

Operations Efficiency Improvements in a De-monopolized Market:

A Case Study at a Cement Factory in Zambia

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Abstract— *In this paper the pitfalls that lead to imbalance of functional operations strategy linkage between manufacturing and commercial, resulting in a low overall equipment efficiency in de-monopolized markets, is determined and corrective efficient improvement model developed. A case study at one of the leading Cement manufacturing plant was conducted and written questionnaires were administered in a non-probabilistic judgmental sampling. A lot of literature has shown that operations strategy formulation focuses on prescribing what to do than prescribing how to do it, hence the pitfalls that lead to imbalance linkage between the manufacturing strategy and commercial strategy during the formulation and implementation phases not being detected. Manufacturing is important in corporate success and thus improving the efficiency of manufacturing operations or attaining operations excellence is cardinal to business. Pareto Analysis was applied on the findings leading to the conclusion that the major pitfall*

for imbalance functional strategy linkage resulting in inefficient operations is low collaboration, between and within the manufacturing and commercial operations functional teams, among other critical but low impact pitfalls such as lack of assertiveness, low competency among manufacturing teams and inadequate information sharing between commercial and manufacturing. Therefore, the strategy process improvement model, 'JMP Collaborative-Model', has been developed to eliminate low collaboration. The model nurtures high collaboration. It is cross-functional strategic review platform aimed at attaining functional strategy linkage balance and sustains competitive efficient operations. To be successful with this model, an organization has to incorporate it in the company ways and operation values or culture.

Keywords— *Strategy, Linkages, Pitfall, Operations, Efficiency, Commercial, Manufacturing.*

I. INTRODUCTION AND BACK GROUND

Unbalanced functional strategy linkage between manufacturing and commercial operations strategies, has been a serious problem facing Zambia Cement Manufacturing Industry. This was reflected in low overall equipment efficiency (OEE) and high production cost against improvements in production sale volumes for consecutive years.

The performance indicators for manufacturing industries on which this research is built are operational excellence (OE) indicators, which are high productivity, high overall equipment efficiency (OEE) and high customer satisfaction, [1]. OE 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 as stated by Greulich, [2], [3]. Low OEE and high production cost is a sign of inefficient operations. Hence, the research’s study title, ‘operation efficiency improvements in de-monopolized markets’. Today, in Zambia most of the manufacturing companies are in competitive business environment, however the level of operations is inefficient. This research was built on the strategy alignment of the operations focusing on the functional level strategy linkages.

The case study Cement manufacturing industry in Zambia experienced little competition, was less customer centric as market was sold out and the focus was to produce more volumes of quality products in a sold-out market. The sector was less cost efficient and was not very good at operational excellence (OE). 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.

The big 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 from neighboring country Zimbabwe. Many others are yet to join like Mpande Cement Plant currently under construction.

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. In this environment, the manufacturing sector which was more sales volume driven, for the sold-out market with the unbalanced attention to the manufacturing operations efficiency, is now open to the effects of unbalanced 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 price war and product differentiations. 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 balanced functional operations strategy linkage alignment by all stakeholders in the organizations.

A. *Research Justification*

There is a notable unbalanced linkage or bias towards commercial which result in unmatched production versus production capability of the manufacturing sector, a phenomena called

P/PC imbalance. P stands for Production and PC for Production Capacity, as by Covey, [4]. The P/PC imbalance is authenticated by record figure obtained at the case study cement factory which were increased production volumes of cement clinker translated in the performance factor (PF) of 109% versus a consistently lower equipment annual reliability factor (RF) of 89.04% below 96%. The average maintenance cost was repeatedly above budget, over 5%. The manufacturing experienced stock out of the product due to breakdowns keeping customer waiting eventually contributing to a high retail cost of cement to an average of 40% above the relative normal price. The low OEE and high production cost are indicators of inefficient operations as a result of misaligned functional strategy implementation.

In monopolized sold out markets, trading-off the equipment reliability (RF) and the cost of maintenance, in preference for high production throughput, in effort to meet customer demands is a profitable business decision, but now with reduced profit margins in a market with readily available cement product competing for a few customers, it is not a profitable business decision for it is unsustainable to business and unappealing to shareholders as they will notice reduction in dividends, which may lead to shareholder loss of confidence.

B. Research Purpose

The aim of this research was to identify the pitfalls that lead to functional level strategy imbalance attributed to as the main cause for inefficient operations improvements in competitive markets and the development of a strategy model of avoiding them. A Pitfall is defined as a hidden cause or a ‘danger or problem that is hidden or not obvious at first’, [5].

Specific Objectives

1. To investigate how manufacturing industries built country specific manufacturing and commercial strategies
2. To identify the pitfalls in the manufacturing industry business strategy formulation process that led to unbalanced linkage between manufacturing and commercial operations strategies
3. To create a model for effective ways of creating balanced linkages between efficient manufacturing and commercial operations strategies that sustains competitive advantage

C. Significance of the Research

1. The manufacturing industry will become aware of the pitfalls that lead to imbalance functional strategy linkage
2. The implementation of the JMP collaboration model is expected to bring about, operations efficiency improvements due to strategy alignment during formulation and implementation. Examples of expected improvements are shutdown planning/execution versus sales/dispatch volume forecasting and alignment on new development with all internal stakeholders.
3. Enrich research work in the area of strategic management with practical knowledge on pitfalls that lead to unbalanced Market-led and operations-led strategy.

D. Limitations and Scope

The research was limited to one organization case study due to limitation of time and resources. However, the research was still valid as Zambia is in the Sub-Sahara Africa (SSA), the only region which had deficit in cement production. 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, [6], [7]. Also, cement prices in SSA were, at the top end, some 200% higher than emerging and developed countries, [7].

Research has revealed that little has been done on pitfalls that lead to imbalance linkage between the functional strategies during the formulation and implementation. This gap is supported by Rheea, who in his research concluded the term, "manufacturing strategy", does not have instant recognition as to its meaning, purpose, and utility, unlike the term, "marketing strategy", [8]. There is no single research paper specifically on operations efficiency improvements in De-Monopolized markets focused on identifying the pitfalls on the strategy linkage imbalance.

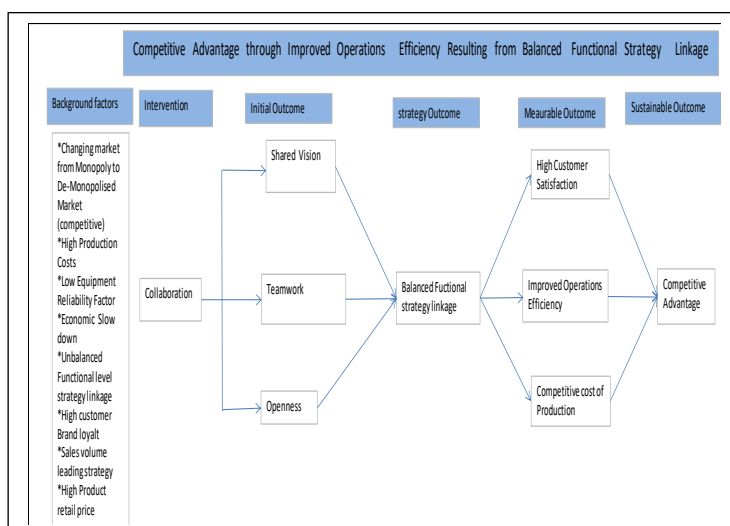
Definitions of some key terminologies frequently used in this study are:

II. MATERIALS AND METHODS

A. Research Method

The research data acquisition methods employed both primary and secondary nature, in a case study format, at one of the leading Cement factories in Zambia, [5]. A combination of qualitative and quantitative methods was employed. Monte Carlo Simulations, Pareto analysis and established operations strategy management theories were used as analysis techniques.

B. Conceptual Framework



1. Commercial operations: It is a logical output of market surveys through functional level strategy combining Marketing and Sales operations, [9].
2. Manufacturing operations: It is a competitive weapon in manufacturing industries utilizing the functional level strategy comprising of engineering, maintenance, production and product or service quality control operations, [10].
3. Operations strategy is defined as a plan specifying how an organization will allocate resources in order to support infrastructure and production. It is typically driven by the overall business strategy of the organization, and is designed to maximize the effectiveness of production and support elements while minimizing costs, [11]. Strategy also denotes actions or patterns of actions intended for the attainment of goals, [12]

Table 1, below outlined some of the questions that must be asked to check alignment and balanced strategic linking for competitiveness, [13].

Table 1 Criteria for evaluating an Operations Strategy

KEY ISSUE	EVALUATION CRITERIA
Consistency (Is the strategy consistent...?)	<ul style="list-style-type: none"> • 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...?)	<ul style="list-style-type: none"> • 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

D. Relevant Literature

Research by Gianesi, and Hill, revealed that there is lack of consistent decision pattern within each function, as the literature by many authors has been more prolific in prescribing the objective than prescribing the process, [14], [15]. The Acur's prophesy chart and Barnes'

three strategy levels are great examples of process in strategy formulation but does not give warning against behaviors, or pitfalls that lead to imbalance strategic linkage during implementation, [16], [13]. There is a lot of coverage on Operations Strategy theory competitive priorities and capabilities by many authors, [17], [18], [19], [20], many more authors have covered strategy formulation process, [14], [15], [21], [22], and many others the need to link resources based view and market based view strategy, [23]. 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, but none did outline the pitfalls that weaken the balanced functional strategy linkages, [24], [25], [26]. It was also noted that much of the literature on resources based and market based approaches is still at the theoretical stage, [24]. This paper has drawn attention to expose behaviors and practices that have been identified as pitfalls for operations inefficiency which are detrimental to organization competitiveness. It is also a further research in line with the proposals made Rhea on a topic to do with establishment of how functional area managerial choices interact with elements of competitive strategy', [8].

III. DESIGN AND METHODOLOGY

A. Research Design and Plan

The research was designed to use a combination of qualitative approach and a quantitative approach. The data was analyzed numerically 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. The research format was a case study research.

B. 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 judgmental sampling method. The study population was in excess of 200 people. This sample was deemed to be a representative population of a Cement Manufacturing industry on a firm which had employed direct 300 permanent workers with 350 contractors making a population of 650.

C. Data Collection Instruments

The data sources comprised company literature, observations on how operations were executed in functions, selected interviews were conducted, focus group discussions using the operations review meetings, 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 correction were applied so as not to limit sources of information and eliminate all possible biasness.

D. Data analysis procedure

All data collected was tabulated in a systematic and logical way using excel, combining similar data together as per questionnaire administered. A questionnaire was first pilot tested, revised and re-administered

after review combining the similar results with new additions not on the original questionnaire. The narrative responses received were arranged into numeric form for quantitative analysis of data using Monte Carlo Simulation and Microsoft Excel for mathematical analysis. Numerical encoding utilized level of agreement scale. Each identified listed pitfall was assigned weighted points for calculating agreement level, called 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 $UL = IF ((0.29SA + 0.51A + 0.17N) - (0.03D + 0.001SD + 0.17N)) > 0.89, 1, 0$ which was derived from the excel actual agreement pattern on pitfalls by responders on questionnaires, see Table 2 formulating Monte Carlo mathematical expression below.

The mathematical expression is as:

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

Where:

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, .17, 0.03, 0.001, are constant ratios derived from the question responses

0.89= is the minimum level of agreement for pitfall arrived at to be considered a true cause for Unbalanced strategy linkage

IF $UL > 0.89$, then a digit “1” will be assigned to mean yes, the pitfall is a cause for unbalance otherwise, digit “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, as well as to evaluate the leading strategy of the Case study Cement Organization basing on observations and feedback pattern on the questionnaire.

Table 2 Formulating Monte Carlo Mathematical Expression

Q1: In this knowledge and information age, what could be the pitfalls (gaps) which contribute 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 “0” mark in the box if you disagree	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.	40	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	30	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	45	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	30	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 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 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
STATISTICAL ANALYSIS					
Number of Majority Selections	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 must be greater than 0.80, or 80% for Balanced Linkage to Occur	0.89				
Proportion sum for strongly Disagree ,50%Neutral and disagree must be less than 0.20 or 20%	0.12				

The SWOTCLOCK™ Model principles were used to check the case study leading strategy in pursuit and the conclusion made was Response

strategy, as per study questionnaire responses. 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. The response strategy is applied in the cases where the market is in 'price war,' competition and the players are focusing and differentiating product quality and operations 'performance improvement through cost reduction and people development or enhanced Human resources.

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

IV. RESULTS AND DISCUSSION

A. Data analysis

1) Qualitatively Analysis

The section provides the qualitative analysis of the findings for research in relations to research objective questions as follows:

- How do manufacturing Industries build country specific manufacturing and commercial functional Strategies?

1. The respondents revealed that the process started with the Organization group strategy, which was 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 got input from the country business strategy for their own strategy on how to actualize the country and group strategy. The process was thorough with input from forward looking Market statistics, team brainstorming, best practice etc. Once this was done individual KPI's were also drawn.

2. The country specific local strategy started with a 3 years business strategy which determined 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.
3. Business Unit strategy also known as country specific strategy was developed first, and then followed by the marketing plans. Thereafter, all other specific functional level strategy formation was completed
4. The market survey studies were used to decide what should be the leading strategy for country. The case study factory findings showed that the firm pursued a, 'Response leading Strategy. This analysis was based on SWOTCLOCK™ Model developed by Tirosh, [27]. Response leading strategy leverages on Strength (S) and Threats (T). The response strategy employs 'strengths' to push the 'threats' away.

- What are the pitfalls in the manufacturing industry business strategy formulation process that lead to unbalanced linkage between manufacturing and commercial functional operations strategies?
1. The respondent revealed 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 organization, breeding the segregated mind-set (silo mentality) and blame culture whenever the ball dropped through the cracks instead of interdependence.
 2. It was noted that there was little matching investment in manufacturing operations to build capacity for competitive market efficiency improvement. 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 was 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.
 3. 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 was 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 and promote interdependence.
 4. 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 need be at world class performance, [15], [28]. That is high productivity, high OEE, high Customer satisfaction and cost efficient.
- How can a model be created and illustrated for effective ways of creating balanced linkages between

manufacturing and commercial operations strategies that sustains competitive advantage?

1. 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.
2. 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
3. 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.

B. Quantitative Analysis

- What are the pitfalls in the manufacturing industry business strategy formulation process that lead to unbalanced linkage between manufacturing and commercial functional operations strategies?

Fig. 1, shows 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. 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. The Pareto analysis data source Table 2 below shows, the identified pitfalls with the weighted respondent rating and Pareto analysis calculations.

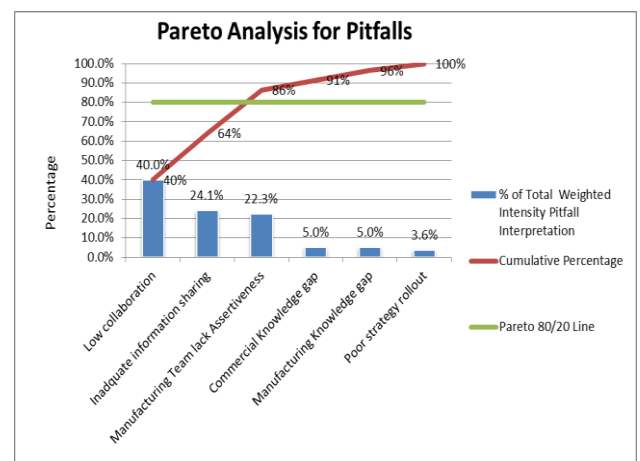


Fig. 1, Pareto Analysis with Cumulative Curve

Table 3, Summarized Strategy pitfalls Pareto Analysis

Q7: In this knowledge and information age, what could be the pitfalls (gaps) which contribute to unbalanced functional strategic linkages 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
f. Low collaboration between marketing and manufacturing operations managers while setting targets to match business goals. h. 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 c. Silo mentalities existing in both commercial and manufacturing divisions g. When cost saving becomes a driving force for profitability	1120	40.0%	Low collaboration	40%
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 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 transparency 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%
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%
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%
j. Lack of awareness/knowledge of manufacturing operations by the commercial team to appreciate the challenges	140	5.0%	Manufacturing Knowledge gap	96%
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%
	2800	100.0%		

Gianesi, admitted that achieving horizontal coherence and “vertical” coherence was not an easy task for several reasons, and this research has revealed some of the identified pitfalls for this incoherence, which result in inefficient operations as per Pareto Analysis above fig. 2.

It is these gaps which makes Acur’s prophesy chart and Barnes three strategy levels, the great examples of process in strategy formulation, look inefficient or porous in as far as avoiding imbalance strategic linkage during implementation is concerned. 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 to ensure that other operations are well prepared for the demand, [13], [16].

V. CONCLUSION AND RECOMMENDATIONS

A. Conclusion

1) Strategy Fomulation

The results demonstrated that there is a fair understanding of strategy development with reference to theory but there were indicators of isolated focus on the rollout and formulation of the strategy to functional strategy level. It was clearly pronounced that commercial felt above manufacturing and indeed in practice they are contrary to the theory of strategy levels, [13]. The understanding is actually that it is at the Business level strategy not functional level as manufacturing. This been the case, it is concluded that the manufacturing must be built on commercial strategy. This supports Hill’s write up that, in many industrial companies, corporate policy and strategic decisions are most based on financial and marketing understandings of what is best for the company in the future, [15].

The results affirm that the literature for strategy formulations process is readily available, for strategic operations managers to make reference to. Strategic Planning Chart exists, developed by Skinner for reference, [29]. In competitive environment low cost strategies are virtually linked with resources and management of manufacturing operations which must be efficient [23].

The results also validates Gianesi’s coherence model. 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” [14].

2) Pitfalls for function strategy linkage imbalance:

a) Lack of Assertiveness and low Competency among Manufacturing Team

Assertiveness means that one can express his or her point of view effectively, without disregarding others but respecting their rights and beliefs. Postponing equipment maintenance stoppage in order to keep the market supplied, continue production, in the interest of keeping the customer satisfaction is an indicator of low assertiveness, however bearing the realization that sales and marketing is at the business level strategy and not at same level with manufacturing, it should be in the best interest of commercials to collaborate and know the manufacturing capability.

b) *Inadequate information Sharing*

Information sharing describes the exchange of data between various organizations, people and technologies. Planning long production stoppages without involving commercial forecast, lack of basic sales and marketing information by the manufacturing operations team, setting production targets and dispatches without involving the manufacturing Managers to advise on production capability, lack of transparency of manufacturing on challenges in the plant and functions working in reactive mode instead of proactive, evidenced low information sharing. On the contrary, cross-functional platform exists but it is the challenge of respecting the established SOPs in volatile market conditions.

c) *Low 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. 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.

Systems for cross function were in place, it is effectiveness and consistence for shared vision that was found lacking in both operations, there was no clear involvement of operations and mid management in short strategic meeting, information flows top down and not the other way round so opportunity to incorporate concerns from shop operations was missed, 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, the result was less efficient manufacturing operations, due to high demands to produce greater volumes, more variety, higher quality, and a faster response without investing in enabling capabilities. Thus overly low collaboration was rated high as an indicator and main cause for strategic misalignment and imbalance linkage leading to inefficient operations.

As seen from the results and discussion the major cause for unbalanced functional level strategy linkage resulting in inefficient operations for the manufacturing industry was low collaboration. Thus a model to resolve was developed called JMP Collaborative Model Fig. 3 below.

JMP Collaborative model, it is an intensive cross-functional model, built on the strategy level process and Strategic planning chart developed by Barnes and Skinner respectively, [13], [29]. The original thought making the collaborative model a new process flow is the cross-functional operations strategy collaborative decision, “check point”. The ‘check’ is JMP main point of modeling, which is

the binding link before any strategic action is implemented.

In managing a conflict, Kilnman model states that the collaborating mode is the highest use of assertiveness and cooperation and is appropriate when your focus is on merging the perspectives of the parties, integrating solutions, and building relationships. However, it owns that over using the collaboration mode can lead to inefficiency, wasting time, and too much diffusion of responsibility, because if everyone is responsible, then really no one is responsible, but in matters of strategy it is not the issue of responsibility but engagement, to check that everyone is aligned to the common goal, [30].

The bonus outcome for collaboration will be the blessing of job satisfaction and retention of skilled workforce as the collaborative culture gives sense of belonging and ownership.

The research solution was shared with most of the participants including country executive members, for feedback through a summary report. The good news is that, the research was timely and to the point on the root cause or pitfalls. The Organization group level and the country have acknowledged that collaboration or engagement was a big problem affecting organization performance and to that effect a number of initiatives have been rolled out at the Country level and group level to transform the organization and make collaboration the organization's key behavioral culture.

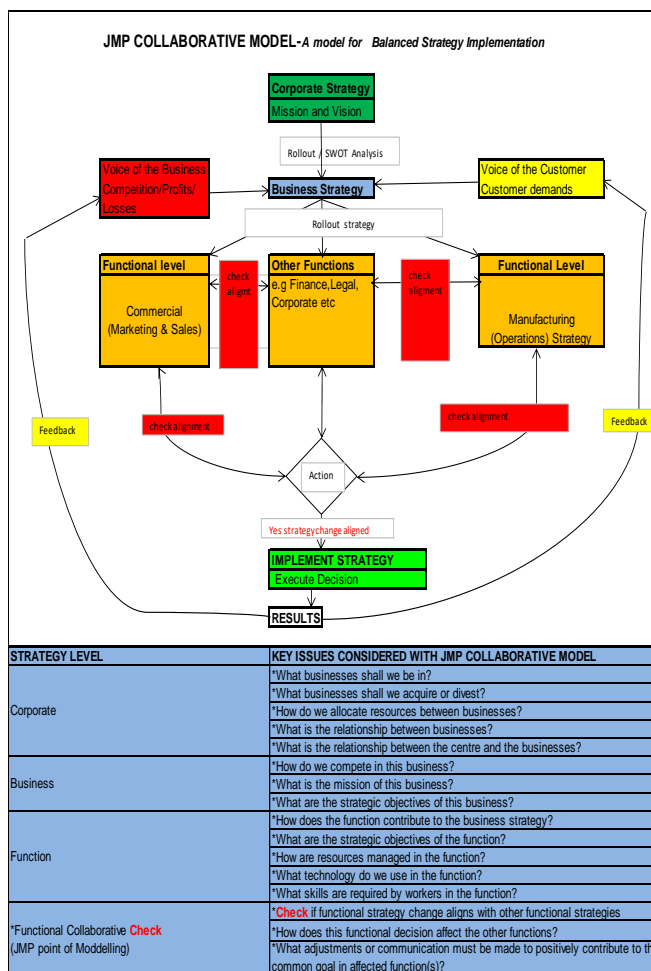


Fig. 2 JMP Collaborative Model

The key messages for 2017 on the case study factory, there 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 this year. Leaders were made ambassadors to ensure alignment of employees, if targets were to be achieved. More ways of increasing collaboration and promoting the synergies across the different levels of the operations to ensure maximum performance are been thought.

This was the first time in history the case study organization had the Country strategy rolled out ceremoniously and communicated with emphasis on collaboration and alignment, with collaboration been enshrined in company values and culture as a way forward.

It is also with great pleasure to state that the researcher was tasked to participate in the local program and made a short presentation on resilience and Collaboration and further was 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 scheduled upcoming country leadership meetings.

B. Recommendations

a) Lack of Assertiveness and low Competency among Manufacturing Team

- i. Human Resource to ensure they hire manufacturing managers who are rounded in operations strategy
- ii. Country leadership to encourage collaborative culture

2) Inadequate information Sharing

- i. Commercial and manufacturing should leverage on best practices on Sales and Operations planning (S&OP)
- ii. Adopt the principles of JMP Collaborative Model [22].

3) Low Collaboration

- i. The feedback to EXCOM should focus on reviews for continuously monitoring of what is working and what is not working.
- ii. Adopt the SWOTCLOCK™ model, in selecting local leading strategy [27],
- iii. Encourage culture to use the Root Cause Analysis (RCA)
- iv. Fully adopt a Collaborative Culture as per Kaizen Principles, 'better the wisdom of 5 people than the expertise of 1 person' [31], [32].

C. Areas for further research

Further research is suggested on, 'Building Engineering capacity in developing nations that will respond to a dynamic customer centric organization strategy with sustainable world class performance', with a focus on skills and technology inhibiting factors

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VI.

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