory in Storage Silos due to breakdowns keeping customer waiting eventually contributing to a high retail cost of cement to an average of 40% (Zunga N. and Lopes-Pinto A., 2011), above the normal price.

In an effort to remain profitable amidst high production cost due to raw material , fuel and maintenance cost, a profitable sales price was set at the factory but this contributed to one of the reasons why Lafarge Cement Zambia was fined a sum of ZMK99,235,400 by competition and consumers protection commission (CCPC) . It was phrased as a "highly priced" Cement product according to the investigations initiated in August 2013 and was closed in December 2017 (CCPC, 2017). Thus, cause of functional operations inefficiencies needed to be analysed as pricing is unsustainable leverage in competitive environment.

1.3 Aim

To investigate causes of inefficient functional level strategy operations, focusing at Manufacturing and Marketing operations strategies in a de-monopolised cement industrial market.

1.4. Objectives

1. Analyse functional level operations strategy in the cement manufacturing industry
2. Examine relations between manufacturing and marketing functional level operations
3. Design a model to align functional level manufacturing and marketing operations strategies

1.5 Research Questions

1. Describe the formulation of functional level operations strategies in Cement manufacturing industries
2. Examine the implementation process for the manufacturing and marketing functional level Strategies
3. Establish the pitfalls in the manufacturing functional level operation strategy formulation
4. Analyse the challenges faced in the implementation process of the manufacturing and marketing functional level operations strategies

5. Assess existing models developed for effective ways of fomulating correlative functional level operations strategies
6. Establish the process of ensuring efficient functional level manufacturing and commercial operations strategies that enables a competitive advantage in a de-monopolized market

1.6 Significance

Cement factories will become aware of the pitfalls that lead to inefficient functional level operations between Manufacturing and Marketing operations resulting in low competitive edge. Further benefits of this study are academia enrichment to the research work in the area of operations strategy and production management.

Specific examples of the impact areas expected in the Cement Industry are improvements in capital expenditure (CAPEX) project management, major shutdown or annual operations planning/execution versus sales/dispatch volume forecasting. Enhence the effectiveness of planning and implementation of Sales and Operations Planning (S&OP) activities. An example could be optimising planning of maintenance major repair stoppages, without disruption of sales and dispatch target volumes to customers in the same time period while production equipment is on planned major maintenance stoppage, which is a pro-customer focus at the same time a pro-cost efficient/reduced cost of maintenance strategy. The reduced cost of repair of production asset is the platform that supports *Value addition Engineering maintenance strategy* as opposed to traditional *Cost centre Engineering maintenance strategy*.

1.6 Research Organization

Chapter 1 is comprised of a brief introduction into the research area of functional level operations strategy between manufacturing and marketing, problem statement and discussion, leading to the research aim and objectives. Then closing with an outline of the dissertation organisation. Chapter 2, provides the Literature survey and background facts on the theoretical knowledge within the area of operations strategy, suitable

research data, analysis methods and confirmation of the knowledge gap existing, which warranted this research. Chapter 3, is the methodology section of this dissertation, an outline on the research method selected described in detail. It also includes descriptions of the research approach, design, the way in which the data analysed was found and used. Chapter 4, the fourth part of the dissertation is the findings section of the study with regard to operations strategy behaviour and the analysis. Chapter 5, has given a summary determining how the research questions have been answered and research purpose fulfilled. The chapter closes with a conclusion for the research recommendations and ideas for future research.

CHAPTER 2: LITERATURE REVIEW

2.1 Functional Operations strategy Setup

The Functional level strategy is composed of sub-functions operations or strategy implementation departments in the organisation. An example of the setup of a manufacturing functional level operations with typical sub-functions or departments is as shown below in Fig. 1

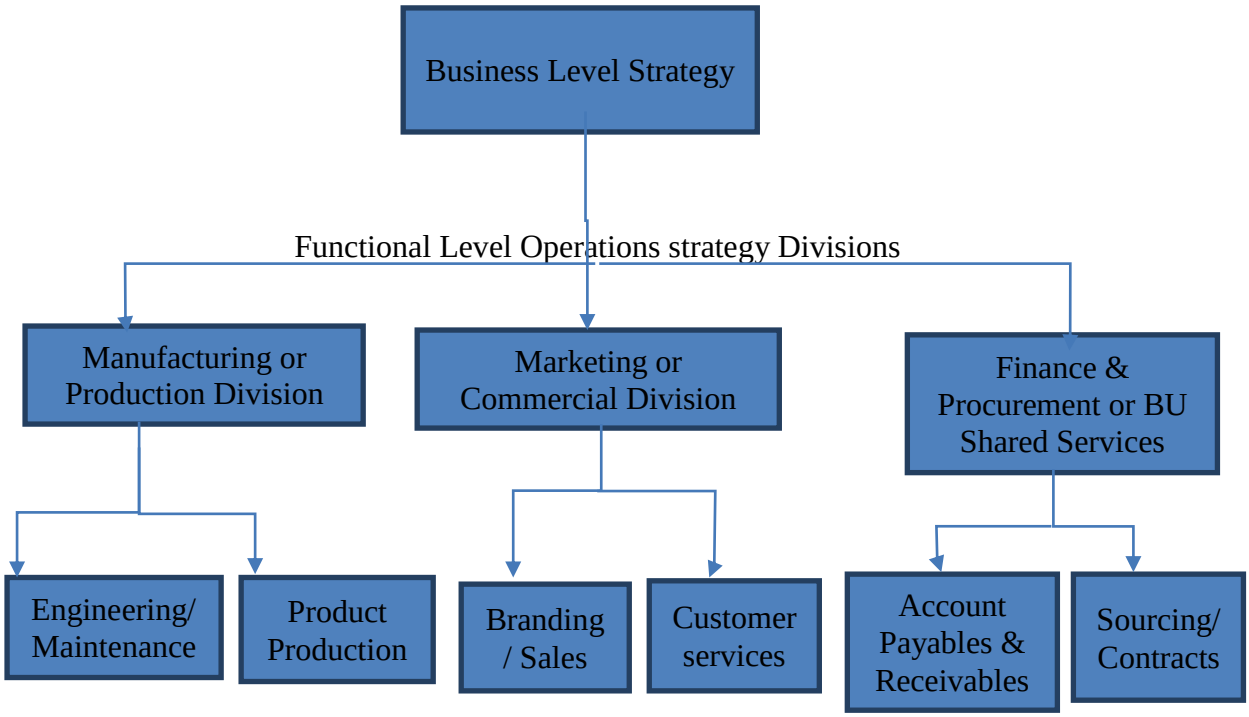

Fig. 1 Functional Operations Strategy Level

The Functional level operations' specialised sub-functions are to ensure efficient execution of tasks, forexample Manufacturing has Engineering and Product Production process departments as sub-functions whereas Marketing has branding, sales and customer services as some of specialised sub-functions of the Functional level operations.

2.1.1 Operations Strategy

In an overview, Operations strategy is a functional level strategy and is defined as a process concerned with the pattern of strategic decisions and actions which set the role,

objectives and activities of operations (Barnes, 2008). Operations refer to an organization's function which is concerned with getting things done, producing goods or services for customers. Whereas strategy is defined as the direction and scope of an organization over the long-term, which achieves advantage in a changing environment through its configuration of resources with the aim of fulfilling stakeholder expectations, (Barnes, 2008). Thus, Strategy denotes actions or patterns of actions intended for the attainment of goals, (Swamidass, 1987).

2.1.2 Manufacturing Strategy

Manufacturing strategy is a functional level strategy defined by the pattern of manufacturing choices which are structural and infrastructure, that a company makes, (Hayes, 1984), (Wheelwright, 1985), (Hill, 1983). The structural is the decisions about facilities, technology, vertical integration, capacity whereas infrastructural is associated with major decisions such as organization, quality management, workforce policies, and information systems architecture.

Manufacturing strategy consists of a sequence of decisions that enables a business unit to achieve a desired manufacturing structure, infrastructure and set of specific capabilities over time (Hayes, 1984). This strategy is a critical part of the firm's corporate and business strategies, (Linköping, 2007). It comprises a set of well-coordinated objectives, a band of efficient operations programs aimed at securing a long-term and sustainable advantage over competitors. It is consistent with the firm's overall strategies, as well as with other functional strategies for example in this research, marketing strategy (Fine, 1985). It is worth to mention that the strategic view of manufacturing as a competitive weapon dates back in the days of Skinner the father of operations strategy, (Enders, 2004). Those days the manufacturing or operations function was assigned the responsibility of producing large quantities of standard products at minimum costs, regardless of the overall goals of the firm (Wiley, 2015,).

The role of manufacturing operations management was generally to minimize costs when there was no global competition and continued high demand for products, it remained virtually unchanged throughout the 1950s and early 1960s, a typical operations setup in a monopolised market. The restriction of manufacturing to the role minimising cost is an inefficiency outlook on manufacturers. Instead it is recommended that companies

develop an operations strategy that would complement the existing other functional level strategies such as marketing and finance strategies in this dissertation. An emphasis must be given to the importance of using the strengths of a firm's manufacturing facilities and people as a competitive weapon in the marketplace, as well as taking a longer-term view of how to deploy them. Now as manufacturing is viewed as a competitive weapon, one of the goals in the development of an operations strategy, therefore, should be to maximize the value added to the goods and services that are provided by the firm, this is what is meant by operations efficiency (wiley, 2016)

Manufacturing strategy is a strategic asset (Moran, 2008). In spite of all the chaos and turbulence in markets, a clear operations efficient strategy can play a significant part in a company's success. It is clear, that achieving long-term competitive advantage depends on the firm's understanding of how to position its manufacturing skills against its competitors (Fine, 1985). Operations strategy has evolved in over five (historical) strategies, (wiley, 2016). These evolution stages are :

1. **Pre-industrial Manufacturing Management**: This stage was charactised by a highly flexibility in a small blacksmith's shop or other tradesman's workshop in the pre-industrial age. No standardisation of operation was in place.
2. **19th Century Manufacturing Management**: The Century size of the manufacturing operations increased, and the use of the steam engine enabled manufacturing operations to acquire machines that automated the manufacturing processes. This indicated that as the organisation manufacturing or production expands systems must start to get in place for sustainable systematic efficient operations.
3. **Scientific Mass Manufacturing Management**: This is the era for mass production, the focus was on increasing the production volume of a standardized product by using standardized work methods, which became less variable and less flexible. These first three manufacturing operations strategies are typical charactistics commonly practiced in monopolised markets and are less efficient
4. **Lean Manufacturing Management**: Is the fourth manufacturing operations strategy which is more efficiency focused. The main components are the introduction of flow, that is smaller batch sizes instead of batch operations, operating the entire value chain based on demand pull rather than manufacturing

push based on forecasts and production scheduling. It is grounded on the rigorous implementation of zero defects in manufacturing factory management rather than being detected by separate post control operations. This strategy is one applicable in de-monopolised markets as it fosters efficient use of resource and hence creating sustainability.

5. **Agile Manufacturing Management**. This is the combination of several management concepts. The fundamental definition of agility was the capability to respond effectively and efficiently to unexpected events. This is the approach required under de-monopolised cement market in Zambia. This is so because of the unpredictable dynamic phase, the cement industry is under going in order to keep operations until the competition and market get saturated or stable with gradual changes.

2.1.3 Marketing Strategy

Marketing or Commercial strategy is the *functional level strategic hub* of the business, which help to achieve and sustain profit by supporting and merging the competing priorities of the sales, technical, finance and legal functions (Enterprises, 2016). In brief, it is a logical output of market surveys (Enterprises, 2016). Marketing sub functional level strategies, drives a Market-orientation business approach, which seeks to understand customers expressed and latent needs, and develop superior solutions to those needs, (Day, 1994). In order to attain this ambition an efficient balanced functional operations strategy linkage must be in place with manufacturing strategy which is the weapon for competitive advantage.

2.1.4 Operations Strategy formulation Process

Organisation Strategy formulation is generally divided into three levels which is Corporate, Business and Functional level. Our focus is on Functional level which is the level for Manufacturing and Marketing. Table 1 shows an extract of the key issues considered at Fuctional level operations to ensure consistence and alignment, (Barnes, 2008). The organization's operations function is concerned with getting things done, (Boyer, 2005), (Chambers, 2004). All business organizations are concerned with how they will survive and prosper in the future (Barnes, 2008)

Table 1 Functional Level of Strategy (Barnes, 2008)

STRATEGY LEVEL	KEY ISSUES
Function	• How does the function contribute to the business strategy? • What are the strategic objectives of the function? • How are resources managed in the function? • What technology do we use in the function? • What skills are required by workers in the function?

From Table 1 above we are able to see that Strategy alignment between manufacturing and the commercial function operations is important, to realise the organisation business plan efficiently as the function level key issues can not be addressed independently of the other. Of course, sometimes in practice business strategy is sometimes interpreted as marketing strategy but it is more than just marketing and sales plan (Barnes, 2008). The definition of a business strategy is a plan or set of intentions that will set the long-term direction of the actions that are needed to ensure future organizational success. However, no matter how grand the plan or how noble the intention, an organization's strategy can only become a meaningful reality, if it is efficiently operationally sanctioned.

The objective of the function operations is to produce the goods or services required by customers with efficient use of resources as is possible. This lead to conflicts within an organization when strategies are not balanced linked. Conflicts between the manufacturing operations and the marketing functions are usually centred on the desire of marketing to ensure that manufacturing concentrate on satisfying customers like the scientific mass manufacturing management era. Whilst this may seem desirable, there is a bias for marketing to usually want operations to be able to meet customer needs under any circumstances. This is what usually leads to demands to produce greater volumes, more variety, higher quality, a faster response, and so on, all of which are likely to lead to less efficient operations if balance is not attained, (Barnes, 2008).

The function level operations strategy objectives must be balanced aligned to ensure they positively contribute to the business strategy. There must be a balanced linkage between

Manufacturing and Commercial toward the shared Business Strategy. Efficient operations strategies need to be consistent and contribute to competitive advantage (Hayes, 1996).

Table 2 below shows a criterion to ensure there was balanced linkage in the formulation of the operations strategy, (Barnes, 2008). The table outlined some of the questions that must be asked to check alignment and balanced strategic linking for competitiveness. This should have been sufficient to create efficient operations but unfortunately inefficient operations and bias in implementations of strategy still exist as indicated in problem statement.

Table 2 Criteria for evaluating an Operations Strategy (Barnes, 2008)

Consistency (Is the strategy consistent…?)	• Between the operations strategy and business strategy • Between operations strategy and the other functional strategies • Between the different decision areas of operations strategy
Contribution to competitive advantage (Does the strategy…?)	• Enable operations to set priorities that enhance competitive advantage • Highlight opportunities for operations to complement the business strategy • Make operations strategy clear to the rest of the organization • Provide the operating capabilities that will be required in the future

These questions tabulated by Barnes are helpful in reviewing strategy implementation and could pick de-link during strategic reviews. The question remains but why do we still have inefficient functional level operations between Manufacturing and Marketing?

In searching for existing methods which could help bring about efficient operations improvement at functional level in a de-monopolised market, a process management

model was discovered and it demonstrated that the model could be used to avoid strategy conflicts that arise during the formulation of strategy, (Acur, 2003). The Tool was called PROHESY an acronym for Process Oriented Performance Headed Strategy developed by Acur and Bititci to facilitate integration of resource-based and market-based approaches to strategy management. The tool is a business process-based approach and facilitates a dynamic balanced approach to strategy process. It can be used to examine the linkages between markets and resources. See Fig. 2 below shows the PROSPHESY Process Chart.

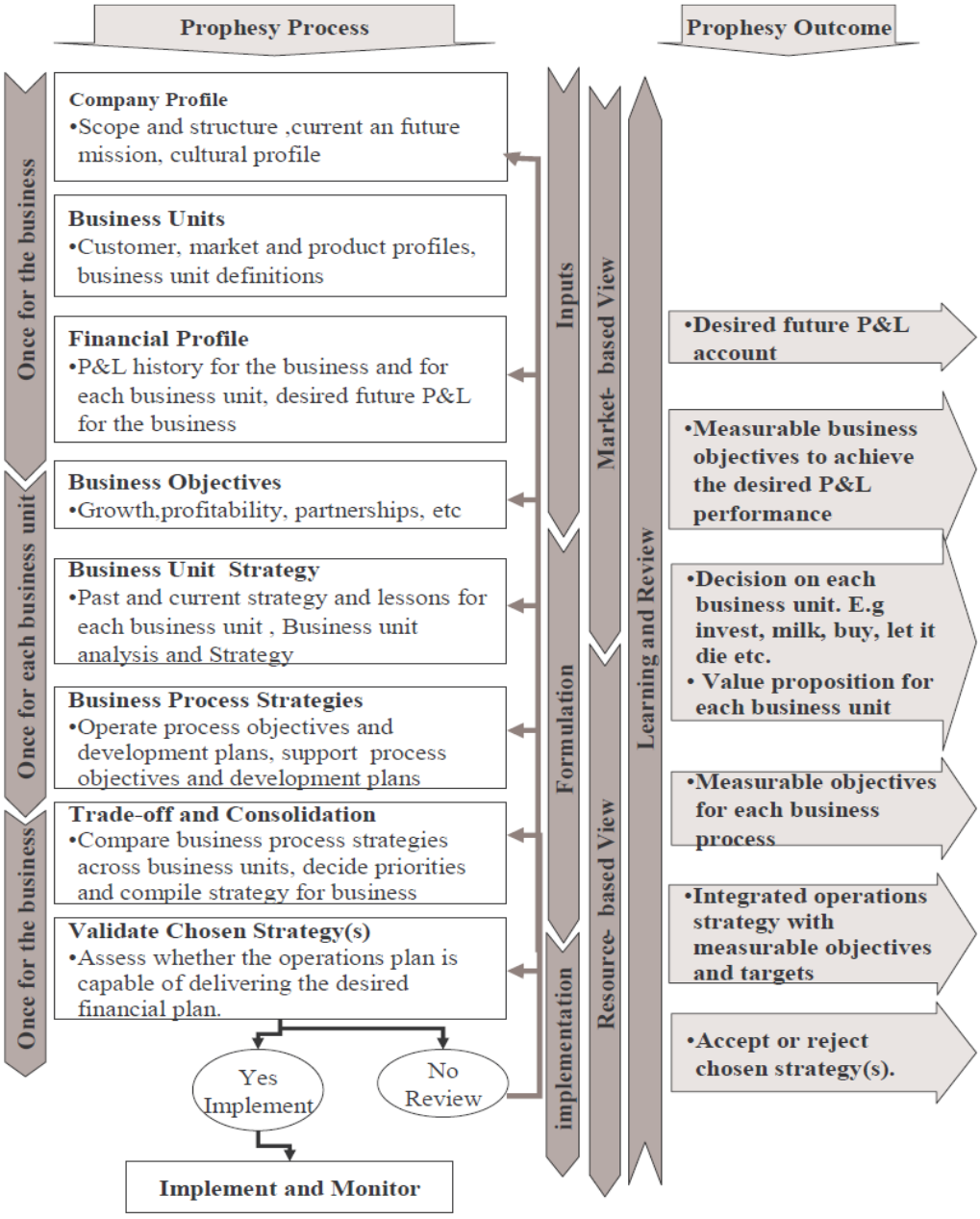

Fig 2 PROSPHESY Process Chart (Acur, 2003)

A balanced approach to strategy process demonstrated how business process based approach (PROPHESY-Process Oriented performance headed strategy) facilitate integration of manufacturing resource based and market based approaches to strategy management (Acur, 2003)), (Acur, 2004)(Acur and Bititci 2003). Prophesy is a strategy development and management tool that embrace the organisation unit of analysis. A strong linkage between resource based and market based improve strategy management process and business performance, hence efficient operations are attainable (Acur, 2003). Improving a focus in marketing is important whereas manufacturing operations is a weapon to respond to markets (Hill, 1993) and (Ferdows, 1987). Prophesy was developed to fulfil gaps on strategy inputs, formulation, implementation and review. Prophesy takes in account cross-checking of strategy and making trade-off where conflicts are detected. It has been reported that Prophesy enables manager to start having simultaneous activities working with production and customers in a more collaborative, build systems to enhance collaboration, and following procedures that create efficient manufacturing operations in meeting customer needs. It is therefore expected that when Prophesy approach is adhered to imbalance strategy linkage could be avoided and operations efficiency attained. Literature shows how a company by the name of M&B used prophesy and realised the following benefits:

1. M&B become more flexible and responsive to demands market changes, and there by achieving a better balance between market and resource-based strategies
2. Managers had a clear view, people had commitment to a balanced approach to strategy process and
3. The firm realised that Resources and capability links are essential for establishing strategy operations efficiency and effectively in short and long term

The question still remains, then why is it that other organization such as M&B under Acur's study attained operations efficiency improvement but others did not (Acur, 2003)? Recognition is given for proposing that the integration should be done under the domain of the production planning process. It has been proved that there is sufficient knowledge on the strategic planning, formulation and linkages of each stage in organisational strategy for strategic operations managers to refer, (Skinner, 1985).

In the formulation of the functional level operations strategy, the business interest is to see a sustainable competitive advantage created in the manufacturing process that consists of incorporating various wishes of the customer into a product thus customizing the product at a competitive price delivered to the location of consumption. (Poesche, 2002). The Manufacturing management strategy should ensure that the unfavourable environmental impacts are minimised by optimizing the use of raw materials and components. In terms of the manufacturing sub functional strategy process, the aim is to minimize the overall waste of raw materials by applying the:

(1) best available technology,
(2) raw material and component saving product design criteria, and
(3) manufacturing and process control systems

2.1.5 Functional level Strategy linkage

The objective of this section seeks to examine the relations between manufacturing and marketing functional level operations. So far it is notable that there is good coverage on hierarchy approaches for strategic management process, aiming to create and sustain competitive advantage, (Gianesi, 1998). To attain operations efficiency and competitive advantage there is great need to identify the pitfalls working against the integration mechanism. It is a global call that Strategies of different businesses in any organization need to be articulate and interactive in order that the corporate objectives are accomplished. There should be consistency, integrated, self-supporting and synergetic in order that competitive power is created and sustained in the business (Gianesi, 1998).

On the subject of functional coherence outlined that, coherence among the different functional strategies should be guaranteed during the formulation process, (Henrique L. Corrêa, 2001). A process of manufacturing strategy formulation in turbulent environments, the case of Cement market in Zambia now, based on contingency models and scenarios which aimed, among other objectives, to achieve balance among functional strategies. The development and maintenance of a consistent manufacturing decision pattern is important, since most decisions, be strategic, tactical or operational, have impact on the strategic performance of the organization, (Hayes, 1984). It was therefore

necessary to ensure that there was intra-functional consistency between the functional strategy, the decision areas, policies and the many individual decisions (Henrique L. Corrêa, 2001). The pattern of the individual decisions taken as a whole represents the actual realized strategy. Therefore, they have crucial importance for the achievement of the performance of the function, the business and the corporation. The coherence between the functional strategies referred to as "high horizontal coherence" and the coherence between the several decision levels within each and every function here called, "vertical coherence", should ensure there was coherence between functional operational decisions referred to as "low horizontal coherence" (Gianesi, 1998). Fig. 3 illustrates low horizontal coherence Model, (Gianesi, 1998).

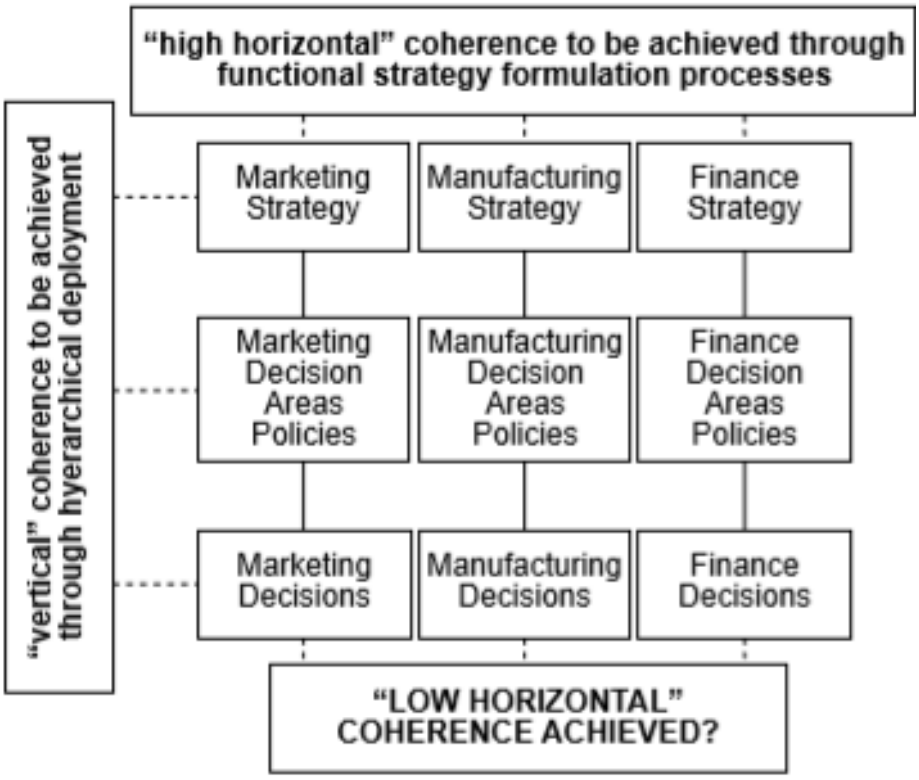

Fig. 3 Low horizontal Coherence Model (Gianesi, 1998)

Turbulent environments, such as the Brazilian industrial world which is similar to Zambian Cement Market now, require frequent re-planning and therefore high collaborative process-like approaches seem to be the most appropriate (Gianesi, 1998). Brazilian companies could not afford to wait, longer like six months to review their

strategies, because the environment required that the strategic replanning process be triggered by relevant events which significantly affect any company function, in a Zambian Cement case, this could be high production cost, low equipment reliability or reduced profit margins or difficult competitive markets or price variations as was in reported in the Annual financial reports by the Case Study Cement company. This is a culture similar to root analysis (RCA).

It is a fact that functional strategy formulation is not easy and although there are several proposed methods, there is not one best approach for any circumstance (Hayes, 1984)), (Hill, 1993), (Irineu G. N. Gianesi, 2001). People related behaviours such as Managers of several functions having their own objectives and personal agendas, which interfere, to a certain extent, with the objectives set by the functional strategies is one of the reason which makes functional strategy formulation difficult. The need to have a consistent decision pattern within each function has been highlighted by several authors, however the literature available has been more prolific in prescribing what to do (objective) than prescribing how to do it (process), (Hayes, 1984). Thus, methods for the implementation of strategic objectives into lower level objectives which actually drive functional decision making at different levels is neither a simple task nor clearly cited in existing literature by other researchers.

2.1.6 Critical Components that Bring about Operations Efficiency

In highlighting the components that bring about operations efficiency, under the de-monopolised market environment an illustrative tale of the 'Goose and the Golden Eggs' was adopted to explain the hypothesis of this dissertation with reference to the case study Cement plants in Zambia, (Covey, 2013).

The Cement manufacturing sector in Zambia had demonstrated a tendency to adopt a pattern of operations strategy implementation that focussed more on golden eggs (sales of cement) and less focus on the Goose (Production Asset and operations systems), (Lafarge, 2016), (Lafarge , 2017). This is sustained by cost control measures implemented beginning in 2011 and pushed commercial focus strategy (Lafarge, 2011). In addition most sales/market outlook leverage on product innovation R&D and strategy

focus on commercial transformation leading to a scientific mass manufacturing management approach (Chenge Besa, 2014), (Lafarge, 2016), (Poesche, 2002).

Mass manufacturing operations approach results into operations inefficiencies because of misaligned functional operations linkage between production and sales of golden eggs (Cement sales volumes). This was sustained in a case of South African Cement plant where clinker had to be imported to keep market share due to equipment breakdown (Lafarge Africa PLC, 2015). The perceived notion that if the production assets were taken care of with same high priority as the marketing goals in this illustration, then the company won't have the finances to pay the workers, suppliers or encourage the shareholders, led to putting preference on pursuing cost reduction initiatives and innovative product differentiation as key levers of competition. To the contrary the later approach may immediately on in the long term weaken competitive advantage on the producing asset, (Ward, 1995.), (Lafarge, 2016). The Strategy balance or alignment called production/production capability (P/PC) Balance must be created in order to compete sustainably in a competitive market (Covey, 2013).

Thus, factors that lead to operations efficiency improvement are systems that eliminate the trade-offs that weaken one function level operations to push another without a proper mitigation plan for the worst scenario immediately or in the long term. The behaviours that contribute to the equipment reliability deterioration or lower overall equipment efficiency (OEE), against the yearly improvements on production sales volume increases must be controlled. The correspondent of the Goose and Golden Eggs fable indicates that if you don't take care of the Goose, you will soon be without eggs (sales or products). This is sustained in operations strategy theory a balanced approach to manufacturing strategy ,(Acur, 2004), (Wheelwright, 1985). Therefore, a P/PC balanced must be created between commercial and manufacturing and root cause(s) associated to the breakdown in functional level strategy linkage between manufacturing and sales must be established in order to drive operations efficiency improvements (Henrique L. Corrêa, 2001), (Unit, 2004).

2.1.7 Indentified Pitfalls of Functional Operations Inefficiency

Some of the possible identified pitfalls that lead to functional level operations inefficiencies or incoherence are listed below, (Gianesi, 1998):

i. Functional Managers have their own objectives and personal agendas, which interfere, with the objectives set at the functional strategy.
ii. There are is absence of consistence in decision pattern within each function
iii. Decision-makers at different levels within any function also have their own personal objectives and agendas, which interfere with the deployed objectives, which were derived from functional strategies. One of the practical results is conflicting decisions which eventually jeopardise the company performance and therefore competitive power

iv. There is knowledge gap in existing Literature by many authors who have been more prolific in prescribing what to do (objective) than prescribing how to do it (process)

v. Low proactivity by each functional area to enable active contribution to the achievement of competitiveness and not only reacting to requirements from other functions.

vi. The existing of organisational barriers that is hierarchical and bureaucratic, which must be broken down

vii. Operational decisions and negotiating process should be on, integrative by nature, allowing involvement of different functions within the company

viii. Agility should be embraced to ensure frequent revisions or replanning to make it possible that the decision coherence is adequately monitored and adjusted; and is checked for relevant impact on the competitive performance of the company

These are some of the pitfalls realized by previous researchers viewed to be contributing to functional strategy unbalanced linkage, leading to inefficient operations not suitable for competitive market environments, the case of Zambian Cement Market and Sub Sahara region.

Thus, the coherence model had extended aims of acting as one of the mechanisms to implement manufacturing and other functional area strategies, emphasis is made that the process should also ensure:

1. the continuous revision of functional strategies aiming to cope with the turbulent environment and at the same time the continuous assessment of the coherence between functional strategies;
2. a thorough understanding, by the functional managers, of the strategic implications of their functional decisions;
3. a proactive role of every functional area involved;
4. the coherence between time phased decisions.

Positive reaction from most manager when incited to think about this potential benefit, they agreed that it would be useful to pursue also the goal of attaining, through the sales and operations planning (S&OP) process, a coherent pattern of operational decisions that might support the strategic direction of the company, focus on the prioritised competitive criteria.

Sales and operations planning implementation has high benefits giving a higher level of co-ordination between functions (Gianesi, 1998). Indeed S&OP is one method to close the pitfalls that lead to unbalanced strategy linkage and eventually attain operations efficiency. The cited benefits are building blocks for operations excellence. The level of coherence between the functional decisions was so poor in most of the companies researched indicated that the simple fact of systematically putting people together to talk could solve critical problems (Gianesi, 1998).

Previous research has indicated that without top management effective commitment and change management techniques it is virtually impossible to get functions like

manufacturing and marketing closer. This is very true and is authenticated from the transition in Lafarge strategy revolution, (Lafarge , 2017), (Lafarge, 2016).Literature showed that some of the companies researched seemed to be more advanced in their relations with suppliers, even on the second tier, than they were internally when the middle management still lacked the ability to work as a team and the organisational barriers still remain most important, to disseminate the teamwork culture and properly educate the middle management to break the barriers. This was true for Case study Cement manufacturer, hence they launched various Team building activities on site and off-site to role out of company annual strategies, perfect example of initiative developed was the RISE culture initiative at Lafarge Zambia (Lafarge,2016). The RISE had engagement as a pillar that could help operations efficiency improvements through a better understanding of other functional areas' needs and constraints.

A study by Forbes Insight also was launched to identify the specific challenges enterprises faced in closing the gap between strategy and operations, in association with SAP, they surveyed more than 200 C-level and senior executives at global enterprises with annual revenues exceeding $500 million, (Forbes Insight, 2015). This was done with an additional ten on-the-record and off-the-record interviews conducted with senior executives to obtain first-hand insights into how companies were managing alignment issues. The report stated that trend on current operational priorities were clearly focused on how companies could do more with less. Typical approach taken by Lafarge starting in the year 2011, on cost cutting on plant operations (Lafarge, 2011). The gaps in perception visibly surfaced when executives were asked to rank their current strategic priorities and their current operational priorities. The priorities in the top five of each category were consistent, but their rankings were often significantly different. There was also a demonstrated gap occurring between corporate strategy's desire to meet the challenges of the marketplace and functional operations' responsibility for containing costs. Strategy and operations executives were in very close agreement over their companies' current strategic priorities, nevertheless, there was unsurprisingly, more than half of the respondents choosing "staying competitive in a challenging market" as their top strategic concern, followed by increasing efficiency and managing costs, again typical approach Lafarge had taken (Lafarge,2017).

Opposingly research findings are that strategic initiatives often do not match their stated operational objectives (Forbes Insight, 2015). When they chose from a separate list of operational priorities that aligned to the strategic issues, a separate set of goals emerged. An example given, was that, while staying competitive was the top strategic priority, its operational counterpart that is identifying and addressing shifts in the competitive landscape, was the fourth highest operational priority, named by 23% of respondents. Nevertheless, the chosen operational priorities were clearly focused on how companies can do more with less. *The top two operational objectives were Cost containment and improving overall efficiency and performance,* which were both short-term goals driven by bottom-line stress. In contrast improving operations efficiency must be the top priority as everything fall in place with this culture. The conclusion is that this could have been driven by the global recession, but it may also be contributing to setting up of barriers that are keeping full alignment from taking place (Forbes Insight, 2015).

Other key notes are that functional coherence or linkage or alignment pitfalls are in the way in which corporate strategy is implemented (Hill, 1983). Other notable pitfalls that contribute to imbalance on functional strategies are from the way manufacturing role are perceived in the strategy formulation process by some organisations such as (Hill, 1983):

1. Viewing manufacturing manager role as a job seen to respond to the needs of the company, by aligning to marketing and finance
2. Viewing the manufacturing strategic role as less to do with the corporate or long-term contribution
3. Involving production managers too late in the corporate debate which results in them taking a reactive role, with less likelihood of contributing to strategy alternatives and influencing the eventual decision
4. Failure by Manufacturing executives and engineers to explain generally the important, conceptual aspects of manufacturing to others in the organisation. A weakness attributed to lack the language as Engineers are considered to be withdrawn. Seldom do they speak out after evaluation to expose the manufacturing implications of corporate marketing decisions, so that alternatives can be considered and more soundly based corporate decisions agreed.

2.1.8 Market conditions and effects on strategy linkage

Inspite of focusing on Zambia Cement industry as a Case study, it was worth highligting that Globalization of business and advances in technology, especially information technology has created a global village.This trend has led to a hyper-competition and is expected to continue (wiley, 2016). Actually the maunfacturing market change from Monopoly to de-monopolised market environment noticed in Zambia, is a global trend, which also affected other manufacturing companies out side Zambia, (Wiley, 2015,).

Zambian cement industry, opened up to competition after over 60 years of state to private owned monopoly. The first Cement Company in Zambia was Chilanga Cement in Chilanga district, which was founded in the year 1949 and commissioned a energy intensive wet process plant in the year 1951 (Lafarge, 2016). The Cement plant was instrumental to building the Kariba Dam in Siavonga, which is the largest man made lake in the world by volume. In 1969 another semi-dry process better energy efficient Chilanga Cement plant in Ndola City was commissioned to service the copperbelt region, a home to the second largest open pit mine in the World, Nchanga Open pit Mine in Chingola. In 2001 Chilanga Cement was acquired by Lafarge group and 2008 Lafarge commissied another New energy efficient 2000TPD Dry process Cement plant in order to meet domestic and region cement demand at the time and continued to enjoy monopoly being the only major player in the country (Lafarge, 2016).

Up until 2009, respectable competitor entered the Zambian market by the name of Zambezi Portland Cement and since then the market has had inflow of other prayers de-monopolizing the market environment (Advisor, 2009). The players in the market by 2018, were Lafarge Zambia, Zambezi Portland Cement, Dangote Cement, Oriental Quarries, Great Wall Portland Cement, Midlands Portland Cement Zimbabwe and Sinoma Group which built a new plant in Lusaka south near Multi-facility Economic zone (MFEZ), called China National Building Materials' (CNBM) cement plant comissed in 2018. Still another Cement plant in Ndola is under planning a joint venture of SinoConst and ZCCM-IH, (Stockbrokers Zambia Limited, 2018). The setting up of new cement manufacturing companies has made the cement products readily available on the Zambian Cement market at a competitive lower retail price, consequently lowering the profit margins for both retailers and manufacturers, this is more visible in

2016 and 2017 Annual financial reports for Lafarge Zambia, (Lafarge, 2016), (Lafarge , 2017).

Market dynamism and operations strategy choice is encompassed by competitive priorities, (Ward, 1995.). The priorities are leveraged by balanced function linkages. It is advisable that the firm that pursues a market orientation must also have a superior ability associated with superior Manufacturing performance in order to understand and satisfy customers, (Day, 1994), (Desphpande, 1993), (Jaworski, 1996), (Slater, 1999), (Han, 1998). In competitive environment low cost strategies are virtually linked with resources and management of manufacturing operations which must be efficient, (Porter, 1980). The strategic role of manufacturing operations is a competitive weapon, (Roth, 1990). Since manufacturing is a competitive weapon, researchers have developed conceptual models for operations that could be utilised in identifying the most significant opportunities and decisions in order to obtain competitive advantages in global industries, (De Toni, 1992).

Efficient organisation establishes mechanisms that complement their market strategy, whereas inefficient organisations struggle with these structural and process mechanisms, (Miles, 1978). Different company strategies arise from the way companies decide to address three fundamental problems: entrepreneurial, engineering (or operational), and administrative problems. The entrepreneurial problem is defined as how a company should manage its market share. The engineering problem involves how a company should implement its solution to the entrepreneurial problem. The administrative problem considers how a company should structure itself to manage the implementation of the solutions to the first two problems.

In dynamic markets, the close linkage between competitive strategy and functional strategic activities is asserted to be a precondition to the achievement of optimal business performance, (Rheea, 2006). The two effect on market and operation impact on performance are:

1. Competitive strategy moderates the relationship between manufacturing operations and marketing strategic activities, consequently reflected in organizational performance.

2. Certain integrated strategic decisions of manufacturing operations and marketing functions have a significant impact on organizational performance.

It is agreeable that the strategic fit among the manufacturing operations, the marketing, and the competitive strategies in a dynamic market is essential to success. It is important to understand sources of sustained competitive advantage and leverage on strategic linkage, (Barney, 2001). To have a lasting improvement in the manufacturing as part of functional alignment, organisation need to know how to work with trade-offs among manufacturing capabilities, (Ferdows, 1990). The strategy making process quality assessment within dynamic and highly volatile market conditions, shows that strategically functional managers are faced with competing paradigms of resource-driven versus market-led approaches to strategy, both paradigms have flaws and may cause strategic disagreement to occur, (Brown, 2005). Strategic disagreement can occur within the strategy process of the firm, such as a key omission which often fall in the neglect of manufacturing operations managers' potentially important contributions to the strategy mainstream process as turbulent market conditions arose from competition and other economic factors.

In the case of Zambia, the Cement market now has opened up to competition. The country has been experiencing a rise in infrastructure development projects from small households' projects to capital government driven projects at the unprecedented faster rate, long time ago people waited for government housing but now almost every working citizen (formal employed or informal sector) is building something and government EURO bond, World bank Funded, Public-private partnership (PPP) (ZDA, 2018) infrastructures project are been implemented across the country from Housing, Shopping Malls, roads, Schools, Hospitals, the list is endless, (Chenge Besa, 2014). This has resulted in high demand for the Cement product and enticing the retailers to trade at a higher competitive retail market price. The high price of sale is as a result of the law of supply and demand, which states that the quantity of goods supplied rises and falls as the price falls. The high demand of cement which was in short supply on the market in the country at the competitive higher price made Zambia an attractive cement market to new cement manufacturing companies, which has changed the market conditions for the Cement market from a monopoly to a competitive market with more market players.

Up until October 2009, the Cement industry in Zambia experienced little competition was less customer centric as the market was sold out and the focus was to produce volumes of quality products in a sold out market (Emmanuel Chokwe,Thabiso Mbongwe,Benson O. Nyagol,Taimi Amunkete,Dr Michael Humavindu,Junior Khumalo,George Nguruse, 2013). The study on Sub-Saharan Africa (SSA) findings indicated that SSA was the world's last cement frontier, by year 2011 with a supply deficit of some 5 million tons per annum, according to the market Survey reports by African Competition Forum (ACF) and Amara's African Cement Report in the year 2011, (Zunga N. and Lopes-Pinto A., 2011). The sector was less cost efficient and was not very good at operational excellence (OE). Operational excellence performance indicators are high productivity, high overall equipment efficiency (OEE) and high customer satisfaction (ICONICS, 2010), (Company, 2005), (infor, 2007) and (Fekete, 2013) .

The competition has affected the cement manufacturers both negatively and positively, depending on the orientation of their operations strategies with respect to internal efficiencies to cushion market competition,), (Wheelwright et al ,1985) and to stay ahead of the competition, businesses are having to continuously review their operational strategies (Acur, 2004). The competitive business environment has little tolerance for inefficient implementation of functional strategies (Swamidass, 1987) hence the birth of lean manufacturing management (Poesche, 2002). In low competitive or monopoly manufacturing business environments, it is more forgiving for inefficient functional strategy. Where as in competitive environments, functional strategy inefficiency is not profitable and is unsustainable. Therefore, for manufacturing sector to compete favourably, the functional operations must be more efficient to enhance timely response to market needs, which could be only achieved if alignment between the commercial and manufacturing functional strategies existed, hence the push to Agile manufacturing management (Poesche, 2002). Agile manufacturing is about an intellectual frame of mind building in efficient operations strategy. It incorporates the lean manufacturing strategy, but it also includes other concepts. Fundamentally, agility may be defined as the capability to respond effectively and efficiently to unexpected events. This was the

research paper building block for operations efficiency improvements in a de-monopolized Market.

The players in the market now are Lafarge Zambia, Zambezi Portland Cement and Dangote Cement. Other small players are Oriental Quarries, Great Wall Portland Cement and Midlands Portland Cement Zimbabwe. Others have joined like Sinoma Group which has built a new plant in Lusaka south near Multi-facility Economic zone (MFEZ), called China National Building Materials' (CNBM) cement plant. The setting up of new cement manufacturing companies has made the cement products readily available on the market at a competitive lower retail price, consequently lowering the profit margins for both retailers and manufacturers, this is more visible in 2016 and 2017 Annual financial reports for Lafarge Zambia, (Lafarge, 2016) (Lafarge , 2017). In this environment, the manufacturing sector which was more sales volume driven, for the sold-out market with the less focus on the manufacturing operations efficiency, is now open to the effects of inefficient functional strategy linkages which cannot be overlooked. This has posed a challenge for Cement manufacturers to be more efficient with their operations to remain competitive and sustain their businesses. The new business environment is under a price and product differentiations competition. This means lower cost of production, customer satisfaction and efficient operations are the key performance factors to competitive advantage, which can only be achieved through a functional operations strategy alignment by all stakeholders in the organizations (Lafarge, 2015).

In this research it is notable that market environmental concerns have a substantial impact on operations strategy and that good performers adopt different operations strategies in response to environmental stimuli than do poor performers (Ward, 1995). First, market environmental considerations should be part of an operations strategy framework. Second, good performers who occupy dynamic or hostile market environments are less likely to emphasize cost reduction strategies than are poor performers facing the same environmental conditions. In other words, good performers in dynamic or hostile environments adopt strategies which enable differentiation based on operations capabilities. Poor performers pursue both differentiation and cost reduction at their danger. The question is that could this be the consequences of decision made by Lafarge Zambia which has led to reduction performance in good performance under competitive environment?

It is a fact the companies' markets environment and global competition is forcing them to revise the way they design and implement their strategies and management systems (De Toni, 1992). This is visible in Zambia (Lafarge, 2016). The strategic management system redesign process requires a 'balanced', 'integrated', 'linked', 'flexible', 'multifaceted' and 'multidimensional' management system. These requirements are not currently well developed and integrated to strategic operations management processes, and could not offer opportunities for firms better understand their operations systems environment and to increase their performance level (Platts, 1990),(Taticchi and Balachandran, 2008, Slack, 2000; Platts, 1995).

2.1.9 Strategies Employed to Bring out Operations Efficiency

It is appreciated that if the organisation's leading business strategy is Marketing led, it should of course ensure customers are constantly kept supplied for business to generate revenue, however, it is still recommended that whatever the leading strategy an organisation choses to pursue, it must establish a strategical functional operations balanced alignment in order to sustain both manufacturing production capability and commercial sales operations or profitable stable revenue generation, which is in line with the fable story of the Goose and the Golden Eggs and in line with the theory of Cumulative Model, which is the notion of cumulative competency building as opposed to the unpopular 'trade-off theory' (Covey, 2013), (Kathuria, 2016).

Thus, the employed strategy that bring out manufacturing operations efficiency is a balance approach with regard to the leading strategy an organisation select to pursue amd must ensure balancing mitigation plan is in place. Manufacturing organisations need to have a well aligned operations strategy from corporate level to functional level in order to be profitable and competitive (Forbes Insight, 2015).

As demonstrated in foregoing sections of this literature review, it is imperative that the two key functional strategies commercial and manufacturing operations have a strategically balanced linkage for sustainable competitive advantage, (Cai, 2014). Fig 4

shows the manufacturing strategy business link to justify why the commercial strategy must support manufacturing sustainable success in order to realise the business objectives sustainably, (Enders, 2012), (Teece, 1994) (Moran, 2008)and vice versa.

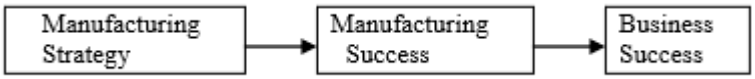

Fig. 4 Manufacturing strategy business Link (Moran, 2008)

Sometimes extreme production contributes little to market success in as much as it offers competitive advantage hence the need to balance the two functional strategies, (Wheelwright, 1985). Improving the focus in market requirements is important whereas manufacturing operation is a competitive weapon to respond to market requirements, (Raymond E. Miles, 1987), (Hill, 1983). Thus, the need to establish strategy balance linkage.

The link between operations strategy and business performance has long been asserted in conceptual work in operations, (Skinner, 1969), (Hayes, 1984). Manufacturing operations strategy is part of the widely accepted hierarchy of strategy suggested by, (Hofer, 1975) and (Hofer, June 1978)). Manufacturing forms a part of the cluster of functional area strategies such as marketing strategy, financial strategy and the like which complement higher level business and corporate. In many industrial companies, corporate policy and strategic decisions are based mostly on financial and marketing understandings of what is best for the company in the future (Hill, 1983). Then the corporate marketing requirements are put forward to Manufacturing, who is asked to comment on the plan and how practicable it would be to accomplish. The amount of formality which is involved in this process will differ from one organisation to the next.

In today's competitive global marketplace, excellence is not an option; it is essential to success (Nemours,2005). "Operations must become a, if not the, primary marketing tool in the firm's arsenal. Quality, maintainability, responsiveness, flexibility and the length of the innovation cycle are controlled by the factory. To achieve Operational Excellence, a combination of the best management processes, globally recognized technologies and technologists, Six Sigma methodology, and a proven culture-change model to provide an

integrated solution must be implemented (Iconnic, 2008). Du Pont is an example of operations excellence system namely Asset Productivity, Capital Effectiveness and Operations Risk Management. Asset Productivity is a process for extracting the maximum value from a manufacturing asset base (people, materials, and investment), resulting in increased cost productivity. Capital Effectiveness; Engineering Process, identified the most critical steps in that process, created best practices to explain how to execute the critical steps, and developed assessment tools to measure how well those steps have been executed. Understanding and controlling risks can provide substantial benefits to the well-being of a company's employees, contractors, finances, and public image: fewer injuries, lower emissions, and reduced claims expenditure.

To achieve operational efficiency using a multidisciplinary planning groups and Foster broad participation and ownership in the planning process is recommended companies seek the next level of business performance, they must seek to improve their operational efficiency and coordination with business objectives (Iconics,2010). Each organization has its own unique situation, based on its own evolution and market realities, but all operations have one thing in common that is better coordination between business systems and production operations will result in improved overall performance. Collaborative Production Management (CPM) is an architecture that most efficiently connects multiple axes of a production operation as efficiently as possible through automation. Business operations are connected to plant operations, design, support, supply and customer systems in ways that minimize the effort and maximize the value between each area of the operation. The greatest benefit occurs when necessary information is available to people at all levels at all times. ICONICS highly recommends portal technology to create corporate portals to show KPIs, OEE data, real-time plant information, alarm notifications, business information and other shared documents. Manufacturers should consider utilizing Manufacturing Intelligence for real-time data collection and connectivity at the plant floor, establishing operational context and exposing manufacturing information to the rest of the enterprise through interoperability. With a very simple approach and adoption of open standards, users can achieve maximum integration and reap the great benefits of Operational Excellence. This is essential to Lean Manufacturing, providing the tools to measure KPIs and OEE that drive operational efficiency

More strategically, the S&OP process has become the guiding force that is what products to launch and when, how much capacity and inventory to invest in, allocation of scarce resources, and other business priorities associated with supply chain (Grackin,2016). S&OP can have a strategic loop as well as an operational one. That is the annual or quarterly planning may work on new product introductions, large capital investment planning, determining a new distribution network etc. The organization track plans, have them reviewed at each subsequent monthly executive S&OP meeting and adjustments are made. The past supply chain processes hindered the ability to cost-effectively scale operations and improve service levels. S&OP can help focus on improving collaboration, to share forecasts across a broader business group. One of the most powerful arguments for S&OP, when it is well run as part of the fabric of the company, is the ability to discuss and assess risks upfront. What are the risks in this plan? Have we put the right investments in place? What downsides we are likely to encounter? Understanding risks and the potential scenarios to deal with them, in a calm climate, usually produces better answers

A dominant portion of manufacturing strategy literature recommends that the various functions of a business, particularly manufacturing and marketing, should be on an equal footing in the strategy development process. However, research evidence suggests that this is not necessarily true in practice (Wheelwright and Hayes, 1985). There has been limited cooperation between the marketing and manufacturing functions (Hill, 1993). Manufacturing in many firms is reactive to marketing, which may be detrimental to the business (Marucheck et al., 1990; Wheelwright and Hayes, 1985). Manufacturing function trails other functions in importance in the strategy development process (Hayes, 1984). The process by which strategy is formulated and implemented addresses how strategic goals and decisions are reached in an organizational setting (Swamidass and Newell, 1987). An example would be the marketing function pursuing strategic goals of product variety, which manufacturing is not capable of delivering. If manufacturing and marketing managers participate and contribute equally to the strategy development process, the potential for incongruent strategic goals between these functions can be reduced or eliminated (Chris Voss, 1992), (Hill, 1983). Manufacturing strategy and business strategy are made consistent by making investments in manufacturing in the light of business goals, and longer-term manufacturing developments are systematically

addressed. Manufacturing strategy results in world class manufacturing (WCM), where manufacturing is a competitive weapon.

If the company wants to be successful and be among the first, it must continuously improve all processes and find optimal solutions for increasing both the efficiency and effectiveness mean to gain a level of performance that provides the company with the ability to succeed and survive into the future. To compete with the in the world, world class production the only way. The business lesson of the 1980's was that Japanese firms, in their quest for global competitiveness, demonstrated a greater commitment to the philosophy of continuous improvement than Western companies did. For such a philosophy the Japanese used the term Kaizen (Thessaloniki, 2006). Thinking Kaizen as a customer-driven strategy for improvement. Kaizen then has emerged in the U.S. as a methodology leading to dramatic increases in productivity by manufacturing companies.

2.2 Summary of Functional Level Strategy Operations Efficiency Findings

This section summarises the findings on the research problem and the gap that exists in the literature review which established the basis on which the research had to continue. The research Scope of this study was to identify and address the causes for functional operations strategy resulting into functional level inefficient operations between Manufacturing and Marketing which do not contribute to sustainable competitive advantage in De-monopolised markets.

As a critical element in business unit strategy, the role of functional level strategy (operations) is increasingly attracting attention from researchers and practitioners alike, but little has been done on pitfalls that lead to imbalance linkage between the functional strategies during the formulation and especially implementation phase as revealed on most research papers. The gap existed on finding the best approach or model that can be used or adopted to close the gaps that lead to functional level strategy imbalance (Gianesi, 2001), Acur PROPHESY model (Acur, 2003), (Unit, 2004), (Forbes Insight, 2015).

Therefore, this research paper focused on the identification of the pitfalls that lead to functional strategic level imbalance linkages, with a concentration on Manufacturing operations and Marketing operations strategies, then creating a model that will close the gap in existing literature on how to avoid the strategy misalignment or imbalance. There is lack of consistent decision pattern within each function, because the operation strategy literature by many authors has been more prolific in prescribing what to do (objective), than prescribing how to do it (process) (Henrique L. Corrêa, 2001). The Acur prophesy chart and Barnes three strategy levels are great examples of process in strategy formulation but does not warn against behaviour that makes the established models look inefficient or porous in as far as pitfall identifications is concerned to imbalance strategic linkage during implementation.

Nevertheless, it is evident that some research has been done on strategy alignment/imbalance between manufacturing and marketing but all of them struggle in modelling a simple way to avoid this traps that lead to operations strategy functional imbalance. A few models have been suggested but they all fall short under the same pitfalls. Thus, in this research all pitfall identified by other researchers and successes achieved in some industries to attain operations efficiency improvements have been taken into consideration to come with the simple effective model.

2.2.1 Literature Key Notes

To this effect there was not yet any research literature done on Mining, Cement or other manufacturing industries in Zambia or anywhere else to the best of the researcher's knowledge, in line with the current transformation of the manufacturing sector, the author came across during the course of this research. The literature review conducted demonstrated a lot of coverage on Operations Strategy theory competitive priorities, formulation process, need to link resources based view and market based view but very little on the pitfalls which lead to imbalance linkage in the integration of the two functional strategies, more over the effects of such imbalance on operations efficiency improvements for manufacturing firms in competitive environment or transitioning from Monopoly into competitive environments.

Other researchers like Nuran Acur and Umit Bititci in their work indicated that stronger linkage between market-based view and resources-based view improve the strategy management process and consequently the business performance, however, they did not outline the solution to pitfalls that weaken the balanced functional strategy linkages, (Acur, 2004). It was also noted that much of the literature on resources based and market-based approaches is still at the theoretical stage, (Acur, 2003), with researchers only beginning to explore the validity of these approaches in practice. Hence, further research proposals on topics such, 'establishing how functional area managerial choices interact with elements of competitive strategy', was cited as an interesting area of research, (Rheea, 2006). This paper will advance research work especially on the pitfalls for imbalance linkage between Manufacturing and Marketing/Sales which starts to develop in strategy formulation stages and worsen during strategy implementation, resulting in P/PC imbalance and consequently poor operations efficiency. The paper has drawn attention and magnified the danger of ignoring or under playing certain behaviours and practices that have been identified as pitfalls for operations inefficiency which is detrimental to organisation competitive advantage. The following paragraphs under this section are a summarised highlight of pitfalls that lead to functional imbalance and remedial actions that have been tried by other researchers.

The combination of the globalization of business coupled with advances in technology has created a hyper-competitive environment in which managers must constantly be looking for new and innovative strategies to stay ahead of the competition (Wiley, 2015,).To properly implement these strategies, managers need to clearly understand the core capabilities of their firm and focus their resources on maintaining and improving these capabilities. Successful firms today are looking to develop strategies that integrate goods and services into a single product offering or "bundle of benefits," which attempts to solve problems for customers rather than just selling them products, this a new strategy Lafarge taking (Lafarge, 2017).

When corporations fail to recognize the relationship between manufacturing strategy and corporate strategy, they become burdened with seriously non-competitive production systems, which are time consuming to change (Moran, 2008).Many corporations do not have senior manufacturing personnel in the ranks of "top management" with the firm

(Brown, 2005); (Skinner, 1969). (Hill, 1993). Top management can correct this problem by having senior level manufacturing managers involved in corporate strategy. These senior level managers, must also have a senior status in the corporation hierarchy, manufacturing must be on par with all departments. Also, senior manufacturing managers must be versed in managing, versus being technically proficient. Manufacturing involves trade-offs, and this requires a manager who can see the entire corporation as a system, not just one corner of it. i.e. the manufacturing factory (Skinner, 1969). Manufacturing personnel need to be involved in business areas, and not merely as technical input. The role and involvement of senior manufacturing personnel is an important factor for three reasons:

i. They help champion the quality drives within the manufacturing function.
ii. They provide guidelines and direction in areas such as training and quality manuals
iii. Because of their involvement in the business of the plant, they were instrumental in translating customer requirements into operational capabilities throughout the plant (Brown, 1998).

There has been little study of those factors which may enable or impede the use of manufacturing strategy to guide decision making at the manufacturing level, (Moran, 2008). Since manufacturing strategy decision making is ultimately determined at the plant level, it is suggested that more attention should be focused on organizational factors which may affect it, such as the organizational culture of the manufacturing plant. (Moran, 2008). Organizational culture describes the complex set of knowledge structures which organization members use to accomplish and generate social behaviour and is taught to new members as the correct way to perceive, think, and feel in relation to specific problems (Bates, 1995). Creating a relationship between manufacturing strategy and organizational culture lead to a well aligned and implemented manufacturing strategy connected to clan oriented organizational culture or associated with a hierarchical organizational culture (Moran, 2008). Manufacturing strategy is essentially a top-down process in which individuals in the plant react to manufacturing strategy as to other formal control mechanisms (Bates, 1995). The analysis signifies that a well aligned and implemented manufacturing strategy, which includes formal planning process,

communication of strategy, contribution to competitive position, and a long-range orientation, coexists with a clan organization culture. This clan organization culture is characterized by the use of groups and teams, low emphasis on hierarchy, and high levels of loyalty with a share plant-wide philosophy (Bates, 1995) a move Lafarge Zambia adopted with the RISE initiative (Lafarge, 2016).

Manufacturing strategy is a strategic asset, which must not be formed in a vacuum but it must be formed in conjunction with corporate strategy. Culture plays a role in manufacturing strategy and thus to enable manufacturing strategy be successful a systems approach is preferred. Team oriented interactions systems help to develop a successful manufacturing strategy. Development of superior manufacturing strategy requires superior intellectual capital. Human resources should be seeking intelligent people, since they will be developing the manufacturing strategy. Some middle-managers don't not completely agree with the top-management position, due to lack of clear strategic directions on which to base their operational decisions (Henrique L. Corrêa, 2001). Other factors that affect the strategic role of manufacturing both directly or indirectly, are the attitude of top managers towards manufacturing and the low involvement of manufacturing managers in setting the strategic direction of the firm (AL-Rasby, 2016). An example, considering manufacturing to be incapable of influencing competitive success and encouraging manufacturing to follow blindly industry practice in matters regarding the work force, equipment purchases, and capacity additions without understanding how manufacturing can provide competitive advantage.

There is belief by some top Managers who think that the best way of solving a manufacturing problem is to toss money at it and hope that the problem will be eliminated. Instead top managers should communicate frequently with manufacturing managers to understand the problems facing them and how they can be solved, such positive attitudes of top executives can have profound consequences on the way employees perceived their roles within a company Hayes and Wheelwright (1984). Manufacturing managers should take a broad view of their role by seeking to understand their company's business strategy and the kind of competitive advantage it is pursuing'. Swamidass and Newell (1987). Past researchers observed that manufacturing managers viewed their roles as being only reactive to the demands placed on the production system, Hill (1993). It was noted that whenever they had the chance to get involved in

corporate strategy debates, they did not explain manufacturing strategy issues effectively. Their involvement in corporate policy debates, very often, came late when the decisions have already been agreed upon, so they had little chance of changing the decisions that can negatively affect manufacturing. This lack of confidence and involvement from the part of manufacturing managers is perceived to be due, among other things, to their lack of education and training in operations. It is believed that this is why there is a notable shift with most of the manufacturing Managers, now are going for MBAs and Management studies to close the gaps.

Research studies have indicated that the usual career path for manufacturing managers started when they leave school at the age of 16 to begin manual work on the shop floor, (Samson, 1993). They progressed to become managers without the needed exposure to the essentials of operations management. The Manufacturing managers are not involved in shaping corporate policies because they spend most of their time in dealing with routine operational matters, (Hill, 1993). The importance of getting manufacturing managers involved upfront in business strategy is summed up by Samson and Sohal (1993), who noted that, 'manufacturing managers must become more than just implementers of engineering and marketing instructions on the shop floor'. Raising the status of the manufacturing function involved getting the manufacturing manager involved in the business development and market competitiveness debate.

The sales and operations planning process has been recommended as one of the adequate starting point to build a mechanism that aims to ensure coherence between operational decisions of different functional areas, which is necessary for a successful strategy implementation (Gianesi, 2001). S&OP process helps to achieve vertical coherence between decisions within the manufacturing function, as well as horizontal coherence between functions, by the process of sales and operations planning in the companies studied (Gianesi, 2001). Some of those companies achieved the following strategy alignment by use of S&OP such as integration of the functions of manufacturing, marketing, finance and engineering, both at policy definition and decision area levels; the coherence between time-phased decisions; the coherence between different level decisions within the manufacturing function; and the breakdown of important organisational barriers. It is the lack of these important characteristics that jeopardise the

process ability to provide efficient operations and competitive power to the company (Gianesi, 2001).

2.2.2 Research gap

There is need to focus on the effect of manufacturing strategy on culture. How does cultural change contribute to the effective installation of manufacturing strategy (Bates, 1995)? With even the implementation of S&OP there is still a struggle in achieving the continuous revision of functional strategies aiming to cope with the turbulent environment and at the same time the continuous assessment of the coherence between functional strategies, Gianesi (2001). A thorough understanding by the functional managers on the strategic implications of their functional decisions, a proactive role of every functional area involvement and the focus on the prioritised strategic competitive criteria, including an effective performance measurement system that favours this focus rather than disseminating conflict between functional efforts is required. The discovery of the unattained coherence gaps was Gianesi's (2001) most important contribution of research and he recommended that the practitioners and academics direct more efforts towards developing design and implementation models of sales and operations planning that can facilitate manufacturing strategy implementation (Gianesi, 2001). Thus, this research validity was established and focused on how best to develop a simple model that could eliminate these pitfalls that create unbalanced functional linkages leading to inefficient manufacturing operations that jeopardise competitive advantage in a De-monopolised market. There has been little study of those factors which may enable or impede the use of manufacturing strategy to guide decision making at the manufacturing level, (Moran.2008).

2.3 Conceptual Framework

The flow chart Fig. 5 below shows the hypothetical conceptual framework for this research based on the reviewed literature existing and the expected results for an efficient operations strategy.

Competitive Advantage through improved Operations Efficiency Resulting from Balanced Functional Strategy Linkage

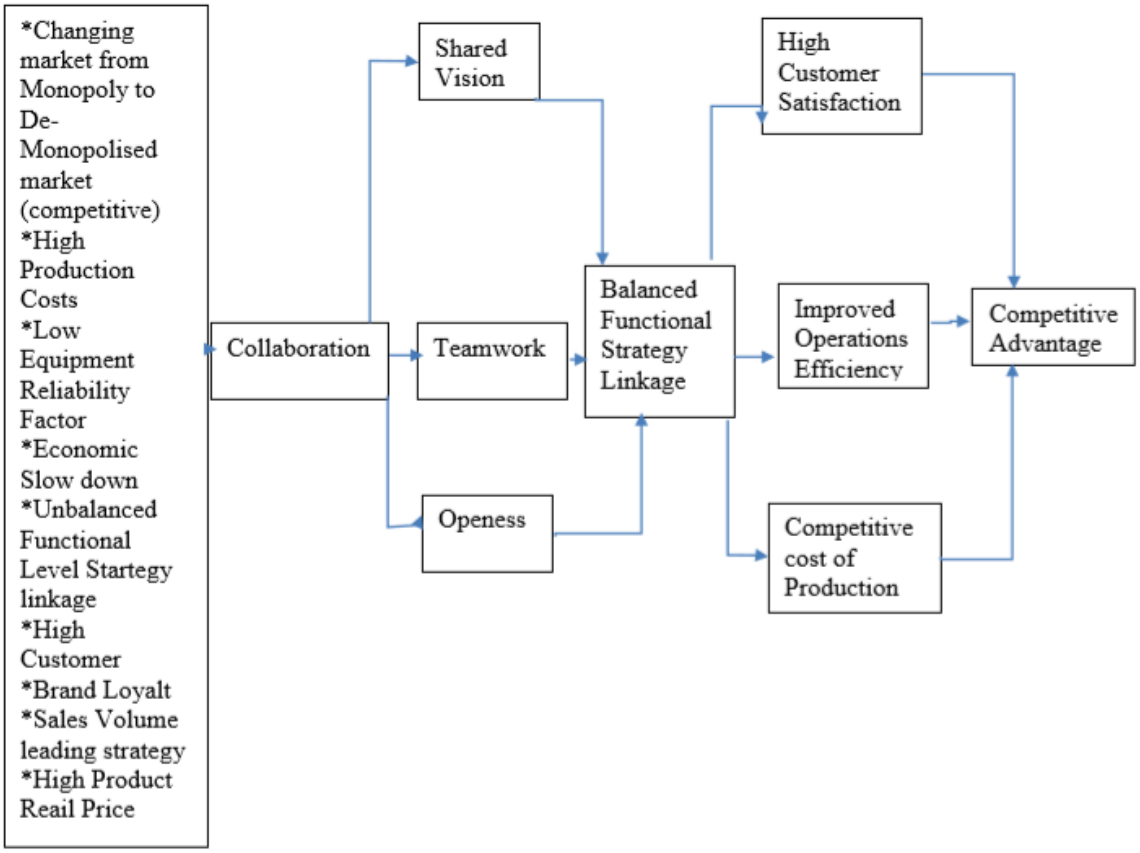

Fig. 5 Conceptual Framework

2.4 Literature on Data Analysis Tools

This section highlights literature review of the chosen research data analysis methods and tools. A few qualitative and statistical research data analysis tools were looked at such as the Statistical Package for the Social Sciences (SPSS), Microsoft Excel, Exploratory factor analysis (EFA), Prophesy Process Chart, Monte Carlo Simulations (MCSim), Pareto Analysis and SWOTCLOCK^{TM} Model. This was in order to select the best method to use in this research type. A relationship was drawn from the research subject area of Operations strategy Management to identify the most suitable methods

for data Analysis, by considering past applications, user-friendliness, and study analysis methods. In this paper a combination of qualitative and quantitative analysis was chosen. Therefore, Microsoft Excel based data analysis Tools were deemed suitable and user-friendly. These are Monte Carlo and Pareto Analysis both are Excel based tools. Some references were also drawn from SWOTCLOCK^{TM} Model in analyzing Case study factory leading strategy. The sub sections below highlights supporting information on the suitability of the chosen data analysis tools in this research.

2.4.1 Monte Carlo Simulations

Monte Carlo (MC) analysis was chosen for input to quantitative analysis as it is a research strategy that incorporates randomness into the design, implementation or evaluation of theoretical models. It is a general term that refers to research that employs random numbers, usually in the form of a computer model or simulation (Pamela Paxton, 2001). The Monte Carlo method was invented by scientists working on the atomic bomb in the 1940s, who named it for the city in Monaco famed for its casinos and games of chance. Whenever you need to make an estimate, forecast or decision where there is significant uncertainty, you'd be well advised to consider Monte Carlo simulation (Pamela Paxton, 2001). This is what made MCSim to be adopted as a method, since strategy imbalance is based on decisions and the higher ups in strategical roles of the organizations are more dealing with uncertainty as they make decision best on either their gut feeling or available analytical data. Many of the problems with which they are confronted in a competitive market are uncertainty, or unpredictability, at their very core. The movement of atomic particles was described by probability models (Pamela Paxton, 2001). Fixed inputs do not lead to the same output every time, so it is like a trial and error would be inevitable. Thus, monte carol simulation is suitable too for this research. Like theories of subatomic particles, animals, trees, so is the people's unpredictability. The Monte Carlo analysis tool was selected as appropriate because the research dealt with strategical decisions of significant uncertainty. Monte Carlo method uses random numbers and probability to solve such decision problems. The Monte Carlo method was invented by scientists and its core idea was to use random samples of parameters or inputs to explore the behaviour of a complex system or process. It is recommended to be used whenever one needs to make an estimate, forecast or decision where there is significant uncertainty (Pamela Paxton,2001).

In the Monte Carlo method "properties of the distributions of random variables are investigated by use of simulated random numbers" (Gentle, 1985, p. 612). Monte Carlo help to assess bias in the estimator in small and moderate sample sizes. This is done by creating a structural equation model with known coefficients and distributions for the observed variables. In this research an equation was developed based response pattern from strategical executives and operations managers. Monte Carlo simulations are appropriate for questions that we cannot evaluate with certainty theory. However, in structural equation modelling (SEM) as well as other areas, the statistical properties rely on unrealistic conditions such as the availability of a large sample or ideal distributional assumptions for variables. It is in these instances that Monte Carlo methods step in to fill the gap and augment analytical results. This was a case study restricted to a leading cement manufacture and thus created a limited sample. Nevertheless, with the use of monte carlos a high sample population was simulated and pattern drawn giving a typical behaviour of people when faced with operations strategy decision challenges.

2.4.2 Pareto Analysis Method

Pareto Analysis is one widely used Analysis tool in Industry to determine the area of focus out of so many issues. In case of this research it was suitable to be used in identifying the vital few pitfalls, leading to corrective action that has a high return say for a low dollar input. As per Pareto principle the 80/20 rule, it meant that 70 to 80 percent of the functional strategic imbalance between commercial and manufacturing operations strategies problems leading to inefficient operations was due to those vital few pitfalls. This is one tool used in Cement Industries equipment downtime incidents over time analysis to identify trends that require significant attention and it was deemed applicable to help correctly direct efforts on the Pitfalls that will help attain the desired strategic linkage balance.

2.4.3 Strategy Analysis SWOTCLOCK™ Model

The SWOTCLOCK™ DIAMOND methodology suggests a simple analytical, rational and quantitative formula of how to embed the SWOT components (Strengths,

Weaknesses, Opportunities, Threats) into the appropriate, 'Leading Strategy', out of the 4 possible strategy combinations: Growth, Response, Survival and Leverage. The 'Leading Strategy', external and internal dynamic changes over the time affect a change of the most likely, 'Leading Strategy', to happen accordingly and the appropriate decision-making process to be applied in practice. The SWOTCLOCK™ model is a creative and innovative approach, developed to strengthen and enhance the firm's ability to consolidate its' business strategy effectively and efficiently. It is a management tool for decision makers that will enhance their capacity to design and implement business strategies to meet current and future challenges." (Tirosh, 2012).

The description of the SWOTCKLOCK Model methodology indicated that it would help to analyse the Case study cement factory leading strategy but was not going to help identify the pitfalls even though would help to realise what might have caused some biasness. It is a known factor that any leading strategy has some inherent biasness which must be avoided to ensure sustainability and get on key players involved with one goal in mind. The model strategy formula helped to identify the leading strategy at that moment by simulating the organisation's actions with reference to what was prevailing in the business environment. The CLOCK behaviour shows the affected change of the Leading Strategy (LS) strategy POINTER over the time series scale factor. The major contributors to SWOT analysis are marketing/sales and Manufacturing Operations, hence when the inputs (objectives) are simulated and weighted as per SWOTCLOCK principles and the outcome (POINTER) gives a Leading strategy opposite to the strategy suitable to the market environment then the functional heads can find it easy to apply the Root Cause Analysis (RCA) methodology to see what pitfall behaviour in either of the operations are at play and quickly resolve to get alignment.

SWOTCLOCK^{TM} Model application examples are available on website, (Tirosh, 2013). One such application is a research disseminated in the proceedings of the 3rd. Euro Med Academy of Business 2010 Annual Conference. It was about, 'Mutual Strategy Relationship of Eilat vs. Aqaba as Tourism Destination', by (Tirosh, 2012). The fig. 6 below illustrates the SWOTCLOCK plotting for leading strategies depending on the analysis of the strategy. Refer to (Tirosh, 2012) for SWOTCLOCK MODEL MATRICs for Calculation of Intensity to determine the Leading strategy of any firm.

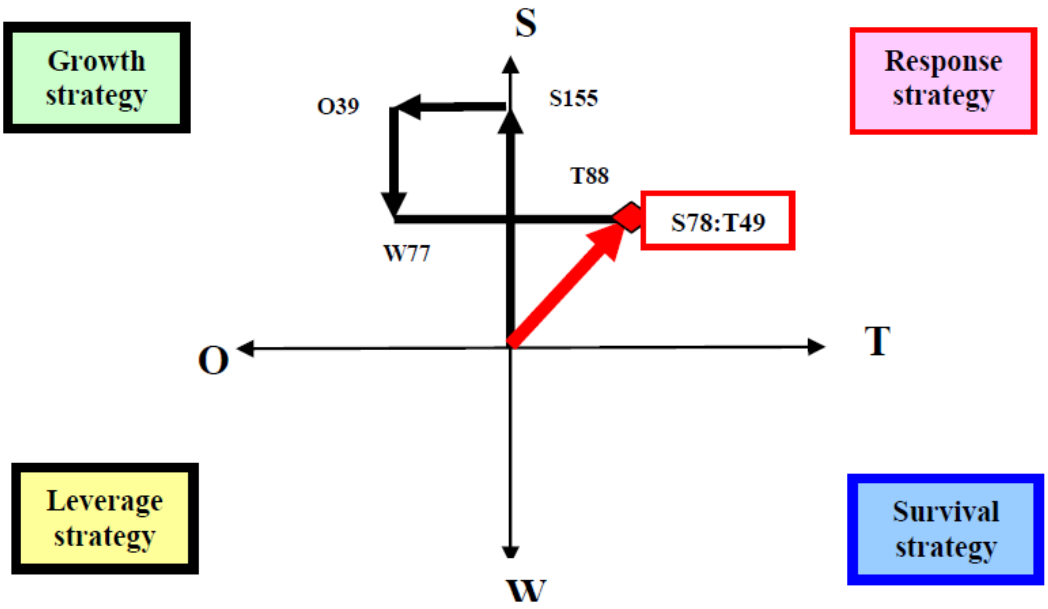

Fig. 6 Illustration of the SWOTCLOCK Pointer Strategic position (Tirosh, 2010)

2.5 Scope and Limitations

The research was limited to one organization case study due to limitation of time and resources. However, apart the selected firm being a global company implementing a lot of best practices from over 90 countries with an employee base of over 115,000 and Zambia is in the Sub-Sahara Africa (SSA), the only region which had deficit in cement production, the research is still valid. Sub-Saharan Africa (SSA) was the world's last cement frontier, by 2011 with a supply deficit of some 5 million tons per annum, according to the market Survey reports by African Competition Forum (ACF) and Amara's African Cement Report 2011, (Emmanuel Chokwe,Thabiso Mbongwe,Benson O. Nyagol,Taimi Amunkete,Dr Michael Humavindu,Junior Khumalo,George Nguruse, 2013), (Zunga N. and Lopes-Pinto A., 2011). Also, cement prices in SSA were, at the top end, some 200% higher than emerging and developed countries, (Zunga N. and Lopes-Pinto A., 2011).

Therefore, a case study still was valid because of new high competition in the region, which made it interesting to review how the industry had been performing under low competition and determine the paradigm shift that would be needed from the operations

strategy point of view to sustain competitive industrial operations and customer satisfaction, as production cost is the only lever manufacturers have total control over and can use as a leverage under price war competition. Is it also important for companies to belong to the leaders in their line of business (Fekete, 2013).

The scope of the case study was operations efficiency improvements with a focus on identifying the hidden causes of unbalanced linkage between commercial and manufacturing a problem identified in the Zambia cement manufacturing industries and to model the best approach to the solution. The cement industry in Zambia is now competitive market. The aim was to investigate the pitfalls in formulation and implementation of strategies, which led to low competitiveness resulting in manufacturing operations inefficiency.

CHAPTER 3: METHODOLOGY

3.1 Research Method

The research methodology behind the work presented in this paper consisted of firstly the identification of the hypothetical research problem area, then literature and fact finding observations for problem definition to authenticate problem existence, at the case study Cement Factory. First hand performance records were reviewed both internal and public released reports including Annual financial performance reports, then focused discusions were conducted with operations managers and firstline supervisors. There after, existing functional level operations strategy literature were reviewed and then a questionnaire was formulated with pitfalls for Operation inefficiencies and functional level strategy misalignment as cited in existing literature in line with the problem statement and also incorporated possible causes highlighted during interviews of operation strategy Executives and Functional level operations managers. The final pr-tested and updated questionnaire was administered in a probabilistic judgmental sampling. The findings were analyzed qualitatively and quantitatively. Lastly results were derived and conclusion with recommendations drawn out.

The research data acquisition methods employed both primary and secondary nature, in a case study format, at the Cement factory in Zambia. Case study adopted because operations management researchers have been calling for greater employment of field-based research methods (Chris Voss, 1992) . The primary sources `are the first occurrences of a piece of work´ and could be for example reports, theses, emails or company reports, (Saunders, 2009). Secondary sources, which are the most used source for this dissertation, were books, online data or journals that are, `the subsequent publication of primary literature. The data used was collected with relevance to the research topic and analysed. A combination of qualitative and quantitative methods was employed. that is Monte Carlo Simulations, Pareto analysis and established operations strategy management theories, review of past research findings and conclusions were analysis tools used to accomplish the study purpose of identifying the pitfalls to functional operations strategy imbalance that led to inefficiency operations of

manufacturing organisations, operating in de-monopolized markets consequently affecting the competitive advantage.

3.2 Research Design and Plan

The research was designed to use a combination of qualitative approach and a quantitative approach to determine the causes and effects on manufacturing performance indicators and marketing performance statistics as a result of inefficient functional level strategic operations linkages. The qualitative approach involved the collection of extensive narrative data in order to gain insights into phenomena of interest which is causes for inefficient functional level operations strategy linkage between Manufacturing and marketing. The quantitative approach involved the encoding of research identified causes or pitfalls for inefficient operations responses into numerical data in order to explain, predict, and/or control phenomena of interest using the Monte Carlo Simulation and the Pareto Analysis to help focus on the vital few causes or pitfalls as will be presented in this chaper under,' Application of Data analysis Methods ', section.

3.3 Population and Sample

The study sample comprised of 200 people in the factory involved in both manufacturing operations and commercial operations. The sample was obtained through random sampling of the population using non-probabilistic judgemental sampling method, which included executive committee members (strategy managers/directors) in charge of manufacturing operations, marketing and Sales, supporting executives' managers in supply chain and finance. The sampling was also extended down to head of departments, head of sections (frontline managers), frontline supervisors and staff (shop floor personnel) below the supervisors in the study target population functions. This sample was deemed to be a representative population of a Cement Manufacturing Industry's operations functions for a firm which has full time employees of about 300 and 350 approximately contracted employees making a population of round about 650 on two sites. This sample was deemed representative due to the nature of the research topic on Operations strategy which is not well known or fully understood at shop floor below

team supervisors. Some supervisors could not even complete fill out the questionaire and returned it with a ,"no idea", comment.

3.4 Data Collection Instruments

Both primary and secondary data was collected. The data sources comprised of the company performance reports, past study area theses, internal company newsletters via emails, dissertation, subject area online books, published papers, journals which are subsequent publication of primary literature. The combined sources of both primary and secondary data used in this research comprised of company literature, observations on how operations were executed in both commercial and manufacturing functions, selected interviews (face-to-face) were conducted, focus group discussions using the operations review meetings were also used as source of information, and written questionnaires were administered in a non-probabilistic judgmental sampling. Judgmental sampling is defined as the sampling where the researcher chooses the sample based on who they think would be appropriate for the study. This is used when there are a limited number of people that have expertise in the area being researched. These combinations of data collection were applied so as not to limit sources of information and eliminate all possible biasness that could result if only one approach was used and this was to ensure that the approach also supported the findings validation for the generalization of the research findings especially that the research method was a case–study. In this research the secondary data used was evaluated before any conclusion was made.

The administration was done in two ways, firstly printed hardcopies were given out in person and secondly soft copies were sent by email. The first questionnaires were sent out and feedback reviewed before the final revised questionnaires were administered, this was to test user friendliness of the questionnaire and simplicity of the phrasing of questions for easy understanding by all respondents. The questionnaires were given out and emailed out in a non-probabilistic judgemental sampling method as described earlier. The inputs sources into the design contents of the questionnaire were obtained through the primary and secondary data collection methods. These were through observations, manufacturing plant shutdown post-mortem meetings, performance reports, company performance bulletins during plant town hall meetings by Chief Executive Officer (CEO) and Manufacturing Director (Plant Manager), daily manufacturing cross-functional

operations meetings, news flash emails, company financial reports, operations strategy management books, literature reviews of dissertations, company online data, Harvard business reviews, Facebook group weekly posts, Google scholar and general internet search engines. The questionnaire design covered all three research specific objectives. All the questions were deliberately checked against research questions and objectives to ensure that all the research objectives were fully researched and answered.

3.5 Data analysis Methods

Three analysis methods were employed namely Quantitative Analysis by Monte Carlo Simulation (MCSim) , qualitative strategy analysis by SWOTCLOCKTM Model, and quantitative results analysis by Pareto Method. The subsequent sections below outlines the suitability of the chosen methods and their application.

3.5.1 Quantitative Analysis by MCSim

All data collected was tabulated in a systematic and logical way using excel, combining similar data together as per questionnaire administered (Appendix B). The narrative feedback on questionnaire question seven (Q7) were transformed into numeric form for quantitative analysis of data using Monte Carlo Simulation (MCSim) and Microsoft Excel mathematical analysis. The Monte Carlo analysis tool was selected as appropriate because this research dealt with decisions of significant uncertainty. Monte Carlo method uses random numbers and probability to solve such decision-based problems. It is recommended to be used whenever one needs to make an estimate, forecast or decision where there is significant uncertainty as was the cause of determining what makes strategical managers and executives to make biased strategy decisions which seem to support their function operations objectives but misaligned with other functional level operations and consequently negatively impacting the overall business performance.

Literature recommended use of Monte Carlo whenever one needed to make an estimate, forecast or decision where there is significant uncertainty (Paxton,2001). This is what made MC Method suitable in analysing strategy imbalance which is as a result of Executive and strategical mangers' decisions whose strategical roles in organizations are more dealing with uncertainty based on either their gut feeling or available analysed

data. Monte Carlo (MC) analysis was suitable for quantitative analyse of the strategic decision randomness. The problems encountered in a competitive market are more uncertain or unpredictable. The suitability of MCSim was further upheld because the sample population in this research was limited and that makes Monte Carlo suitable choice as it enabled research to simulate results over a large sample for a representative conclusion to base generalisation of the findings based on the fact that the research was also administered in a judgemental sampling method.

Dr. Sam Savage, a noted authority on simulation and other quantitative methods recommended using Monte Carlo simulation to avoid the trap of the flaw of averages, (FrontlineSolvers, 2015). He also warned that plans based on average assumptions are wrong on average. In addition, most business activities and plans are focused on strategic decisions and processes that are too complex for analytical solutions. Many business situations involve uncertainty in many dimensions for example, variable market demand, unknown plans of competitors, uncertainty in costs, and many others. The problem study for this research is compounded by such factors hence found that the Monte Carlo method was the suitable effective data analysis methods for this research. Strong support points are drawn from the strength of the simulation to eliminate the fallacy of averages and enables one to explore a thousand of combinations for the' what if 'factors and analysing the full range of possible outcomes, this was deemed to give much more accurate results.

Some of the real-life recent research work and projects that have used Monte Carlo Simulations are studies in Risk management and structural equation modelling (SEM), examples are:

a. Risk Management within the International Construction Industry (Nemuth, 2008).
b. examination of fit indexes, non-convergence, and improper solutions, (Gerbing, 2016)
c. Study of likelihood ratio test statistics, (al, 1996)
d. Analysis of cut off criteria for goodness-of-fit statistics, (Bentler, 1999).
e. Study of the effects of coarse categorization in structural equation model estimation, (Kaplan, 1992)

3.5.1.1 Application Procedure of MCSim Method

The numerical encoding was applied to question seven (Q7), where the level of agreement on each identified listed pitfall validated on questionnaire was assigned weighted points for calculating agreement level Weighted Intensity. The agreement weighted intensity was arrived at by multiplying the weight for the most agreed with the corresponding sample sum number. To establish result reliability and validity a mathematical expression for Unbalanced Linkage (UL), was deduced as equation 1 below;

UL =IF ((0.29SA +0.51A+0.17N) -(0.03D+0.001SD+0.17N))>0.89,1,0) **Equation 1**

This equation was derived on Monte Carlo Simulation (MCS) following the pattern on pitfalls by responders on questionnaires. Table 3 below shows how this Monte Carlo mathematical expression or equation 1 was derived.

Table 3 MCS Equation Formulation 1Inputs (See uncompressed Table 4 on appendix A)

Q7: In this knowledge and information age, what could be the pitfalls (gaps) which contributes to unbalanced functional strategic linkage between the Manufacturing (i.e. Production/ Maintenance Engineering) and Commercial (i.e. marketing/Sales) operations strategies?(Please indicate your level of agreement or disagreement with each of these tabulated statements. Place a "√" mark in the box of your answer)	Strongly Agree (Weighted 5 points)	Agree (weighted 4 points)	Neutral (Weighted 3 points)	Disagree (Weighted 2 points)	Strongly Disagree (Weighted 1 point)
a. Planning long production stoppages without involving commercial (Marketing/Sales) forecast resulting in stock outs of the product on the market.Maintenance planning without taking into account market needs.	50	20	0	15	10
b. Postponing planned equipment maintenance stoppage in order to keep the market supplied with little consideration of secondary damages to equipment	50	40	0	5	0
c. Setting production targets and dispatches without involving the manufacturing (production/maintenance) Managers to advise on production capability	35	40	5	10	5
d. Reducing the scope of planned equipment stoppage ,in order to quickly turn on equipment and continue production, in the interest of keeping the customer satisfaction	55	40	0	0	0
e. Lack of skilled manufacturing operations managers with capability to respond at short notice ,with quality repair on secondary damage which result from running equipment to failure while pushing to meet business sales targets	20	40	20	10	5
f. Lack of Overall Equipment Efficiency (OEE) knowledge in Commercial Managers, demonstrated by demands on Operations team to meet customer needs under any circumstances	20	35	15	20	0
g. Repetitive conflicts between the manufacturing operations and the marketing/sales functions centered on the desire of marketing to ensure that operations concentrate on satisfying customers	20	40	20	15	0
h. Less efficient manufacturing operations as a result of high demands to produce greater volumes, more variety, higher quality, and a faster response without investing in enabling capabilities	30	40	5	15	0
i. Low collaboration between marketing and manufacturing operations managers while setting targets to match business goals	30	50	10	5	0
j. Lack of awareness/knowledge of manufacturing operations by the commercial team to appreciate the challenges	25	35	15	20	0
k. Also lack of of basic sales and marketing information by the manufacturing operations team to appreciate customer and market challenges	50	20	0	15	2
l. There is no clear involvement of operations and mid management in short strategic meeting	10	50	25	5	5
m. Information flows Top down and not other way round so we miss the opportunity to incorporate concerns from shop floors/operations	0	50	25	15	10
n. Set up of objectives must be centralised so that no one function will focus on its "small" objectives at the expense of the good of the whole organisation.This also brings conflicts as each function pushes for its interest only	10	5	25	50	5
o. Silo mentalities existing in both commercial and manufacturing divisions	25	25	50	0	0
p. Lack of transperency of manufacturing on challenges in the plant	0	25	50	25	0
q. When cost saving becomes a driving force for profitability	0	25	45	0	25
r. Lack of communication on variability of demand in times of very high demand and times of low sales	0	25	50	5	15
STATISTICAL ANALYSIS					
Number of Majority Selections	**20**	**36**	**12**	**2**	**0**
Total Number of Selections	**70**				
Percentage Proportion per Selction	**29%**	**51%**	**17%**	**3%**	**0%**
TOTAL Percentage	**100%**				
Probability Conversion per Selection	**0.29**	**0.51**	**0.17**	**0.03**	**0**
Maximum Probability	**1**				
Proportional Sum of Strongly Agree,Agree and 50%Neutral must be greater than 0.80. or 80% for Balanced Linkage to Occur	**0.89**				
Proportion sum for strongly Disagree ,50% Neutal and disagree must be less than 0.20 or 20%	**0.12**				

Therefore, the mathematical expression equation 1, is explained as:

$$UL=IF\ ((0.29SA+0.51A+0.17N)-(0.03D+0.001SD+0.17N))>0.89,\ 1,\ 0) \quad eq.1$$

Whereas:

UL=Unbalanced strategic Linkage
SA=Strongly Agree count
A=Agree count
N=Neutral count
D=Disagree count
SD=Strongly Disagree count
0.29, 0.51, 0.17, 0.03, 0.001=Constants ratios derived from the question responses
0.89= Implies minimum level of agreement that indeed the pitfalls arrived at are the true cause for Unbalanced strategy linkage
IF UL>0.89, then a '1', will be assigned to mean yes, the pitfall is a cause for unbalance otherwise a '0', is assigned to mean it's not a cause for imbalance.

The expression was simulated in the Monte Carlo simulation, to check repeatability of results with a wider sample size from 200 to 1000 repetitions. The concepts of reliability and validity are very important to take into consideration when carrying out a qualitative research since they help to determine the objectivity of the research. Reliability and validity are measurement instruments that illustrate the level of trustworthiness and credibility of a research. The Monte Carlo application was selected based on its suitable application in dealing with decisions and randomness to test reliability of the finding with the simulation of a wider range of sample size. To evaluate the leading strategy of the Case study Cement Organisation basing on observations and feedback pattern on the questionnaire.

3.5.2 Qualitative strategy analysis by SWOTCLOCK™ Model

The SWOTCLOCK™ Model principles were used to check the case study leading strategy in pursuit ant the conclusion made was Response strategy, as per study questionnaire responses to question one (Q1) in Appendix E. Response strategy is a situation in which the weighted power intensity (WPI) of 'threats' is larger than the power intensity (PI) of ‘opportunities' and that of 'strengths' is larger than that of 'weaknesses.' Therefore, the Response strategy employs 'strengths' to push the 'threats' away. A strategy seen applied by the case study cement factory as the market is in 'price war,' and the players are focusing and differentiating product quality and operations 'performance improvement through cost reduction and people development or enhanced Human resources.

3.5.3 Quantitative results analysis by Pareto Method

Pareto Analysis is one widely used Analysis tool in Industry to determine the area of focus out of so many issues. In case of this research it was suitable to be used in identifying the vital few pitfalls, leading to corrective action that has a high return say for a low dollar input. As per Pareto principle the 80/20 rule, it meant that 70 to 80 percent of the functional strategic imbalance between Marketing and Manufacturing operations strategies problems leading to inefficient operations was due to those vital few pitfalls. This is one tool used in Cement Industries equipment downtime incidents over time analysis to identify trends that require significant attention and it was deemed applicable to help correctly direct efforts on the Pitfalls that will help attain the desired strategic linkage balance.

3.6 Results Presentation format

The final conclusions of the qualitative and quantitative analysis were drawn with reference to established Operations strategy Management literature. The application of Pareto Analysis helped to focus the solution of the findings on the vital few pitfalls, draw research findings conclusion and recommendations. After analysing the findings from

past research and questionnaire feedback under this research the major cause was identified and corrective solution Model was designed and other possible solution Models existing were recommended.

3.7 Ethical Considerations

Prior to conducting the study, a research proposal was prepared and submitted to the selected case study Cement Factory Company Secretary (Lawyer), work force learning & Development Manager/Industrial Relations Manager, Human Resources Director, Cement Factory Plant Manager, Engineering Manager and Corporate affairs Director were engaged on ethical consideration on the research scope and clearance to proceed was given for academic use only at this stage until the research was completed and findings evaluated. The proposal included a description of the purpose and nature of the study. No Consent form was signed but a written email granting permission to proceed was sent by the corporate affairs Manager See Appendix C. The manner of information disclosure with respect to company policy privacy will be only considered after the research findings and recommendations are reviewed by the organisation, as matters of strategy are classified as confidential information.

CHAPTER 4: DATA COLLECTIONS AND ANALYSIS

4.1 Findings

A considerable amount of time was invested in finding the root causes or pitfalls that lead to inefficient operations at functional level strategy and linkages.Low operations efficiency weaken the competitive advantage in de-monopolised (competitive) markets. The chapter shall present the findings and analysis both qualitatively and quantitatively.

4.1.1 Presentation of data

These findings are a result of feedback from the administration of a written questionnaire in addition to research literature revealed, interviews conducted and observation carried out over a period of four years. Question number Q7 presented hereunder has statistical feedback with additions from responders after the first sampling response using original questionnaire on appendix A and the response findings on other question Q1 to Q11 are presented in appendix B as opposed to in main text presentation, to avoid making readers to struggle on following the findings, see appendix B for reference. Refer to appendix A, B and Table 4 in Appendix A for reference on detailed research finding responses. Table 4 below presents the consolidated raw data responses. Kindly not that question Q7 part (a) to (i) were original pitfalls compiled from literature review, interviews and observations by the researcher. And Table 4 question Q7 part (j) to (r) were additional pitfalls which were added by responders on the first questionaire. Now Table 4 is the consolidated updated final questionaire with statistical response pattern.

The inefficient operations in competitive markets are associated with unbalanced linkage between the business commercial and manufacturing functional operations strategies. Hence the scope for this research was to identify these pitfalls which led to this unbalanced linkage and the aim was to come up with model or recommendations on how to best avoid the pitfalls in order to create a balanced linkage that will lead to efficient manufacturing operations. The tabulated Q7 is a revised questionaire which was

subjected to holistic scrutiny, reliability test, bias test and consistent check through the feedback from the operations strategy experts and professionals in the field.

Find here under findings on the pitfalls administered under Q7, Table 4 updated, which was subjected to qualitative and quantitative analysis under this section using existing knowledge in operations strategy and management (Qualitative method), Monte Carlo Simulation and Pareto analysis (Quantitative method).

4.1.2 Data analysis

In analysing of the findings, firstly theoretical analysis was applied as a qualitative approach part of the research, with reference to established Operations Strategy Theories and Guidelines, refer to section 4.1.2.1 Qualitative analysis below. Secondly quantitative analysis using Monte Carlo Simulation and Pareto Analysis was computed in order to validate the pitfalls identified which lead to unbalanced linkage between the Manufacturing and the Business commercial operations strategies from practice, refer to Table 4 under Appendix A and section 4.1.2.2 Quantitative Analysis. It is believed that eliminating these pitfalls would result in a balanced linkage between the two key functional operations strategies, in this case the commercial and manufacturing operations strategies, consequently achieving operations efficiency improvements in competitive manufacturing industry market. Monte Carlo Simulations has been used to test the reliability of the findings by simulating the uncertainty over a wide sample size, making it easier to overcome the challenges of getting many responses from responders within the limited time and resources, achievable. Also, Pareto Analysis has been used to identify the vital few pitfalls to focus on and attain expected linkage balance during strategy implementation.

4.1.2.1 Qualitatively Analysis

The research results under this section are presented with response to research questions and are discussed with reference to existing tested literature to draw conclusion. Hereunder is summary of the findings to research questions one (01), two (02) and the third (03) as follows;

A. Analyse functional level operations strategy in the cement manufacturing industry

The literature findings showed that the process started with the Organisation group strategy, which is then cascaded down to the country strategy plan to localize, based on specific market conditions, the basis for the country strategy or ambition plan resulted from the different departments, including commercial and manufacturing operations which feed from the country business strategy for their own strategy on how to actualize the country and group strategy. It's a thorough process with input from forward looking Market statistics, team brainstorming, best practice etc. Once this was done individual Key performance Indicators (KPI's) were also drawn.

The country specific local strategy started with a 3 years business strategy which determines production requirements, operational requirements to meet the targeted production volumes. The planned requirements included manpower, Capex and other technical-commercial needs. These plans were then broken into 1-year plans which are called budgets.Business Unit strategy also known as country specific strategy was developed first then followed by the marketing plans. Thereafter, all other specific functional level strategy formation was completed.

The market survey studies were used to decide what should be the leading strategy for country. In the case study factory, the findings showed that the firm pursed a, 'Leading Strategy', RESPONSE. This was based on a quick reference SWOTCLOCK analysis. The findings indicated Response leading strategy which leverages on Strength (S) and Threats (T) was adopted. This strategy indicates a situation in which the weighted power intensity (WPI) of 'threats' is larger than the power intensity (PI) of 'opportunities' and that of 'strengths' is larger than that of 'weaknesses'. In this case the response strategy employs 'strengths' to push the 'threats' away. This strategy is used in cases were organisations are in price war, focusing and differentiating, performance improvement, enhanced human resource motivation, and so on.

The case study cement factory also revealed that the organisation was adopting customer centric strategy that is customer satisfaction focus. This strategy is susceptible to unbalanced functional strategy linkage with Manufacturing operations, as commercial

tends to expect manufacturing to respond as the market demands and may overlook some other parameters that need to be put in place for an organisation that choose to pursue strategy to efficiently operate. This also confirmed the observation made by Hill that manufacturing managers view their roles as being only reactive to the demands placed on the production system.

The literature review findings showed that Market lead operations strategy was a common practice for manufacturing firms in de-monopolised markets, and requires that manufacturing operations strategic managers have a good understanding of the business cycle in order to timely align and re-focus efforts. As Market led strategy is susceptible to unbalanced functional strategy linkage with manufacturing operations, since the customer dictates market demand curves, that is high demand and low demands periods which has a bearing on plant production cost and equipment efficiency as well as commercials volumes and sales.

Thus, we also see a correlation with Moran observation on which he said that when corporations fail to recognize the relationship between manufacturing strategy and corporate strategy, they become burdened with seriously non-competitive production systems, which are time consuming to change.

B. *Examine relations between manufacturing and marketing functional level*

The relevance reference is on appendix be population of responses received on questionnaire and interviews.

The findings showed that there was a gap on strategy sharing and involvement of functional strategy operations managers close to the shop floor by top management. The issues of strategy were deemed to be high level nature, so each functional strategy Manager/Director chose how best to execute his function strategy in segments to his/her direct report operations managers which resulted into misalignment from the common shared vision at the business level strategy down the strategy hierarchy to the shop floor

operations teams and become competition instead of collaboration within the same organisation, breeding the segregated mind-set (silo mentality) and blame culture whenever the ball dropped through the cracks instead of interdependence. This was also noted by Gianesi (2001) when he said decision-makers at different levels within any function also have their own personal objectives and agendas, which interfere with the deployed objectives, which were derived from functional strategies. Literature further shows that manufacturing operations managers were included too late in the strategy process (AL-Rasby, 2016), (Hill, 1993).

It was noted that there was little matching investment in manufacturing operations to build capacity for competitive market efficiency improvement. Rightly put, manufacturing utilised mid-term plan developed by commercial to plan its activities. The commercial operatives had this in mind, "We are in business to make money; therefore, the commercial strategy is developed first and then all other strategies should aim to support the main aim". See this data on appendix E, Q5 response 9. However, to be competitive manufacturing capability must be robust and mastered, for it to efficiently respond to the market lead competitive industry. This mindset confirmed what Hills (1983) observed that what cause this imbalance is the mentality of viewing manufacturing manager role as a job seen to respond to the needs of the company, by aligning to marketing and finance as well as viewing the manufacturing strategic role as less to do with the corporate or long-term contribution.

It was learnt that both commercial and manufacturing have common objectives at Business Unit level which are then cascaded down by head of functions called strategic Managers below functional level. However, there are still conflicts between the two as what may be considered to increase productivity and reduce cost in one function, actually lead to inefficiency/losses in another. This showed that there was need to work on knowledge gaps in order to attain a shared vision and eliminate independence, blame mind-set and control unhealthy functional competition among functional strategy managers together with their operations teams but promote interdependence.

This substantiated Gianesi (2001) recommendation observed on some successful case study companies which achieved the strategy alignment by use of S&OP by integration of the functions of manufacturing, marketing, finance and engineering, both at policy definition and decision area levels; the coherence between time-phased decisions; the coherence between different level decisions within the manufacturing function; and the breakdown of important organisational barriers.

The manufacturing operations were rated satisfactory and performed on average with regard to the world class manufacturing parameters which are quality, cost effective, flexibility and innovation. In competitive markets operations should be at world class performance. That is high productivity, high OEE, high customer satisfaction and cost efficient. This is as a result of what Moran (2008) attributed to as non-competitive production, was as a consequence of corporation's failure to recognize the relationship between manufacturing strategy and corporate strategy, hence becoming burdened with serious non-competitive production systems, which are time consuming to change (Moran,2008). Not until commercial and top management take time to look into the challenges of manufacturing the two functions will not efficiently compliments each other.

C. Design a model to align functional level manufacturing and marketing operations strategies

By analysing gaps in literature review, findings by other researchers and correlating with findings in this research, hereunder are the major pitfall(s) outlined which have been deemed to lead to unbalanced functional strategy linkage, a remedial model has developed and efficient existing models' recommendations drawn out;

The majority research respondents made a call for more collaboration between the two functions, that is commercial and manufacturing and for decision makers to have a good understanding of both functions operations. This observation was line with the success recorded by Wheelwright (1984) he suggested that top managers should communicate frequently with manufacturing managers to understand the problems facing them and how they can be solved, such positive attitudes of top executives can have profound consequences on the way employees perceive their roles within a company Hayes and

Wheelwright (1984). Lafarge (2016) RISE culture campaign and to Bates point that, a well aligned and implemented manufacturing strategy, includes formal planning process, communication of strategy, contribution to competitive position, and a long-range orientation, coexists with a clan organization culture. He defined the clan organization culture has been characterized by the use of groups and teams, low emphasis on hierarchy, and high levels of loyalty with a share plant-wide philosophy (Bates, 1995) is evident enough that people collaboration is the only way to attain balanced strategy alignment.

Nevertheless, the findings showed that systems existed to enable continuous communication between the two functions at different levels to keep the strategic alignment between the functional level strategy operations. Examples of such system platforms at the case study cement manufacturing were executive committee meetings (EXCOM), which took place monthly with remote weekly updates into the Chief Executive officer, the inputs were from all functional level operations, which included manufacturing and commercial. There were also other operational meetings for functional strategic managers with their operations managers held weekly to ensure alignment and review plans with input updates from the ground operations.

The questionnaire respondent demographic data indicated that the organisation had an energetic age group from top to front line management demonstrating capacity to implement an evolution in strategic management, if all layers could be involved for operations efficiency improvement by avoiding the pitfalls for functional strategy imbalance. The findings demonstrated that systems for cross function were in place, it was effectiveness and consistence for shared vision that was found lacking in both operations, justifying the need for a deliberate policy or model to enforce high collaboration. Suggestion was made by Skinner (1969) that top management can correct this problem by having senior level manufacturing managers involved in corporate strategy. These senior level managers, must also have a senior status in the corporation hierarchy, manufacturing must be on par with all departments. Also, senior manufacturing managers must be versed in managing, versus being technically proficient.

The respondents proposed high frequency of communication or meetings between marketing, sales, procurement, production, engineering and quality teams to brain storm. In addition, a suggestion was made to enact a deliberate policy to allow mobility of workforce i.e. engineers with business acumen to be transferred to commercial and vice versa, a system that allow job rotation for Techno-commercial managers. Sales and operations planning (S&OP) process has been recommended as one of the adequate starting point to build a mechanism that aims to ensure coherence between operational decisions of different functional areas, which is necessary for a successful strategy implementation (Gianesi, 2001). S&OP process helps to achieve vertical coherence between decisions within the manufacturing function, as well as horizontal coherence between functions, by the process of sales and operations planning in the companies studied (Gianesi, 2001). Some the companies achieved the strategy alignment by use of S&OP such as integration of the functions of manufacturing, marketing, finance and engineering, both at policy definition and decision area levels; the coherence between time-phased decisions; the coherence between different level decisions within the manufacturing function; and the breakdown of important organisational barriers was attained.

Further Bates and Moran pronounced that since manufacturing strategy decision making was ultimately determined at the plant level, it was suggested that more attention should be focused on organizational factors which may affect it, such as the organizational culture of the manufacturing plant. (Moran.2008). Organizational culture describes the complex set of knowledge structures which organization members use to accomplish and generate social behaviour and is taught to new members as the correct way to perceive, think, and feel in relation to specific problems (Bates, 1995). This though process is also enshrined in the Collaboration approach.

4.1.2.2 Quantitative Analysis

This analysis section is based on the feedbacks as tabulated on appendix B and uncompressed Table 4 is in Appendix A. Quantitively Pareto analysis was applied on Table 4 to develop Table 5 below showing Pareto Analysis of Pitfall Weighting Responses. The tabulated pitfalls were identified as the causes for strategically unbalanced linkages between Commercial and Manufacturing. As earlier mentioned this

list was compiled from the research findings and literature reviews during the research period. The level of agreement or disagreement was assigned weighted points 1-5 as indicated. Then the highest leading number of responses on pitfall was multiplied by the column agreement weight as tabulated in the column named weighted intensity. The equation 2 below shows how weighted intensity was calculated;

Weighted Intensity=Weight*number of responses **Eq 2**

The ratios of the weighted intensity were derived using Monte Carlo Simulation. The Table 3 in methodology section showed the formulation of the Monte Carlo mathematical expression, to validate the generalisation of the pitfalls over a large sample. This is in order to authenticate the findings and recommendations on how to create balanced functional linkages between commercial and manufacturing operations. The Pareto analysis was statistically used to help arrive at the vital few pitfalls on which to focus on.

Table 4 Pareto Analysis of Pitfall Weighting Responses(Uncompressed Appendix A**)**

Q7: In this knowledge and information age, what could be the pitfalls (gaps) which contributes to unbalanced functional strategic linkage between the Manufacturing (i.e. Production/ Maintenance Engineering) and Commercial (i.e. marketing/Sales) operations strategies?(Please indicate your level of agreement or disagreement with each of these tabulated statements. Place a "\" mark in the box of your answer)	Strongly Agree (Weighted 5 points)	Agree (weighted 4 points)	Neutral (Weighted 3 points)	Disagree (Weighted 2 points)	Strongly Disagree (Weighted 1 point)	Sample Level of Agreement (Weighted intensity)	% of Total Weighted Intensity
d. Reducing the scope of planned equipment stoppage ,in order to quickly turn on equipment and continue production, in the interest of keeping the customer satisfaction	55	40	0	0	0	275	8.5%
a. Planning long production stoppages without involving commercial (Marketing/Sales) forecast resulting in stock outs of the product on the market.Maintenance planning without taking into account market needs.	50	20	0	15	10	250	7.7%
b. Postponing planned equipment maintenance stoppage in order to keep the market supplied with little consideration of secondary damages to equipment	50	40	0	5	0	250	7.7%
k. lack of of basic sales and marketing information by the manufacturing operations team to appreciate customer and market challenges	50	20	0	15	2	250	7.7%
i. Low collaboration between marketing and manufacturing operations managers while setting targets to match business goals	30	50	10	5	0	200	6.2%
l. There is no clear involvement of operations and mid management in short strategic meeting	10	50	25	5	5	200	6.2%
m. Information flows Top down and not other way round so we miss the opportunity to incorporate concerns from shop floors/operations	0	50	25	15	10	200	6.2%
c. Setting production targets and dispatches without involving the manufacturing (production/maintenance) Managers to advise on production capability	35	40	5	10	5	160	5.0%
e. Lack of skilled manufacturing operations managers with capability to respond at short notice ,with quality repair on secondary damage which result from running equipment to failure while pushing to meet business sales targets	20	40	20	10	5	160	5.0%
g. Repetitive conflicts between the manufacturing operations and the marketing/sales functions centered on the desire of marketing to ensure that operations concentrate on satisfying customers	20	40	20	15	0	160	5.0%
h. Less efficient manufacturing operations as a result of high demands to produce greater volumes, more variety, higher quality, and a faster response without investing in enabling capabilities	30	40	5	15	0	160	5.0%
o. Silo mentalities existing in both commercial and manufacturing divisions	25	25	50	0	0	150	4.6%
p. Lack of transperency of manufacturing on challenges in the plant	0	25	50	25	0	150	4.6%
r. Lack of communication on variability of demand in times of very high demand and times of low sales	0	25	50	5	15	150	4.6%
f. Lack of Overall Equipment Efficiency (OEE) knowledge in Commercial Managers, demonstrated by demands on Operations team to meet customer needs under any circumstances	20	35	15	20	0	140	4.3%
j. Lack of awareness/knowledge of manufacturing operations by the commercial team to appreciate the challenges	25	35	15	20	0	140	4.3%
q. When cost saving becomes a driving force for profitability	0	25	45	0	25	135	4.2%
n. Set up of objectives must be centralised so that no one function will focus on its "small" objectives at the expense of the good of the whole organisation.This also brings conflicts as each function pushes for its interest only	10	5	25	50	5	100	3.1%
						3230	**100.0%**

Table 6 shows a list that determine the main pitfalls in the 80% impact range after sorting Table 5 by weighted intensity percentage.

Table 5 Summarized Strategy Pitfalls Pareto Analysis

Q7: In this knowledge and information age, what could be the pitfalls (gaps) which contributes to unbalanced functional strategic linkage between the Manufacturing (i.e. Production/ Maintenance Engineering) and Commercial (i.e. marketing/Sales) operations strategies?(Please indicate your level of agreement or disagreement with each of these tabulated statements. Place a "√" mark in the box of your answer)	Sample Level of Agreement (Weighted intensity)	% of Total Weighted Intensity	Pitfall Interpretation	Cumulative Percentage	Pareto 80/20 Line
i. Low collaboration between marketing and manufacturing operations managers while setting targets to match business goals, l. There is no clear involvement of operations and mid management in short strategic meeting. g. Repetitive conflicts between the manufacturing operations and the marketing/sales functions centered on the desire of marketing to ensure that operations concentrate on satisfying customers Information flows Top down and not other way round so we miss the opportunity to incorporate concerns from shop floors/operations h. Less efficient manufacturing operations as a result of high demands to produce greater volumes, more variety, higher quality, and a faster response without investing in enabling capabilities o. Silo mentalities existing in both commercial and manufacturing divisions q. When cost saving becomes a driving force for profitability	1120	40.0%	Low collaboration	40%	80%
a. Planning long production stoppages without involving commercial (Marketing/Sales) forecast resulting in stock outs of the product on the market.Maintenance planning without taking into account market needs. k. lack of of basic sales and marketing information by the manufacturing operations team to appreciate customer and market challenges c. Setting production targets and dispatches without involving the manufacturing (production/maintenance) Managers to advise on production capability p. Lack of transperency of manufacturing on challenges in the plant r. Lack of communication on variability of demand in times of very high demand and times of low sales	675	24.1%	Inadquate information sharing	64%	80%
d. Reducing the scope of planned equipment stoppage ,in order to quickly turn on equipment and continue production, in the interest of keeping the customer satisfaction b. Postponing planned equipment maintenance stoppage in order to keep the market supplied with little consideration of secondary damages to equipment e. Lack of skilled manufacturing operations managers with capability to respond at short notice ,with quality repair on secondary damage which result from running equipment to failure while pushing to meet business sales targets	625	22.3%	Manufacturing Team lack Assertiveness	86%	80%
f. Lack of Overall Equipment Efficiency (OEE) knowledge in Commercial Managers, demonstrated by demands on Operations team to meet customer needs under any circumstances	140	5.0%	Commercial Knowledge gap	91%	80%
j. Lack of awareness/knowledge of manufacturing operations by the commercial team to appreciate the challenges	140	5.0%	Manufacturing Knowledge gap	96%	80%
n. Set up of objectives must be centralised so that no one function will focus on its "small" objectives at the expense of the good of the whole organisation.This also brings conflicts as each function pushes for its interest only	100	3.6%	Poor strategy rollout	100%	80%
	2800	**100.0%**			

Fig 7 below show the Pareto analysis of major pitfalls that lead to strategy linkage unbalance at functional level strategy operations, with a cumulative curve and the Pareto 80/20 cut-off line. The Pareto 80/20 line indicates the pitfalls that the organisations must focus on to eliminate the imbalance. In this study it shows that low collaboration and inadequate information sharing are the two main causes and the rest are of low priority or effect really on the problem.

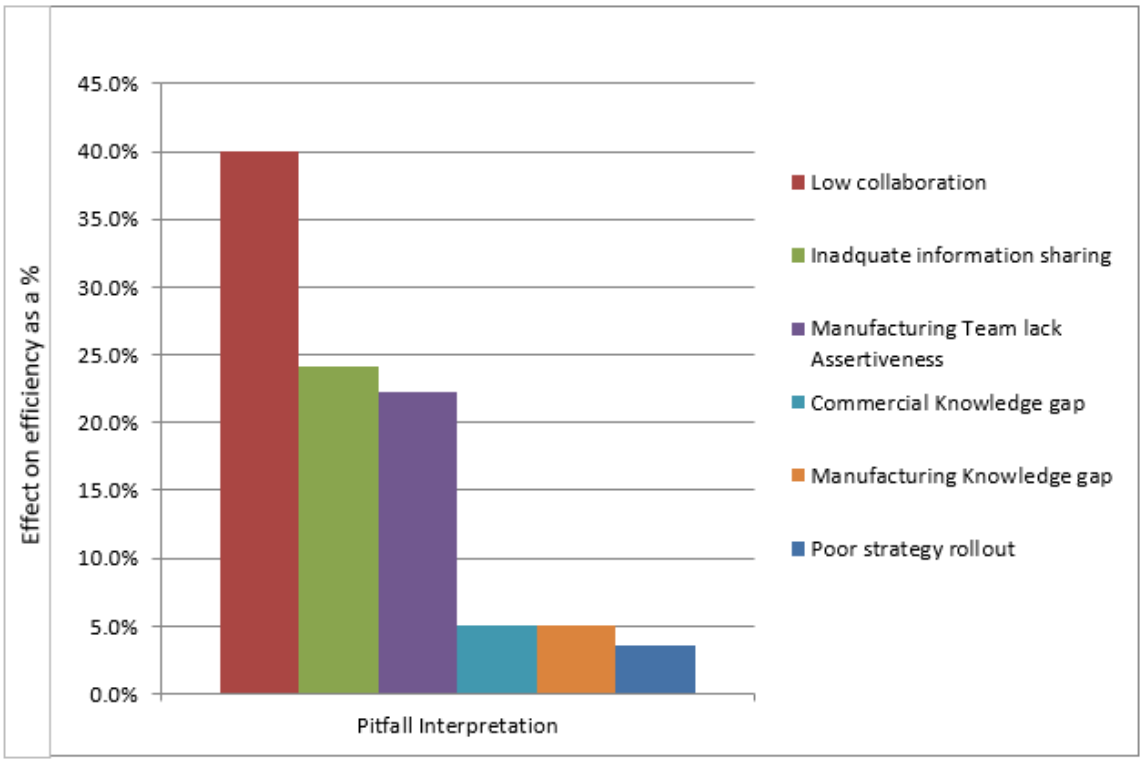

Fig. 7 Pareto Analysis Bar Chart

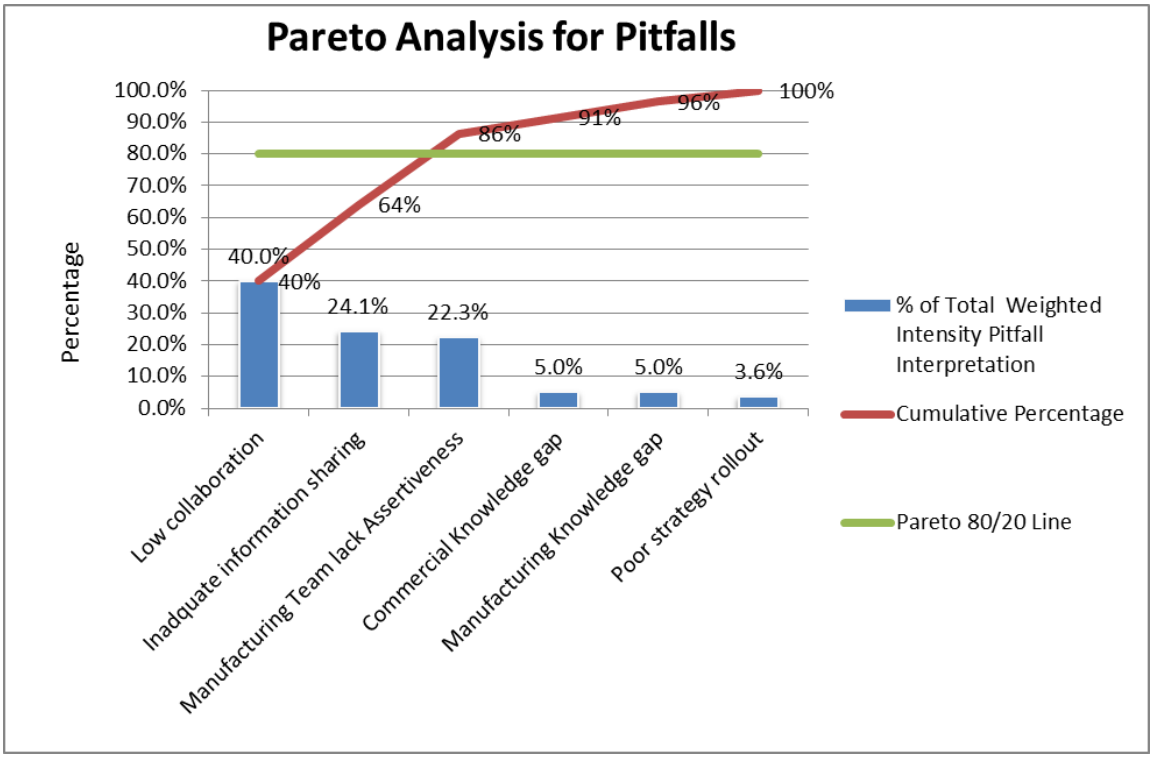

Fig. 8 Pareto Analysis Cumulative Curve

The Pareto analysis Table 5, Table 6 and Fig. 8 shows the identified 80% pitfalls tabulated initially in Table 5 as major causes for unbalanced functional strategy linkage and other 20% low effect pitfalls cause for the imbalance in functional strategy linkage. We shall now run this finding through the Monte Carlo simulation, to simulate chance processes according to equation 1, restated below, with a wider simulated sample of 1000 and 10000 responses.

(UL) =IF ((0.29SA +0.51A+0.17N) -(0.03D+0.001SD+0.17N))>0.89, 1, 0). **Eq 1**

Monte Carlo is used to draw a random number and simulate a Linkage decision. Random used because real life is full of uncertainty when it comes to human states of mind at any moment. Table 6 below shows a sample picture screen print of the Monte Carlo workbook front page and the derived simulation of equation 1. Table 3 Formulating Monte Carlo Mathematical Expression and Table 5 Pareto Analysis of Pitfall Weighting Responses showed the results of the analysis as confirmation of pitfalls for functional unbalanced linkage anticipated. The input to this simulation is based on the response pattern obtained from the questionaire. The questionaire responses does not validate generalisation of results due to limited sample size thus the randomness effect due to

sample size of 200, is not representative on a global scale. Hence for the reliability test to be established on the findings, simulations using Monte Carlo with a simulated larger sample 1000 and 10000 was necessarily has it given chance to a high random effect to check consistence on results.

Table 6 Sample for Monte Carlo Simulation (MCSim)

To simulate a balanced strategic linkage between Commercial and Manufacturing , we use a random draw in an IF statement. Scroll down to see how.

The random draw uses the formula, "=RANDOM()", to get a uniformly distributed number in the 0,1 interval.
Click in cell B5 to see the formula. Hit F9 (or CTRL - =) to draw a new number. For more on random number generation, see sections 9.2 and 9.3.

Random draw	0.748181881731461

The RANDOM() function is the foundation of the Monte Carlo Simulation because it's our roulette wheel,
but we need one more concept to complete the simulation. We need a way to tell Excel that strategic Managers
have a 90% chance of creating a balanced functional strategic linkage
Fortunately, this is easily done with an IF statement.

Take a look at the formulas in cells B18, C18, and D18.
Cell D18 says, "if the value in cell B18 is greater than 0.26, then the value of this cell is 1, else the value is 0."
The structure is "expression to be evaluated," "value if true," "value if false."
Notice the difference between cells D18 and D19--yet they end up doing the same thing.
While you are at it, try to figure out what's going on in cells C18 and C19.

STATISTICAL ANALYSIS

	Strongly Agree (SA)	Agree (A)	Neutral (N)	Disagree (D)	Strongly Disagree (SD)
Selection Scale (Weighted Points *# of Series high tally)	20	36	12	2	0
Total Number of Selections	70				
Percentage Proportion per Selection	29%	51%	17%	3%	0%
TOTAL Percentage	100%				
Probability Conversion per Selection	0.29	0.51	0.17	0.03	0
Maximum Probability	1				
Proportional Sum of Strongly Agree, Agree and 50% Neutral is gre	0.89				
Proportional sum for strongly disagree ,50% Neutral and disagree less	0.12				

Random select strongly Agree	0.607234626359881	YES its is a pitfall	1	Random Select Agree	0.692825616659981	YES it is a pitfall	1
Random select Neutral	0.275550625880971	YES it is a pitfall	1	Random select Disagree	0.677803329042067	YES it is not a pitfall	0
Random select strongly disagree	0.863074572227464	YES it is a pifall	0	Functonal strategy State	1	Unbalanced Linkage Pitfalls	

Combining the RAND and IF statements into a single formula, we get a virtual 90% unbalanced functional strategic decisions:

Unbalanced Linkage =IF((0.29SA +0.51A+0.17N)-(0.03D+0.001SD+0.17N))>0.89,1,0) Equation used in detemining functional state)

Hit F9 (or CTRL - =) repeatedly (say 30 times in a row) to see how the unbalanced linkage is coming out.

As long as the value stays at 1, there is a functional unbalanced strategical linkage. When it changes to 0, balanced linkage occurs.

The definition of the threshold values in table 3 the Monte Carlo simulation starts with the input values as per Mathematic expression deduced from the questionaire response patterns according to table 3. Table 6 showing Monte Carlo Simulation (MCSim) sample Sheet Screen Print. The Table 7 below showing the summary information and results of simulation of 200 samples using by single repetitions, with F9 function key. However, a number of 1000 to 10000 repetitions (iterations) are useful and practicable.

Table 7 Threshold Values as basis for Monte Carlo Simulation

Percentage causes (pitfalls) for unbalanced Linkage						91%	This sheet contains a single repetition of 200 unbalanced linkage
Percentage of First Ten pitfalls for unbalanced Linkages						80%	decisions (linkage selection attempts).
Attempt	Strongly Agree (SA)	Agree (A)	Neutral (N)	Disagree (D)	Strongly Disagree (SD)	Results	Strategic Management and support attains 90% linkage of their
1	1	1	1	0	0	1	unbalanced linkage decisions. The formula in Cell G4 informs
2	1	0	0	0	0	1	Excel of this chance process.The exact same formula is used in
3	0	0	1	0	0	0	the 200 cells from G4 to G203. Click on a few of these cells to see
4	1	1	1	0	0	1	for yourself.Hit F9 to simulate another 200 linkage decisions.How did
5	0	1	1	0	0	1	Strategic Managers do this time?Hit F9 again and again. Watch cell G1.
6	1	0	1	0	0	1	How much balance or unbalance is there?
7	1	0	1	0	0	1	
8	1	1	1	0	0	1	Wouldn't it make sense to keep track of strategic Managers' sample
9	0	0	1	0	0	0	percentage?Click on the button below to do so.
10	1	1	1	0	0	1	Monte Carlo
11	1	0	1	0	0	1	
12	1	0	1	0	0	1	
13	1	0	1	0	0	1	Curious about streaks? Click on the button below.
14	1	1	1	0	0	1	Streak Finder Click this button several times.
15	0	1	1	0	0	1	

Intro | Onestrategicdecision | Sample | Q&A | MCSim | Streak | Statistical Analysis Input

As outlined the reasons for Monte Carlo Simulations is to get a wider test sample and established reliability and validation for generalization of results. Fig. 9 below show first simulation screen print of 1000 samples or repetitions from MCSim.

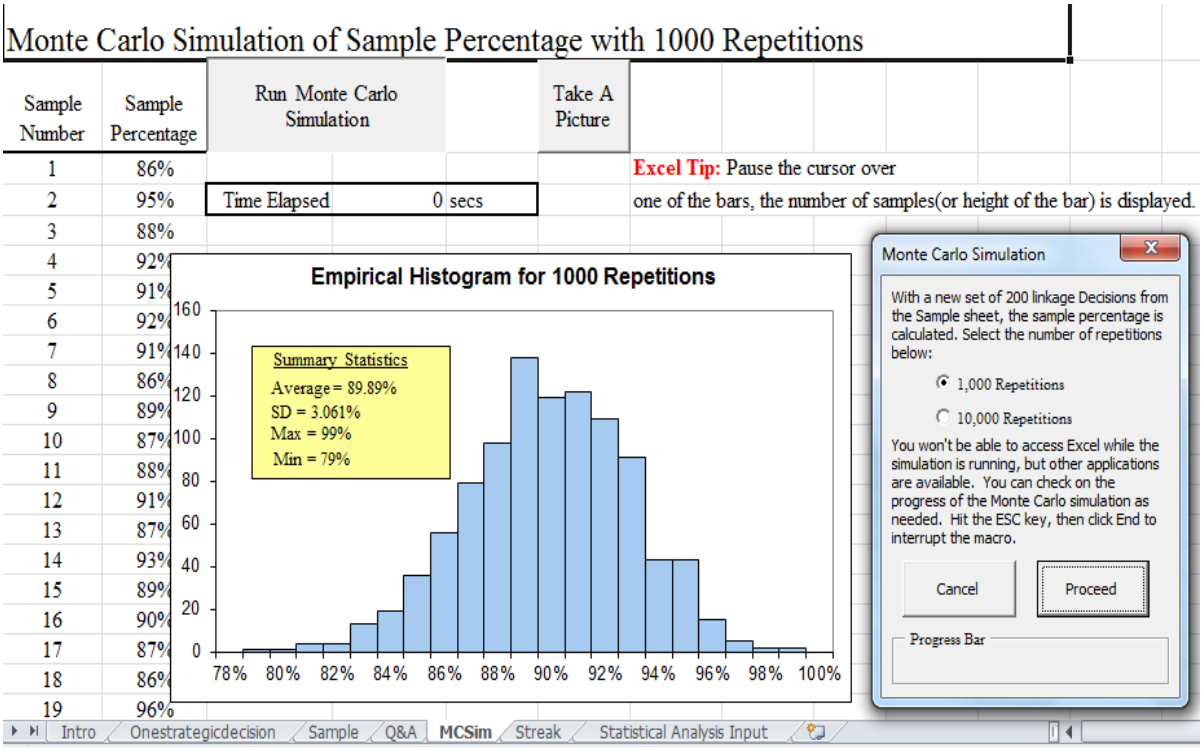

Fig. 9 MCSim 1000 Repetition sample Histogram Results

The interpretation of the simulation screen prints done for both the 1000 repetitions Histogram Fig 10 and the 10000 repetitions histogram Fig 11 summary statistics was the basis for to drawing conclusions that established reliability and validation for generalization of results.

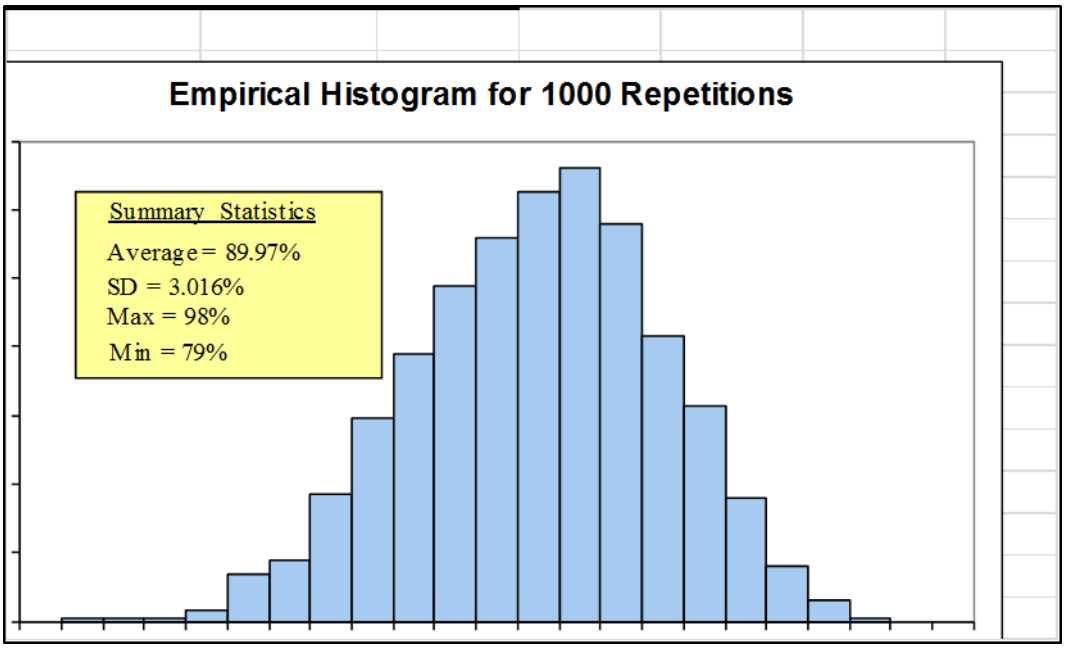

Fig. 10 MCSim 1000 Repetition sample Histogram Results

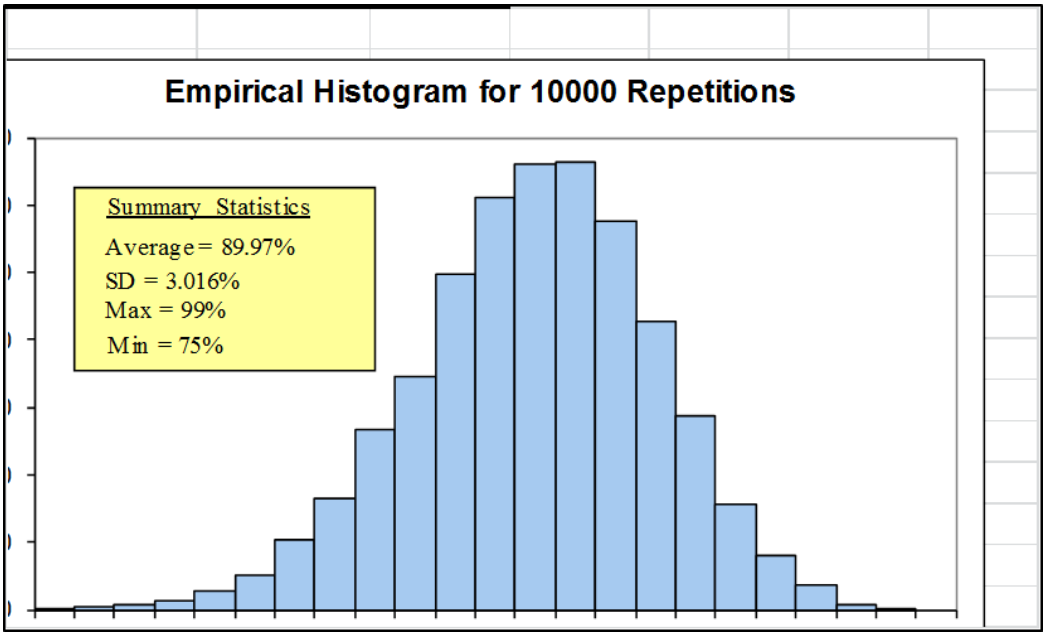

Fig. 11 MCSim 10000 Repetitions sample Histogram Results

4.1.2.3 Monte Carlo Simulation Histogram Results Interpretation

The results of the Monte Carlo Simulation are probability distribution. Fig. 11 and Fig. 12 shows the probability density for 1000 repetition and for 10000 repetitions respectively. This Monte Carlo simulation Histograms showed that the statistical average correlated with the field response Pareto analysis on the pitfalls tabulated in question seven (Q7) on which the Monte Carlo simulation equation 1 was derived from. The MCSim of 1000 repetition and 10000 repetitions has produced results percentage average value of 90%, standard deviation of 3%, the low limit (Minimum) 79% and upper limit of 98%. The standard deviation shows that the distribution of scores is around the mean average expected within 3%. If everyone gave the same score, then the standard deviation would be zero and the agreement would be high (or ideal). However, in practical terms, the responders don't agree the same way which correlates with the high standard deviation. The histograms show that as the sample size increased a normal distribution was formed. Standard deviation indicates a measure of the extent to which responders agree or disagree with each another. Thus, from the smaller standard deviation we note that responders were in more agreement with one another. Otherwise in the case of a large standard deviation it would have been interpreted as inconsistency

or diverse views opposing each other. It is worth noting, however, that a single "outlying" response can distort the standard deviation and the sense of agreement between responders. Therefore, it is advised to take such cases into consideration. This was the reason mixed data analysis approach was adopted as qualitative method which relied on tested existing knowledge and two statistical methods The Monte Carlo Simulation and the Pareto Analysis adding numbers or scientific approach to decision patterns for authentic conclusions on the research results. Findings.

4.2 Designing of the Problem Solution Model

Therefore, from the analysis of the findings collaboration was the determining factor in the success or failure of any operations strategy model or process. This conclusion validates Gianesi's research finding on which he revealed that there is lack of consistent decision pattern within each function, because the operation strategy literature by many authors has been more prolific in prescribing what to do, (objective), than prescribing how to do it (process). Thus, the contribution of this research to close this gap is the creation of JMP Collaborative-Model, created by the researcher, see fig 12 below and the approach or guiding steps on implementation shown by Table 8 JMP Check point of Modelling. The foundation of this Model is built on the work of Barnes operations strategy levels. The JMP collaborative point of modelling is called the check loop, see Table 8 JMP Check point of Modelling. This is the glue of all the best practices aimed at improving operations efficiency in the field of Operations strategy and management.

JMP COLLABORATIVE MODEL-A model for Balanced Strategy Implementation

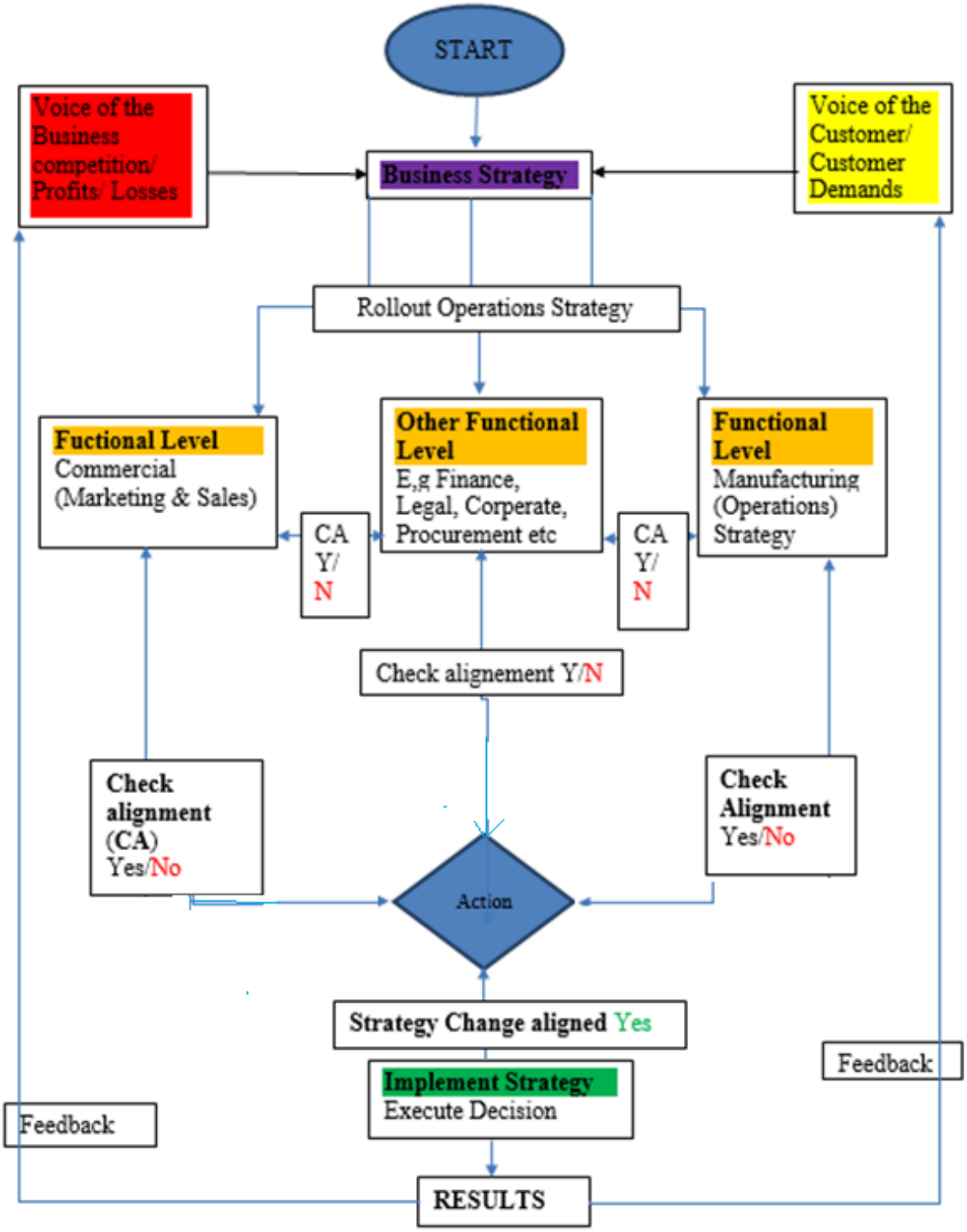

Fig. 12 JMP Collaborative Model

The table 8 below shows the unique features of the JMP Collaborative Model called JMP Check point of modelling.

Table 8 JMP Check point of Modelling

STRATEGY LEVEL	KEY ISSUES
Function	• How does the function contribute to the business strategy? • What are the strategic objectives of the function? • How are resources managed in the function? • What technology do we use in the function? • What skills are required by workers in the function? •
Functional Collaborative *Check* (JMP point of Modelling)	• *Check* if the functional strategy change aligns with the other functional strategies • How does this functional decision affect the other functions? • What adjustments or communication must be made to positively contribute to the business common goal in affected function (s) • Implement strategy Decision only when you get 4-YES

Just as was demonstrated in the research finding cited by past researchers and RISE campaign initiated at the case study, *the factor which impede the attainment of a balanced functional operations strategy linkage between manufacturing and commercial is low collaboration.* This gives the answer to Moran's question of what impede operations functional balance. The pareto analysis of this research showed that low collaboration is the major contribute to the 80/20 rule and the research arbitrary assigned out of 100% of the causes for imbalance, about 75% contribution based on fact that almost every researcher as mentioned it in passing using different terminologies such as teamwork, coherence, involvement, wide participation, over-communication etc. but non stopped to magnify it as this research as contributed.

From the literature review and observation it is established that the currently prevailing level of collaboration is assessed to be at 50%,a break-even level, bearing to the facts

that most of manufacturing organisations like the case study factory, are global companies who have demonstrated that they have world class R&D capabilities, they have a tremendous industrial heritage and unparalleled industrial capabilities to build on. They have world leading brands and technical solutions for their customers. And they have the best and highly skilled employees in the industry working to serve customers every day, however not most of them have demonstrated a high collaborative culture in their company values, which is the case in this research results. This is concluded to be so because fostering a collaborative culture may be deemed as not a core strength in manufacturing but has seen from the results it is the glue of operations efficiency improvements. Putting together all on one table. This is supported by the successful operations excellence achieved in Dupont, Brazilian and Japanese industries by utilization of world class systems, collaborative models such as S&OP, and PROSPHESY Model.

Thus, the JMP Collaborative-Model will help raise the level to over 80%, an addition of 30% plus on existing level of collaboration. If the principles are applied and adopted as a culture, the pitfalls that lead to imbalance in functional operations strategy and consequently inefficient operations will be avoided. The implementation of the JMP Collaborative-Model ‘s key inputs are strategy level model process flow built from Barnes theories and the existing researcher gap. The unique feature making the collaborative model a new process flow is the cross-functional operations strategy collaborative decision check, this is the JMP point of Modelling. The combination of Barnes thought process and research analysis has given birth to a new knowledge model and if effectively used, the chances of functional unbalanced linkage will be completely eliminated and will see sustainable Operations efficiency improvement in manufacturing organization and other institutions operating in competitive environments. This is because no action or decision will be implemented without a simple collaborative check with other functions and the business strategy. The bonus outcome also will be the blessing of job satisfaction and retention of skilled workforce as the collaborative culture gives sense of belonging and ownership. This must be implemented with rigor and vigour. The model is a cross-functional strategic review platform, which is also able to review individual performance as well as address issues of competency, training and hiring of right people for right positions. As the development of superior manufacturing strategy requires superior intellectual capital.

Further the research findings have demonstrated that often times misalignment tends to exist in companies between the articulated strategy and the execution decisions. Few organisations master the art of thinking continuous process improvement (CPI) but just look at major milestones, ignoring small deviations in the baby steps of the strategy roll out which ultimately grows into unbalanced linkages resulting in inefficient operations whose impacts is eventually cannot off-set by good performance in one functional operational excellence. Small steps can increase the option value by testing hypotheses that provide valuable insights from which the ultimate decisions are made. Once the strategy has been finalised, it is a mistake to see it cast in stone. A strategy needs to develop and evolve throughout a business and as such needs review and adjustment. Agile companies are collaborative driven, they refine their strategies continuously and are more able to pre-empt risk pitfalls as well as defining market opportunities in the ever-changing de-monopolised business market.

As demonstrated above the method is the one that fosters high collaboration. The list comprises models such as the newly created JMP Collaborative Model Fig. 12, which is a product of this research, S&OP, PROSHESY Model, Dupont Operations Excellence world class principles, Horizontal Coherence Model, SWOTCLOCK Model and any customised company performance improvements system drawing on world class principles.

CHAPTER 5: DISCUSSION,RESULTS AND CONCLUSION

5.1 Discussion

The aim of this research was to study how strategic behavior (pitfalls) affects functional level strategy linkage balance and consequently lower operations efficiency improvements within Manufacturing Industry which reduces the competitive advantage. The existing operations strategy literature was reviewed relating to the problem. Technical-Commercial functional strategy linkage balance or alignment was explored from the perspective of operations efficiency improvement and competitive advantage.

Analyse functional level operations strategy in the cement manufacturing industry

The qualitative analysis demonstrated that manufacturing Industries built country specific manufacturing and commercial Strategies according to established operations strategy theoretical framework as outlined by Barnes strategy level process, and Acur and Bititci Prophesy model. However, there were gaps on strategy formulation on lower ranks and the organization lacked discipline in consistently adhering to the established strategy process consistence evaluation for alignment and coherence at functional level strategies.

Examine relations between manufacturing and marketing functional level operations

Research questions launched earlier in the research study have been investigated and they have led to the reveal of the major pitfalls in the manufacturing industry business strategy formulation process that led to unbalanced linkage between manufacturing and commercial operations strategies as shown and sorted in Table 5 Summarized Strategy Pitfalls Pareto Analysis.

The Table 6, figure 7 and figure 8 are showing Pareto quantitative Analysis of the vital few Pitfalls and the qualitative analysis under Chapter 4, section 4.1.1 and 4.1.2 of the findings that led to the conclusion that the main three causes for the strategically functional level operations imbalance leading to inefficient operations are interpreted as:

1. **Low Collaboration**

Low Collaboration has been identified as a major cause of unbalanced functional strategy operations. This is defined as a joint effort of multiple individuals or work groups to accomplish a task or project. Within an organization, collaboration typically involves the ability of two or more people to view and contribute to documents or other content over a network. It is simply teamwork taken to a higher level. Teamwork is often a physical joining of two people or a group to accomplish a task. This is in with existing literature. Hill (1993) observed that manufacturing managers view their roles as being only reactive to the demands placed on the production system an indicator not getting involved. Bates (1995) proposed a clan organization culture which is characterized by the use of groups and teams, low emphasis on hierarchy, and high levels of loyalty with a share plant-wide philosophy, which also further low collaboration as a major cause of inefficient operations.

De-monopolised market effects made Lafarge Zambia to launch the RISE initiative (Lafarge, 2016) which was aimed at improving performance and containing competition. The RISE campaign as mentioned, stood for Resilience, Integrity, safety and engagement culture which was a call to more collaboration performance driven culture. The importance of getting manufacturing managers involved upfront in business strategy is summed up by Samson and Sohal (1993) who noted that 'manufacturing managers must become more than just implementers of engineering and marketing instructions on the shop floor but raising the status of the manufacturing function involved getting the manufacturing manager involved in the business development/market competitiveness debate, which also is the call for more collaboration. Gianesi cited low collaboration as the cause for incoherence (Gianesi, 2001). He stated that Functional Managers were having their own objectives and personal agendas, which interfered, to a certain extent, with the objectives set by the functional strategies. Not having a consistent decision pattern within each function. He further said that decision-makers at different levels within any function also had their own personal objectives and agendas, which interfered with the deployed objectives, which were derived from functional strategies. One of the practical

results was conflicting decisions which eventually jeopardize the company performance and therefore competitive power. He sealed his call for more collaboration by suggesting that focus of Operational decisions and negotiating process should be on, being an integrator by nature, involving different functions within the company and Agility should be embraced to ensure frequent revisions or replanning to make it possible that the decision coherence is adequately monitored and adjusted; and is checked for relevant impact on the competitive performance of the company.

It is worth explaining further what collaboration is and its benefits. The phrase 'putting our heads together' would be a good example of this important element of collaboration. Collaboration in the workplace incorporates teamwork and several other aspects, such as; thinking and brainstorming ideas to provide solutions, a strong sense of purpose or common vision and equal participation which encourages, 'a leave your titles at the door' Slogan. When collaborating treating everyone as equals can open up communication and encourage ideas from all levels of the company or department, not just the managers or directors. There are many benefits to collaborating in the workplace such as; ability to utilize the strengths and skills of everyone involved, gives employees a better understanding of how the company operates at a higher level, and not just their individual department, access to several employees with unique expertise and viewpoints will most likely allow you to come up with ideas and solutions that you may not have thought of on your own at a faster pace, improved work efficiency (Divide and Conquer strategy), job satisfaction and employee retention. Employees are more likely to stay at a job or company longer when they have strong bonds with others around them and feel they are a part of something important. This will give an organization a people competitive advantage and increment performance improvement. However, as seen from the list of the Pareto analysis Table 6, figure 7, figure 8 and qualitative feedbacks received, low collaboration was a major cause for pitfalls in spite of the systems being put in place as evidenced by the following respondents' feedback points:

a. Systems for cross function are in place, it is effectiveness and consistence for shared vision that was found lacking in both operations. The study

firm had well developed Sales and Operations planning guidelines but implementation was off alignment. See appendix D, E & F for reference of such cross-functional systems.

b. Low collaboration between marketing and manufacturing operations managers while setting targets to match business goals.
c. There is no clear involvement of operations and mid management in short strategic meeting.
d. Information flows from Top to bottom and not the other way around hence the opportunity to incorporate concerns from shop floors/operations is missed.
e. Repetitive conflicts between the manufacturing operations and the marketing/sales functions centered on the desire of marketing to ensure that operations concentrate on satisfying customers.
f. Silo mentalities existing in both commercial and manufacturing divisions.
g. When cost saving becomes a driving force for profitability.
h. Less efficient manufacturing operations as a result of high demands to produce greater volumes, more variety, higher quality, and a faster response without investing in enabling capabilities.

From the analysis of the pitfalls identified it was realized that an organization that fosters collaborative culture will overcome all deficiencies together and improve operations efficiencies at all levels. Thus, the decisive solution to this problem was the development of a collaborative operations model in the dynamic strategy formulation process as an effective way of creating balanced linkages between efficient manufacturing and commercial operations strategies and within the functions in order to sustain a competitive advantage. It is a well-known fact that charity begins at home, meaning the manufacturing sector as a function need to enhance internal collaboration and also commercial, in that way it will be easier to implement it across functions and consequently as a corporate culture.

2. **Lack of Assertiveness and low Competency among Manufacturing Team**

Hill (1993) noted that whenever manufacturing managers had the chance to involve in corporate strategy debates, they did not explain manufacturing strategy issues effectively. This an indicator of lack of assertiveness. Being assertive

means that one can express himself or herself effectively and stand up for his/her point of view, while also respecting the rights and beliefs of others. Being assertive shows that one respects himself or herself because they are willing to stand up for their interests and express their thoughts and feelings. It also demonstrates that they aware of the rights of others and are willing to work on resolving conflicts, (www.mayoclinic.org). It was also observed that manufacturing managers viewed their roles as being only reactive to the demands placed on the production system (Hills,1993). Their involvement in corporate policy debates, very often, came late when the decisions have already been agreed upon, so they had little chance of changing the decisions that could negatively affect manufacturing.

This lack of confidence and involvement from the part of manufacturing managers was perceived to be due, among other things, to their lack of education and training in operations strategy and management. Hence the low competency was cited as a contributor to strategy imbalance between commercial and manufacturing. Competency is a cluster of related abilities, commitments, knowledge, and skills that enable a person to act effectively in a job or situation. Competence indicates sufficiency of knowledge and skills that enable someone to act in a wide variety of situations, (www.businessdictionary.com). Hence the modern trend today leads manufacturing manager to study Masters classes such as Engineering management and business administration (MBA). Other research studies (Samson, 1993), have indicated that the usual career path for manufacturing managers starts when they leave school at the age of 16 to begin manual work on the shop floor. Some progress to become managers without the needed exposure to the essentials of operations management. Moreover, (Hill, 1993) found that part of the reason manufacturing managers is not involved in shaping corporate policies is that because they spend most of their time in dealing with routine operational matters.

From the Pareto analysis Table 8 and qualitative feedbacks received, it was concluded that the Manufacturing decisions and responses to commercial decisions demonstrated traits of low assertiveness and low competency evidenced by listed pitfalls below:

a. Postponing planned equipment maintenance stoppage in order to keep the market supplied with little consideration of secondary damages to equipment

b. Reducing the scope of planned equipment stoppage, in order to quickly restart equipment and continue production, in the interest of keeping the customer satisfaction

c. Lack of skilled manufacturing operations managers with capability to respond at short notice, with quality repair on secondary damage which result from running equipment to failure while pushing to meet business sales targets

d. Manufacturing utilized mid-term plan developed by commercial to plan its activities. The commercial operatives had this in mind, *"We are in business to make money; therefore, the commercial strategy is developed first and then all other strategies should aim to support the main aim*". However, to be competitive manufacturing capability must be robust and mastered, for it to efficiently respond to the market lead competitive industry.

e. The manufacturing operations were rated satisfactory and performed on average with regard to the world class manufacturing parameters which are quality, cost effectiveness, flexibility and innovation. In competitive markets operations need, be at world class performance. That is high productivity, High OEE, high Customer satisfaction and Cost efficient.

Th above list indicates the low assertiveness on manufacturing industrial teams showing that they need to be more assertive and collaborate with commercial to prevent unplanned production stoppages due to equipment or process breakdown related to commercial sales and operations planning.

3. **Inadequate information Sharing**

Hayes and Wheelwright (1984), advocated that Top managers should communicate frequently with manufacturing managers to understand the problems facing them and how they can be solved, such positive attitudes of top

executives can have profound consequences on the way employees perceive their roles within a company. This was an indicator of inadequate information sharing. Information sharing describes the exchange of data between various organizations, people and technologies. The Pareto analysis Table 6 and qualitative feedbacks received, led to the conclusion that there was inadequate real time work information sharing between the Commercial and manufacturing as evidenced by listed pitfalls below:

a. Planning long production stoppages without involving commercial (Marketing/Sales) forecast, consequently leading to stock outs of the product on the market. Maintenance planning without considering market needs.
b. Lack of basic sales and marketing information by the manufacturing operations team to appreciate customer and market challenges
c. Setting production targets and dispatches without involving the manufacturing (production/maintenance) Managers to advise on production capability
d. Lack of transparency of manufacturing on challenges in the plant

Manufacturing managers take a broad view of their role by seeking to understand their company's business strategy and the kind of competitive advantage it is pursuing'. Swamidass and Newell (1987). This shows that manufacturing operation managers try had to figure out on how best to remain relevant to organization as follows hence imbalance strategies. This was established by the observation made by Hill (1993) that manufacturing managers viewed their roles as being only reactive to the demands placed on the production system. It's like they have to be on their toes to keep up with commercial and prove their relevance every time by reading between the lines on strategic issues. Other factors that affect the strategic role of manufacturing both directly or indirectly, are the attitude of top managers towards manufacturing and the involvement of manufacturing managers in setting the strategic direction of the firm (AL-Rasby, 2016). Al-Rasby sustained this point by an example, that top managers consider manufacturing to be incapable of influencing competitive success and encouraging manufacturing to follow blindly industry practice in matters

regarding the work force, equipment purchases, and capacity additions without understanding how manufacturing can provide competitive advantage. The information sharing pitfall is further sustained past researchers who stated that many corporations do not have senior manufacturing personnel in the ranks of "top management" with the firm (Brown, 2005); (Hill, 1993); (Skinner, 1969). (Skinner, 1969). They advocated that manufacturing personnel need to be involved in business areas, and not merely as technical input. They argued that the role and involvement of senior manufacturing personnel is an important factor for three reasons:

i. Manufacturing personnel help to champion the quality drives within the manufacturing function.
ii. They provide guidelines and direction in areas such as training and quality manuals
iii. Their involvement in the business of the plant, they are instrumental in translating customer requirements into operational capabilities throughout the plant (Brown, 1998).

This indicates that the functions are pushed to work in reactive mode instead of proactive. This creates unstable operations in as much as customer focus is concerned, however, a better application of existing Sales and operations planning guidelines could limit the negative effects through the proposed JMP Collaborative Model.

Design a model to align functional level manufacturing and marketing operations strategies

As demonstrated in the results section the method is the one that fosters high collaboration. To this effect success of this research is the highlight of the existing pitfalls that lead to unbalanced functional strategy linkage resulting in inefficient operations by past researchers and the validation of such pitfall under this research leading to the creation of the JMP Collaborative Model and recommendation of old tested collaborative fostering models such as Kaizen Principle, S&OP, PROSHESY Model, Dupont Operations Excellence world class principles and Horizontal Coherence

Model. Nevertheless, what makes the JMP Collaborative model that it is the Mother of effective implementation of cited collaborative models above. The JMP Collaborative model advances the work culture that advocates for teamwork, coherence, involvement, wide participation, over-communication which are the glue to effective and efficient implementation of any operations strategy and business sustainability through operations efficiency improvement. Thus, it promotes the attributes demonstrated in the research literature for operational excellence.

5.2 Conclusion

The conclusion on the articulated past research findings coupled with this dissertation results it is that the operations efficiency improvements in a De-monopolized Market can be achieved by :

1. Following the well established body of knowledge on the formulation of operations strategy for the country,function or department and adopt the collaborative culture during formulation and implemenetation.

2. addressing the following pitfalls that lead to unbalanced operations functional strategy between manufacturing and commercial and hence impeding competitive advantage:

    a) Low collaboration
    b) Lack of Assertiveness and low Competency among Manufacturing Team
    c) Inadequate information Sharing

3. Fostering collaborative and cross-functional work culture by use of JMP Collaborative Model in conjuction with existing collaborative models such as PROPHESY management Tool discussed earlier.

It suffices to say in summary of the research that, Low collaboration is an effect of people behaviour or work culture. Unbalanceed strategy functional linkages is also an effect of low collaboration. Consequently inefficient operations is an effect of unbalanced functional strategy linkage. In conclusion organisation performance is an

effect of inefficient operations or efficient operations. All external factors impact is determined by internal controllable factors.

Through the implementation of the system or culture that foster high level of collaboration such as the newly developed JMP Collaborative Model in conjunction with established models such as PROSHESY Model, SWOTCLOCK^{TM} Model, Dupont Operations Excellence world class principles and Horizontal Coherence Model. It must be done in conjunction with the JMP Collaborative Model because, MP Collaborative model embraces the effective implementation of cited collaborative models above by eliminating the behaviour of strategic managers and top executives that impeded the above Models not to attain superior sustainable performance. *The simple unique action of just ''**checking**'' with other functions or stakeholders before a decision is implemented.* Thus, JMP collaborative model in itself is not sufficient but creates a platform for effective implementation of the recommend model to attain excellence in operations strategy formulation and implementation.

The details of the above three factors are as highlighted in discussion section of Chapter 5 of this dissertation as the factors which lead to unbalanced functional strategy linkages between the two key functional level operation strategies, namely commercial (Sales/Marketing) and Manufacturing (Engineering/Production). From the research journey of this topic and analysis of the summary of the findings, it was noted that the major cause for inefficient operations is not lack of operations strategy knowledge but lack of assertiveness and low competency among manufacturing teams, inadequate information Sharing and the major part been low collaboration between and within the manufacturing and commercial operations teams. It is also learnt that most of, if not all, manufacturing industries and institutions operating in competitive or de-monopolised markets are pursuing market led strategy which is more susceptible to unbalanced alignment between the operations functions if any of the main three causes are not taken care of.

This research findings and implementation of solution was shared with most of the case study participants including some Lafarge country executive members, for feedback through a summary report. The feedback received was that, the research was timely and to the point on the root cause or pitfalls. The Organization group level and the country

had acknowledged already through other surveys and yes this study was in line by citing collaboration or engagement has a big problem affecting the organization performance not only at the country level but group level as the industry was facing a global competition as well and to that effect a number of initiatives had been rolled out at the Country level and group level to transform the organization and make collaboration the organization's key behavioral culture.

The key messages for 2017 on the case study factory, was emphasis on making a Collaborative culture as a way to go in transforming the business. The initiatives launched comprised of a call for collaboration and alignment. Greater collaboration among teams, to adopt new behaviors of being agile, collaborative and ensure trust is built in order to effectively deliver on targets in 2017. Leaders were tasked as ambassadors to ensure alignment of employees, if targets were to be achieved (Lafarge, 2016). More ways of increasing collaboration and promoting the synergies across the different levels of the operations to ensure maximum performance where been thought.

2016 was the first time Lafarge had to launch the Country strategy roll out, ceremoniously and communicated with emphasis on collaboration and alignment, with collaboration been enshrined in company values and culture as a way forward. A wide communication to the country workforce and all functional managements was made. It is also with great pleasure to state that the researcher of this dissertation was tasked to participate in the local RISE program and made a short presentation on Resilience and Collaboration at the Lusaka plant the RISE launch day. The researcher was further tasked to conduct a survey on the engineering team on their feedback with the launch of the new spirit of collaboration culture values as an input for the scheduled country leadership meeting planned for the second quarter of 2016 at Twangale Park.

5.3 Recommendations

These recommendations are drawn from the research results in chapter 4 and discussion section in chapter 5 which was arrived at by research reading on existing literature and research questionnaire administration of this dissertation, below were the main identified major causes of operations inefficiency in the De-monopolised market with synthesized recommendation as follows:

1. **Lack of Assertiveness and low Competency among Manufacturing Team**

    a. Human Resource to ensure they hire manufacturing managers who are rounded in operations and promote high performers with understanding of the both Manufacturing and Commercial into key positions

    b. Human resource and functional managers to identify young talents and build them up on tailored career path to progress into planned strategic positions both in Manufacturing and commercial functions

    c. Country leadership to empower operations Managers through a collaborative culture to develop their language

2. **Inadequate information Sharing**

    a. Commercial and manufacturing should leverage on best practices on Sales and Operations planning (S&OP), see appendix D

    b. Leverage on the principles of JMP Collaborative Model to share the strategic big picture top bottom in coherent bits for operations team to understand how their role fit in the shared vision and then demand commitment from each team member as each function will make plans/promises based on agreements with the other function

3. **Low Collaboration**

    a. There should be regular feedback to EXCOM and reviews to continuously monitor what is working and what is not working. This is a Business level strategy meeting. Use the JMP Collaborative –Model to jointly validate functional strategy setting and action plans together for transparent communication.

    b. As per Kaizen Principles, ‘better the wisdom of 5 people than the expertise of 1 person’ (Dobbs, 2017), (THESSALONIKI, 2006). Fully adopt and endorse

a Collaborative Culture as a behaviour and core value. Use the JMP Collaborative –Model to jointly validate functional strategy setting and action plans together for transparent communication. This will greatly compliment and strengthen the existing best practices such as S&OP

c. There should be regular cross-functional updates on industrial and commercial at implementation stage by operatives (i.e. HODs, HOS, and Staff). Refer to the Sales and Operations planning best practice on appendix E, value framework developed by some leading Globe company in manufacturing and by Quartz A/S, a management consulting company offering services in sales and operations planning; market research; and cross-over advisory services, bridging business strategy with brand, positioning, and marketing strategy.

d. Business review should include analysis of implemented actions agreed in functional techno-commercial meetings to hold accountable a non-cooperating Head of function.

e. Adopt the SWOTCLOCKTM model, (Tirosh, 2012), to guide everyone on defining and understanding the organization's leading strategy

f. Encourage culture to use the Root cause Analysis (RCA) if the collaborative leading strategy actions are off targets with business results in order to align

5.4 Areas for further research

Further research is suggested on, testing and critic of the JMP Collaborative Model as an embracing Model for existing operations excellence models in institution or industry.

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APPENDIX

A: Questionnaire and Table 4

Operations Efficiency Improvements in a De-monopolized Market-Questionnaire

I. Introduction

Dear Sir/Madam,

Good day! The University of Zambia runs a postgraduate Masters programme in Engineering Management. One of the partial requirements for students to be awarded the masters is by completing a research study on any identified problem area, in line with the programme. Under this survey the problem has been identified as, poor operations efficiency in De-monopolized (competitive) markets, caused by unbalanced linkage between the Business Commercial and manufacturing operations strategies. The scope for this research is to identify the pitfalls which lead to this unbalanced linkage. Today Business Market Globally in the Manufacturing sector is getting competitive and efficient manufacturing operations are an important part in corporate success or survival. Through this brief survey, your answers will be helpful in finding the solutions to the pitfalls which leads to unbalanced linkage between the Manufacturing and the Business commercial operations strategies, whose implementation will result in operations efficiency improvements to match the competitive manufacturing industry market. Your response will only be used for this study purposes and enhancement of operations strategy research work. In case you have any questions regarding the survey, please call Jagger Marvin Phiri at +260-969-693505 or email marvinjagger2003@yahoo.co.uk. Thank you very much for your time and responses.

II. Questions

Q1: A de-monopolized market is defined as a competitive market. Is your industry facing any competition?

a) Yes b) No

If yes, do you know the strategy company is pursuing from the SWOT (Strength, Weakness, Opportunity, and Threat) business analysis? (Simple definition for strategy is method or plan chosen to bring about a desired future or achieve business objectives or Aims)

_____

_____

_____

Q2: The focus in this study is operations in a competitive monopolistic, product manufacturing industry, market. Monopolistic refers to product differentiation (i.e. distinguish a product from similar offerings on the market**) strategy. Is your firm operating in a monopolistic competitive market?**

□ Yes □ No

If yes, how does customer feedback through marketing and sales team get incorporated into Manufacturing Operations?

_____

_____

_____

Q3: Briefly explain how your manufacturing firm builds its specific Commercial and manufacturing Operations strategies?

_____

_____

_____

Q4: How do you rate and describe the efficiency of the manufacturing operations in your organization? (Please indicate your level of agreement or disagreement with each of these tabulated statements. Place a "√" mark in the box of your answer**)**

	Strongly Agree	Agree	Neutral	Disagree	Strongly Disagree
a. Very poor, due to misalignment between commercial and manufacturing operations strategies					
b. Poor, due to low collaboration between manufacturing and commercial teams					
c. Average due to high level of compromise between the commercial and manufacturing strategies, resulting in comfortable operations with no stretch target for better performance					
d. Good, because production and engineering teams are always aligned in a balanced way to maintain the Production/Production Capability balance of the Manufacturing equipment to meet market demands.					
e. High, because the Manufacturing strategy is dynamic and continuously aligns with the commercial dynamic targets and strategies easily					
f. Very high, because of corporate investment employed in building					

manufacturing operations competitive capabilities to match the dynamic demands of the monopolistic market operations strategy					
g. Excellent, due to a high level of corporate shared Vision with the leading teams in commercial and manufacturing operations, which is also cascaded to the shop floor operations teams					
h. World class, the manufacturing operations demonstrate the world class parameters which are quality, cost effective, flexibility and innovation					

Q5: How does your organization build and implement a balanced linkage between manufacturing and commercial operations strategies?

_____
_____
_____
_____
_____
_____
_____
_____

Q6: How would you rate your overall experience with your firm's manufacturing operation's efficiency in relation to your competitors or with peer plant in the group (this part is applicable for multi-national companies)?

a) **Highly satisfactory**

b) **Satisfactory**
c) **Neutral**
d) **Unsatisfactory**
e) **Highly Unsatisfactory**

Q7: In this knowledge and information age, what could be the pitfalls (gaps) which contributes to unbalanced functional strategic linkage between the Manufacturing (i.e. Production/ Maintenance Engineering) and Commercial (i.e. marketing/Sales) operations strategies? (Please indicate your level of agreement or disagreement with each of these tabulated statements. Place a "√" mark in the box of your answer)

	Strongly Agree	Agree	Neutral	Disagree	Strongly Disagree
a. Planning long production stoppages without involving commercial (Marketing/Sales) forecast resulting in stock outs of the product on the market					
b. Postponing planned equipment maintenance stoppage in order to keep the market supplied with little consideration of secondary damages to equipment					
c. Setting production targets and dispatches without involving the manufacturing (production/maintenance) Managers to advise on production capability					
d. Reducing the scope of planned equipment stoppage, in order to quickly turn on equipment and continue production, in the interest of					

keeping the customer satisfaction					
e. Lack of skilled manufacturing operations managers with capability to respond at short notice, with quality repair on secondary damage which result from running equipment to failure while pushing to meet business sales targets					
f. Lack of Overall Equipment Efficiency (OEE) knowledge in Commercial Managers, demonstrated by demands on Operations team to meet customer needs under any circumstances					
g. Repetitive conflicts between the manufacturing operations and the marketing/sales functions centered on the desire of marketing to ensure that operations concentrate on satisfying customers					
h. Less efficient manufacturing operations as a result of high demands to produce greater volumes, more variety, higher quality, and a faster response without investing in enabling capabilities					
i. Low collaboration between marketing and manufacturing operations managers while setting targets to match business goals					

Do have any other pitfalls not appearing in the table in mind?

_____
_____
_____
_____
_____
_____
_____

Q8: What do you recommend as effective and efficient ways of creating a balanced linkage between Manufacturing Operations and Commercial (sales/marketing) operations strategies?

_____
_____
_____

III. Demographic Data

Q9: What is your level in the Organization?

□ **EXCOM (**Executive Committee**)**
□ **HOD** (Head of Department)
□ **HOS** (Head of Section)
□ **FLS** (Front line Supervisor)
□ **Staff**

Q10: What is your Area of functionality?

□ **Strategic Management**
□ **Finance**
□ **Supply Chain**

□ **Production**

□ **Maintenance Engineering**

□ **Quality Control**

□ **Human Resources**

□ **Sales and Marketing (Commercial)**

Q11: Gender: ____M or ____F and Age group: ____

□ **15-24 Years**

□ **25-34 Years**

□ **35-44 Years**

□ **45-54 Years**

□**More than 55 Years**

IV. Thank you for your support and sharing your thoughts

Table 4 Updated Q7 Revised Questionaire

Pitfalls identified	**Strongly Agree**	**Agree**	**Neutral**	**Disagree**	**Strongly Disagree**
a. Planning long production stoppages without involving commercial (Marketing/Sales) forecast resulting in stock outs of the product on the market	50	20	0	15	10
b. Postponing planned equipment maintenance stoppage in order to keep the market supplied with little consideration of secondary damages to equipment	50	40	0	5	0
c. Setting production targets and dispatches without involving the	35	40	5	10	5

Pitfalls identified	Strongly Agree	Agree	Neutral	Disagree	Strongly Disagree
manufacturing (production/maintenance) Managers to advise on production capability					
d. Reducing the scope of planned equipment stoppage, in order to quickly turn on equipment and continue production, in the interest of keeping the customer satisfaction	35	40	0	0	0
e. Lack of skilled manufacturing operations managers with capability to respond at short notice, with quality repair on secondary damage which result from running equipment to failure while pushing to meet business sales targets	20	40	20	10	5
f. Lack of Overall Equipment Efficiency (OEE) knowledge in Commercial Managers, demonstrated by demands on Operations team to meet customer needs under any circumstances	20	35	15	20	0
g. Repetitive conflicts between the manufacturing operations and the marketing/sales functions centered on the desire of marketing to ensure that operations concentrate on satisfying customers	20	40	20	15	0
h. Less efficient manufacturing operations as a result of high	30	40	15	15	0

Pitfalls identified	Strongly Agree	Agree	Neutral	Disagree	Strongly Disagree
demands to produce greater volumes, more variety, higher quality, and a faster response without investing in enabling capabilities					
i. Low collaboration between marketing and manufacturing operations managers while setting targets to match business goals	30	50	10	5	0
j. Lack of awareness/knowledge of manufacturing operations by the commercial team to appreciate the challenges	25	35	15	20	0
k. lack of basic sales and marketing information by the manufacturing operations team to appreciate customer and market challenges	50	20	0	15	2
l. There is no clear involvement of operations and mid management in short strategic meeting	10	50	25	5	5
m. Information flows Top down and not the other way around so we miss the opportunity to incorporate concerns from shop floors/operations	0	50	15	15	10
n. Set up of objectives must be centralized so that no one function will focus on its "small" objectives at the expense of the good of the whole organization. This also brings conflicts as each function pushes for	10	5	25	50	5

Pitfalls identified	Strongly Agree	Agree	Neutral	Disagree	Strongly Disagree
its interest only					
o. Silo mentalities existing in both commercial and manufacturing divisions	25	25	50	0	0
p. Lack of transparency of manufacturing on challenges in the plant	0	25	50	25	0
q. When cost saving becomes a driving force for profitability	0	25	45	0	25
r. Lack of communication on variability of demand in times of very high demand and times of low sales	0	25	50	5	15

B: Questionnaire Research Responses Q1-Q6, Q8-Q11

II. Questions						**Objective/Comment**
Q1: A de-monopolized market is defined as a competitive market. Is your industry facing any competition?						**To investigate how to create a balanced linkage between manufacturing operations and commercial operations strategies which support competitive manufacturing operations efficiency (Main Objective)**
a) Yes	√√√√√√ √√√√√√					The Industry is right for case study research

	√√√√√√					
b) No	√					

If yes, do you know the strategy company is pursuing from the SWOT (Strength, Weakness, Opportunity, and Threat) business analysis? (Simple definition for strategy is method or plan chosen to bring about a desired future or achieve business objectives or Aims)	**To investigate how to create a balanced linkage between manufacturing operations and commercial operations strategies which support competitive manufacturing operations efficiency (Main Objective)**
Optimize operations efficiency by: a) Reducing the cost of production reduction of waste, stable and optimum operation levels) getting close to the customer to understand customer needs and working to satisfy the customer	SWOT clock Response (S+T) strategic direction
Aggressive Marketing through a) Customer product awareness b) Product support-find solutions to address customer issues	SWOT clock Growth (S+O): strategic direction
The company has known and trusted brands. The focus is being the best in customer service, quality delivery and time management and not necessary the biggest	SWOT clock Response (S+T) strategic direction
Keep the market supplied and take product closer to point of use. Maintain the quality of product to protect the strong brand name. With changes on the market can no longer dictate pricing therefore critical to keep manufacturing cost low so as to maintain profit margins	SWOT clock Response (S+T) strategic direction
Cost Efficiency and market share. The strategy is focused on cost efficiency from production and distributions at the same time value addition to the products, in terms of additional services offered to customers to enhance loyalty and increasing switching costs.	SWOT clock Response (S+T) strategic direction
Through company values and culture based on **an acronym**	SWOT clock Response

CRISP: **C**ustomer, **R**esults, **I**ntegrity, **S**ustainability and **P**eople focus						(S+T) strategic direction
The company uses SWOT frame work to embark on extensive advertising its products on both electronic and print media, introducing new differentiated products on the market						SWOT clock Growth (S+O): strategic direction
Strategic focus is on customer service excellence and cost reduction. The Production, processes and marketing strategies have been identified as weakness and can be easily copied						SWOT clock Response (S+T) strategic direction
Q2: The focus in this study is operations in a competitive monopolistic, product manufacturing industry, market. Monopolistic refers to product differentiation (i.e. distinguish a product from similar offerings on the market) strategy. Is your firm operating in a monopolistic competitive market?						To identify the pitfalls in the manufacturing industry business strategy formulation process that lead to unbalanced linkage between manufacturing and commercial operations strategies **(specific Objective #2)**
□ **Yes**	√√√√√√√√√√√√√					SWOT clock Response (S+T) strategic direction
□ **No**	√√√√√√					
If yes, how does customer feedback through marketing and sales team get incorporated into Manufacturing Operations?						To identify the pitfalls in the manufacturing industry business strategy formulation process that lead to unbalanced linkage between manufacturing and commercial operations strategies **(specific Objective #2)**
Customer tells us what product performance they want. This						From customer to

feedback gets us to design a product that will meet their aspirations. The Product is Cement but different applications cement products differentiates us from other cement products	commercial
Through weekly meeting and customer complaint forms, we also have a weekly survey that we do under customer service and any feedback from customers will be passed on.	From customer to commercial to manufacturing. Enhance balanced functional strategy linkage
Operations team also included in customer visits to appreciate their requirements	Best practice in balanced strategy linkages
Through customer visits by marketing	From customer to commercial. danger it may not reach Manufacturing in time
Quarterly marketing manufacturing meetings. Customer satisfaction survey results and complaints review team comprising commercial and operations meet to review results and way forward	Best practice in balanced strategy linkages
Monthly product quality testing of own and competitor testing (1. CRM (Customer Relationship management Tool) Oracle based application, all feedback and complaints are registered in this tool. We have timelines to resolve all issue raised by the customer and issues are assigned to the relevant departments for resolution and closure. These complaints / feedbacks are reviewed every month at executive committee level	Best practice in enhance balanced functional strategy linkage, Commercial to EXCOM to Manufacturing
Annual customer satisfaction survey (2. We have an annual Independently contracted satisfaction survey done in the market to give the business feedback. The different departments including manufacturing operations get any feedback related to them	From customer to commercial. Danger it may not reach Manufacturing in time
The primary source of customer feedback is through our customer facing officers, both from the Sales Department and from the Customer Service Department (Order Processing). The	From customer to commercial. Danger it may not reach Manufacturing in

feedback will be sent into their respective management teams. For complaints to do with product quality, these are sent to the marketing department and eventually the quality department in the plant to investigate and take corrective actions where there is need. The communication channels are quite open in the company and issues of feedback sometimes are even sent directly to the Sales Director by email or phone depending on gravity and urgency of the issue.	time
Q3: Briefly explain how your manufacturing firm builds its specific Commercial and manufacturing Operations strategies?	To investigate how manufacturing Industries, build country specific manufacturing and commercial Strategies **(Specific Objective #1)**
Commercial give the demand pattern of each product. Manufacturing use this to design and plan production strategy to meet this demand pattern	**Market led strategy**. Susceptible to unbalanced functional strategy linkage with Manufacturing operations
It starts with the group strategy, which is then cascaded down to the Country strategy plan to localize based on specific market conditions, basis the Country strategy/ ambition plan, the different departments including commercial and manufacturing operations feed into this for their own strategy on how to actualize the Country and group strategy. It's a thorough process with input from forward looking Market statistics, team brainstorming, best practice etc. Once this is done individual KPI's are also drawn from this.	Best Practice if effectively used no room for imbalance strategy linkages
Customer service department meets weekly with operations team to give feedback on customer preferences and market trends and operations team to give feedback on ability to meet	Best practice to keep aligned with a balanced functional strategic linkage. Hinges on

demands (quality, amount or other specific preferences)	respect and effectiveness
Start with 3-year strategy of business which determines production requirement, operational requirements to meet the targeted production. Are then planned these requirements include, manpower, Capex and other technical needs. These plans are then broken into 1-year plans which are budgets	Best Practice if effectively used no room for imbalance strategy linkages
Company Value and culture system acronym **CRISP**: **C**ustomer, **R**esults, **I**ntegrity, **S**ustainability and **P**eople focus	**Market led strategy**. Susceptible to unbalanced functional strategy linkage with Manufacturing operations
Through consultation with all stakeholders i.e. production and engineering, through workshops, seminars and town hall meetings	Best practice to keep aligned with a balanced functional strategic linkage. Hinges on respect and effectiveness. Responding to business economic dynamics
Commercial and operations strategy is born by the country ambitions planned which is followed by the marketing plans. From the BU strategy is developed followed by specific strategy formation by different functions	**Market led strategy**. Susceptible to unbalanced functional strategy linkage with Manufacturing operations
Yearly marketing plan defining priority segments and key product requirements	**Market led strategy**. Susceptible to unbalanced functional strategy linkage with Manufacturing operations
Yearly production budget through the mid-term plan driving volumes in different geographic lines	**Market led strategy**. Susceptible to unbalanced functional strategy linkage with Manufacturing operations
The starting point is normally from the Sales and marketing	**Market led strategy**.

section depending on customer feedback, forecasts and plans. The Sales and Marketing will do forecasts of sales by month for a whole year and this is discussed with plant and logistics teams. The respective teams then meet to agree on how to execute the forecast. In cases of new product development, this is done by having a cross functional project team, with marketing and manufacturing included.						Susceptible to unbalanced functional strategy linkage with Manufacturing operations
Q4: How do you rate and describe the efficiency of the manufacturing operations in your organization? (Please indicate your level of agreement or disagreement with each of these tabulated statements. Place a "√" mark in the box of your answer)	**Strongly Agree**	**Agree**	**Neutral**	**Disagree**	**Strongly Disagree**	To identify the pitfalls in the manufacturing industry business strategy formulation process that lead to unbalanced linkage between manufacturing and commercial operations strategies **(specific Objective #2)**
a. Very poor, due to misalignment between commercial and manufacturing operations		√√	√	√√√√√	√√√√√ √√√√	The poor operations efficiencies are not as a result of misalignment between manufacturing and commercial

strategies						
b. Poor, due to low collaboration between manufacturing and commercial teams		√√	√√	√√√√√√√√	√√√√	The poor operations efficiencies are not as a result of low collaboration between manufacturing and commercial
c. Average due to high level of compromise between the commercial and manufacturing strategies, resulting in comfortable operations with no stretch target for better performance		√√√√	√√√√√	√√√√√√√	√√√	The poor operations efficiencies are not as a result of levels of compromise between manufacturing and commercial
d. Good, because production and engineering teams are always aligned in a balanced way to maintain the	√√√	√√√√√ √√√√√ √√√	√	√		Manufacturing aligns its operations to marketing demands cause for good performance

Production/Production Capability balance of the Manufacturing equipment to meet market demands.						
e. High, because the Manufacturing strategy is dynamic and continuously aligns with the commercial dynamic targets and strategies easily	√√√	√√√√√ √√√√√	√√√√√	√	√	Manufacturing aligns its operations to marketing demands cause for good performance
f. Very high, because of corporate investment employed in building manufacturing operations competitive capabilities to match the dynamic demands of the monopolistic	√√	√√√√√ √	√√√√√√	√√√√	√	There is no matching investment in manufacturing operations to build capacity for competitive market efficiency improvement

market operations strategy						
g. Excellent, due to a high level of corporate shared Vision with the leading teams in commercial and manufacturing operations, which is also cascaded to the shop floor operations teams	√√	√√√√√	√√√√√√√√	√√		There is a gap on strategy sharing and involvement of functional strategy operations managers close to the shop floor by top management
h. World class, the manufacturing operations demonstrate the world class parameters which are quality, cost effective, flexibility and innovation	√√√	√	√√√√√√√	√√√	√√√	Due to gaps in strategy there is room for efficiency improvement as world class parameters are average for most manufacturing firms
Percentage selection	**0%**	**25%**	**38%**	**25%**	**13%**	**100%**

Majority Manufacturing Performance selection	**Average**	
Q5: How does your organization build and implement a balanced linkage between manufacturing and commercial operations strategies?		To identify the pitfalls in the manufacturing industry business strategy formulation process that lead to unbalanced linkage between manufacturing and commercial operations strategies **(specific Objective #2)**
The Business unit vision is agreed at Executive committee level, were commercial and industrial agreed. This is cascaded to operation departments at head of department and section level for implementation		Best practice. World class if implemented with vigor and tenacious focus
There are teams comprising commercial, customer service, production and quality meeting weekly to discuss changes necessary via customer feedback		Still working on this system for robustness
Both have common objectives at BU level which are then shared by the different functions. However, there are still conflicts between the two as what may be considered to increase productivity and reduce cost in one function, may actually lead to inefficiency/losses in another		Best practice. Need to work on knowledge gaps and in still a shared vision. Eliminate silo and blame mindset. Eliminate internal functional Competition among functional strategy managers and their operations teams
This is done through weekly meetings between operations staff and monthly reviews with strategic review		Best practice for short term business strategy alignment to dynamic market forces
Effective communication through town hall meetings and		Best practice for short term

global mailing of the bigger picture. By creating rapport between the two, and driving a shared vision	business strategy alignment to dynamic market forces
By identifying the internal strengths, weakness, the opportunities and then looks at the threats affecting production because these have a negative bearing on the customer satisfaction through interaction between commercial and manufacturing operations	Best practice for short term business strategy alignment to dynamic market forces
Holding joint techno-commercial meetings that help in planning and implementation of any new strategy	Best Practice
Manufacturing utilize mid-term plan developed by commercial to plan its activities. We are in business to make money; therefore, the commercial strategy is developed first and then all other strategies should aim to support the main aim. Also, a good understanding of the business cycle and seasonality is key	**Market led strategy**. Susceptible to unbalanced functional strategy linkage with Manufacturing operations
Continuous communication between the two functions at different levels keeps the alignment between the two strong. EXCO meetings which take place weekly include representation from Manufacturing and Commercial. Operational meetings are also held at the manager level weekly to ensure alignment and plans.	Best practice for short term business strategy alignment to dynamic market forces and keeping the end go alive
Q6: How would you rate your overall experience with your firm's manufacturing operation's efficiency in relation to your competitors or with peer plant in the group (this part is applicable for multi-national companies)?	To identify the pitfalls in the manufacturing industry business strategy formulation process that lead to unbalanced linkage between manufacturing and commercial operations strategies **(specific Objective #2)**

a) Highly satisfactory	√√√					
b) Satisfactory	√√√√√√ √√√√√√					Not synchronized or positioned for World

	√√					class Hence room for operations efficiency improvements
c) Neutral						
d) Unsatisfactory	√					
e) Highly Unsatisfactory						

Q8: What do you recommend as effective and efficient ways of creating a balanced linkage between Manufacturing Operations and Commercial (sales/marketing) operations strategies?	To identify and or recommend a model for effective ways of creating balanced linkages between efficient manufacturing and commercial operations strategies that sustains competitive advantage **(specific Objective #3)**
There should be good understanding of industrial and commercial operations at EXCO level	This is best practice for Production Capability (PC)/Production (P) Balance. The Goose and the golden Egg Principle. This will eliminate room for functional strategy linkage.
There should be regular updates on industrial and commercial at implementation stage by operatives (HODs, HOS, Staff)	Important to keep alignment to Corporate and Business level strategy
There should be regular feedback to EXCO and reviews to continuously monitor what is working and what is not working	Important to keep alignment to Corporate and Business level strategy. Key to spot pitfalls to imbalance in functional strategies
The commercial, manufacturing meeting should be taken	Important to keep alignment

seriously and actions agreed upon suctioned and implemented by senior management. Building Budget and Maintenance plans together frequently transparent communication. Joint strategy setting. To have a monthly cross functional meeting to agree and implement the Production planning led by Production with sales in attendance	to Corporate and Business level strategy. Key to spot pitfalls to imbalance in functional strategies
Get more customer oriented such as customer visits (manufacturing team) so that the clear understanding of customer needs even before commercial raise any concerns	Important to keep alignment to Corporate and Business level strategy. Key to spot pitfalls to imbalance in functional strategies
More collaboration between the two functions	Important to keep alignment to Corporate and Business level strategy. Key to spot pitfalls to imbalance in functional strategies
Decision makers must have good understanding of both functions	This is best practice for Production Capability (PC)/Production (P) Balance. The Goose and the golden Egg Principle. This will eliminate room for functional strategy linkage.
Demand high performance level from each team member as each function will make plans/promises based on agreements with the other function	Important to keep alignment to Corporate and Business level strategy. Key to spot pitfalls to imbalance in functional strategies
Mutual respect. Targets must be agreed on by both and set according to how the market demands	This is best practice for Production Capability (PC)/Production (P) Balance. The Goose and the golden Egg Principle. This will

	eliminate room for functional strategy linkage.
Have monthly review meetings with a focus on continuous process improvements (CPI) attended by all key functions in commercial and Manufacturing	Important to keep alignment to Corporate and Business level strategy. Key to spot pitfalls to imbalance in functional strategies
Deliberate company policy must be developed to enhance knowledge exchange between manufacturing operations and commercial operations through round table discussions and social interaction through which or amid at creating a balanced linkage between the two. Otherwise there is still a gap.	Important to keep alignment to Corporate and Business level strategy. Key to spot pitfalls to imbalance in functional strategies
A deliberate policy is enacted which allows people with engineering background are employed in commercial/stores department and vice versa	This is best practice for Production Capability (PC)/Production (P) Balance. The Goose and the golden Egg Principle. This will eliminate room for functional strategy linkage.
Frequent meeting between commercial, production, engineering and quality teams to brain storm and allow mobility to workforce i.e. engineers with business acumen to be transferred to commercial and vice versa	This is best practice for Production Capability y (PC)/Production (P) Balance. The Goose and the golden Egg Principle. This will eliminate room for functional strategy linkage.
Sales and Marketing people to keep in close touch with Manufacturing teams at all levels of the organization. Weekly meetings are a must and adhoc meetings with all parties involved in times of need should be called. Sales to take more interest understanding capabilities of the production process. And Senior Managers from production to periodically join customer visits to appreciate market view and feedback.	This is best practice for Production Capability (PC)/Production (P) Balance. The Goose and the golden Egg Principle. This will eliminate room for functional strategy linkage.

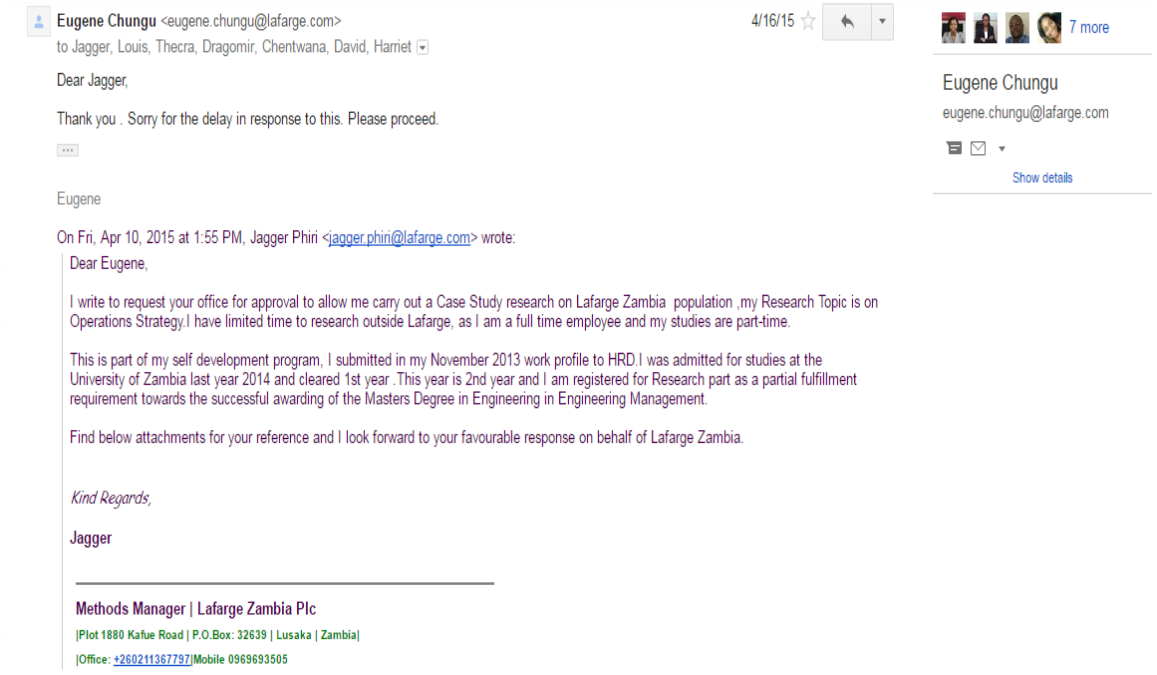
III. Demographic Data						
Q9: What is your level in the Organization?						**To investigate how to create a balanced linkage between manufacturing operations and commercial operations strategies which support competitive manufacturing operations efficiency (Main Objective)**
□ **EXCOM**	(Executive Committee)	√√				Validates findings on Strategy development or formulation
□ **HOD**	(Head of Department)	√√√√√√				Validates findings at functional strategy implementation
□ **HOS**	(Head of Section)	√√√√				Validates feedback from operations challenges
□ **FLS**	(Front line Supervisor)	√√√√√√√				affirms operations challenges
□ **Staff**		√				Confirms the gap

						at shop floor on strategy issues
Q10: What is your Area of functionality?						**To investigate how to create a balanced linkage between manufacturing operations and commercial operations strategies which support competitive manufacturing operations efficiency (Main Objective)**
□ **Strategic Management**		√√√				Statistical level involvement in research questionnaire
□ **Finance**		√√√				Statistical level involvement in research questionaire
□ **Supply Chain**		√√				Statistical level involvement in research questionaire
□ **Production**		√√√√√√				Statistical level involvement in research questionaire

□ **Maintenance Engineering**		√√√√				Statistical level involvement in research questionaire
□ **Quality Control**		√				Statistical level involvement in research questionaire
□ **Human Resources**		√				Evidence and statistical involvement
□ **Sales and Marketing (Commercial)**		√√√√√				Evidence and statistical involvement
Q11: Gender: and Age group:						**To investigate how to create a balanced linkage between manufacturing operations and commercial operations strategies which support competitive manufacturing operations efficiency (Main Objective)**
M	√√√√√√ √√√√√√ √√√√√					Male dominance
F	√					Low female

						participation
□ **15-24 Years**						
□ **25-34 Years**	√√√√					
□ **35-44 Years**	√√√√√√ √√√					Great experience and with capacity to implement an evolution in strategic management
□ **45-54 Years**	√√√√√√					Great experience and with capacity to implement an evolution in strategic management
□**More than 55 Years**						

C- Ethical Consideration Email



Eugene Chungu <eugene.chungu@lafarge.com> 4/16/15

to Jagger, Louis, Thecra, Dragomir, Chentwana, David, Harriet

Dear Jagger,

Thank you . Sorry for the delay in response to this. Please proceed.

...

Eugene

On Fri, Apr 10, 2015 at 1:55 PM, Jagger Phiri <jagger.phiri@lafarge.com> wrote:

Dear Eugene,

I write to request your office for approval to allow me carry out a Case Study research on Lafarge Zambia population ,my Research Topic is on Operations Strategy.I have limited time to research outside Lafarge, as I am a full time employee and my studies are part-time.

This is part of my self development program, I submitted in my November 2013 work profile to HRD.I was admitted for studies at the University of Zambia last year 2014 and cleared 1st year .This year is 2nd year and I am registered for Research part as a partial fulfillment requirement towards the successful awarding of the Masters Degree in Engineering in Engineering Management.

Find below attachments for your reference and I look forward to your favourable response on behalf of Lafarge Zambia.

Kind Regards,

Jagger

Methods Manager | Lafarge Zambia Plc

|Plot 1880 Kafue Road | P.O.Box: 32639 | Lusaka | Zambia|

|Office: +260211367797|Mobile 0969693505

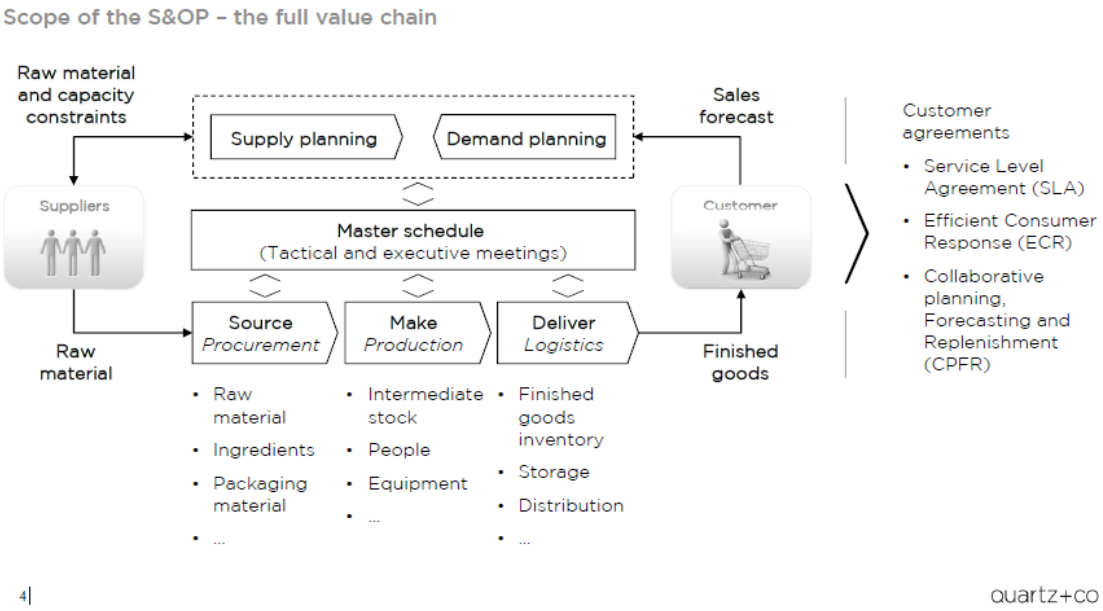
7 more

Eugene Chungu

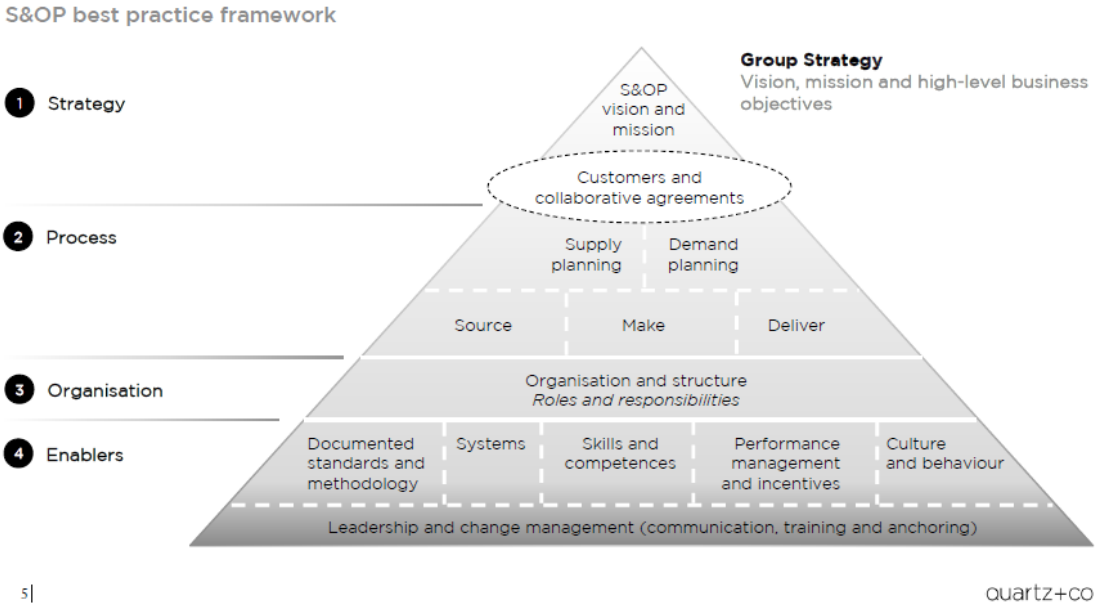
eugene.chungu@lafarge.com

Show details

D: Sales and Operations planning (S&OP) Best Practices



E: Quartz Company S&OP



F: Move Supply Chain Operating Model