# A PERFORMANCE METRIC SYSTEM FOR THE LONG-TERM SUSTAINABILITY OF A MULTI-NATIONAL ENTERPRISE

by

**John I. Buyers**

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# DECLARATION

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DECLARATION:

I, John Ian Buyers, Student Number 211252654, hereby declare that the dissertation for Students qualification to be awarded is my own work and that it has not previously been submitted for assessment or completion of any postgraduate qualification to another University or for another qualification

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DATE: December  2018

# DEDICATION

*I dedicate this thesis to the following people who have all played a significant role in the completion of my research towards the fulfilment of this thesis. I am eternally grateful.*

My life-coach, my late father John Buyers, who was by far the most intelligent person I have ever had the privilege of knowing and who unintentionally, continually and convincingly conveyed and instilled a thirst for knowledge in me from a very early age.

My eternal cheerleader, my late mother Iris Buyers. Her hard work and creativity were always in abundance and were expressed through what was presented at the kitchen table or through the apparel she designed. No better example can anyone ask for.

My forever interested, encouraging and continually enthusiastic wife, Kotie Buyers. Although she is not an academic, she is always keen to know what I am doing and how I am proceeding. I remain eternally grateful to her for providing me with moral and emotional support and keeping me sustained with love and an abundance of things to eat.

I am also grateful to my daughters Chantelle and Kirsten. Time spent with them was sacrificed when I was consumed by work and a string of academic pursuits needing my attention, including my research for this thesis. I hope and pray that in some way I will be a role model and example to both of them in all of their future endeavours.

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Mrs Fransiena Potgieter my PA, who was instrumental in the collection of the data, which was a challenging and frustrating task. She competently directed and completed this for me.

Finally and most importantly, I extend gratitude and eternal thanks to my family for their great support: My wife, Kotie for her warm enthusiasm and genuine interest in everything I do, all served with huge dollops of love, support and understanding during the long hours of studying; my daughters Chantelle and Kirsten for their encouragement, fair share of competitive badgering and encouragement and push when I needed it the most. They provided a supportive environment throughout this long and demanding academic pursuit.

Thanks to everyone for their encouragement, guidance, motivation and faith in me!

# ABSTRACT
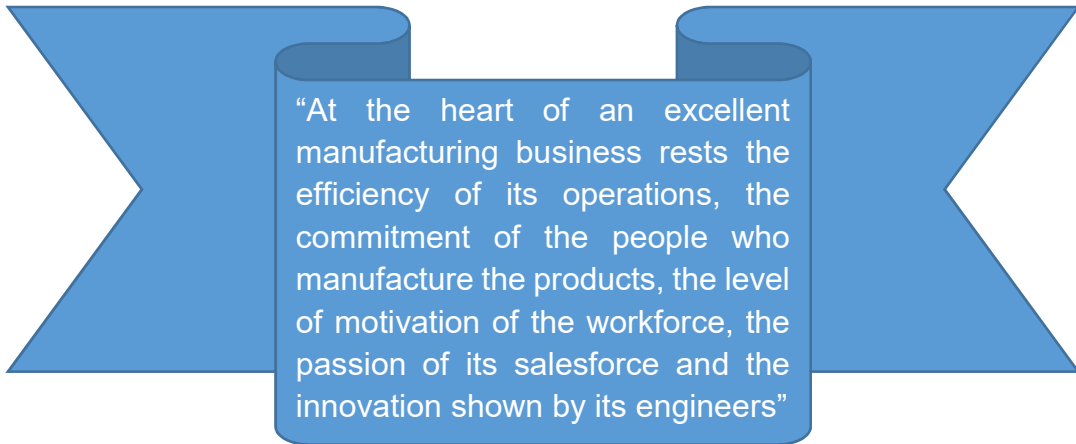
> "At the heart of an excellent manufacturing business rests the efficiency of its operations, the commitment of the people who manufacture the products, the level of motivation of the workforce, the passion of its salesforce and the innovation shown by its engineers"

Source: Researcher's own construction

The purpose of this Qualitative research was to determine the metrics required to define the Long-Term Sustainability of a Multinational Enterprise (MNE). The study investigated and analysed how the individual subsidiaries of a listed organisation interpreted LTS and what measurements (metrics) were the most important in supporting this long-term approach.

The research analysed questionnaires administered to managers from different disciplines within the organisation. This process sought to accumulate a set of responses and through the statistical analysis of these responses, in particular, extensive qualitative research was used to find a common thread of relevant metrics, which can be used presently and in the future to determine LTS.

The researcher reviewed models and the literature to establish a set of questions for the construction of individual questionnaires. This was based on current theory combined with institutional knowledge and experience. The questionnaires were designed to provoke responses from management of their view of the important contributors to LTS. The individual questionnaires (Annexures I to VIII) comprised a series of focused questions and multiple-choice answers based on either 5 or 10-point Likert scales and a few open-ended questions. The main respondents were VPs, MDs, OMs, Human Resource Managers, Financial Managers, and Sales and Marketing Managers of the subsidiaries within the MNE. These

respondents were all best suited to answer questions at the required level of expertise, when taking into consideration the LTS of the organisation.

The data obtained from the research was used to devise suggested scorecards that may be used as guidelines for current and future initiatives when considering LTS.

Qualitative research methods were used in this research as they seek understanding of "how things work in particular contexts". This allows for the building of new theory and the conceptual advancements of knowledge, starting with very general concepts which, as the research progresses, change their definition (Brannen, 2016). In qualitative research, researchers use themselves as the instrument, attending to their own cultural assumptions as well as to the data. to achieve imaginative insights into the respondents' social worlds. (McCracken, 1988). Concepts and categories are relevant to qualitative research. as quantitative research is an exercise in analytical induction.

**KEY WORDS:** Long-term sustainability, Multinational Enterprise, Financial Management, Sales and Marketing, Operations Management, Human Resource Management, Lean manufacturing, Metrics, Qualitative research.

# LIST OF ACRONYMS

| | |
|---|---|
| AMAPs | Advanced Management Accounting Practices |
| BBBEE | Broad-based Black Economic Empowerment |
| BSC | Balanced Scorecard |
| CEO | Chief Executive Officer |
| CI | Continuous Improvement |
| CIM | Continuous Improvement Manager |
| CLV | Customer Lifetime Value |
| CPA | Customer Profitability Analysis |
| CRM | Customer Relationship Management |
| EBIT | Earnings Before Interest and Tax |
| EFQM | European Foundation for Quality Management |
| EVA® | Economic Value Added |
| FM | Financial Manager |
| GAAP | Generally Accepted Accounting Principles |
| HCM | Human Capital Metrics |
| HR | Human Resources |
| HRM | Human Resources Manager |
| IPA | Interpretative Phenomenological Analysis |
| ISBM | Institute for the Study of Business Markets |
| JIT | Just in Time |
| LM | Lean Manufacturing |
| LTS | Long-term sustainability |
| MAS | Management Accounting Systems |
| MD | Managing Director |
| MM | Mixed Methods (in Research design) |
| MNE | Multinational Enterprise |
| NOPAT | Net Operating Profit After Tax |
| OM | Operations Manager |
| OTD | On-time Delivery |
| OTDIF | On-time Delivery in Full |
| PMS | Performance Management Systems |
| ROA | Return on Assets |

| | |
|---|---|
| ROE | Return on Equity |
| ROTA | Return on Total Assets |
| R&D | Research and Development |
| SCOR | Supply Chain Operations Reference |
| SDT | Self Determination Theory |
| SIC | Standard Industrial Classification |
| SM | Sales and Marketing |
| SMM | Sales and Marketing Manager |
| TM | Talent Management |
| VP | Vice President |
| WCM | World Class Manufacturing |
| YTD | Year to date |

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# CHAPTER ONE
# INTRODUCTION

## 1.1    INTRODUCTION

The storehouses of human knowledge, with the physical characteristics of the world we inhabit, as well as the universe within which that world is embedded, have been steadily expanding. Additionally, the accumulation of knowledge about the social characteristics of civilisation is expanding. Pattberg and Widerberg (2016) believe that consideration for a transnational multi-stakeholder partnership is ideal in addressing complex, sustainable development problems and they caution that this theory has yet to reach its full potential. It is currently recognised that an explosion of understanding is underway and revolutionary communication technologies are becoming available, thereby allowing the wide distribution of such intensifying knowledge (Akyildiz, Nie, Lin & Chandrasekaran, 2016; Büyükbaykal, 2015; Malone & Yohe, 2002: 4).

**Figure 1.1: Context of sustainability**
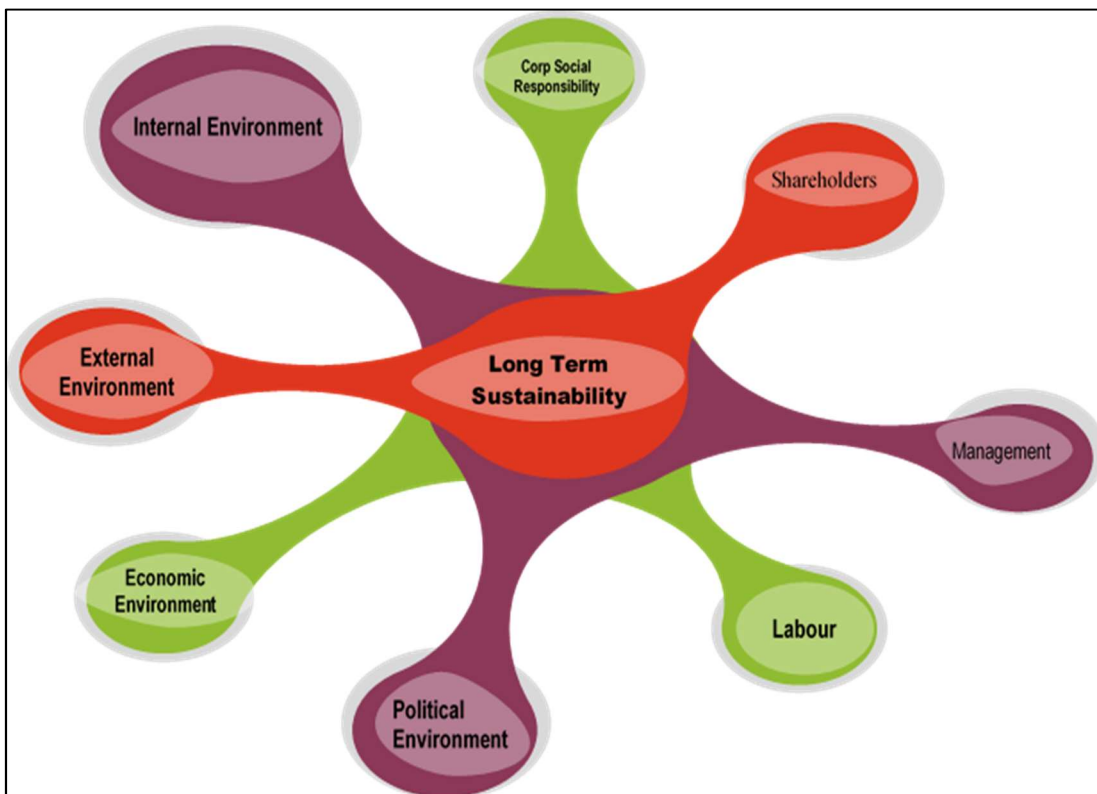


Source: Researcher's own construction

Figure 1.1 represents the researcher's contemplation of the context of sustainability. Sustainability is defined as economic development that meets the needs of the present generation without compromising the ability of future generations to meet their own needs (Epstein & Buhovac, 2014: 2).

Business sustainability includes corporate social responsibility and citizenship, improved management of corporate social and environmental impact and enhanced stakeholder engagement (Epstein & Buhovac, 2014: 2). This poses challenges for businesses, including increasing social responsibility coupled with the element of sustainability, as well as the engagement of corporate stakeholders more effectively. It is about the specific actions that managers can implement to effectively manage the paradox of trying to simultaneously improve corporate social and financial performance (Epstein & Buhovac, 2014: xiv).

Figure 1.1 is also a representation of the elements that may influence long-term sustainability and they are appropriate and important in this study for the following reasons: existing research does not adequately explain the sustained ability of certain multinational enterprises (MNEs) to identify opportunities continuously. Additionally, the ability of such MNEs to creatively assemble and coordinate the resources required to exploit such opportunities and thereby create value, necessitates further investigation (Mahnke, Venzin & Zahra, 2007: 1279).

## 1.2    GLOBAL PERSPECTIVES AND COMPLEXITIES OF BUSINESS

The disciplines of knowledge, technology, economy as well as communication technologies have advanced rapidly and become more complex. This has resulted in the border between technology and knowledge becoming increasingly blurred and disjointed causing confusion between the two. A mutual interdependence may serve to indicate that each could be the driving force of the other. Nevertheless, technology and knowledge are ultimately different, manufacturers have sales teams working in coordination and transgressing country borders to negotiate projects using technology and designs that do not yet exist, to create revenue streams creating LTS. Engineers and designers from different continents often work together in product

development, refining and changing the product design so that the project that is specified in the contract becomes a feasible reality. This complex puzzle requires a combination of skills with coordination and integration into a practically manufactured and tangible product offering able to satisfy these complex demands (Freel, 2000; Zhouying, 2005: 36; Schmidt & Farkas, 2016).

This study focuses on the specific challenges facing businesses. Thomas and Eden (2004) found that most American manufacturing MNEs might not have reached their optimal degree of multinational integration. In contrast to this, Fleming and Cabral (2016) argue that another justification of positive effects of internationalization is submitted in the form of the flexibility of organizations. A company, operating in many countries, can react fast to changes on national markets by shifting production or the diversion of goods flows. Both Thomas and Eden, (2004); Fleming and Cabral, (2016) agree that American and most other MNE's may acquire additional gains from international diversification. To the degree that this is true, the future appears very bright for the internationalization of organisations. The results of the aforementioned study of Thomas and Eden (2004), however, fail to indicate how long it may take companies to optimise the benefits arising from globalisation, effects of further internationalization on corporate success depend on Firm Factors, Industry Factors and Home-Country Factors, (Fleming & Cabral, 2016).

Much more empirical and theoretical research is, therefore, required to understand this relationship, as well as how long it would take the benefits to outweigh the associated costs.

It may be stated that in both general and strategic terms, organisations are facing a myriad of complex new challenges and technologies. These exert a direct impact on the ability of the MNE to compete in a global marketplace. Presently, the complexities faced by businesses include challenges associated with how to best measure long-term sustainability (LTS).

Kristensen and Morgan (2007: 197) describe the concept of "institutional competitiveness" as relatively recent in origin. Moreover, through their observations,

it emerges that globalisation does not create a "flat world" as it does not reduce all differences between societies to a minimum. Rather, globalisation enables those areas that can generate and sustain institutional competitiveness to find expanding markets in the world economy. Consequently, this reinforces national institutional differences, rather than causing them to disappear. The challenge for the MNE is to recognise these differences and to realize that MNEs cannot merely be treated as relays for external forces and processes. On the contrary, MNEs are major actors in the challenge for, and development of, institutional competitiveness.

The modern business world is becoming increasingly complex due to globalisation, the speed of innovation and intense competition. Taking advantage of the opportunities presented by this complexity compels organisations to employ technology and measurement systems to launch co-ordinated effort to maintain and grow pockets of success.

Ivanova and Castellano (2011) studied the impact of globalisation on legitimacy signals and identified the reactions of organisations when faced with environmental factors that render a negative impact on their ability to operate in a certain environment. These reactions often include an attempt by the organisation to access another layer, such as local, national or international. Organisations are faced with various issues in this process. Ivanova and Castellano (2011) propose that organisations employ the signalling theory of legitimacy to address such issues. Thus, a focal organisation moving from one layer of the environment to another must signal its legitimacy, thereby representing its adherence to certain requirements proposed and accepted by the evaluating audiences located at the new level. To ensure the validity of such legitimacy, it is essential that the success or failure of the process be legitimised by formulating a core measurement system. Legitimacy can therefore be measured by the application of appropriate metrics to determine LTS.

## 1.3    THE IMPORTANCE OF APPLYING APPROPRIATE METRICS

Issues in evaluating marketing performance and devising appropriate metrics for measurement have recently gained attention in marketing thought and practice

(Grewal, Iyer, Kamakura, Mehrotra & Sharma, 2016). The question may be posed regarding whether this statement also carries weight when applied to other areas of business.

A performance metric is a measure of an organisation's activities and performance and many performance metrics are finance-based. It is generally believed that companies are intimately involved in HR as a strategic initiative and as such creating methods and measurements of performance management practices, outperform those that do not measure and manage their performance. In addition, performance management affects the behaviour of individuals in organisations and this can lead to organisational goals, the use of performance measures on the shop floor in production and distribution coupled with improvements in management accounting systems (MAS). Literature recognizes these as the use of non-financial performance indicators, and together with their deployment have a strategic focus as they consist of both financial and non-financial information, allowing inward focus on the performance of the organisation. However, metrics may also measure organisational performance against that of customers' requirements (Abdel-Maksoud, Cheffi & Ghoudi, 2015: De Leeuw & van den Berg, 2011).

Brown (1996: ix) asserts that managers spend at least 25 percent of their time reviewing data and this may increase depending on the size of the organisation. Ultimately, there should be no more than 20 performance metrics in place, as an individual can only measure, manage and appropriately interpret up to 20 variables on a regular basis.

A major challenge facing organisations is that of developing a business model to assist new acquisitions and existing subsidiaries in identifying the most important metrics available to measure and thereby maximise, their potential to generate LTS. Muratbekova-Touron (2009) argues that the introduction of a competency-based leadership model allows a multinational organisation to gain both internal and external organisational legitimacy and that the agency theory provides a rationale for the introduction of the model. Contrary to this, Raelin (2016) challenges us in asking that we imagine there are no leaders as such and that in terms of practice, it is not clear

what exactly leaders do that is unique or consistent and if leadership actually has a profound impact on performance.

As performance improvement and management systems are priority items on business agendas of many companies globally and there are a growing number of improvement models available presently, due diligence must be applied in adopting an approach that will yield the most attractive return on investment.

According to Wongrassamee, Simmons and Gardiner (2003: 14), as performance improvement is prioritised on the agendas of many companies and with the global increase of the number of available improvement models, it is of paramount importance for companies to adopt an approach that will yield the most attractive returns on their investments. Their paper compares two widely known and well-publicized improvement models: Kaplan and Norton's Balanced Scorecard (BSC) represented in Figure 1.2 and the EFQM Excellence Model represented in Figure 1.3. Each consists of a non-prescriptive template offering managers a relatively small number of categories of key performance metrics to focus on. These are examined from a critical perspective concerning five central issues represented by five questions relating to: objectives, strategies and plans, target setting, reward structures and information feedback loops. The analysis conducted reveals that despite having some significant differences, both approaches seem to be developed from similar concepts. The paper concludes that it is difficult to find a perfect match between an organisation and a performance measurement framework and that further research should concentrate on how to implement strategic performance frameworks effectively in specific types of organisation. This reinforces the idea that although the BSCs of Kaplan and Norton are "aged", they remain relevant in the present-day context and their original work can be considered as a classical principle, which has relevance, with more recent developments that can be used to complement this longstanding theory. Cooper, Ezzamel and Qu, (2017); Gomes and Romão, (2017); Sen, Bingol and Vayvay ,(2017); and Tizroo et al. ,(2017) are all examples of BSCs being used currently in different environments and for different sets of objectives.

Figure 1.2 is an example of a balanced scorecard used by a subsidiary of an MNE. It is specifically aimed at the performance of a finance team, but it can be expanded to be either individually, organisation or team based, depending on the needs and preferences of the individual or corporation at the point of leadership. This reinforces the literature references in the above chapter.

According to Uygur and Sumerli (2013: 980), the EFQM Excellence Model is a non-prescriptive framework for continuous quality improvement that can be used by any kind of organisation, regardless of sector, size, structure or maturity. The essential elements that constitute the EFQM Excellence Model are the fundamental concepts of excellence. The EFQM Excellence Model is a self-assessment tool designed to assist companies to assess their own activities and the results of activities regularly to determine strengths and weaknesses. Further to this, Uygur and Sumerli (2013: 981) discuss the shortcomings of pure financial and accounting measurements as failure to convey effective strategies and priorities within an organisation, encouraging short-termism and inflexibility to change. Measures defined appropriately can ensure the strategic alignment of the organisation and communication of the strategy throughout the business. The weaknesses of traditional measurement systems are evident in their one-dimensional and backward-looking nature. This has led to the development of innovative performance measurement frameworks such as the BSCs and the EFQM Excellence Model that view business performance through multiple perspectives.

The perception of performance measurement being coherent with low-level action within a business is considered an enabler, initiating the development of processes for implementing performance measurement systems. In some cases, this has led to the development of a method of sustaining and maintaining successful performance measurement systems.

**Figure 1.2: Example of a Balanced Scorecard**

| Finance Team Scorecard for 2017 | | | | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | **Objective** | **Measurement Criteria** | | | | **Jan Score** | **Feb Score** | **Mar Score** | **Apr Score** | **May Score** | **Jun Score** | **Jul Score** | **Aug Score** | **Sep Score** | **Oct Score** | **Nov Score** | **Dec Score** | **Total Score** |
| COMPANY | Finance Metrics | Operating Profit | R 1150K | R1000K | < R 950 K | R1150K=100% R1000K=50% >R950K=0% | | | | | | | | | | | | | 0% |
| | | Gross Margin | 45% | 40% | < 39% | 45%=100% 40%=50% =>39%=0% | | | | | | | | | | | | | 0% |
| | | NPAT | 110% | 100% | 90% | 110%=1 100%=.75 90%=0 | | | | | | | | | | | | | 0% |
| | | Current Ratio | 1+ | 1 | Less Than 1 | >1=100% 1=50% <1=0% | | | | | | | | | | | | | 0% |
| | | Debtors Collection | 55 Days | 60 Days | 60+ Days | 55 Days=100% 56-60 Days=50% <60 Days=0% | | | | | | | | | | | | | 0% |
| | | Quality Of Income | 1+ | 1 | Less Than 1 | >1=100% 1=50% <1=0% | | | | | | | | | | | | | 0% |
| | Ops & Sales Metrics | Sales Turnover | 95% - 100% | 94 - 90% | less than 90% | 95-100%= 100 % 90-95 % = 75 % < 90 %=0 % | | | | | | | | | | | | | 0% |
| | | ON-TIME Delivery target achieved | 95% - 100% | 94 - 90% | less than 90% | 95-100%= 100 % 90-95 % = 75 % < 90 %=0 % | | | | | | | | | | | | | 0% |
| | | Quality Of Product | Y = Yes | | N = No | | | | | | | | | | | | | | 0% |
| | Leadership & Strategic Metrics | People Management | Y = Yes | | N = No | | | | | | | | | | | | | | 0% |
| | | Effectively working with Co-workers | Y = Yes | | N = No | | | | | | | | | | | | | | 0% |
| | **Monthly Score Team** | | | | | | | | | | | | | | | | | | |

Average calculation of Team Performance 0% of Target KPI's — 0%

Source: Researcher's own construction

According to the EFQM Model, as presented in Figure 1.3, assessment and review cover what an organisation needs to review and improve in approach and deployment of the approach, for the main elements of an organisation. These are known as enabler criteria. These criteria are leadership, policy and strategy, people, partnership and resources, and processes. By using this approach, not only does the organisation help to review its performance, but also uses relevant measures in its business. In their closing conclusion, Uygur and Sumerli (2013: 992) emphasise that the performance measurement system of an organisation is the mechanism to manage and control the organisation. For organisations that use Performance Management Systems (PMS) as basis for their operations and development, the health of the organisation depends on the effectiveness of the PMS and the process of reviewing performance is considered a complex task spanning the whole organisation. Involving the appropriate persons to spend sufficient time to review the PMS is a costly exercise. Nevertheless, it is very important to the continuous adjustment of the business and its performance orientation.

The rapid increase in global competition has further exacerbated technological change, product variability and has accentuated the role of performance management and improvement.

**Figure 1.3: The EFQM Excellence Model**
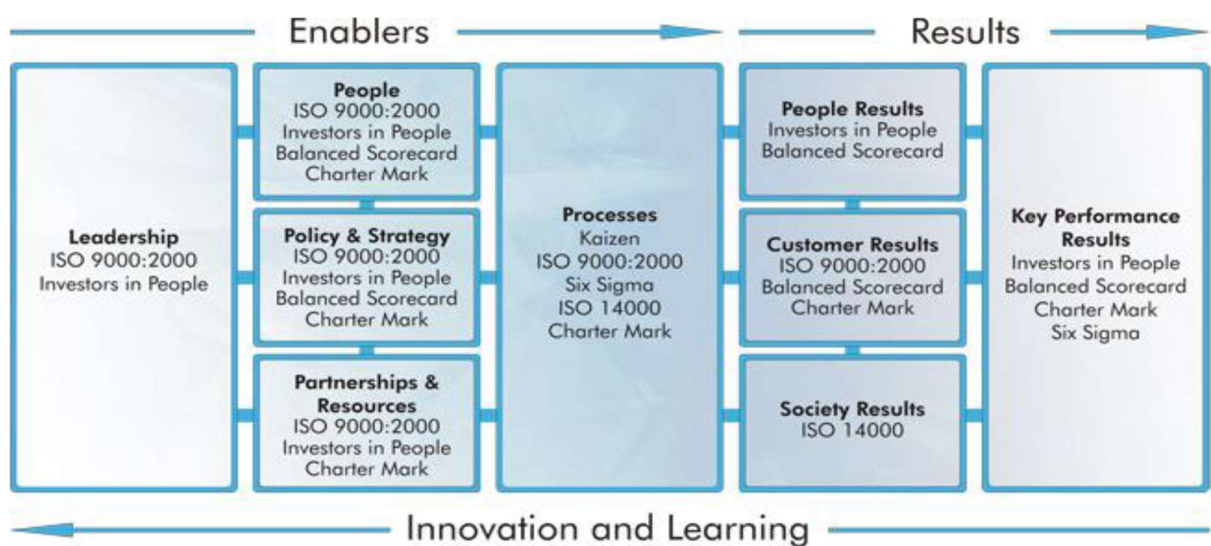


Source: EFQM (2003)

Further to this, researchers Wongrassamee et al. (2003) state that the specific purpose of the EFQM Excellence Model is to provide a systems perspective for understanding performance management, and that the model is a non-prescriptive framework based on nine criteria reflecting validated, leading-edge management practices such as those shown in Figure 1.3: The EFQM Excellence Model.

Accounting calculations and ratios are well documented and researched. Financial controls are more effective than non-financial or behavioural controls in improving profitability, regardless of the environmental contingencies analysed. In particular, systems comprising both financial and behavioural (action accountability) controls could further improve short-term profitability (Kihn, 2007: 531–554). Should this statement be relevant it gives rise to the question regarding which other performance measurements would create an enabling environment for long-term profitability and sustainability, as well as which performance measurements would only apply to short term gains.

Most financial results (revenue, material margin, manufacturing expenses, gross margin and return on assets) contribute toward measuring the performance of an organisation. Financial results assist in exercising control and further contribute to management decisions. The question, however, must be posed as to whether financial results serve as future indicators. Additionally, it must be ascertained whether they provide managers with a means of formulating overall long-term performance measurement metrics.

According to Paulson Gjerde and Hughes (2009: 60), financial measures are more heavily weighted than non-financial measures such as customer satisfaction and defect rates. Given the focus on financial measures, it is not surprising that managers typically view performance measurement systems as tools that report results and provide feedback to operating units, rather than as a means of shaping strategy and identifying strategic initiatives. In their paper on non-financial measures, Ittner and Larcker (2003) postulate that an increasing number of organisations are measuring non-financial metrics which they believe ultimately affect profitability and that doing so offers several benefits, in that

managers can get a glimpse of the business's progress well before a financial verdict is pronounced and the soundness of their investment allocations has become moot. Employees can receive better information on the specific actions needed to achieve strategic objectives. Furthermore, investors can have a better sense of the organisation's overall performance, since non-financial indicators usually reflect areas of intangible value, such as research and development productivity that accounting rules refuse to recognize as assets. Does this, therefore, imply that there are other financial and non-financial performance metrics to assist MNEs in developing long-term strategies to assist in achieving long-term profitability and sustainability?

Despite the importance of the dimension of time in the world of competitive strategy, only a few researchers have focused on the issue of the speed of the integration (SOI) in the process of mergers and/or acquisitions (M&A) and its impact on the success thereof. This impact changes depending on the combination of many variables, such as the main reason for the acquisition, the type of acquisition, the characteristics of the companies involved and the selected integration approach. Therefore, every acquirer must pay attention to the SOI variable to adjust the optimal speed to the specific acquisition scenario (Omri & Barakonyi, 2009: 55).

From the afore-mentioned, it becomes evident that a clearly defined set of performance metrics, used to identify the benefits and/or deficiencies within the MNE, is essential to ensure long-term success. Measurement techniques will provide managers with the ability to recognise and leverage core competencies within the organisation, whilst at the same time, highlight weaknesses that need to be addressed and managed to retain organisational sustainability.

Development and recognition of actual core competencies will further enable MNEs to leverage best practice. This does not merely refer to the cost of manufacturing in countries with low labour rates, but rather to the ability to first rapidly design, develop and test products in low-cost manufacturing environments.

It is well documented that there are important links between strategy, execution and value creation. The ability to recognise the appropriate measurable metrics is more difficult than it may seem. Melnyk, Stewart and Swink, (2004); Gong, Simpson, Koh and Tan, (2018), propose that metrics, being some of the most powerful management tools, allow people to pull together and make the organisation's objectives more tangible. This is done by managers translating the organisation's mission into a set of goals and performance measures, making success tangible for everyone and this is the real bottom-line for the organisation being monitored. There is a need to perform data refinement on an ongoing basis and recognition for the increasing difficulty and complexity of organisation will propagate as the organisation grows. Metrics exist as tools for people and the actions that people take and their decisions determine the degree and nature of value that an operation creates. All these actions and decisions can be greatly influenced by metrics.

Globally engaged organisations generate most of the innovations that feed into higher productivity, primarily because they learn more from additional sources. These results can inform ongoing research on the productivity dispersion and the role of global linkages. In addition, globally engaged organisations such as both MNEs and exporters generate more ideas than their purely domestic counterparts (Criscuolo, Haskel & Slaughter, 2005).

Business performance by nature is dynamic and requires constant and vigilant metamorphosis. The last 30 years has seen a revolution in performance measurement and management accounting measures have been replaced by Key Performance Indicators (KPIs) (Bourne, Melnyk, Bititci, Platts & Andersen, 2013).

O'Connell and O'Sullivan (2016) in their article on non-financial metrics, aver that more companies use non-financial measures in the guise of strategic management tools such as BSCs, corporate boards, customer satisfaction, employee engagement and openness to innovation as measures to encourage behaviours that have the power to increase the organisation's long-term value rather than maximise short-term financial performance. The notion of using non-

financial metrics such as customer satisfaction to shape executive behaviour is attractive to managers, the extent to which including these measures in compensation schemes improves organisation value and financial performance is a matter of debate. Research according to them is an example that customer satisfaction is often a weak leading indicator of an organisation's future financial performance. Other non-financial measures, such as employee engagement and product quality, have displayed similar weaknesses, raising critical concerns about their usefulness. Most of the research to date, about performance measures used to determine CEO compensation, has focused on standard financial indicators such as accounting earnings and stock performance. Studies have found that linking compensation to accounting earnings incentivizes CEOs to maximize short-term financial performance.

According to a comprehensive survey conducted by the American Institute of Certified Public Accountants, only 35 percent of surveyed respondents considered their companies' performance measurement systems as effective or very effective. The satisfaction rate was even lower within small and medium-sized enterprises (American Institute of Certified Public Accountants and Maise, 2001). Does this, therefore, mean that current performance metrics do not satisfy the objectives of a LTS Model? As metrics and systems have evolved over time, systems have become more sophisticated and the measurements and processes to evaluate these metrics that were available when this survey was done, have improved significantly.

## 1.4    PROBLEM STATEMENT

Preformed Line Products (PLP) is a worldwide designer, manufacturer and supplier of high-quality cable anchoring and control hardware and systems, fibre optic and copper splice closures, and high-speed cross-connect devices. There are four distinct categories, namely communications, energy, special industries and solar. The organisation serves customers engaged in telecommunications networks, cable television and broadband services, power utilities, corporations and enterprise networks, government agencies, educational institutions and specialized industries. PLP has consistently pioneered modern advances in communications and power utility networks since 1947, adding value

to customers through expertise and their unparalleled customer support. By embracing lean and modern manufacturing technologies, PLP can produce a wide array of products quickly and efficiently. PLP holds ISO 9001:2015 and ISO14000 certifications and meets testing specifications as defined globally and at the local level.

PLP is growing rapidly and during the last financial year five new facilities were opened, employing 2500 to 3500 people. The organisation's acquisition strategy was achieved by means of aligned acquisitions that required rapid alignment and integration with the parent organisation and existing subsidiaries. The transfer of knowledge between the corporate parent and its subsidiaries is essential for collective growth. The performance metrics, therefore, must be suitable and homogeneous across the organisation, whilst at the same time contributing to the long-term growth and success of the organisation. Based on the literature reviewed, it is evident that financial measurements alone are not sufficient when considering the LTS and profitability of an organisation.

Evidently, a gap exists between financial performance metrics used to determine short-term results and metrics used to determine LTS. Therefore, there is strong motivation to research the following question:

**"What would be an effective performance metric system to assess the LTS of an MNE?"**

## 1.5     THE CONCEPTUAL IDEA SUPPORTING THE STUDY

The rationale behind this research is the introduction of a range of metrics that determine the strategic position of an MNE. This research, embarked on in collaboration with Preformed Line Products, was conducted to determine if defining, implementing and using specific tools and performance metrics for creating an appropriate framework would add value to the continued success of the organisation, thereby rendering a positive impact on the LTS of the MNE.

The development of a robust, measurable system will assist with streamlining the existing businesses, as well as the process of understanding new businesses when the opportunity of further acquisition presents itself. This in turn, will assist in determining which performance metrics drive long-term profitability and sustainability and conversely, which metrics are not conducive to or do not significantly contribute towards long-term profitability and sustainability of the MNE.

It would be prudent at this stage to define what is meant by LTS in the context of this study. LTS is considered the endurance and growth capacity of an MNE, whilst balancing the needs of all stakeholders for a period exceeding the usual year or two used for financial data and prediction techniques and at the same time being productive, long-lived and healthy. As described previously, sustainability for humans is the potential for the long-term maintenance of well-being and incorporates environmental, economic and social dimensions.

The study was conducted on an MNE strategically positioned with 16 manufacturing facilities, operating in 14 countries and dispersed over all continents. The head office is located in Cleveland, Ohio, in the United States of America. The MNE acquired three more companies through acquisition over the past three years. These acquisitions are also dispersed over different countries and continents.

The metrics derived from conventional business theory may assist in improving operations, recognising core competencies in specific locations and aligning the vision and strategy of the various facilities with that of the parent organisation.

## 1.6    LTS MODEL

The LTS Model in Figure 1.4 is the diagrammatic representation of the author's interpretation of a method and means, representing the concept researched. It represents the elements that are deemed as the areas of greatest importance to LTS within an MNE. The LTS Model is aimed at providing an overview of the concepts and terms included and used in this body of work. The individual

elements were further investigated during the research and these are described throughout the remainder of this study.

**Figure 1.4: LTS Model**



Source: Researcher's own construction

## 1.7    ROLE OF PERFORMANCE MEASUREMENT IN BUSINESS

It may be argued that organisations rely largely on financial results to determine their success or failure. Most financial metrics only determine the short-term success of an organisation and do not provide information regarding the long-term prospects of the MNE or its subsidiaries. It is therefore necessary to measure the organisation comprehensively to provide additional information toward creating an in-depth understanding of the organisation.

Figure 3.1 in chapter three provides a representation of the research elements investigated and includes the financial element, as well as other proposed elements.

## 1.8    CHALLENGES OF MEASUREMENT

As stated previously, the need exists to develop a set of metrics to measure the LTS of the organisation. However, an additional challenge is that of deciding which techniques and measurements to use. Managers in large and small organisations spend many hours every day either analysing data or taking measurements. It further stands to reason that the data collectively amassed by organisations is immense. Therefore, it is important to question how much of the collected data is of intrinsic value and what percentage is not adding value to the bottom line?

Measuring and reviewing too many metrics and data do not lead to good business practice and could possibly result in confusion. Keeping everything simple, measurable and understandable would be of great benefit to an organisation, especially to senior managers who should not be spending valuable time on analysing masses of data. Such managers' time could be better employed looking at the overall important measurements that will enable them to determine the long-term success of the organisation.

Persuading managers to select those few vitally important metrics from the wide array of information available may be difficult, especially as information has always been viewed as power. Brown (1996: 17) provides a guideline towards determining the appropriate number of metrics to be used and recommends that the ideal scorecard for a Chief Executive Officer (CEO) should include 20 metrics. The process should start by highlighting 10 of these measures and work towards completing all 20. Brown (1996: 18) further suggests it should take at least three years to populate all 20 metrics with data. This suggestion was tested in this study.

## 1.9    RESEARCH DESIGN AND METHODOLOGY

The Oxford English Dictionary defines research as, "the systematic investigation into and study of materials and sources in order to establish facts and reach new conclusions" Oxford English Dictionary, (2016). Thus, in its most basic and simplest form, research is a way of finding out answers to questions. Further to

this, the term case study is defined as, "… a process or record of research into the development of a particular person, group, or situation over a period of time " (Oxford English Dictionary, 2016).

In brief, this research was undertaken to determine the metrics that would contribute to the LTS of an MNE. The research was undertaken over a period of five years in total. However, the study also included historical data and time thereafter to formulate the work into the case study presented. The research employed a case study method of research (qualitative) as only a single organisation was observed.

According to Algozzine and Hancock (2016) conducting case study research begins with an examination of the scientific method as the context for exploring topologies and procedures used to conduct educational research.

In its most basic and simple form, research is a way of finding out answers to questions. Flyvbjerg (2006) postulates that there are five common misunderstandings around case study research and that these include the following points: theoretical knowledge is more valuable than tacit knowledge; the researcher cannot formulate a generalization from a single source; case studies are useful for generating hypothesis but not for testing of them; contamination can arise from bias and it is difficult to summarize case studies.

It is further argued in this work that Kuhnian insight without many thoroughly executed case studies is a discipline without systematic production of exemplars, and that a discipline without exemplars is an ineffective one. One main advantage of case studies is that they allow the researcher to focus on the individual in a way that is rarely possible in group research (Mackay & Gass, 2015).

Both qualitative and quantitative methodologies within the case study approach are applied. In the quantitative method, questionnaires were constructed based on the theory that was researched through a literature review of available journals, books, researchers' previous experiential learning (Epistemology) and the MNE policies, procedures and directives. Further detail of the research design is covered in chapter two.

## 1.10 RESEARCH OBJECTIVES

The primary and secondary objectives of this study are discussed in this section.

### 1.10.1 Primary objective

The primary objective of this study was to identify those metrics that were most beneficial to MNEs in improving overall long-term performance. This was achieved by investigating which metrics could be employed by the MNE to best recognise weaknesses and optimally exploit opportunities within the organisation. The leveraging of these metrics to sustain the organisation, rather than focusing on short-term solutions to the detriment of the MNE's long-term success, was also investigated.

### 1.10.2 Secondary objectives

Several secondary objectives formed part of the study to achieve the primary objective and included the following objectives:

- What role do metrics play in the LTS of an MNE?

- What are the appropriate metrics that contribute to the LTS of the MNE?

- How do these metrics compare to current theory?

- How can the metrics be developed, modified or standardised to assist with the LTS of an MNE?

- How, and by whom, should the newly constructed set of metrics be implemented within the MNE and its subsidiaries?

## 1.11 DELINEATION

Since the study involves a multinational enterprise operating in fourteen different countries, external factors related to the various foreign country environments are excluded for the purposes of this research.

Risk is excluded for purposes of this research, as it is country and regionally specific, the influences of risk are also diverse and time dependant. Risks as an example, include climate change, political interference, economic activity and cultural differences within countries etc. Therefore, risk is extremely complex by nature, businesses in general and especially corporations that are internationally involved are exposed to risk of all types, in this research, there are some areas of risk covered but It is not the specific focus of this case study research.

The decision to break the research down into different areas of investigation namely financial, sales and marketing, manufacturing and operations, human resources and innovation, was based on the current structure and strategy of the MNE. Further to this, the structure of the MNE is guided by the MNE's headquarters and is broken down into four areas of responsibility, these being financial, sales and marketing, manufacturing and operations and human resources. It was deemed prudent to distribute questionnaires to the senior person responsible for these functional departments within the MNE. It was decided to use questionnaires as a means of data collection and even though these questionnaires were largely quantitative by nature, the questionnaires, in some instances, contained a small number of open-ended questions. These open-ended questions were aimed at gleaning information based on the perception and opinion of the individual respondent. Unfortunately, during the study, the open-ended questions in most cases did not elicit the responses that were expected. The respondents preferred to answer the structured questions by using a mouse click in the column or field they believed was most relevant to them. The data collected was predominantly qualitative data prepared for analysis.

## 1.12 THE STRUCTURE OF THE THESIS

The structure of the thesis is represented in Figure 1.5 below and is an illustration of the structure of the thesis to create a better understanding of the layout and flow of the research undertaking. The structure is broken down into the chapters with a brief description of the contents thereof, this is a guide to the research carried out.

## Figure 1.5: The structure of the thesis

| | |
|---|---|
| **CHAPTER 1: INTRODUCTION** | • General introduction and overall description of the study. The chapter includes a brief overview of the theory used as well as the roles of management and the challenges that they may face when determining what constitutes long-term sustainability within a multinational organisation. |
| **CHAPTER 2: RESEARCH DESIGN AND METHODOLODGY** | • Description of how the data was collected and the methods used to decipher the data as well as how it was used. It also describes the respondents who were targeted. This chapter refers to the structure and the content of the questionnaires which were distributed for completion by the targeted respondents. |
| **CHAPTER 3: EXPLORING THE INDIVIDUAL ELEMENTS** | • An in-depth look at the theory and issues which are pertinent to the study. This chapter looks at literature which has been published in books, journals and articles relevant to the study to determine the structure and content of the questionnaires distributed for completion by the targeted respondents. |
| **CHAPTER 4: FINANCIAL ELEMENTS** | • Comprehensive description of the financial elements and their relevance to the study. This chapter includes literature from journals, books and magazine articles deemed to be pertinent to the study. The authors' works were appropriately referenced using the Harvard method. |
| **CHAPTER 5: SALES AND MARKETING ELEMENTS** | • Comprehensive description of the sales and marketing elements and their relevance to the study. The chapter includes literature from journals, books and magazine article deemed to be pertinent to the study and the authors' works were appropriately referenced using the Harvard method. |
| **CHAPTER 6: OPERATIONS ELEMENTS** | • Comprehensive description of the operations elements and their relevance to the study. The chapter includes literature from journals, books and magazine articles deemed to be pertinent to the study and the authors' works were appropriately referenced using the Harvard method. |
| **CHAPTER 7: THE HUMAN RESOURCE ELEMENTS** | • Comprehensive description of the Human Resource Management elements and their relevance to the study. The chapter includes literature from journals, books and magazine articles deemed to be pertinent to the study and the authors works were appropriately referenced using the Harvard method. |
| **CHAPTER 8: INNOVATION** | • Comprehensive description of the subject innovation and how it is relevant to an organisation. The chapter also looks at how innovation can be better utilised and measured, applied and understood in the context of long-term sustainablity. |
| **CHAPTER 9: RESULTS FROM DATA COLLECTION** | • This section covered the collection of the data and the analysis of the data collected. The sections were analysed using appropriate statistics and the results were discussed to determine the importance of the individuals' responses to the questions. These results were condensed for discussion at the conclusion of the thesis. |
| **CHAPTER 10: CONCLUSION OF STUDY** | • Examined the conclusion from the volume of work collected so that the most important long-term sustainability metrics could be determined. |

## 1.13   CONCLUSION TO CHAPTER ONE

The chapter is significantly relevant to the MNE used in the case study and it was highlighted that as an organisation grows, the change become more complex and the challenges experienced undergo metamorphosis. Appropriate measures need to be taken, when evaluating performance. These can be financially based which are considered inwardly focused or performance can be measured against what the customer believes is important to them.

A person has a limit to the number of variables that can be measured on a regular basis and it is recommended that no more than 20 variables should be regularly presented for measurement.

Current trends indicate that management systems have become high priority items on business agendas and that an increasing number of improvement models have been constructed for consideration. Performance management by using techniques such as the BSC in Figure 1.2. and the EFQM Model in Figure 1.3, are some of the more popular and practical methods that have been applied by executives to ensure that high performance teams have clear goals and objectives that align with organisational missions and values. The multinational that was researched, has a penchant for using BSCs as a means of performance management. However, this warranted further, detailed investigation as it is apparent that a BSC requires thought, research and alignment with the organisation's vision, mission, goals and objectives before it is constructed and introduced as a management tool.

In many organisations, a gap exists between financial performance and customer satisfaction. The MNE researched, was no exception to this phenomenon, so therefore it is imperative to determine through research which metrics can be constructed into a system to improve the LTS of an MNE.

# CHAPTER TWO
# RESEARCH DESIGN AND METHODOLOGY

## 2.1 AN INTRODUCTION TO RESEARCH DESIGN AND TYPES OF RESEARCH

Design plans and methodologies for a research study can comprise of quantitative, qualitative and mixed research methods or it can combine the case study method of research (qualitative), based on the study conducted on a particular MNE as in this research study. According to Elman, Gerring and Mahoney (2016), case studies are usually considered a qualitative method. However, some aspects of case study research, notably the selection of cases may be viewed through a quantitative template.

Research usually includes three important elements, namely philosophical assumptions, strategies of enquiry and specific research methods. Vinet and Zhedanov (2011) postulate that the choice of a particular research design is based on considering these three elements, in addition to that of the problem being investigated, the personal experiences of the researcher and the audiences for whom the research study will be written.

Research design may be described as the science of planning those procedures required for conducting studies to obtain valid findings Collis, Hussey and Hussey, (2009). Research designs consist of the plans and procedures for research that span the decisions from broad assumptions to detailed methods of data collection analysis Vinet and Zhedanov, (2011). Further, determining the most appropriate research design should provide a detailed plan to guide and focus the research findings (Collis et al., 2009).

Denzin (2010) postulates that since the 1980s, there have been at least three paradigm wars: the post positivist war against positivism (1970 to 1990); the wars between competing post positivist, constructivist and critical theory paradigms (1990 to 2005); and the current war between evidence-based methodologists and the mixed methods, interpretive and critical theory schools (2005 to present).

These so-called wars have created challenges to the current and have assisted in changing paradigms. Currently, Denzin (2010) states that researchers should collaborate and share research challenges to bring about a methodological diversity. Interestingly, he does not provide a roadmap or a new war chest for researchers and does not offer any advice on how he believes this situation can be embraced, but he does call researchers to arms.

## 2.2 TYPES OF RESEARCH AND UNDERLYING ELEMENTS THAT DESCRIBE RESEARCH

In consideration of the methods used in this case study, the researcher was required to consider which of the methodologies would suite the original question posed, and which metrics contribute to the LTS of an MNE. The decision to use the case study method was based on the theoretical framework and methodology which was derived from the research of the theory, presented below.

### 2.2.1 Case study research

"Case studies represent another type of qualitative research, they are different from other types of research, they are an intensive analyses and description of a single unit or system bounded by space and time," (Algozzine and Hancock, 2016). According to Collis et al. (2009), a case study is a single instance of a phenomenon of interest and is an example of a phenomenological methodology. A case study provides a form of inquiry that elevates a view of life in its complexity. The origins of case study are believed to be found in the professional training of lawyers at the Harvard Law School in the nineteenth century, however, it is believed that the case study method would have been stumbled on even without these insights (Hancock & Algozzine, 2006). There is currently a belief that case study methods have become increasingly popular as a research method (Easton, 2010; Maxwell, 2015; McSkimming, 2015; Algozzine & Hancock, 2016; Elman et al., 2016).

Although case studies rely on the truth being written, this can sometimes be justified on the grounds of defence based on epistemology (Wellington, Hunt and

Mcculloch, 2005; Easton, 2010). Epistemology is defined as the theory of knowledge, especially with regard to its methods, validity and scope and the distinction between justified belief and opinion (Oxford English Dictionary, 2016). Thus epistemological assumptions are concerned with how we know, the nature of knowledge, what constitutes knowledge, where knowledge comes from, whose knowledge it is, and what it is possible to know, understand and re-present (Wellington et al., 2005). Further to this, is the notion of truth in terms of how the data that research methods obtain correspond with the existing knowledge claimed to be researched and the truth in terms of how the researcher communicates and represents the knowledge they obtain from their research (Wellington et al., 2005). Case study research has become an increasingly popular approach among qualitative researchers and has assisted many of them. This is in spite of continual debate about credibility and reported limitations when comparing with other approaches. Thus many researchers believe this substantiates the argument that case study research remains a stand-alone qualitative approach (Malone & Yohe, 2002; Hancock & Algozzine, 2006; Baxter & Jack, 2008; Collis et al., 2009; Hyett, Kenny & Dickson-Swift, 2014).

In studying the five misunderstandings about case study research, Flyvbjerg (2006) postulates that theoretical knowledge is more valuable than practical knowledge. Further to this, one cannot generalize from a single case. Therefore, a single case study cannot contribute to scientific development and the case study is most useful for generating hypotheses, while other methods are more suitable for hypotheses testing and theory building. In addition, the case study contains a bias toward verification and finally it is often difficult to summarize specific case studies (Flyvbjerg, 2006). This contribution is important in that it relates closely the context of the research being undertaken.

Although case studies are discussed extensively in the literature and employed frequently in practice, little has been written regarding the specific steps one may use to successfully plan, conduct and share the results of a case study project, thus this study undertaken is based on the diagram as shown below in Figure 2.3.

### 2.2.2 Empirical research

The term empiricism is defined by the Oxford English Dictionary as, "The theory that all knowledge is based on experience derived from the senses," (Oxford English Dictionary, 2016). Empiricism was stimulated by the rise of experimental science. This type of research that developed in the 17th and 18th centuries was expounded in particular by John Locke, George Berkeley and David Hume.

Empiricism is a philosophical term that describes a theory based on experience as the fundamental source of understanding. It refers to what we learn and filter through our own experience and it is also closely associated with the ability to learn from observation instead of by the written word (Punch, 2014; LoPucki, 2015).

Empiricism can be a principal driver of collaboration, mainly because of the relative size of differences in the rates of collaboration in review articles when compared to empirical review articles. This suggests a shift towards empiricism that causes an increase in review collaboration. However, this does not prove beyond doubt that a mechanism by which empiricism increases collaboration is better than without. Researchers can only venture that collaboration increases with the sophistication of the methodology. When projects become so complex that it is no longer practical to get useful feedback from non-authors, authors must engage co-authors. This means that people sometimes attempt an answer by obtaining direct and observable information from the surrounding world. The term used in research for observable information is data. The idea in empirical research is to use data as the way of answering questions and for developing and testing ideas (Punch, 2014; LoPucki, 2015).

In their work on the analytical and conceptual in the Foucaultian inquiry, Koopman and Matza (2013) explore the concepts and categories of conceptual material. This work is only relevant in that it raises interesting questions concerning the empirical status of categories in inquiry, the theoretical status of concepts in inquiry and the relation between the two where the stable concepts become categories. An example of the concept of discipline is refined into a categorical

lens or where categories, themselves are submitted to conceptual interrogation. For context, Michel Foucault (1926 to 1984) was a major figure in two successive waves of 20th century French thought and these were the structuralist wave of the 1960s and the poststructuralist wave after this period.

### 2.2.3　Quantitative research

The term quantitative is defined by the Oxford English Dictionary as relating to, measuring or measured by the quantity of something rather than its quality. The term is considered in the sense of 'having magnitude or spatial extent'. It is derived from the Medieval Latin terms of quantitativus or quantitas (see quantity). It's English origin is late 16th century (Oxford English Dictionary, 2016).

Advocates of quantitative and qualitative research paradigms have engaged in ardent dispute for more than a century (Johnson and Ongwuebuzie, 2004: 14–26). Quantitative purists articulate assumptions that are consistent with a positivist philosophy and contend that the observer is separate from the entities that are subject to observation. Quantitative research methods seem to be more widely accepted, partly for their connection to classic understandable research methods. Quantitative research is as old as the scientific method noted primarily for its use of the physical sciences (Cormack, 1991). Unlike qualitativism, quantitativism follows an objective formula method for questioning propositions and measuring results (Kopf, Hsu, Shows & Albinsson, 2016).

Quantitative purists maintain that social science inquiry should be objective to provide both time and context-free generalizations that are desirable, possible and real, as well as the ability to reliably and validly determine causes of social scientific outcomes (Johnson & Ongwuebuzie, 2004: 14–26).

Quantitative research methods employ statistics, numbers and a high level of difficulty associated with numbers and calculations. Therefore, quantitative methodology has to with the collection of numerical data.

This data is analysed by mathematical and statistical means to explain and

understand the research phenomena under investigation (Dane, 1990; Mark & Caputi, 2001; Collis et al., 2009: 186–187; Turner, Cardinal & Burton, 2017).

In theory, if not in practice, the quantitative researcher isolates and defines variables and variable categories. These variables may be further linked to frame a hypothesis, and this could occur even before the data has been collected. Testing of data is conducted by using an analysis instrument such as a predetermined and finely tuned technological tool that does not allow for any flexibility. Where the research issue is clearly defined, the questions posed to respondents require unambiguous answers and a quantitative data collection tool such as a questionnaire may be appropriate. One of the main purposes of this application is to discover how many and what kinds of people in the general or parent population have a characteristic which is suspected to be of similar nature throughout the population. The aim is to infer from a characteristic or a relationship between variables from a parent population (Dane, 1990; Langerak, 2001; Johnson & Ongwuebuzie, 2004; Baxter & Jack, 2008; Collis et al., 2009; Turner et al., 2017).

### 2.2.4    Qualitative research

Qualitative is defined as relating to or the measurement of the quality of something rather than its quantity. Furthermore, the term is used to describe the quality of something in size, appearance or value. Such adjectives can be further modified by words such as very and can have comparative and superlative forms. The origin of the term is found in late middle English, from the late Latin terms of qualitativus or qualitas (see quality), (Oxford English Dictionary, 2016).

According to Johnson and Ongwuebuzie (2004), qualitative purists reject positivism and argue for constructivism, idealism, relativism, humanism, hermeneutics and post-modernism. Qualitative purists further contend that multiple constructed realities abound.

Qualitative research methods seek understanding of "how things work in particular contexts," allowing for the building of new theory as well as conceptual

advancements of knowledge. The qualitative researcher begins with defining very general concepts which, as the research progresses, change their definition (Brannen, 2016). In the qualitative tradition, researchers must use themselves as the instrument, attending to their own cultural assumptions as well as to the data. In seeking to achieve imaginative insights into the respondents' social worlds, the investigator is expected to be flexible and reflexive and yet somehow manufacture distance (McCracken, 1988).

Concepts and categories are relevant to qualitative research. As quantitative research is considered to be an exercise in analytical induction, a researcher moves from the data to a formulation of a hypothesis, then to the testing and verification of the work (McCracken, 1988; Johnson & Ongwuebuzie, 2004; Baxter & Jack, 2008; Collis et al., 2009; Creswell, 2013; Brannen, 2016; Turner et al., 2017).

## 2.2.5    Regression analysis

The Oxford English Dictionary (2016) defines regression analysis as a measure of the relation between the mean value of one variable, for example output and corresponding values of other variables, for example time and cost.

In statistical modelling, regression analysis is a statistical process for estimating the relationships among variables. It includes many techniques for modelling and analysing several variables when the focus is on the relationship between a dependent variable and one or more independent variables.

## 2.2.6    Multiple regression

This is a widely used method to determine relationships when research is being conducted and if there are correlations among any number of variables and a single continuous response variable. When multiple regression is used, the coefficients are called regression coefficients and they can be interpreted in much the same way as correlation coefficients (Dane, 1990).

### 2.2.7     Mixed methods research

Mixed methods research has become an acceptable research methodology. According to Halcomb and Hickman ,(2015); Johnson and Ongwuebuzie, (2004); Maxwell, (2015); and Turner et al., (2017), all methods of research are individually flawed and the limitations can be overcome by the use of a combination of methodologies. Linking these methodologies has enabled researchers to build a mixed method approach, which is shown in Figure 2.1 below.

**Figure 2.1: Building blocks for triangulation based mixed methods research**
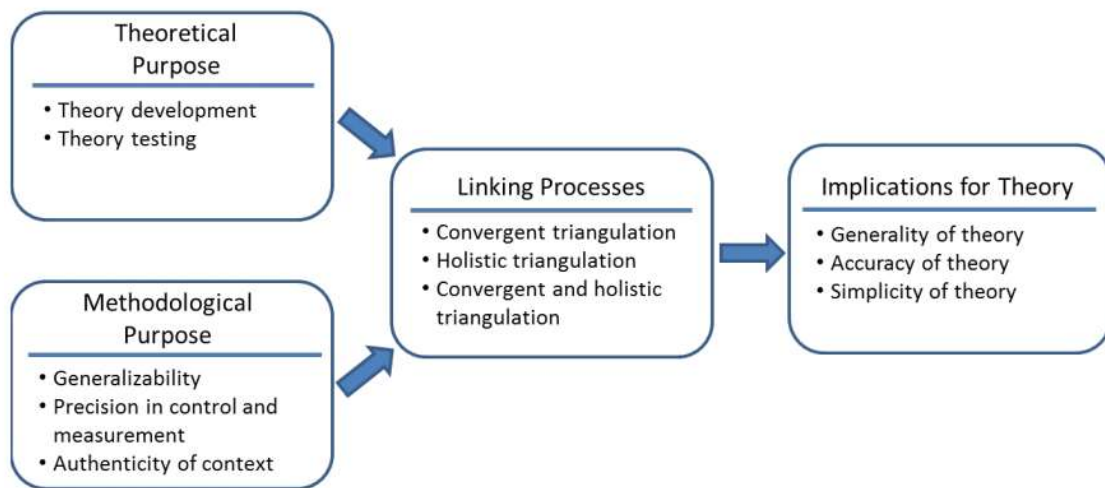


Source: Turner et al. (2017)

Figure 2.1 above reflects a practical example of the process of conducting a mixed method research project and shows how the elements can be built up into a cohesive and understandable framework from which to work. At its most basic level, mixed methods research involves the use of both qualitative and quantitative data in a single project. It represents an alternative methodological approach to traditional qualitative or quantitative research approaches (Halcomb and Hickman, 2015). Maxwell (2015) states that it is necessary to begin from the basics to understand the present use of this model. He further asserts that these ideas originate from work done in the 1950s and that in argument, most of the work done has been superficial and does not emphasise the importance of the method, thus giving the impression of simplicity and not that of a "self-conscious strategy". The mixed method approach as elaborated on by Denzin (2010), is

regarded as a mixed-multiple emergent-method that is bold, innovative, energizing and at the same time disruptive. Further to this, the method represents a challenge to the broader qualitative interpretive community at large.

This challenge has been a major driver for the substantial growth in interest around mixed methods research in recent years in the fields of social science, education and health (Bowers et al., 2013).

With the development of both qualitative and quantitative research in the social and human sciences, mixed methods research using combinations of both approaches has become common practice and continues to grow in stature as an acceptable method and framework for research design and analysis. The idea of using the best of both worlds is seen as a step forward and if research is based on the utilisation of the strengths of both disciplines, complex problems can become easier to understand (Creswell, 2013;Teddlie and Yu, 2007; Turner et al., 2017).

**Figure 2.2: Roadmap for designing triangulation based mixed methods research**
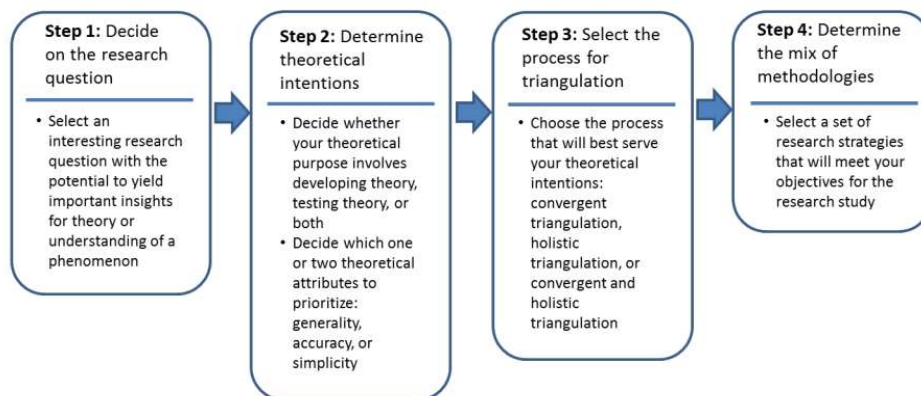


Source: Turner et al. (2017)

At the beginning of a mixed methods research project, it is advisable to begin with a practical roadmap that assists the researcher to understand what is required from the project about to be undertaken. The Turner et al. (2017) Model in Figure 2.2 above shows an example of this in a very practical and understandable format that can be used or alternatively adapted for use in mixed methods research situations.

**Table 2.1: Types of mixed methods sampling**

| | **Mixed Methods Sampling** | |
|---|---|---|
| | **Type** | **Description** |
| A | Basic mixed methods sampling | Use of both qualitative and quantitative data in a single project. |
| B | Sequential mixed methods sampling | These techniques involve the principle of gradual selection. The researcher examines instances of the phenomenon of interest and they are defined and elaborated. The investigator samples people, institutions, documents or wherever the theory leads the investigation. |
| C | Concurrent mixed methods sampling | Concurrent sampling involves the selection of units of analysis for an MM study through the simultaneous use of both probability and purposive sampling. Both probability and purposive sampling procedures are used at the same time. |
| D | Multilevel mixed methods sampling | Multilevel MM sampling is a general sampling strategy in which probability and purposive sampling techniques are used. This sampling strategy is common where different units of analysis are combined with each other such as schools, hospitals, and various types of bureaucracies. |
| E | Combination of mixed methods sampling strategies | As the word implies, this is a combination of any or all the MM approaches used above, it is however advisable to try and keep complexity at bay as this could lead to over-elaboration and high complexity. |

Source: Adapted from Johnson and Ongwuebuzie (2004); Teddlie and Yu (2007); Uygur and Sumerli (2013); Turner et al. (2017)

After deciding which research method to use, the next stage would be to consider the type of mixed method sampling to be used. Table 2.1 above represents some of the methods that may require consideration when sampling the population from where data will be collected.

Time and context-free generalizations are neither desirable nor possible as research is value-bound. Therefore, it is impossible to differentiate fully the

causes and effects or that logic flows from specific to general and consequently, the researcher and knowledge cannot be separated. Further to this, purists are characterized by a dislike of a detached and passive style of writing, preferring a detailed, rich description written directly and informally (Johnson and Ongwuebuzie, 2004). This requires researchers to utilise their best writing skills and at times to engage professional, external people to assist with the creation of a coherent and factually concise document that does not overlook anything, especially that which is beyond the obvious to the researcher.

Researchers may consider using regression analyses of survey data to test their theoretical arguments. Regression analysis is as an example of a process to follow during holistic triangulation, which supports convergence or corroboration of the findings. Next, the researcher may consider interviews and/or questionnaires, firstly to seek corroborating evidence for their survey-based findings and secondly to explore the continuous nature of LTS. Triangulation is therefore an important process to test data gathered during a study.

Overall, the theoretical explanation of how knowledge sharing leads to the creation of LTS could be supported by research. In this study, a pilot study was used. In addition, survey results from interviews were tested using convergent triangulation and qualitative analysis of the interviews and questionnaires were conducted via holistic triangulation. It is possible to understand by using metrics (holistic triangulation) how an LTS advantage is measured and recognised.

### 2.2.8    The phenomenological approach to research

The phenomenological approach to research is a methodology that aims at interpretative phenomenological analysis (IPA). According to this methodology, respondents in a study can make sense of their personal and social world and IPA allows the researcher to conduct dynamic research. IPA also emphasizes that the research exercise is a dynamic process with an active role for the researcher in that process. Thus, a two-stage interpretation process, or a double hermeneutic, is involved. The participants attempt to make sense of their world, while the researcher attempts to make sense of the participants attempting to

make sense of their world (Smith, 2008; Hopkins, Regehr and Pratt, 2016; Eatough and Smith, 2017; Sohn, Thomas, Greenberg and Pollio, 2017).

## 2.3    METHODS USED IN THIS RESEARCH

### 2.3.1    Research overview

As only a single MNE was researched, this research study is defined as a case study method which is qualitative in design but uses quantitative survey tools (Algozzine & Hancock, 2016; Elman et al., 2016). Both sets of researchers postulate on this phenomenon in their literature. It is necessary to investigate the purpose of the research, which was to determine which metrics contribute to the LTS of an MNE. This was achieved by conducting research using questionnaires which where quantitative in nature, to determine the perception of the respondents using a series of responses including statistical analysis using quantitative techniques, the use of other observational sources on the MNE, which together were analysed to determine individual opinions (case study theory), and in this particular instance was based on the effects experienced by one MNE.

One of the key qualitative methods used is observation within the MNE and gathering of qualitative data on the MNE. This is where the case study methods came to into full effect, as the data from questionnaires (quantitative), observations (qualitative) and other qualitative sources serve as the main elements of data gathering.

Previously, triangulation methods were discussed. The rationale behind triangulation is the corroboration and collaboration of the data collected in a study. The combination of various research elements requires further detailed discussion of the processes used to reach the objectives of this study. The process, which was followed in conducting this research, was based on the thinking that by linking the processes for convergent and holistic triangulation, the theoretical argument garnered from the literature review could be tested using regression analyses of the survey data.

Next, interviews and questionnaires were constructed based on the literature research undertaken. The use of the theoretical findings combined with the tacit knowledge that already existed within the MNE, were combined with the researcher's empirical understandings. This was done firstly to seek corroborating evidence for the questionnaire that was distributed to the respondents and secondly to explore the related question of how LTS is continuous. The flow chart in Figure 2.3 shows the method and flow of the research conducted as well as how the data was created, collected and analysed.

**Figure 2.3: Flow diagram of research process followed**



| Literature review | Devise metrics | Questionnaires designed |
|---|---|---|
| To determine the metrics which contribute to the long-term survival of the MNE | System of metrics based on these determinants | Using information and outcomes from literature review |

| Determine population | Pilot group survey | Questionnaires distributed |
|---|---|---|
| Research method of determining setup of groups of respondents | To ensure that questionnaires were understood and the language was clear | Send via email to different groups of respondents through 3rd party to administer |

| Field enquries | Questionnaires returned | Data collected |
|---|---|---|
| Answer any questions and explain anything which is not clear to respondents | Wait for questionnaires to be completed and returned to 3rd party | Data collected and entered into Microsoft Excel spreadsheets for further analysis |

| Observation of Data | Data design | Data analysis |
|---|---|---|
| observation of data and sources within the MNE as a form of qualitative data gathering | Application of statistics using Microsoft Excel statistics and graphs as a calculation tool | Determine important metrics for each individual group of respondents based on statistics from data |

| Research conclusion | Suggest methods of metric measurement | Research complete |
|---|---|---|
| From data analysis determine the respondents view on LTS of the MNE | | |

Source: Researcher's own construction

Overall, the theoretical explanation of how knowledge sharing leads to the creation of LTS could require support by research and the conducting of a pilot study. The results from a pilot study form the content and format of the interviews (convergent triangulation) and the quantitative and qualitative analysis of the interviews and questionnaires may be refined and developed before being distributed to the entire population of respondents.

The targeted respondents were selected mainly based on the role they play within the MNE subsidiaries, at the time of the study. Based on their collective responsibilities in the MNE structure and strategy, with the underlying assumption that their positions were both strategic and operational, their contributions to both long and short-term sustainability were the motivating factors in their inclusion in the respondent group.

In conclusion, it is recognised that both quantitative and qualitative research are important and useful. The goal of a mixed methods research approach is not to replace either of these approaches, but rather to draw from the strengths and minimize the weaknesses of both. This allows the researcher to develop techniques that are closer to what other researchers use in practice. It is therefore from this reasoning that the study conducted employs a mixed methods approach.

## 2.3.2    The research paradigm

The research paradigm lends itself to the mixed methods research methodology. This study employed both quantitative and qualitative methods. Questionnaires were submitted to targeted executives and operational managers within specialist areas of the selected MNE, with subsidiaries in 13 different countries. The completed questionnaires were analysed, and the results were compared to existing theories. It was anticipated that this would assist in determining how performance metrics could be improved in current practice.

Further to this, employing a transformative mixed methods approach lends itself to the use of a theoretical lens as an overarching perspective of the design. Within

this design method, the elements lend themselves to the development of a framework for the topics of interest pertaining to this specific study (Vinet & Zhedanov, 2011).

This study was based primarily on a reflective practitioner approach as it contained most of the elements common to this type of research. According to Forrest (2008), reflective practice is increasingly recognized as an essential skill for practitioners who are required to analyse and evaluate personal and service performance. Larrivee (2000) asserts that critical reflection is the distinguishing attribute of reflective practitioners. The term critical reflection, as developed here, merges critical inquiry and the conscious consideration of the ethical implications and consequences of business practice with self-reflection, deep examination of personal beliefs and assumptions about human potential and learning.

Reynolds and Vince (2014) suggest that in the context of reflection, action and problem solving, it is no surprise that experiential learning theory, including the concept of reflection, has been so influential in the context of the workplace. The reasoning is that reflection provides the platform from which theory and practice in self-directed learning, action learning, problem-based learning and organisational learning have been developed. Approaching business analysis as a reflective practitioner, therefore involves infusing personal beliefs and values into a professional identity, thereby resulting in developing a deliberate code of conduct (Larrivee, 2000).

The use of a mixed methods approach for this study was further corroborated and motivated in the sub-foci for the use of both open-ended type questions and multiple forms of data (theory, seminarian, statistical and text-based) as well as observation. This means that triangulation of data sources is required to obtain convergence across qualitative and quantitative methods (Vinet & Zhedanov, 2011).

The study was undertaken in co-operation with the executive management of the MNE and it was, therefore, a reasonable assumption to expect a high response rate to the questionnaires. This is confirmed in Table 2.3, which represents the

response of the respondents in the specific categories. Table 2.2 below provides a summary of the research design elements of this study.

**Table 2.2: Summary of research design elements**

| Research design and methodology | Triangulation achieved by means of employing both qualitative and quantitative methods. |
|---|---|
| Quantitative methods | Questionnaire, as described in Sections 7 and 8.<br>Quantitative data will be analysed with comparative evaluations. |
| Qualitative methods | The study focuses on one business only and employs the case study method of qualitative research.<br>Unstructured interviews with selected employees who have access to key data.<br>Observation and analysis of organisation documents, structures, plans and systems. |
| Research strategy and approach | To contextualize one MNE but provide more global inferences on MNE performance measurement. |
| Improving validity of the research | Triangulation (multiple methods). |
| Improving reliability of data collected | Complementing quantitative surveys with unstructured interviews and analysis of qualitative data sources. |

Source: Researcher's own construction

### 2.3.3    Delimitations/limitations of the study

According to Collis et al. (2009), a limitation identifies potential weaknesses in the research, whilst delimitation determines the scope of the study. This study was focused on a single MNE, Preformed Line Products, a manufacturer of telecommunications products, transmission and distribution hardware, substation fittings and related products.

The selected organisation is a medium-sized MNE in the manufacturing sector of the economy and has 13 subsidiaries dispersed across seven continents. The head office is in Cleveland, Ohio and there are three manufacturing facilities in the United States of America giving a total of 16 factories and a headquarters. As only one MNE was researched, this research was case study based and therefore

it is acknowledged as qualitative and the use of a questionnaire, defined as a survey tool, is quantitative in nature.

The researcher was possibly subjected to bias as perception arising from self-experience may have resulted in certain decisions being based on his experience. With an epistemological approach, this is particularly valid in instances where qualitative methods are applied, and definitive conclusions made.

In this particular research there were some parallels to a research study by McSkimming (2015) on virtual volunteering. In that study it was outlined that the respondents did not believe that they could contribute to the LTS of the MNE, but rather that their job function was focused on a short-term strategy (one to two-year horizon). This was mainly due to the majority of respondents being selected from a range of management disciplines e.g. Operations, Finance, HR etc. and they were by no means experts in the field of LTS. Furthermore, there may have been a strong possibility that this group did not have the ability to determine which choices were meaningful to LTS but were more versed in and biased towards short term goals and the smooth running of operations short-term. Most of those respondents seemed not to be concerned about the 10-year horizon that is the focal point of this research. Exceptions to this would theoretically be the VP's and to some extent, MD's of the subsidiaries.

The next section outlines the data methods that were applied to the context of a sustainability model, as depicted in Figure 1.1. and shown again below as Figure 2.4

As mentioned in section 2.3.1, the process followed is shown in Figure 2.3. The theoretical argument was tested with regression analysis by data triangulation, specifically from a convergent and holistic perspective. This included interviews carried out with a small pilot sample of employees of the MNE to seek corroborating evidence for the survey-based findings and in addition to explore the related question of how LTS could be easily understood by employees of the

MNE. Overall, the theoretical explanation for how knowledge sharing leads to the creation of LTS was supported by the survey results.

**Figure 2.4: Context of sustainability**
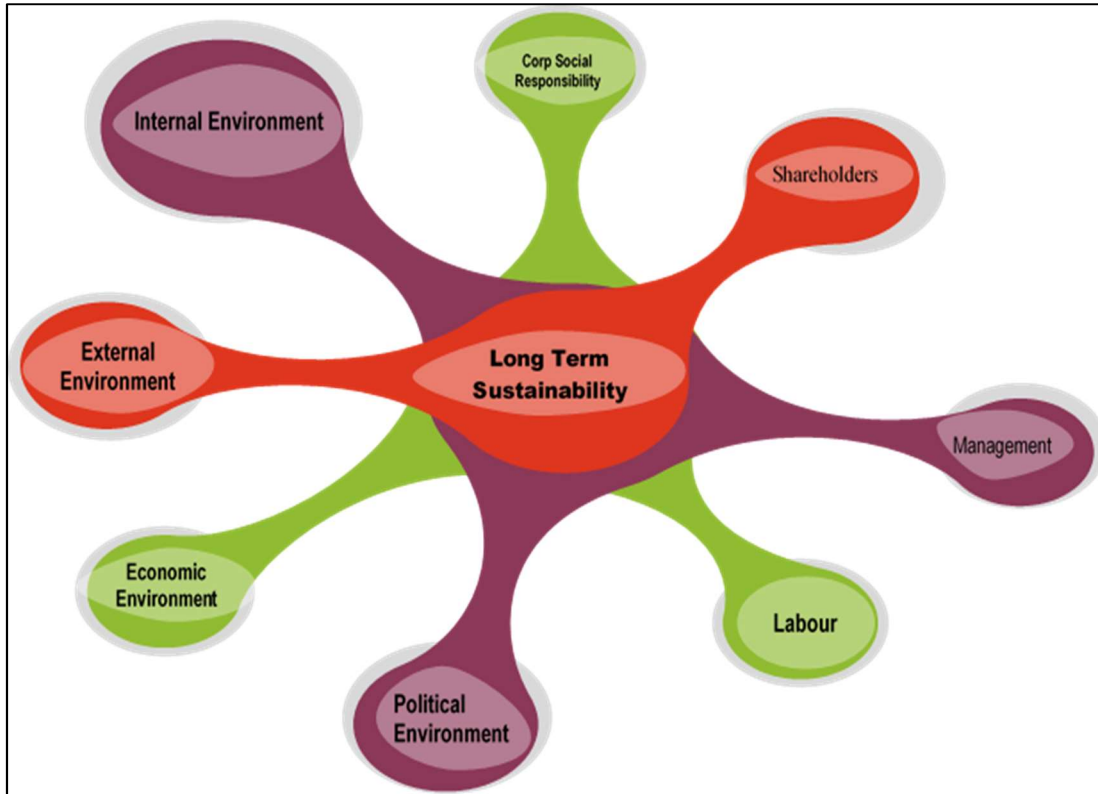


Source: Researcher's own construction

The interviews (convergent triangulation), the qualitative analysis of the interviews and the questionnaires were developed after this by the researcher. These were drafted in such a way that the questionnaires assisted in the understanding and development of LTS. Of further importance was how it can create advantage with emphasis on sustainability (holistic triangulation).

From the perspective of theory attributes and through the combination of methods, the study supported the accuracy of predictions derived from the theory (i.e. support for internal validity from the surveys and interviews). However, the study provided very little evidence supporting the generality of the theories underlying the questionnaires. Therefore, it may be perceived that for the respondent to answer the question posed, they should be provided with theory

through formal education and specialised, focused development training of the rationale that the researcher investigated. Unfortunately, this was not possible and probably could have created a bias towards a common agreement on the theory. This had the potential to place immediate doubt on the current state where the respondents answered using their own framework of understanding as opposed to that of the researcher, and this at least removed any possibility of collective thinking. Second to this, it would be impractical and prohibitively expensive to bring such a diverse group together and embark on a training exercise as there would not only be challenges in getting such a group together and communicating with them, but a considerable investment in senior management time would also be required for this exercise, with no guarantee of success.

## 2.3.4    Data collection methods

The study employed both primary and secondary sources of data. The literature review, considered as the collection of secondary data, allowed for the identification of any gaps that would require further consideration. The literature review however, shall always remain incomplete. This is inevitable with any research, being that we live in an ever-changing world with new technology allowing for rapid dissemination of all types of media and communication. There will always be new sources of literature that will be relevant to this and other research as it evolves, and current information will only be able to influence this research before it is submitted for appraisal.

The questionnaires were based on the findings collected from the literature gathered at that current point in time. Therefore, when the questionnaires were distributed to the respondents for their comment and completion, new and future ground-breaking discoveries could not be encompassed or accounted for.

Main sources of secondary data included, but were not limited to, financial business theory based on GAAP; and organisation reports and audited financial statements available on the organisation's website. In addition, web-based

research was conducted, using the Nelson Mandela University library resources and all other electronic communication means that were available during the course of the research study.

The main source of the primary data was derived from the literature review and formulated into a sequence of questionnaires that were developed and distributed to the targeted sample of respondents as listed below in Table 2.3. As mentioned previously in chapter two, the respondents also had some limitation in the context of the research carried out and the findings.

**Table 2.3: Summary of primary data collected**

| Subject matter | Respondents | Collection period |
|---|---|---|
| **Financial elements** | 29 | 60 Days |
| **Sales and marketing** | 30 | 60 Days |
| **Operations** | 34 | 60 Days |
| **Human Resource Management** | 35 | 60 Days |
| **Research and development** | 32 | 60 Days |
| | 155 | 60 Days (staggered) |

Source: Researcher's own construction

### 2.3.5   Primary data collection tables

Primary data collection was based on information summarised in the following tables. Data was collected in a transparent, planned and traceable manner. The sample size remained unchanged, as displayed below.

**Table 2.4: Data collection financial elements**

| Country | VPF | VPI | OCFM | OFP | SMD | SFM | Respondents | Collection Period |
|---------|-----|-----|------|-----|-----|-----|-------------|-------------------|
| **Corp HQ** | X | X | X | ? | | | 3 | 60 Days |
| **Plant NM** | | | X | ? | X | X | 2 | 60 Days |
| **Spain** | | | | ? | X | X | 2 | 60 Days |
| **Poland** | | | | ? | X | X | 2 | 60 Days |
| **G Britain** | | | | ? | X | X | 2 | 60 Days |
| **S Africa** | | | | ? | | X | 1 | 60 Days |
| **Australia** | | | | ? | X | X | 2 | 60 Days |
| **N Zealand** | | | | ? | X | X | 2 | 60 Days |
| **Thailand** | | | | ? | X | X | 2 | 60 Days |
| **Indonesia** | | | | ? | X | X | 2 | 60 Days |
| **China** | | | | ? | | X | 1 | 60 Days |
| **Malaysia** | | | | ? | X | X | 2 | 60 Days |
| **Mexico** | | | | ? | X | X | 2 | 60 Days |
| **Brazil** | | | | ? | X | X | 2 | 60 Days |
| **Canada** | | | | ? | X | X | 2 | 60 Days |
| **Count** | 1 | 1 | 2 | | 12 | 13 | 29 | 60 Days |

| Key | |
|-----|-----|
| **VPF** | Vice-President Finance |
| **VPI** | Vice-President International |
| **OCFM** | Other Corporate FM |
| **OFP** | Other Financial Practitioners |
| **SMD** | Subsidiary MDs |
| **SFM** | Subsidiary FM |

Source: Researcher's own construction

According to the sampling plan, the sample of respondents consisted of the financial experts within the corporation. These respondents were chosen for their expertise in the field, as they were responsible for the financial reporting at the time of the study. The group size was purely co-incidental and was based on the structure of the organisation and the subsidiaries as they were structured at the time of the study. It was originally envisaged that all respondents would complete the required questionnaires. However, there was never any guarantee that this would transpire, and this is evident in the data collection depicted in Table 2.4. The response and data are further analysed in a subsequent section of the research.

**Table 2.5: Data collection sales and marketing**

| Country | VPSM | VPI | CSPM | SMD | SSMM | Respondents | Collection Period |
|---------|------|-----|------|-----|------|-------------|-------------------|
| Corp HQ | X | X | X | | | 3 | 60 Days |
| Plant NC | | | | | | 0 | 60 Days |
| Plant AK | | | | | | 0 | 60 Days |
| Plant NM | | | | X | X | 2 | 60 Days |
| Spain | | | | X | X | 2 | 60 Days |
| Poland | | | | X | X | 2 | 60 Days |
| G Britain | | | | X | X | 2 | 60 Days |
| S Africa | | | | | X | 2 | 60 Days |
| Australia | | | | X | X | 2 | 60 Days |
| N Zealand | | | | X | X | 2 | 60 Days |
| Thailand | | | | X | X | 2 | 60 Days |
| Indonesia | | | | X | X | 2 | 60 Days |
| China | | | | X | X | 2 | 60 Days |
| Malaysia | | | | X | X | 2 | 60 Days |
| Mexico | | | | X | X | 2 | 60 Days |
| Brazil | | | | X | X | 2 | 60 Days |
| Canada | | | | X | X | 2 | 60 Days |
| Count | 1 | 1 | 1 | 13 | 14 | 30 | 60 Days |

| Key | |
|-----|---|
| VPSM | Vice-President Sales and Marketing |
| VPI | Vice-President International |
| CSPM | Corporate and Subsidiary Product Managers |
| SMD | Subsidiary MDs |
| SSMM | Subsidiary SMMs |

Source: Researcher's own construction

According to the sampling plan, this sample of respondents consisted of the SM experts within the corporation and they were chosen for their expertise in the field, as they were responsible for the SM functions within the local subsidiaries and corporate head office at the time of the study. The group size was based on the structure of the organisation and the subsidiaries as they were structured at the time of the study. It was originally envisaged that all respondents would complete the required questionnaires. However, there was never any guarantee that this would transpire, and this is evident in the data collection depicted in Table 2.5. The response and data are further analysed in a subsequent section of the research.

**Table 2.6: Data collection Operations Management**

| Country | VPM | VPI | OCOM | SMD | SOM | SCIM | Respondents | Collection Period |
|---|---|---|---|---|---|---|---|---|
| Corp HQ | X | X | | | | | 2 | 60 Days |
| Plant NC | | | X | | X | | 2 | 60 Days |
| Plant AK | | | X | | X | | 2 | 60 Days |
| Plant NM | | | X | | X | | 2 | 60 Days |
| Spain | | | | X | X | | 2 | 60 Days |
| Poland | | | | X | | X | 2 | 60 Days |
| G Britain | | | | X | X | | 2 | 60 Days |
| S Africa | | | | | X | | 1 | 60 Days |
| Australia | | | | X | X | | 2 | 60 Days |
| N Zealand | | | | X | X | | 2 | 60 Days |
| Thailand | | | | X | X | | 2 | 60 Days |
| Indonesia | | | | X | X | | 2 | 60 Days |
| China | | | | X | X | | 2 | 60 Days |
| Malaysia | | | | 1 | X | | 2 | 60 Days |
| Mexico | | | | X | X | | 2 | 60 Days |
| Brazil | | | | | X | | 1 | 60 Days |
| Argentina | | | | X | X | | 2 | 60 Days |
| Canada | | | | X | X | | 2 | 60 Days |
| Count | 1 | 1 | 3 | 12 | 16 | 1 | 34 | 60 Days |

| Key | |
|---|---|
| VPM | Vice-President Manufacturing |
| VPI | Vice-President International |
| SMD | Subsidiary MDs |
| SOM | Subsidiary OMs |
| SCIM | Subsidiary CIMs |

Source: Researcher's own construction

According to the sampling plan, this sample of respondents consisted of the operations experts within the corporation and subsidiaries. They were chosen for their expertise in the field, as they were responsible for operational issues at the time of the study. The group size was purely co-incidental and based on the structure of the organisation and the subsidiaries as they were structured when the study was conducted. It was originally envisaged that all respondents would complete the required questionnaires. However, there was never any guarantee

that this would transpire, and this is evident in the data collection represented in Table 2.6. The response and data are further analysed in a subsequent section of the research.

**Table 2.7: Data collection Human Resource Management**

| Country | VPHR | VPI | PHRM | SMD | SHRM | Respondents | Collection Period |
|---|---|---|---|---|---|---|---|
| **Corp HQ** | X | X | | | X | 3 | 60 Days |
| **Plant NC** | | | X | X | | 2 | 60 Days |
| **Plant AK** | | | X | X | | 2 | 60 Days |
| **Plant NM** | | | X | X | | 1 | 60 Days |
| **Spain** | | | | X | X | 2 | 60 Days |
| **Poland** | | | | X | X | 2 | 60 Days |
| **G Britain** | | | | X | X | 2 | 60 Days |
| **S Africa** | | | | | X | 1 | 60 Days |
| **Australia** | | | | X | X | 2 | 60 Days |
| **N Zealand** | | | | X | X | 2 | 60 Days |
| **Thailand** | | | | X | X | 2 | 60 Days |
| **Indonesia** | | | | X | X | 2 | 60 Days |
| **China** | | | | X | X | 2 | 60 Days |
| **Malaysia** | | | | X | X | 2 | 60 Days |
| **Mexico** | | | | X | X | 2 | 60 Days |
| **Brazil** | | | | X | X | 2 | 60 Days |
| **Canada** | | | | X | X | 2 | 60 Days |
| **Argentina** | | | | X | | 1 | |
| **Count** | 1 | 1 | 3 | 16 | 14 | 35 | 60 Days |

| Key | |
|---|---|
| **VPHR** | Vice-President HR |
| **VPI** | Vice-President International |
| **PHRM** | Plant Human Resource Managers |
| **SMD** | Subsidiary MDs |
| **SHRM** | Subsidiary HRMs |

Source: Researcher's own construction

According to the sampling plan, this sample of respondents consisted of the HR practitioners within the corporation and local subsidiaries. They were chosen for their expertise in the field, as they were responsible for HR issues during the study. The group size was purely co-incidental and based on the structure of the organisation and the subsidiaries as they were structured at the time of the study.

It was originally envisaged that all respondents would complete the required questionnaires. However, there was never any guarantee that this would transpire, this is evident in the data collection shown in Table 2.7. The response and data are further analysed in the research.

Table 2.8: Data collection research and development

| Country | VPE | VPI | PEM | SMD | SEM | OE | Respondents | Collection Period |
|---------|-----|-----|-----|-----|-----|-----|-------------|-------------------|
| Corp HQ | X | X | | | | X | 3 | 60 Days |
| Plant NC | | | | | | X | 1 | 60 Days |
| Plant AK | | | | | | X | 1 | 60 Days |
| Plant NM | | | X | | | X | 1 | 60 Days |
| Spain | | | | X | X | | 2 | 60 Days |
| Poland | | | | X | X | | 2 | 60 Days |
| G Britain | | | | X | X | | 2 | 60 Days |
| S Africa | | | | | X | | 1 | 60 Days |
| Australia | | | | X | X | | 2 | 60 Days |
| N Zealand | | | | X | X | | 2 | 60 Days |
| Thailand | | | | X | X | | 2 | 60 Days |
| Indonesia | | | | X | X | | 2 | 60 Days |
| China | | | | X | X | | 2 | 60 Days |
| Malaysia | | | | X | X | | 2 | 60 Days |
| Mexico | | | | X | X | | 2 | 60 Days |
| Brazil | | | | X | X | | 2 | 60 Days |
| Canada | | | | X | X | | 2 | 60 Days |
| Count | 1 | 1 | 1 | 12 | 13 | 4 | 32 | 60 Days |

| Key | |
|-----|-----|
| VPE | Vice-President Engineering |
| VPI | Vice-President International |
| PEM | Plant Engineering Managers |
| SMD | Subsidiary MDs |
| SEM | Subsidiary Engineering Managers |
| OE | Other Experts |

Source: Researcher's own construction

According to the sampling plan, this sample of respondents consisted of the engineering experts within the corporation and local subsidiaries. They were chosen for their expertise in the field, as they were responsible for engineering

activities at the time of the study. The group size was purely co-incidental and based on the structure of the organisation and the subsidiaries as they were structured during the study. It was originally envisaged that all respondents would complete the required questionnaires. However, there was never any guarantee that this would transpire, and this is evident in the data collection reported in Table 2.8. The response and data are further analysed in a subsequent section of the research.

## 2.3.6    Ethical considerations

In addition to conceptualising the writing process for a proposal, researchers need to anticipate the ethical issues that may arise during research studies. Research involves collecting data from people about people. Writing about these issues is not only an important topic in the format of a proposal, but it is also required for developing an appropriate argument (Vinet & Zhedanov, 2011).

The notion that ethics is important to the natural sciences, such as medicine, is a natural one. However, it is equally difficult to avoid ethical arguments and issues in social sciences (Collis et al., 2009).

While it was not anticipated that too many confidentiality issues would be encountered during this research, it was possible that some ethical dilemmas would occur. These deliberations were considered during the data collection phase of the study. When a decision was required regarding the level of confidentiality and/or anonymity, it was duly taken. Therefore, the researcher, using personal judgement, did not believe that any ethical dilemmas became apparent during the research process. As an additional precaution, ethics approval was also applied through the appropriate committees of the Nelson Mandela University. The ethics approval received for the study satisfied all requirements for the research.

## 2.4 CONCLUSION TO CHAPTER TWO

In chapter two, the research carried out encompassed the collection of data from multiple sources within an MNE. The study employed a mixed methods approach and the data collected was aimed at creating a set of metrics, which can be universally applied to determine the organisation's LTS. This study was limited to one MNE and was therefore a case study. This enabled a level of flexibility not readily offered by other qualitative approaches such as grounded theory or phenomenology.

Case studies are designed to suit the case and the research question. Published case studies demonstrate a wide diversity in the research design of a study. There are two popular case study approaches in qualitative research. The first approach is the social constructivist paradigm and the second approach adopts a post-positivist viewpoint of the case study. Social constructivism according to Kim (2011) emphasizes how understandings grow out of social encounters. Case studies are usually considered a qualitative method. However, some aspects of case study research, notably the selection of cases, may be viewed through a quantitative template. It is valuable for researchers to contemplate the ways in which case study research might be conceived and improved, by applying lessons from large-N cross-case research. The metrics therefore may or may not be compatible to other organisations. However, there are many internal benefits and advantages to using the metrics.

Dynamics have an important role to play, as well as rapid advancements and changes in technology. A delimitation in the current information technology investments may fundamentally alter the set of business level strategic alternatives and value creation opportunities an MNE may encounter (Drnevich & Croson, 2013).

# CHAPTER THREE

# INTRODUCTION TO A LONG-TERM SUSTAINABILITY MODEL FOR AN MNE

## 3.1    INTRODUCTION

The LTS Model in Figure 3.1 below is a diagrammatical representation of the concept and elements that were researched. It represents the collective elements deemed as the areas of greatest importance to LTS within the MNE. This model forms the primary foundation of the research that was undertaken and is the nucleus of the answer to the research question. The basis of the thesis is derived from answering the question of which metrics are most relevant to LTS of the MNE and the focus is based on the outcome derived from the LTS Model below.

**Figure 3.1: LTS Model**



Source: Researcher's own construction

Figure 3.1 represents the prime elements that form the basis of the research undertaking. This model directs the flow and creates boundaries for the research. Furthermore, the model was constructed to create a focused approach to specific areas that the research undertook to analyse. It must continuously be kept in mind that the LTS Model is dynamic in nature and that all of the elements are interlinked.

All of these elements contributed to the identification of those metrics required for LTS. Furthermore, the degree to which these elements impacted on the findings of the research was investigated. It must be noted that the literature research, in addition to data available from other primary and secondary sources, directed the researcher to the elements represented. It stands to reason that certain elements, in the context of this study, may not yet have been discovered. It is, therefore, not conclusive that the study was only limited to the defined sub-foci areas and that there are additional metrics that need consideration. This was derived from the outcome of the questionnaires.

Table 3.1 provides a summary of the sub-elements of the research that was undertaken, as well as the areas that were proposed for deliberation during research. The research and analysis stages of the study uncovered or highlighted additional areas that were considered in the formulation of the questionnaires.

**Table 3.1: Summary of model**

| Financial | Sales and Marketing |
|---|---|
| • Financial health report | • Sales forecasting metrics |
| • (short-term) | • (short-term) |
| • (long-term) | • (long-term) |
| • Not yet researched or used | • Not yet researched or used |
| • The budget process | • Customer relations |
| | • (short-term) |
| | • (long-term) |
| | • Not yet researched or used |

| Operations | Human resources |
|---|---|
| • Manufacturing metrics | • Human Resource Management metrics |
| • (short-term) | • (short-term) |
| • (long-term) | • (long-term) |
| • Not yet researched or used | • Not yet researched or used |
| • Continuous Improvement (CI), Lean Manufacturing (LM) metrics | • Organisational structure metrics |
| • (short-term) | • (short-term) |
| • (long-term) | • (long-term) |
| • Not yet researched or used | • Not yet researched or used |
| • Strategic purchasing | |
| • (short-term) | |
| • (long-term) | |
| • Not yet researched or used | |
| **Research and development** | |
| • New product development metrics | |
| • (short term) | |
| • (long-term) | |
| • Not yet researched or used | |

Source: Researcher's own construction

## 3.2 FINANCIAL ELEMENTS OF THE RESEARCH

The framework summarised in Table 3.1 represents the approach followed in the research. In the section below, the outline of the approach that was followed when the financial elements were addressed is explained. The analysis was undertaken to determine how the financial theory would be formulated into a questionnaire that aligned to the MNE's current practices in a clear, concise and understandable format. Figure 3.2 shows the elements that were investigated in this research.

**Figure 3.2: Analysis of the financial elements of the research**

Reflective use of historical data **+** Forecasting future **+** Capital expenditure planning **+** Conventional measures, GAAP **+** Literature review **=** Financial scorecard / performance Metrics
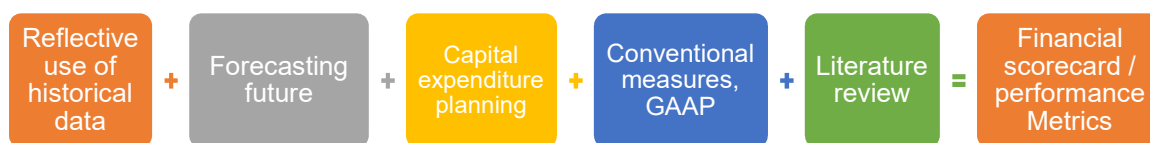
Source: Researcher's own construction

**Table 3.2: Exploring financial elements**

| | |
|---|---|
| **What did I need to know?** | • What current reports are used?<br>• What type of analysis is done?<br>• Is there a standard that is used throughout the organisation?<br>• How does this compare to modern theory in the public domain?<br>• What regulations govern the reporting methods; how do I determine if a subsidiary is performing well or not?<br>• What are the Generally Accepted Accounting Principles (GAAP) procedures and corporate governance rules in all countries where subsidiaries operate? What are the most important metrics used for interpretation in the best performing subsidiaries? |
| **What did I need to show?** | • Details of current methods used, and standards applied; actions based on the results received; measures in place to assist in predicting the LTS of the subsidiary.<br>• What timing is used to make decisions on any major changes and interventions that need to be implemented; what are the most common metrics used and which of these are important to the most successful subsidiaries?<br>• Subsidiaries and corporate head office questionnaire results; literature pertaining to current practices. |
| **Origin of data** | Corporate Vice-Presidents (VP), VP Finance, subsidiary Managing Directors (MD), Financial Managers (FM); existing financial and organisation reports, databases, journals, case study literature. |
| **Data collection methods** | Existing public domain information (NYSE listed organisation); focused questionnaires; interviews with responsible persons; survey interpretation; literature reviews; presentations made at exhibitions and conferences. |

### 3.2.1   Overview of a financial health report

All organisations generate a set of metrics determined by a set of accounting principles, usually based on GAAP. These measurements allow for an analysis of the performance of the organisation to determine if the business is a financially viable concern. In conventional business, it is common practice to forecast a detailed budget for at least the forthcoming year and in most cases, for the following five years. These budgets, which are usually based on historical data, always serve purely as guidance for subsequent years. The metrics used include some of those major metrics that contribute to determining the long-term profitability of the organisation.

Kihn (2007: 13) suggests that an emphasis on financial controls generally improves short-term profitability in business units. However, organisations that focus on a combination of both financial and non-financial controls achieve better results. The implication for this study was, therefore, that neither should be ignored. It is also noteworthy that some financial controls, such as capital investment plans and long-term budgets, have a direct impact on the LTS and indicate strategic intent. Moreover, these would be considered as performance metrics.

### 3.3   SALES AND MARKETING ELEMENTS OF THE RESEARCH

The framework in Table 3.1 of the research and as shown in Figure 3.3 represents the method followed in determining the sales and marketing elements that were considered. The basic outline of the approach taken to address the sales and marketing elements is discussed in the subsequent section. An analysis was undertaken to determine how the sales and marketing theory formulated into a questionnaire aligning with the MNE current practices in a clear, concise and understandable format. The sales and marketing elements included the Sales Forecasting Model, as well as customer satisfaction and value.

**Figure 3.3: Sales and Marketing Model**

| Literature review and theory | + | Sales Forcasting effect on value chain | + | Customer satisfaction and value | + | Supplier relationships | + | Internal customer relationships | + | Staff relationships | = | Sales and marketing elements |
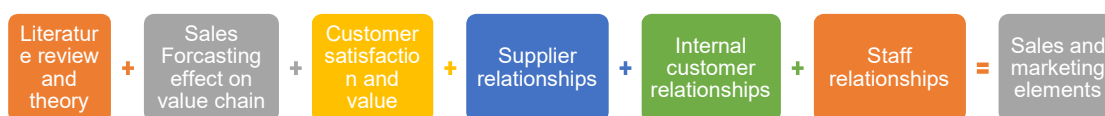
Source: Researcher's own construction

**Table 3.3: Exploring sales and marketing elements**

| | |
|---|---|
| **What did I need to know?** | • What current reports are used? <br> • What type of analysis is done? <br> • Is there a standard that is used throughout the organisation? <br> • How does this compare to modern theory in the public domain? <br> • What regulations govern the reporting methods; how do I determine if a subsidiary is performing well or not? <br> • How is sales forecasting achieved in the respective subsidiaries; how does this relate to existing theories; are there any gaps and how can these be exploited? <br> • How customer satisfaction is measured; is this viewed as contributing to LTS; how are new customers solicited and looked after; is a customer retention strategy in place and how is this measured? |
| **What do I need to show?** | • What are the most important metrics used for interpretation in the best-performing subsidiaries? <br> • What are the most common metrics used and which of these are important to the most successful subsidiaries? <br> • Details of current methods used; what standards are applied; actions based on the results received; what measures are in place to assist in predicting the LTS of the subsidiary; what timing is used to make decisions on any major changes and interventions that need to be implemented? <br> • Subsidiaries and corporate head office questionnaire results; literature pertaining to current practices. |
| **Origin of data** | Corporate Vice-Presidents, subsidiary MDs, sales managers; existing financial reports and organisation reports; databases, journals and case study literature. |
| **Data collection method** | Existing public domain information (NYSE listed organisation); focused questionnaires and interviews with responsible persons; survey interpretation; literature reviews; presentations made at exhibitions and conferences. |

### 3.3.1　Sales Forecasting Model

Bonney (2009: 12–16) suggests that the evaluation of employee attitudes towards the three main factors in the implementation of a sales forecasting model must be considered. These main factors are: financial considerations; value chain analysis; and customers, suppliers and staff relationships.

According to Mentzer (2006: 42–47), sales forecasting management emphasises that a sales forecast is a projection of expected future demand, given a stated set of environmental conditions. It is imperative that this is distinguished from an operational plan, as there is a distinct difference between sales forecasting and sales targets. An organisation should never confuse forecasting with motivational strategy. Figure 3.4 illustrates the analysis areas researched.

**Figure 3.4: Sales forecasting and the effect on the value chain**



Source: Researcher's own construction

A study into the effect of customers' and suppliers' perceptions of the market orientation of manufacturing organisations contains three key findings (Langerak, 2001: 35–63). These will be further explored in chapter five and relates to Figure 3.5.

**Figure 3.5: Customer satisfaction and value**



Source: Researcher's own construction

## 3.4     OPERATIONS ELEMENTS OF THE RESEARCH

The operations elements comprised various aspects that will be discussed in this section. The framework in this section of the research and as shown in Figure 3.6 represents the method followed in determining the operations elements that were considered.

Below is the outline of the approach that was used to address the operations elements, with the analysis that was undertaken. The outcome determined how the findings from the operations theory were formulated in a clear, concise and understandable format into a questionnaire that aligns with the MNE's current practices. The operations elements included the Sales Forecasting Model, as well as customer satisfaction and value.

**Figure 3.6: Operational elements of the research**
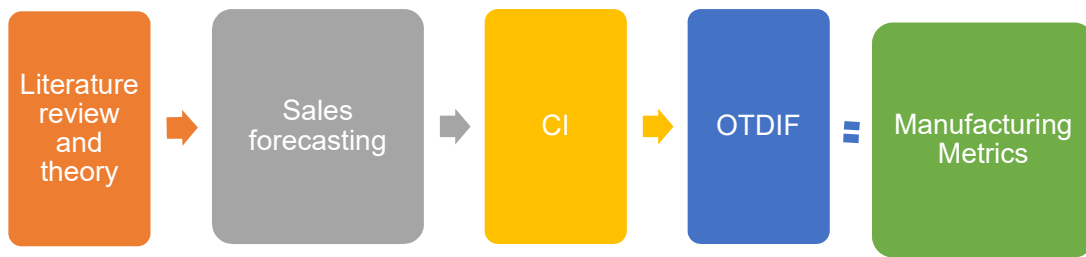


Source: Researcher's own construction

**Table 3.4: Exploring operations elements**

| What did I need to know? | • Methods currently used to determine production efficiency and variances at all manufacturing plants. |
|---|---|
| | • Current LM and CI methods used to improve processes; which methods prove most successful; who has been the main driver of these initiatives? |
| | • Availability of current literature on modern manufacturing metrics; which of these metrics is being used successfully; what gaps exist, and can these be adapted to contribute to improvements in the organisation? |
| | • What can improve the current situation; what will contribute to long-term sustainable growth? |
| | • Current procurement methods; which measurements used |

| | |
|---|---|
| | currently, are effective; how does the practice compare to current literature and methods employed? |
| **What do I need to show?** | • Manufacturing facility methods used; which metrics are used by the most successful facilities; how are variances currently measured; what is best practice? <br><br> • Details of current purchasing procedures and practices; most successful methods; how do these compare to current external practices and literature; which methods best suit the entire MNE; how will it contribute to long-term profitability and is it sustainable? <br><br> • LM and CI processes successfully employed in the organisation; outcomes in monetary terms or value of contribution to the organisation or subsidiary. |
| **Origin of data** | VP Manufacturing, factory production and operations managers (OM), purchasing managers or persons responsible for procurement, CI practitioners, corporate CI manager (CIM); databases, journals, case study, literature, conference and exhibition presentations. |
| **Data collection method** | Questionnaires and reports; interviews with responsible persons; survey interpretation; literature reviews; exhibition and conferences presentations. |

### 3.4.1   The manufacturing metrics

A focused approach is required when considering on time delivery (OTD) variance metrics and methods. OTD is considered to have a profound effect on improvements in e-production and consequently, methods for maintaining and improving efficiency and increasing competitiveness.

Bower (2006: 20–32) describes the advantages of sales and operational planning and names five potential value opportunities. Many quality improvement programmes target variance reduction. To this end, manufacturers use statistical tools to model their processes, identify opportunities to reduce variance and confirm the success of changes. Some examples of the metrics to consider are shown in Figure 3.7.

**Figure 3.7: The Manufacturing Metrics**
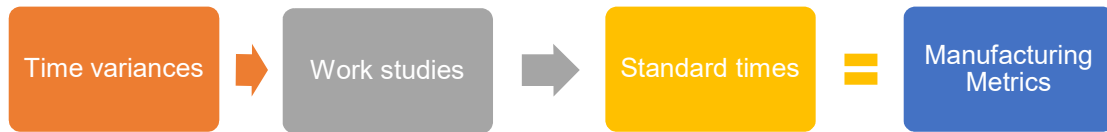


Source: Researcher's own construction

A common challenge with evaluating batch-manufacturing processes is that the key input variables often represent either a single process setup for the batch run or the general characteristics of the incoming material. As a result, an analysis of the output variation may be limited to the proportion of total variance related to mean shifts, either between batches or during runs (Majeske and Hammett, 2007). Products and batch size variation coupled with multiple manufacturing operations result in complex processing. This is due to the number of variables requiring consideration, which in turn requires complex analysis to determine efficiency and the ability to react to customers' demands.

### 3.4.2    CI and LM Metrics

Theories can be applied which assist with improvements in many areas of the business, including office efficiency. Figure 3.8 shows some of the elements requiring investigation when CI is undertaken. The afore-mentioned methodologies are well documented and widely used and have proven to be successful when properly implemented in organisations. However, tailoring is required, and a significant amount of management pragmatism is required to ensure it is suitable and sustainable when considering the LTS in the organisation where these methods are being implemented.

**Figure 3.8: Continuous Improvement**



Source: Researcher's own construction

### 3.4.3    Strategic purchasing

Leveraged purchasing is increasingly viewed as an important activity. The impact this can have on competitive advantage seems obvious and extends beyond pure savings-based programs.

Strategic purchasing, as shown in Figure 3.9: has evolved with organisational growth and improvements in technology have contributed to the ability of MNEs to extend their purchasing strategy beyond country borders. Improved communication between companies' subsidiaries has paved the way for collective bargaining techniques to leverage on supply chains, thereby extracting value and enhancing competitive advantage where possible.

**Figure 3.9: Strategic purchasing**



Source: Researcher's own construction

## 3.5 HR ELEMENTS OF THE RESEARCH

The HR element comprises various aspects that are discussed in this section. The framework of the research shown in Figure 3.10 represents the method followed in determining the HR elements that were considered. Below is the outline of the approach taken to address these elements, as well as the analysis undertaken to determine how the HRM theory was incorporated into the questionnaire that aligned with the MNE current practices in a clear, concise and understandable format. The HR elements include strategy, structure and HRM as an organisational strategy. A small amount of literature addressed the regulatory framework, but it is not comprehensive as the subject matter is extremely large, complex and country specific.

**Figure 3.10: HR elements of the research**



Source: Researcher's own construction

**Table 3.5: Exploring human resource elements**

| | |
|---|---|
| **What did I need to know?** | • What methods, currently in use, are effectively improving HR practices within the organisation; what regulatory issues have a direct impact on current practice and are these positive or negative and are they transferable?<br><br>• What is the current structure of the subsidiary; how does this compare to the other subsidiaries; which structure is used in the most successful subsidiaries and is it transferable; which structure is best positioned to manage demands; which current modern practices are discussed in literature?<br><br>• Do subsidiaries and headquarters have succession plans; what plans are in place to align HR practices with the organisation's strategy; how do current practices compare to current literature and practices; which current best practices are used in the most successful subsidiaries; can these be transferred to other subsidiaries? |
| **What do I need to show?** | • Details of current succession planning methods; current HR strategies; how does this compare to external current practices and literature; what are the most successful strategies and how can they be applied?<br><br>• Details of current organisational structures, what they entail; which structures are attributed to successful subsidiaries, how do these differ from worst-performing subsidiaries; do these compare to current modern structures, practices and literature; are modern theories transferable to the MNE? |
| **Origin of data** | Vice-President HR management (HRM), subsidiary MDs, HRM, persons responsible for HR Management; codes of good practice |

| | in subsidiary countries; databases, journals, case study and seminar literature, conference and exhibition presentations. |
|---|---|
| **Data collection method** | Questionnaires and reports; organisational charts; interviews with responsible persons; survey interpretation; literature reviews; exhibition and conference presentations, internet search of government departments within subsidiary countries. |

### 3.5.1　Human Resource Management Metrics

Human Resource Management Metrics comprise leveraging resources and capabilities in an appropriate manner so that they are congruent with the organisation's strategy. This is represented in Figure 3.11. As an organisational strategy, this contributes to improving employee morale, assisting with succession planning systems and providing guidance toward alignment of the long-term goals of the organisation.

The positive and significant link between knowledge stocks at individual (human capital), group (relational capital) and organisational (organisational capital) levels contribute to the creation of a long-term, sustainable competitive advantage (Lytras and de Pablos, 2008: 464–479).

**Figure 3.11: Human Resource Management**



Source: Researcher's own construction

### 3.5.2　Organisational structure metrics

Leveraging of the structure to align with the strategy to achieve a competitive advantage is investigated first to determine the structural configurations implemented by organisations and then classified to identify appropriate structures. Figure 3.12 represents the areas that are relevant to this research.

**Figure 3.12: Organisational structure**



Source: Researcher's own construction

## 3.6    INNOVATION ELEMENT OF THE RESEARCH

The various components comprising the innovation, research and development elements will be discussed next. The framework in section 3.6 of the research and shown in Figure 3.13: represents the method followed in determining the innovation and R&D elements that were considered. Below is the outline of the approach taken to address this element. Analysis was undertaken to determine how innovation and R&D theory could be formulated into a questionnaire aligning with the MNE current practices in a clear, concise and understandable format. The innovation and R&D elements include new product development as a strategy and the theory surrounding effective application, control of R&D methods promoting appropriate product development, as well as new product development selection criteria required for LTS.

**Figure 3.13: Innovation, R&D and New Product Development Cycle**



Source: Researcher's own construction

**Table 3.6: Exploring innovation**

| **What did I need to know?** | • What products are being developed and which methods are followed for design and development?<br>• How are successes (or failures) measured?<br>• Is there duplication of effort; is the technology appropriate? |
|---|---|

| | • How do practices compare to that of other subsidiaries? <br> • Does the portfolio align with current corporate long-term strategy? <br> • Is there room for improvement; which subsidiaries are the most or least successful? |
|---|---|
| **What do I need to show** | • Details of current development methods employed; how do these align to organisational goals? <br> • Which methods are the most or least successful? <br> • How can the successful strategies be transferred? <br> • What new technology is available inside and outside the organisation? |
| **Origin of data** | VP Engineering, subsidiary engineering managers, persons responsible for research and engineering in subsidiaries and corporate head office; databases, journals, case study, seminar literature and conference and exhibition presentations. |
| **Data collection method** | Questionnaires and reports submitted; interviews with responsible persons; survey interpretation; literature reviews; scanning of presentations made at exhibitions and conferences. |

### 3.6.1   New product development

The development of new products represented in Figure 3.14 has a profound and lasting impact, both from a strategic perspective, and by contributing significantly to the ability to achieve long-term success in the development of products promoting future growth (Cohen, Eliashberg and Ho, 1996: 173–186; Špaček and Vacík, 2016: Wowak and Craighead, 2013). The suggestion that employing metrics which "simultaneously capture time-to-market as well as product performance criteria" may be more advantageous is therefore of extreme relevance. This observation was motivated by Hewlett Packard's "BET / 2" metric which is directed towards reducing break-even time for new products by half. A key to implementing sustainable production is applying consistent and comprehensive metrics, thereby allowing every organisation to benchmark its process against that of its competition and the industry.

### 3.6.2    New product development metrics

There are several compelling reasons for introducing performance metrics in new product development. Metrics are required to satisfy the growing demand from consumers and institutional purchasers for easy-to-use tools to compare and select sustainable products. Companies need clear, consistent criteria to both respond to sustainable requirements from consumers, as well as to conform to increasingly restrictive international environmental regulations. Properly applied metrics provide a market advantage to companies that demonstrate they manufacture sustainable products. Metrics could also promote product design changes that serve to reduce resource depletion (Nasr, 2009: 24). The impact of global pressure on the conduct and performance output, such as the sales value of new products and indicators of process or product innovation of an MNE's subsidiaries are broader measures of interest for two reasons.

Firstly, frontier innovations need not be patented. Many studies acknowledge that not all innovations are patentable and that not all patentable innovations are chosen to be patented (patenting is just one of many forms of protecting intellectual property). The reasoning for this is sometimes based on the premise that a patented device can be optimised or remain effective and still be circumvented. This has been the researcher's own experience. Other reasons include that given the big productivity dispersion innovations represent movements towards the world frontier of knowledge for most organisations (where patented innovations are more likely to feature). Indeed, innovation is often described as the adoption of earlier frontier innovations and as such adoption and improvement of competing or similar products are also forms of innovation (Criscuolo et al., 2005: 1–46; Wowak and Craighead, 2013). Measures of innovation output should therefore, allow for insight into the broader set of all innovation activity, frontier or otherwise.

**Figure 3.14: New product development**
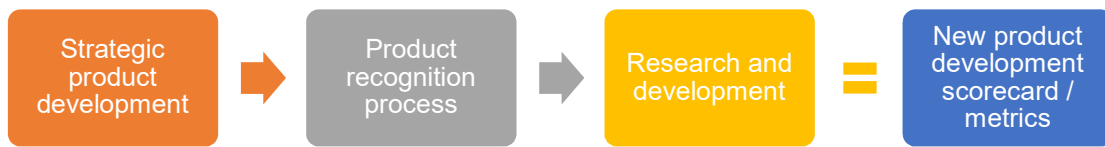
## 3.7    CONCLUSION TO CHAPTER THREE

Chapter three discussed the LTS Model, as depicted in Figure 3.1. This model of the LTS, proposed by the researcher, represents the prime elements of the case study of the single MNE investigated in this research study. Emphasis is placed on the individual elements of the LTS being interlinked and relevant to the MNE. Furthermore, when considering the model and its elements, it becomes essential that a more comprehensive review of current literature and theory needs to be established so that the impact on the outcome of this research can be better understood and explained.

The traditional financial elements considered as part of the research, emphasised that financial controls play a crucial and an important role in the short-term profitability of an organisation. It can further be reasoned that the short-term financial analysis combined with the long-term financial projections contribute to and provide a system of guidance to the LTS. It is important that the short-term benefits be built upon a solid platform on which long-term benefits can be erected. If there are no short-term plans, there are no guarantees that the organisation will survive in the long-term and that financial performance along with all the other elements discussed will assist the MNE in achieving its vision, mission, goals and objectives over a longer period.

# CHAPTER FOUR
# FINANCIAL ELEMENTS

## 4.1 INTRODUCTION

This chapter will examine finance theory currently used in industry, as well as new ideas that are presently being explored. These ideas are compared to existing practices within the MNE, allowing for the development of a system to identify potential areas of improvement, as well as the improvement of the status quo within the MNE. Figure 4.1 shows the LTS Model and the relationship to the LTS Model. Figure 4.1 also represents the dynamics of the model and that all of the elements are interlinked to create a synergy supporting LTS. In addition, Figure 4.1 highlights the interrelationship between the elements. In this section, emphasis is placed on finance and the role it plays in determining metrics capable of fulfilling the requirements in support of the LTS of the MNE in the context of the case study.

**Figure 4.1 The Financial Element**
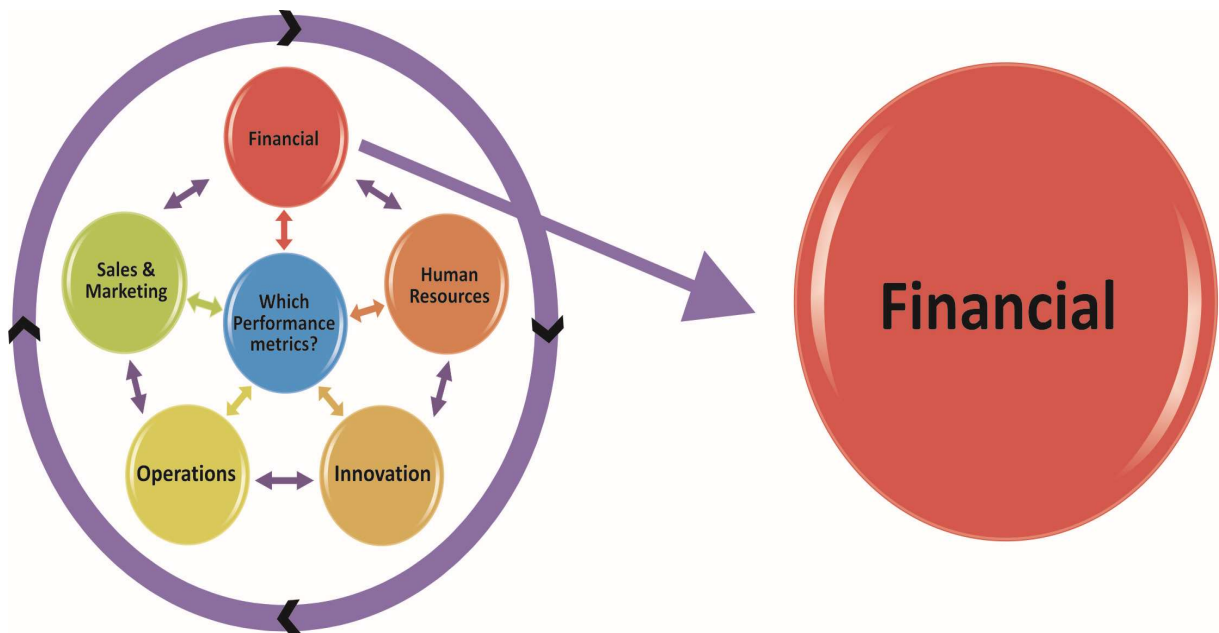


Source: Researcher's own construction

## 4.2    FINANCIAL ELEMENT - ANALYSIS OF THE FINANCIAL HEALTH REPORT

From previous work the author has researched, it was decided to examine the elements depicted in the diagram below. These are explored by comparing some of the theory based on these elements in the form of financial calculations.

**Figure 4.2: Financial elements**



Source: Researcher's own construction

According to Yap, Helmi, Munuswamy and Yap (2011), the use of ratio analysis is one of several categories of analytical procedures used by auditors, accountants and financial analysts. It is a useful tool for identifying areas in an organisation's financial statements where errors, misclassifications or potential fraudulent reporting of results and financial status may occur. Green (1978) states that financial ratios have long been regarded as indicators of corporate health, being used for reporting liquidity, leverage, activity and profitability and that an investor may use such ratios to evaluate an organisation's performance and its future likelihood of success.

Maina and Sakwa (2017) emphasise the importance of predicting financial distress, as it has severe effects on the operation of an organisation as the market value of the distressed organisation declines. Unfortunately, many managers focus on succeeding in the short run, but the use of an early warning system model is critically important to make a reliable measure of any organisation's financial health to reduce any risk. It is assumed that organisations within the same sector should not differ in financial position as they operate in the same economic environment. In practice, this is far from true and the financial health of an organisation is affected by management styles, capacity, government policies,

stock ratings, current legal affairs and many other factors. It is true that companies largely depend on the capability of their people and the decisions they make. Through comparison with other companies in the same industry, one can gauge whether one's results and financial position are above or below the industry average. Pedersen, Gwozdz and Hvass (2016) postulate that companies with innovative business models are more likely to simultaneously address business model innovation and corporate sustainability, as model innovation and corporate sustainability have their origins in the fundamental principles guiding the organisation.

According to Flynn (2001), ratio analysis is undoubtedly the most popular of all analytical techniques. However, it is essential that the strengths and limitations of this technique be explored before an attempt is made to apply and evaluate the output. Furthermore, the ratios reflect the relative magnitude of one number to another and that they may be denoted in different ways.

There exists a plethora of possible ratios, which include financial ratios and corporate governance indicators such as ownership and these should be combined (Liang, Lu, Tsai and Shih, 2016). Therefore, careful consideration must be given to the chosen ratios to demonstrate exactly what one is trying to evaluate.

The use of a financial health report, such as the one shown in Table 4.1, in this case will benefit the MNE's subsidiaries when analysing and comparing the results from year to year. The aim is to determine if there is evidence to suggest that common metrics exist, which may determine the long-term sustainability for an MNE. There is a distinction made between different ratios and what the benefits derived from these are when determining LTS. The most important metrics will be determined and investigated within the subsidiaries to evaluate the effectiveness of the subsidiaries based on the theory and practical application.

## 4.3    CONVENTIONAL MEASURES, FINANCIAL HEALTH REPORT

Investigating or analysing financial statement information, also known as quantitative analysis, is one of the most important elements in the fundamental

analysis process. Massive amounts of numbers in an organisation's financial statements can be bewildering and intimidating. However, through financial ratio analysis, one will be able to work with these numbers in an organized fashion.

Below in Table 4.1, the most commonly used calculations when determining the health of an organisation are exhibited. The elements will be explained in detail and the discussion on their merits will follow. Some additional information has been included to explain in detail, the merits of each type of calculation, while demonstrating the benefits and importance of the calculations. It must be noted that there are many metrics available with numerous combinations the user may want to explore, as the list is almost infinite. However, for this study, only those metrics which will contribute towards the long-term sustainability of an MNE, were analysed. This requires that the research remained practical and the analysis of the metrics currently used was aimed at achieving benefit.

## 4.4 DATA COLLECTION

The data collected was assimilated from the corporate head office and used to analyse the current financial situation. This information was analysed by the use of the theory discussed in the subsequent section. The data analysis was compared with the replies from the financial questionnaire completed by the respondents listed in chapter two, Table 2.4: Data collection – Financial elements.

## 4.5 PRELIMINARY DESCRIPTION OF HEALTH REPORT

The information in Table 4.1 below is the combination of the ratios used to determine the status of the MNE's subsidiaries since 2006. These combined ratios determine the "health" of the individual subsidiaries and assist in determining the areas of concern. Although the information is historical, it will provide a good indication of the sustainability of the organisation, where there are areas of improvement and the contribution to future sustainability.

The management of the areas of concern will be key to the recovery from ill health and will provide improvement in the areas contributing overall towards long-term sustainability.

The health report of the MNE has been divided into six financial sectors. These areas are explained in more detail in the subsequent sections that follow, with relevance to the LTS of the MNE.

### 4.5.1 Operations and growth ratios

These ratios will assist in determining the operation and sales, state of health and growth of the subsidiary. The ratios will highlight where the specific areas of success and concern lay and will have a significant impact on the ability of operations measurements to derive value and achieve LTS, thus determining and serving as part of the measurement criteria for chapter six.

Chapter six deals with the operations metrics portion of this study of the MNE and the effect that operations metrics have on the LTS of the MNE. The sales growth and impact of LTS on the MNE are further discussed in chapter five of the study as the growth ratios are of prime interest to the SM group within the MNE.

### 4.5.2 Rate of return

It is important to understand that all stakeholders in an organisation want to achieve some element of success and derive benefit from the MNE. This section of the health report is important to the shareholders of the MNE and the LTS. The calculations determine the return on the investments they have made in the MNE and its subsidiaries and this in turn will determine the overall success and long-term sustainability of the MNE.

### 4.5.3 Liquidity ratios

These ratios impact on operations and the financial sustainability of the MNE. Their main benefit is the impact on cash flow of the subsidiaries of the MNE and it is of paramount importance to have the benefit of a strong cash flow within the subsidiaries of an MNE, as this will enable the subsidiary to work independently and finance its own growth from a generic perspective. This will strengthen the foundation of the subsidiary, create a strong platform for growth within the subsidiary and in turn have a positive effect on the LTS of the MNE.

Free cash flow benefits the MNE when there is the opportunity to declare independent dividends to the corporate parent. This has a knock-on effect and assists the MNE in improving its cash flow position, which will shape and strengthen strategy around LTS.

### 4.5.4    Cash flow ratios

As discussed above, these ratios are of importance to the subsidiary and the corporate parent. They have a large impact on the ability of the organisation to finance its own growth using its own funds, again contributing significantly to the LTS of the MNE.

### 4.5.5    Profitability ratios

Companies that are listed on a stock exchange are focused on improving these ratios. In a subsidiary, they do not have any impact and do not form part of the financial health report. However, if the ratios that are calculated and determined above are not in "good health" then this will have an impact on the MNE ability to raise cash and attract investors in the long-term. The effect would be negative to LTS.

### 4.5.6    Financing ratios

These ratios would be of importance to an organisation when managing its debt and borrowings, to determine its ability to remain long-term sustainable. In the case of the MNE and the subsidiaries being researched, there is no impact derived from the finance ratios, as most financing is either from generic growth within the subsidiary or alternatively from loans from the MNE. Therefore, they were not researched in the context of this case study analysis. This does not mean that there is no place for financial analysis in the prediction of the LTS of the MNE. Therefore, a financial health report allows stakeholders to conduct analysis and a comparison of information that will enhance and add value to the research carried out in the determination of the LTS of an MNE. Table 4. below represents the ratios used in this study and an explanation of the ratios and the contribution they make towards the LTS of an MNE in the context of this research.

## 4.6    INTRODUCTION OF THEORY OF RATIOS USED IN THIS RESEARCH

A recent study by Jewell and Mankin (2011) of ratios found that authors are in unanimous agreement on how to calculate the current ratio, gross profit margin, and dividend yield. Yet, there are many other common ratios with substantial disagreement in the formulas and these include return on assets, quick ratio and inventory turnover. It is therefore important to explain and present the formulas that are used to determine ratios in this case study of an MNE and its LTS.

**Table 4.1: The Financial Health Report**

| Financial Health Report | |
|---|---|
| **Description** | **Formula** |
| **Operations and Growth Ratios** | |
| Sales turnover | |
| Sales growth Y/Y | |
| Material margin | **Mat COS/sales** |
| Labour and overheads | **Labour and overheads/sales** |
| Gross margin | **Labour and mat COS/sales** |
| Gross profit % | **GP/sales** |
| Operating profit % | **OP/sales** |
| Pre-tax profit % | **PP/sales** |
| Net profit % | **NP/sales** |
| Net profit growth | |
| **Rate of Return** | |
| Return on Equity % (ROE) | **NP/equity** |
| Return on Net Assets % (RONA) | **OP/net assets** |
| Return on Total Assets % (ROTA) | **OP/total assets** |
| NOPAT | **OP-TAX/NET ASSETS** |
| EVA®= | **NOPBT – WACC x IC** |
| EVA® NOPAT= | **NOPAT – WACC x IC** |
| Net asset T/O | **Sales/net assets** |
| Stock turn | **COS/stock** |
| Working capital intensity | **WC/sales** |
| Working capital turnover | **Sales/WC** |
| **Liquidity Ratios** | |
| Current ratio | **Curr Ass: Curr Liab** |
| Quick ratio | **Cur Ass - stock: CL** |
| Solvency ratio | **Total assets/Total liab** |
| Debtors collection period | **Debtors/sales** |

| Creditors collection period | **Creditors/sales** |
| --- | --- |
| Retained Earnings % | **RE/NP** |
| **Cash Flow Ratios** | |
| Cash flow/debt ratio | **Cash flow/debt ratio** |
| Liability settlement period | **Total liab/cash avail ops active** |
| Quality of sales | **Cash from sales/sales** |
| Quality of income | **Closing cash/operating profit** |
| Cash profitability of total assets | **Closing cash/total assets** |

Source: Researcher's own construction

### 4.6.1    Operations and growth ratios

In this section, all the ratios are derived from calculations used in a standard income statement and they relate to the MNE. Any influence on the ratios would therefore be directly related to decisions taken by management on any part of the operations of the MNE when considering the LTS.

The researcher believes that when considering operations and growth ratios, the impact can be instantly derived and determined. The result can be calculated in advance to determine the outcome or accumulative effect when determined by a form of predetermined budgetary calculation model.

**Sales Turnover –** is the amount in a currency that is directly attributed to the sales of products to the organisations customers and is the "fruits of the labour" or services that are carried out by the organisation. In the MNE, this is the lifeblood of any subsidiary when considering the LTS of the MNE and it's expected growth year-on-year.

The researcher is of the opinion that for the MNE to remain successful and achieve LTS, it would be expected that growth experienced within the MNE be at least above inflation. To achieve LTS and growth, a minimum requirement would be to beat inflation by at least two percentage points and this would indicate a satisfactory growth rate and the ability to maintain LTS.

**Sales Growth Y/Y –** as indicated above is purely the percentage growth achieved over the previous year and is calculated as:

$$\frac{Sales\ Turnover\ y - (Sales\ Turnover\ y - Sales\ Turnover\ y - 1)}{(Sales\ Turnover\ y - 1)}\ \%$$

In this metric, y is a year-end, y-1 is the previous year and the equation is represented by a percentage growth. As discussed above, this should be a measurement of growth and contribute to the LTS. It follows that for the MNE to be LTS this growth should be measured as growth above inflation as a minimum requirement. True growth would be a measurement as a percentage above inflation in any given annual period based on some form of investment criteria.

**Material Margin –** is the percentage that is calculated as follows:

$$\frac{Material\ Cost\ Of\ Sales}{Sales\ Turnover}\ \%$$

This is a very important metric in that input material costs will have a large impact on the outcome as far as profitability and LTS are concerned. This is notably apparent in the manufacturing sector as raw material inputs are a large contributing factor or the makeup of a product that requires manufacturing.

In service and project-related organisations, the impact may arguably be smaller as there is more emphasis on professional input and thus costs of HR may have a larger impact on the ability to remain sustainable.

The manufacturing and conversion of raw materials however are crucial to the LTS of the MNE researched in this study. The value of the metric is also a form of measurement of improvement in material purchasing strategies. This forms part of the operational portion of this study and as such will be further developed under that subject matter. It has a significant impact on the LTS of the MNE.

It is the researcher's opinion that the metric is additionally useful around determination of the sustainability of the Sales Model. In simple terms, if the

material margin has deteriorated, this means that despite the best efforts of the procurement initiatives, there is an imbalance in the sales margin value of the product. An adjustment to the pricing strategy is urgently required and an investigation of the impact is important to the MNE so that the LTS is not affected negatively.

**Gross Margin** – is the percentage calculated as follows:

$$\frac{\textit{Labour And Material Cost of Sales}}{\textit{Sales Turnover}}\%$$

This is the combination of the raw material and the labour used to convert the items into finished goods. The researcher's opinion is that, as is the case with Material Margin, this is an extremely important metric which has a major impact on the LTS of the MNE in that it is the combined effort of proper procurement of raw materials and the appropriate use and efficiency of labour paid which are calculated to produce this conversion metric. Obviously, the reduction of the percentage contribution on the labour would also have a direct impact on the cost of the finished goods, but these metrics will be discussed in the operational part of this study.

**Gross Profit %** - is the percentage calculated as follows:

$$\frac{\textit{Gross Profit Amount}}{\textit{Sales Turnover}}\%$$

This metric is the percentage achieved after including all other manufacturing related expenses. These include items such as other manufacturing expenses, which are consumables, electricity, water, freight, packaging and shipping. It is necessary to determine a pricing of these items so that there is a clear distinction between what is being spent on the items mentioned.

This metric is impacted by both operational issues and the sales strategy of the MNE. A limited amount of efficiency can be procured from a system before inflation and other external factors create an imbalance. This can influence the

change in pricing and sales strategy of the subsidiary of the MNE. This subject matter will be further explored in both the sales and operational elements of the research. According to Halim, Jaafar, Osman and Haniff (2012), gross profit margin is the percentage of revenue left over after paying construction and equipment costs.

**Operating Profit %** - is the percentage calculated as follows:

$$\frac{Operating\ Profit\ Amount}{Sales\ Turnover}\ \%$$

It is the opinion of the researcher that operating profit remains after the deduction of period expenses. It is important that there is a distinction between period expenses and manufacturing expenses. Period expenses are more prone to be fixed expenses. The term implies that they will remain constant, within the MNE and there are many influences on these as they are prone to change during wage increases, SM activities, movement of resources, periods of intense engineering activity and other types of administrative activity. However, if these expenses are not seen in isolation, they have a significant impact on sustainability and need to be balanced against the organisation's ability to compete in the macro environment. There can be a serious, negative impact on the LTS of the MNE if these expenses are not monitored and controlled properly.

**Pre-tax Profit %** - is the percentage calculated as follows:

$$\frac{Pre\ Tax\ Profit\ Amount}{Sales\ Turnover}\ \%$$

In the opinion of the researcher, moving down the income statement of the MNE, the percentage of profit improvement becomes less due to the accumulation of expenses. The remaining amount becomes more important especially when considering the LTS of the MNE. It is extremely important to understand all of the influences the ratios analysed and calculated previously, will have on the pre-tax profit of the MNE. In addition, it becomes important to the LTS that the containment of certain expenses is necessary, as they will have a direct impact

on the ability to make profit and remain sustainable as an entity. This needs to be balanced with the ability to remain inventive in both new product design and the manufacturing of existing products under the most agreeable circumstances.

**Nett Profit %** - is the percentage calculated as follows:

$$\frac{Nett\ Profit\ Amount}{Sales\ Turnover}\ \%$$

This is largely beyond the control of the management and staff of the organisation as it is government intervention and rule that determine the amount that is tax deductible (Nett Profit Amount is an after-tax profit calculation). However, it is the opinion of the researcher that there are certain elements contained within an organisation that will influence the LTS of the MNE as well as the end payment that is made to the internal revenue department of government. There are certain tax breaks that the subsidiary of the MNE need to become mindful of and then take advantage of where it is relevant to the MNE and its LTS.

**Net Profit Growth** - is a percentage calculated as follows:

$$\frac{Net\ Profit\ after\ tax\ Y - (Net\ Profit\ after\ tax\ Y - Net\ Profit\ after\ tax\ Y - 1)}{(Net\ Profit\ after\ tax\ Y - 1)}\ \%$$

The researcher's opinion is that despite the outside interferences and impositions related to tax payments, this metric should also improve year-on-year if there is growth. As with turnover, it should consider inflation. However, as with all ratios, this calculation should not be treated in isolation and therefore a thorough understanding of the underlying influences and business decisions is needed so that the LTS of the MNE can be appraised. There may be areas within the subsidiaries of the MNE where the decisions made will affect outcomes significantly. Changes in governmental legislation where tax laws are concerned would also have a significant influence.

### 4.6.2    Rate of return

The ratios below are a combination of balance sheet and income statement calculations. They are responsible for determining how effectively funds are managed and used to the advantage of the MNE and its subsidiaries when considering LTS. These ratios are important to operational management as well as to the shareholders of the MNE as they are influenced by contributions made by both parties.

In the opinion of the researcher, shareholders of the MNE are interested in how well their money is being managed and utilised to create value, while operational managers are responsible for the decisions on purchasing of assets (usually capital investment in equipment and other material assets) for the organisation, and how these assets influence the outcome.

Both parties have much to lose or gain in the successful decision-making process prior to determining the Rate of return ratio. Invariably the performance of operational mangers will be linked directly to the performance and outcomes of this calculation, which in turn has a profound impact when a decision is made on investments within the subsidiary of the MNE. These operational managers are rewarded on their ability to positively implement and gain a return on the investments that they have made in the subsidiary of the MNE. This in turn has a direct impact on the LTS of the MNE and they are rewarded according to positive outcomes.

The researcher further believes that a shareholder would be very interested in how wisely their money was managed within the MNE. In particular, the return on the investment made which creates a positive return on overall investment in the MNE that affects and influences their further commitment to the MNE and its subsidiaries, which has a knock-on effect on the LTS of the MNE.

**Return on Equity % (ROE) –** is a percentage calculated as follows:

$$\frac{Net\ Profit}{Equity}\ \%$$

As discussed above this is a calculation derived from the overall investment on an ongoing basis and is directly influenced by the profit generated from the equity (money invested) in the business being analysed. This is termed "Return on Investment" for shareholders and influences the LTS of the MNE, positively or negatively depending on the outcome calculated from the metric (Halim et al., 2012).

This ratio should not be used in isolation, according to Chaudhuri, Kumbhakar and Sundaram (2016). If ROE were chosen as an indicator of organisational performance, then it would explain how effectively the organisation has utilized assets to generate earnings. The ratio is not the only determining factor when considering an MNE's LTS. Further to this, ROE can be problematic and if investors are not careful, their attention can be diverted from the fundamentals of the MNE, if they do not account for the market-oriented factors.

**Return on Net Assets % (RONA) –** is a percentage calculated as follows:

$$\frac{Operating\ Profit}{Fixed\ Assets + Net\ Working\ Capital}\ \%$$

Similar to ROE, but in this case calculated using the operating profit. Return on net assets is used to determine a more stringent measurement as it is directly calculated from the fixed assets. These are tangible items including items utilised in the production of goods or services and can include property, equipment and machinery. Net working capital is calculated by taking the organisation's current assets minus its current liabilities. This means that the higher the return, the better the profit performance of the organisation.

If the purpose of performing the calculation is to generate a longer-term perspective of the organisation's ability to create value, extraordinary expenses may be added back into the net income figure. For example, if an organisation

had a net income of $10 million but incurred an extraordinary expense of $1 million, the net income figure could be adjusted upward to $11 million. This adjustment would not accurately reflect the organisation's return on net assets in that year but might provide an indication of the return on net assets the organisation could expect in the following year if it did not have to incur any further extraordinary expenses.

Jewell and Mankin (2011) postulate that return on assets (ROA) is one of the most popular and useful of the financial ratios and it has been used in industry since at least 1919 when the DuPont Company used it as the top of its ratio triangle system. Analysts often use ROA in their investigation of an organisation's financial position, performance and prospects.

**Return on Total Assets % (ROTA) –** is a percentage calculated as follows:

$$\frac{Net\ income + Interest + Taxes\ (Operating\ Profit)}{Total\ Assets}\ \%$$

ROTA is a ratio that measures an organisation's earnings before interest and taxes (EBIT) against its total net assets. This ratio is considered an indicator of how effectively an organisation is using its assets to generate earnings before contractual obligations must be paid and an organisation's earnings in proportion to its assets. The greater the coefficient from this calculation, the more effectively that organisation is said to be using its assets. The ROTA is a derivative of ROA and one of the many calculations that form part of the group of ROA calculations.

To calculate ROTA, one must obtain the net income figure from an organisation's income statement, and then add back interest and/or taxes that were paid during the year. The resulting number will reveal the organisation's EBIT. The EBIT number should then be divided by the organisation's total net assets (total assets less depreciation and any allowances for bad debts) to reveal the earnings that the organisation has generated for each currency value of assets on its books (Halim et al., 2012). In the context of their study, they describe this ratio as the measurement of the efficiency of a construction organisation in utilizing its assets.

**NOPAT –** is a percentage calculated as follows:

$$\frac{Operating\ Profit - Tax}{Net\ Assets}\%$$

NOPAT is the net operating profit after tax reflected as a percentage of sales turnover. It reflects the income that is left for growth and dividend pay-out at the end of each financial year. This amount is transferred to the balance sheet as retained income. Investors can then decide as to whether they would require a dividend or use the cash to fuel generic internal growth by means of capital investment. It is the simple form of determining the success of the MNE in terms of financial success. NOPAT is defined by Halim et al. (2012) as the percentage of revenues converted into profit after tax deductions. This measure is the easier measure of a method to determine if managers have beat inflation and generated value for the shareholders of the MNE.

**Economic Value Added (EVA®)**

The concept of economic value added - EVA®, was developed by Stern Stewart & Co. which was founded in the 1980's (Khan, Aleemi and Qureshi, 2016). The term EVA® is the economic profit that is added for the shareholders by management. EVA® is a trademarked measurement that is aggressively promoted by Stern Stewart & Co. The simplest way to calculate EVA® is to subtract capital charges (invested capital multiplied by the WACC) from net operating profit after taxes (NOPAT).

International management practices emphasise the Economic Value Added (EVA®) Model as one of the most important performance measures. The main distinction between EVA® and traditional metrics relates to the fact that EVA® incorporates both remunerated liabilities and financing costs of debt as well as the invested capital (Pinto and Machado-Santos, 2011).

The main assumption behind this model suggests that decisions concerning financial performance should aim to maximize the EVA® and not just the net profit.

A considerable difference distinguishes these two metrics: the cost of capital. While the net income only considers the financial costs of liabilities, the EVA® Model also considers the cost of recovering the capital invested by the shareholders.

If organisations obtain a positive EVA®, they achieve a return above the cost of capital and therefore create value. If companies have a negative EVA®, they do not generate resources and thus destroy value. The simplicity of this model has inspired many studies that demonstrate the existence of an effective link between EVA® and the creation of value for shareholders, which is measured by Market Value Added (MVA) (Pinto and Machado-Santos, 2011).

$$EVA_{®} = NOPAT - (WACC \times IC)$$

Clearly, you can increase EVA® several ways. These include: 1) increasing NOPAT; 2) lowering the WACC; and 3) reducing invested capital (divesting functions that do not contribute to value growth). Often, companies refine their EVA® calculations by making accounting adjustments to overcome the inherent limitations in generally accepted accounting principles (GAAP). More than 150 possible accounting adjustments are available, but most EVA companies make five or fewer. The most important criterion when considering an accounting adjustment is whether it will have a direct effect on managers' incentives to create value. In the case of the subsidiaries of this MNE, it has been agreed that the royalties paid back to the corporate headquarters be added back to the individual subsidiaries NPBT calculation so as not to disadvantage the subsidiaries of the MNE.

**Net Asset T/O –** is a percentage calculated as follows:

$$\frac{Sales\ Turnover}{Net\ Assets}\ Times\ Per\ Annum$$

The ratio is used to determine how effectively the assets are being used to generate income. The expectation is that it should be in a growth pattern, as the turnover should be increasing on investments made. An element of caution

should however be used, as there may be instances where investments have been made and there is a timing issue due to the asset not yet being used to the expected sufficiency. This also holds true for investments that are made that may not show direct growth as an investment, e.g. a new addition to a warehouse or a new office block. According to Halim et al. (2012), this is a measurement of the efficiency of an organisation in utilizing its assets. It is also known as the assets-to-sales ratio.

**Stock Turn (Inventory Turnover) –** is a percentage calculated as follows:

$$\frac{Cost\ Of\ Sales}{Stock}\ Times\ Per\ Annum$$

This is not only a financial consideration, but has a profound influence on the operational efficiency of an MNE. If one has the correct inventory to complete work, then this will have a positive effect on one's ability to convert inventory into cash and satisfy customer demand. The converse is also true, as excessive inventory of slow-moving goods can lead to the certain demise of any operation. This important metric is not only good for short term gain, but also can have severe long-term implications for an organisation.

The inventory turnover ratio provides an indication of the number of times that inventory is changed either into sales or in the case of manufacturing processes, into material consumed. The ratio will thus indicate the extent to which inventory ageing occurs or to what degree there is a relative decrease in inventory (Faul, Pistorious, van Vuuren, Vorster and Swanevelder, 1999).

**Working Capital Intensity –** is a percentage calculated as follows:

$$\frac{Working\ Capital(Current\ assets - Inventory)}{Sales\ Turnover}\ \%$$

Working capital is defined as the capital employed in an organisation without the inventory. This is used to examine the capital and its use to fuel growth. It is the researcher's opinion that the interpretation of working capital intensity should not be done in isolation, as the results are dependent on other organisational factors

such as retained earnings versus dividends and investments in equipment and buildings

The organisation's stock of working capital serves as a measure of operating liquidity. The use of working capital instead of cash flow as a measure of an organisation's liquidity is preferable as it is better at indicating funds available for investment. Working capital as an indicator of investment decisions includes not only cash but also other values that can easily be converted into cash (Hottenrott, Hall and Czarnitzki, 2016).

**Working Capital Turnover (WCT) –** is a ratio calculated as follows:

$$\frac{Sales\ Turnover}{Working\ Capital}\ Times\ Per\ Annum$$

According to Halim et al. (2012), WCT is a measurement of the efficiency of an organisation in utilizing its working capital (WC), which represents funds available for future operations. Enqvist, Graham and Nikkinen (2014) found that the impact of the business cycle on the working capital profitability relationship is more pronounced in economic downturns. The significance of efficient inventory management and accounts receivables conversion periods are important contributors to this metric. Active working capital management is vital for inclusion in an organisation's financial planning.

The converse of this is also important, as the nature of a ratio is that if one element is high and the other is low, the gearing is amplified. Therefore, if one's working capital is dwarfed by the sales turnover, then one is geared positively and using one's working capital effectively and "sweating the assets" to the MNE's advantage.

**Current Ratio (CR) -**

$$\frac{Current\ Assets}{Current\ Liabailites}$$

CR is a measurement of an organisation's ability to use current assets to pay for

its current liabilities (Halim et al., 2012). The current ratio measures only the extent to which current liabilities are covered by current assets at a specific point in time. Jewell and Mankin (2011) postulate that the current ratio is one of the few ratios with unanimous agreement on the construction of the formula. Current liabilities comprise creditors who must be paid in cash in the short-term. Current assets consist mainly of inventory, debtors and cash. However, inventory must be sold and the resulting credit to debtors must first be collected before the cash becomes available. If the current assets are converted into cash at a slower rate than that at which the creditors demand payments in cash, the enterprise could experience liquidity problems. The current ratio, however, gives no indication of this rate (Faul et al., 1999). It therefore stands to reason that the current ratio has some limitations in the measurement of long-term sustainability.

**Quick Ratio or Acid Test (QR) -**

$$\frac{Current\ assets\ - Stock}{Current\ Liabilities}$$

QR is a measurement of an organisation's ability to pay short-term liabilities with cash or near-cash assets (Faul et al., 1999). The acid test ratio is often used on the same basis as the current ratio, but because inventory is less liquid than any of the other current assets, it is left out of the equation (Faul et al., 1999). As discussed above, the current ratio and the quick ratio must be used with caution, especially when determining the long-term sustainability of an organisation as a sizeable investment in inventory and or debtors would lead to a favourable result.

**Solvency Ratio -**

$$\frac{Total\ Assets}{Total\ Liabilities}$$

Solvency may be described as the extent to which the enterprise's assets exceed its liabilities in the long-term. Thus, solvency not only pertains to the enterprise's current state of affairs, but also to its ability to maintain a sound level of solvency over the long-term. The difference between solvency and liquidity is that whereas the latter relates to honouring short-term liabilities, the former concerns the excess of total assets to total liabilities. When solvency declines to a point where the liabilities exceed the assets, the enterprise is in fact insolvent and its

continued existence is in danger (Faul et al., 1999). Taking the above into consideration, it stands to reason that an analysis of the solvency ratio of an organisation, subsidiary or group of companies is important to measure when determining long-term sustainability.

**Debtors Collection Period -**

$$\frac{Current\ Debtors}{Sales\ Turnover}\ X\ 365\ Days$$

This represents the average time an organisation takes to pay its bills. It is a measure of how extensively an organisation utilizes trade financing (Halim et al., 2012; Muhammad, Jibril, Wambai, Ibrahim and Ahmad, 2015: Solomons, 2014). This is taken from calculating the debtors by the sales days and multiplying it by the number of days in the year. The calculation in days tells the MNE how many days it takes to collect money owing and it is an important measure when considering cash flow. Simply put, if one cannot collect money from one's customers, one will not be able to pay the creditors, staff and all the other commitments.

**Creditors Collection Period -**

$$\frac{Current\ Creditors}{Sales\ Turnover}\ X\ 365\ Days$$

Collectors Period is a measurement of the average time it takes an organisation to collect its account receivables. CP is likewise a measure of how long an organisation's capital is used to finance its client's construction project (Halim et al., 2012; Solomons, 2014; Muhammad et al., 2015). This is determined by dividing the current creditors by the sales turnover and multiplying this by 365 and it provides information about the time taken to realize cash from the creditors of the MNE. If the ratio is geared high, this means that one's sales turnover exceeds the payments one should be making to creditors and one is in a good

position to cover the short-term commitments. The converse would be that if the collection period for the organisation is very high or the ratio is geared low, the organisation would not be able to pay its creditors due to cash flow constraints.

**Retained Earnings % -**

$$\frac{Retained\ Earnings}{Net\ Profit}$$

This is merely a calculation reflected in percentage of the retained earnings as a proportion of net profit. It is the researcher's opinion that this would interest the shareholders, as they would have a keen interest in the real investment that was taking place in the organisation and their possibility of earning a dividend from the funds that were retained within the organisation

### 4.6.3　Cash flow

**Cash Flow/Current Liabilities -**

$$\frac{Closing\ Cash\ Value}{Current\ liabilities}$$

This is used to determine the ratio of cash available to pay debt. It is important to create a balance between the payment of accounts and the settlement of current liabilities. This is measured to see if the cash generated by the organisation meets and satisfies the payment of short-term commitments.

**Liability Settlement Period -**

$$\frac{Current\ liabilities}{Closing\ Cash\ Value}$$

This is the inverse of the above and as mentioned determines a value which measures the ability to manage short-term liabilities.

### 4.6.4    Profitability and financial ratios

As previously mentioned, these ratios are of high importance to an organisation managing its debt and borrowings when required to determine its ability to remain sustainable. The MNE researched, and its subsidiaries, did not during the time of this study, experience any negative impact emanating from the profitability and financial ratios as their cash flow and retained earnings were positive, given this scenario, the ratios either were of no consequence or were of little significance. However, these analytical tools are amongst the most popular of all analytical tools used in organisations.

It is essential that the strengths and limitations of this very technique be explored before an attempt is made to apply and evaluate the influence and impact on the output of an organisation. A plethora of possible ratios could be selected. However, the objective of the analysis is the criteria used when deciding upon the relevant ratios to be selected. In their introduction to analysis and interpretation of financial statements Faul et al. (1999), under their section on ratio analysis, discuss two groups of users. These are:

- External users, and they include all persons and institutions that, although they may have a financial interest, nevertheless exist outside the enterprise and are not directly involved in its management.
- Internal users are generally employed by the enterprise and are responsible for its management.

Faul et al. (1999) also list the three most important aspects evaluated in the analysis and interpretation as follows:

- Profitability.
- Liquidity.
- Solvency.

According to Koen, Oberholtster and van der Laan, (1994); Ueno, (2014). This information can be used to judge the past and current performance of an enterprise as well as its potential.

Currently, businesses must use their resources efficiently because of substantial competition and uncertainty in market conditions. To determine whether a business is efficient or not, financial performance indicators have a rather important place.

Financial ratio analysis is more commonly used to measure financial performance. With the help of ratio analysis, information in the financial statements of a business is examined proportionally and important decisions are made based on the indicators concerning financial performance. Interpretation of these indicators for only one organisation may not be enough. Therefore, financial ratios are subject to comparisons between organisations.

Fundamental analysis of stock links financial data to organisational value in two consecutive steps. These are, firstly a predictive information link tying current financial data to future earnings, and secondly a valuation link tying future earnings to organisational value. At each step, many causal factors must be factored into the evaluation.

Essential analysis of stocks determines the fundamental value of a stock by analysing available information with a special emphasis on accounting information. Over the last decade, accounting researchers have redirected their attention to this task. A number of empirical studies have used information from financial statements to predict future earnings as an indication of the future performance of an organisation (Abad, Thore and Laffarga, 2004).

## 4.7    CONCLUSION TO CHAPTER FOUR

In chapter four, financial metrics where researched. It was clearly visible and understood that financial analysis and therefore financial elements and their measurement play vital roles in determining the short and long-term sustainability of an MNE.

Keeping in mind the organisational challenges involved in generating revenues, it is understood that financial sustainability is an organisation's capacity to obtain

revenues to sustain productive processes (projects) at a steady or growing rate to produce results (accomplish the mission, goals or objectives). In other words, the central aim is the results the organisation wishes to achieve. The means to achieve these results is a fundraising or capital raising capacity that makes it possible to implement projects and activities that lead to that goal (León, 2001). Securing critical funds to implement the necessary activities in fulfilment of their objectives is one of the greatest challenges facing the MNE researched as well as other organisations. This is especially the case when considering new investments in either existing subsidiaries, newly developing markets or countries, where MNEs are either partners or owners. This was covered in the literature. These challenges exist at local, national and international level. The onus is on the MNE to convince investors, either internal stakeholders or external financial institutions, that the MNE is financially stable, can service its commitments and can provide proof of LTS.

The MNE researched is of no exception and therefore it is relevant to maintain and continuously challenge current financial analysis being performed, thereby providing evidence of both short and LTS by way of a financial health report. A financial health report constructed and designed at the organisation's headquarters, which requires submission on a regular basis, may satisfy the terms and conditions prescribed by the above-mentioned stakeholders who have a vested interest in the MNE.

Key financial metric measurement is complementary to the long-term sustainability of an MNE. There is no one set of metrics that covers all aspects required in meeting the long-term goals, vision and mission of the MNE as all elements are considered to be of equal importance.

The MNE researched used financial ratios to determine its current performance. However, as covered in the literature, the trap remains the same as the MNE recognises the short-term merits of using the financial ratios for analysis of accounts, yet there is no evidence of any ratios being used for the LTS of the MNE.

The questionnaires were constructed from the theory derived from the literature search. The data received from the responses is analysed in a subsequent chapter, with conclusions presented in chapter ten.

# CHAPTER FIVE
# SALES AND MARKETING'S CONTRIBUTION TO THE LTS OF AN MNE

## 5.1 INTRODUCTION

This chapter will examine the Sales & Marketing (SM) theory currently used in industry, as well as new ideas that are presently being explored. These will be compared with existing practices within the MNE, allowing for the development of a system that may be employed to identify potential areas of improvement in the MNE. These are explored in the context of the study and the SM element of the Sustainability Model is investigated.

**Figure 5.1: SM Elements**
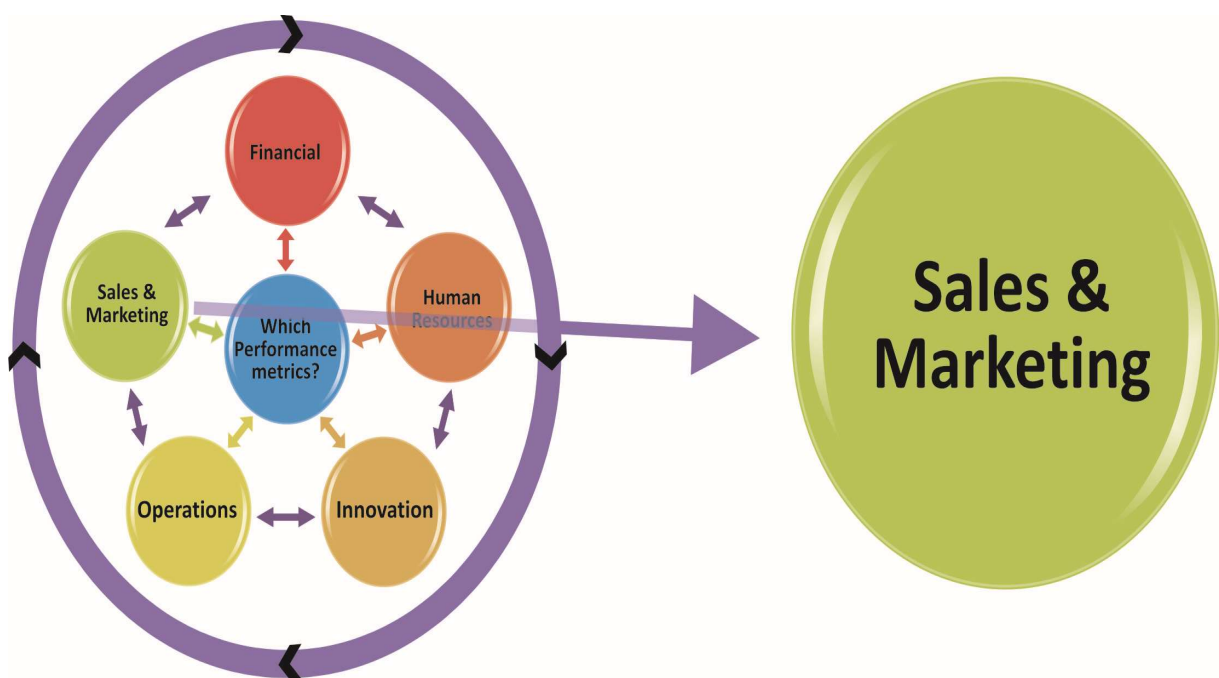


Source: Researcher's own construction

Solcansky, Sychrova and Milichovsky (2011) emphasize that every organisation should be able to demonstrate own efficiency and effectiveness by using metrics or other processes and standards. Businesses may be missing a direct comparison with competitors in the industry, which is only possible using appropriately chosen instruments, whether financial or non-financial.

The results of the study describe relevant metrics to prove efficiency in various types of organisations regarding marketing effectiveness. The studies also outline the potential methods for further research, focusing on the application of metrics in a diverse environment. The study contributes to a clearer understanding of how to measure performance and effectiveness to be effective in all actions, especially in that of marketing activities. For business competitiveness and sustainability of its successful functioning of the market, it is important to have appropriate metrics for measuring effectiveness.

Financial metrics should be defined as the type of metrics where it is possible to formulate the exact amount of money. Authors Gaiardelli, Saccani and Songini (2007) used process-oriented metrics with the ability to distinguish features of the supply chain performance measurement called the SCOR Model (supply chain operations reference), profitability ratios (ROE, ROI, ROS), MSI Index (measures proportion between count of customers and totally number of potential customers) and index BM (reports on cost, revenues and margins). These have already been explained in chapter three.

According to Gaiardelli et al. (2007), non-financial metrics cannot be defined in monetary terms. They illustrate a comprehensive view of business. Greiling (2006) used comparative studies in his own article. According to Zahay and Griffin (2010), the customer scale is not as rigid as financial metrics. These customer scales are for example customer lifetime value, share of wallet and customer retention.

Llonch, Eusebio and Ambler (2002) state that despite the importance of assessing business performance, there is little research on the measures used to evaluate marketing effectiveness. Their paper replicates some research in Spain that was originally undertaken in the United Kingdom. This research was about the relative importance of categories of marketing metrics, for example financial and non-financial, customer and competitive. The Spanish results are compared with those from the UK. In Spain, respondents saw financial metrics as less important than their UK counterparts did and they appeared to be more marketing oriented. In both countries, the importance given to metrics used was

consistent with orientation. Marketing assets appear to be more regularly tracked in Spain than in the UK. In Spain, performance metrics are mostly compared with the previous year, whereas in the UK the marketing plan is the principal benchmark. Spanish managers are more satisfied with the metrics they use to assess marketing performance although both see considerable room for improvement.

If marketing's contributions were readily visible in quarterly changes in sales and earnings, the task would be simple because investors are known to react quickly and fully to earnings' surprises. However, much of good marketing is building the intangible assets of the organisation around brand equity, customer loyalty and market-sensing capability.

Progress in these areas is not readily visible from quarterly earnings, not only because different non-financial, intermediate performance metrics are used (customer satisfaction measures) but also because the financial outcomes can be substantially delayed. As with research and development (R&D), marketing requests that the investor community adopts an investment perspective on spending (Srinivasan & Hanssens, 2009).

## 5.2 SALES ELEMENTS

The sales elements of the SM Model's relationship to the LTS of an MNE are shown in Figure 5.2. The figure highlights all the individual disciplines within the sales element that require consideration within the context of the case study of the LTS of the MNE.

**Figure 5.2: Sales elements of the Sales and Marketing Model**
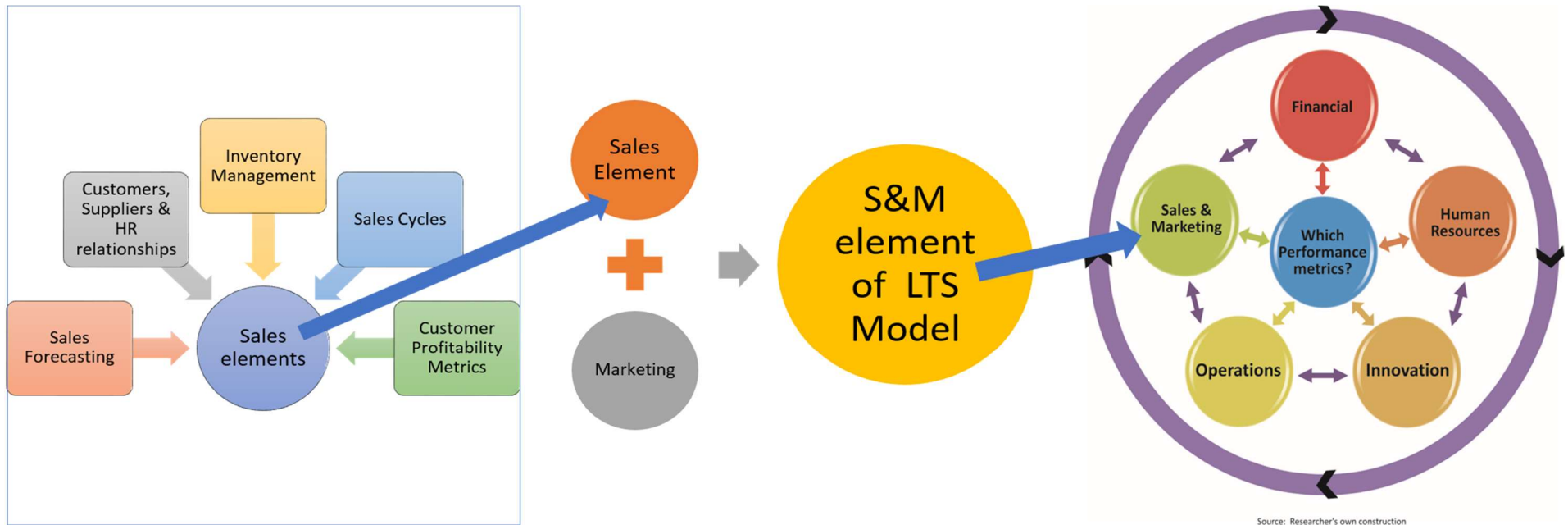


Source: Researcher's own construction

### 5.2.1 Sales Forecasting Model

Bonney (2009) asserts that centralizing demand forecasting and planning improves forecasting accuracy and highlights that when each department performs its own forecasting, bias will occur.

This research further evaluates employee attitudes towards the three main factors contributing to the implementation of a sales forecasting model, namely financial considerations; value chain analysis; customers, suppliers and staff relationships. Moreover, employee perception of the four key elements of the Forecasting Model, namely inventory days, profit levels, back orders and customer service, will be investigated. In support of this argument, Bower (2006) cites results from a Woolworths, South African case study, and declares that a 14 percent increase in operating margin, a four percent increase in gross margin, a 55 percent reduction in inventory write-off and a 17 percent increase in new product revenues are not surprising. Zager (2010) illustrates how the combination of sales forecasting and value chain can be leveraged to complement an organisation's strategy.

As mentioned in chapter three, Mentzer (2006) hypothesises that when sales forecasting management is properly implemented, then a sales forecast is a projection of expected future demand, given a stated set of environmental conditions. It is imperative that this is distinguished from an operational plan, as there is a distinct difference between sales forecasting and sales targets. An organisation should never confuse forecasting with motivational strategy. Figure 5.3 illustrates the proposed analysis areas within this case study to be researched.

### 5.2.2 Sales forecasting

Sales forecasting management is about recognizing that as an organisational function, it is typically called sales forecasting, but demand is actually being forecasted. It is necessary to know customers' demands for organisations to plan to achieve sales at or near that level. Sales forecasting involves the use of various

qualitative and quantitative techniques in the context of corporate information systems to meet the needs of different users of the sales forecasts as well as the management of this process. A sales forecast is a projection into the future of expected demand given a stated set of environmental conditions. This should be distinguished from an operational plan, which is a set of specified managerial actions to meet or exceed the sales forecast. Examples of operational plans include production plans, procurement plans and logistics plans. Both the sales forecast and the operational plans should be distinguished from sales targets, which are sales goals that are established to provide motivation for SM employees (Mentzer, 2006).

**Figure 5.3: Sales forecasting and profitability**



Source: Researcher's own construction

Demand forecasting is the process that seeks to avoid these problems. From manufacturers setting production lines, to transportation carriers lining up capacity, companies have long been trying to have accurate demand forecasting, but the recession that has ravaged every facet of the supply chain is bringing new urgency to the efforts and giving them a new twist. Instead of merely forecasting demand, many companies are trying to shape it through improved use of software, artificial and human intelligence. "We don't forecast, we plan demand, we manage demand," Bub Boucher, VP of customer service and logistics at Colgate-Palmolive, told a recent Lehigh University symposium (Bonney, 2009).

### 5.2.3    Value chain analysis

Depending on an organisation's position in the supply chain, the role of sales forecasting changes. All supply chains have only one point of independent

demand or amount of product demanded (by time and location) by the end-use customer of the supply chain. Whether this end-use customer is a consumer shopping in a retail store or online, or a business buying products to conduct its operations, these end-use customers determine the true demand for the product that flows through the supply chain. The organisation in the supply chain that directly serves the end-use customer experiences this independent demand.

All proceeding and subsequent companies in the supply chain experience a demand that is tempered by the inventory levels and the order fulfilment and purchasing policies of other companies in the supply chain. This second type of supply chain demand is called derived demand as this is because it is not the independent demand of the end-use customer, but a demand that is derived from what other companies in the supply chain do to meet their demand from their immediate customers (the organisation or end-use consumer that orders from them) (Mentzer, 2006).

### 5.2.4 Inventory Management

Many inventory problems experienced currently, result from an organisation's inability to leverage their relationship assets. Using industry benchmarks for inventory turns is a good way to determine efficiencies. Mushrooming inventory is a good indicator that the organisation is having difficulty matching the sales team's demand information with manufacturing's production activities. This increase in inventory exposure risk leads to unwanted write-offs and higher carrying costs.

A CRM process improves visibility into the sales pipeline and increases sales forecasting accuracy, which enables the organisation to better correlate production with demand (Kennedy, 2004). An inventory analysis will form part of chapter six of this research under operations management.

### 5.2.5 Sales cycle performance metrics

Kennedy (2004) emphasises that close ratios and sales-cycle time are indicators of relative sales productivity and should be compared to industry averages or

what management deems acceptable.

Within the sales' cycle, bottlenecks often develop from lead to close. Bottlenecks are the result of limited sales resources available to pursue multiple opportunities or leads. With a lead-tracking system in place, management can improve lead-generation quality, sales-contact management and ultimately, close ratios. Without a comprehensive lead-tracking system, visibility into the sales cycle is limited, which allows bottlenecks to develop and exist unchecked. In these cases, the organisation's financial risk exposure is unnecessarily increased.

### 5.2.6    Customer-profitability Metrics

Customer profitability defines an organisation's relative ability to generate a profit from their customers after considering the costs invested to acquire, develop and retain customers.

Their ability to allocate their SM resources efficiently enables the organisation to leverage and cultivate their relationship assets in an effective manner. These metrics consist of two critical components: revenues-historical customer revenues from the accounting system plus forecasted revenues from the sales-forecasting system, and customer costs to acquire, develop and retain customers.

Without the sales-forecasting and lead tracking processes, customer profitability is diluted and these assets risk impairment. For example, Boise Cascade, winner of the Gartner CRM Excellence Award, uses their CRM's customer profitability to direct their SM efforts to compete in a commodity-driven environment. According to Boise Cascade's David Goudge, senior VP of marketing, they categorize each customer, using their own nomenclature, as Most Valuable Customer, Most Growable Customer, Migrators or Opportunity, also known as Below Zeroes. With this detailed breakdown, the organisation is able to use this information to more effectively allocate their SM resources to maximize their efforts (Kennedy, 2004).

Accurate sales-revenue forecasting provides a critical element necessary for optimizing relationship assets. Expectations of revenue streams help determine how an organisation allocates its resources across the enterprise and how in some cases, are used in a larger model to communicate expectations to external investors. If certain expected revenue streams never materialize, metrics can be negatively impacted and frustrate both internal and external stakeholders. For example, faulty sales-revenue forecasts can increase an organisation's inventory exposure risk. According to Steve Ward, general manager for IBM's Global Industrial Sector, "Our sales forecasting processes are relatively advanced and are critical in managing supply-chain efficiencies," which has positioned IBM to weather the economic downturn and helped extend their lead over the competition. The context of sales forecasting extends beyond the obvious bookings and backlog and includes deals in process as well as other market intelligence, which provide a long-range detailed view into the sales pipeline by customer and product. These forecasts incorporate the knowledge-based assets, which are retained in a central database. Over time, as intelligence is gathered on deal wins and losses, sales forecasting accuracy improves (Kennedy, 2004).

Holm, Kumar and Rohde (2012) emphasise that customer profitability measurement models are ways of quantifying an individual customer's or a group of customers' contributions to the financial performance of the organisation. Hence, any customer metric incorporating financial outcomes such as profits or cash flows at the customer or segment level are to be included in this categorization.

Research on customer profitability measurement models, has emerged along the lines of the prospective Customer Lifetime Value (CLV) approach and the retrospective Customer Profitability Analysis (CPA) approach. The CLV approach is aligned with the forward-looking nature of resource allocation decision making.

Cardinaels, Roodhooft and Warlop (2004) suggest that most decision-making research in management accounting remains focused on cost information in a production context. Little is known about the relevance of CPA reports, which more accurately reflect revenue and marketing support variations among

customers, for marketing decisions. Their study uses an experimental design to examine the impact of such reports on resource allocation decisions (that affect the organisation's profits) in marketing environments varying in complexity. The main result of the experiment suggests that the value of CPA reports depends on the complexity of the marketing setting. Only in a highly complex marketing setting do they enhance resource allocation decisions and resultant organisational profitability. Conversely, in a simple marketing environment, decision makers can combine their traditional volume-based cost data with other available types of feedback to perform as well under a more accurate CPA report. It is argued that improvements in the current research design, in the form of regularly updated profitability reports and further accuracy, increase the relevance of CPA reports in a complex marketing setting.

In addition, Cardinaels et al. (2004) discuss the benefits of further accurate customer profitability reports for marketing resource allocation decisions increase with the complexity of the marketing environment. Moreover, only in a complex marketing setting was it detected that there was an effect of cost on profit performance, while in a simple setting such an effect was absent. In simple settings, combining other data such as outcome feedback and prior descriptions of a customer's cost behaviour with traditional costing already constitute a diagnostic tool as effective as a more accurate CPA report. Therefore, in the context of this research, it is important to determine the environment and if it is complex or simple. This will determine the method and accuracy of which measurement to use.

### 5.2.7 Customers, suppliers and staff relationships

The design of a Customer Relationship Management Model must take into consideration and allow for the modification of all aspects of the organisation, including the organisational culture, structure and operations. CPA, if managed effectively, can deliver improved profitability and a greater return on investment. This is achieved by targeting acquisition activities at those prospects with the greatest potential lifetime value, while developing stronger and more profitable relationships with existing customers and ensuring that scarce financial and staff

resources are allocated to those customers with proven value or potential.

As mentioned in chapter three, a study into the effect of customers' and suppliers' perceptions of the market orientation of manufacturing organisations Langerak (2001), contained three key findings.

Firstly, the results demonstrated that the perceived downstream market-oriented efforts of manufacturing organisations, engaged in partnerships with selected customers, positively influenced customers' perceptions of the relationship in terms of trust, cooperative norms and satisfaction.

Secondly, the findings revealed that the perceived upstream market-oriented efforts of the manufacturing organisation were positively related to suppliers' belief that trust, cooperative norms and satisfaction existed in the relationship. Thus, the supplier of an upstream market-oriented manufacturing organisation was more likely to believe that both channel participants were working toward satisfying mutual goals.

Thirdly, the results revealed that customer and suppliers' perceptions of the cooperative norms in the relationship with the manufacturing organisation were positively related to the financial performance of the manufacturing organisation. The implication was that simultaneously adopting a downstream and upstream market orientation was an economical decision taken by the manufacturing organisation's top management towards improving financial performance through the expansion and maintenance of channel relationships.

The implication is that any manufacturing organisation must look after its suppliers to maintain its customers. This phenomenon will be studied in chapter six of this study.

## 5.3    MARKETING ELEMENTS

The marketing elements of the SM Model's relationship to the LTS of an MNE is show in Figure 5.4 highlighting that all of the individual disciplines in the marketing element require consideration within the context of the case study of the LTS of

the MNE undertaken.

Not all customers require the same things, but almost all have a universal view when it comes to quality, fair price and timely delivery. These are only some of the areas in which a business must strive to maintain good standards. Arguably, customer satisfaction is one of the most important strategies for the growth and LTS of a business. Various strategies exist for soliciting new customers, managing existing customers and ensuring customer retention.

One of the first principles in determining customer satisfaction is to segment customers into groups according to their expectations and requirements. The three most common approaches to identifying customer requirements are (1) assume you already know what customers want; (2) ask customers what they want and expect; and (3) determine customer requirements through soliciting their feedback and identifying what it is they complain about. None of these approaches are very effective (Brown, 1996).

**Figure 5.4: Marketing elements of the Sales and Marketing Model**
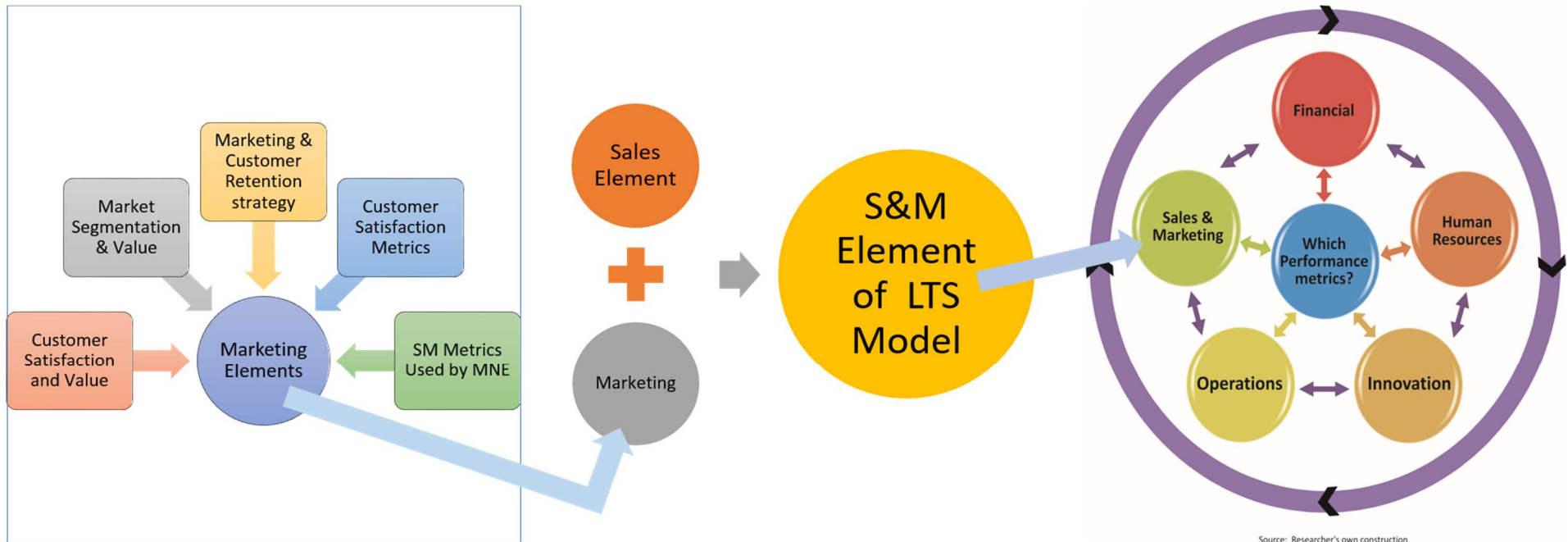


Source: Researcher's own construction

### 5.3.1    Customer satisfaction and value

Not all parts of traditional balance sheets relationship assets are defined as customer relationships, channel relationships and partner relationships. Also included are the investments that companies utilize to build these assets, specifically the investments in SM (Kennedy, 2004).

As companies are facing an ever-increasing level and intensity of competition and a rapid evolution of the market environment, the analysis and management of customer profitability become key issues in securing the long-term success of a business. Metrics for calculating, predicting and increasing customer profitability, based on the measurement of customer satisfaction in real market conditions are essential tools that can positively affect the long-term prospects of an MNE.

Customer satisfaction measurement can provide a good basis for calculating, predicting and improving customer profitability. However, customer satisfaction must be investigated and evaluated in a real-life situation taking into consideration any competitive offers in the market. This analysis is equally important to the acquisition of new customers as well as the retention of existing customers.

Gurau and Ranchhod (2002) assert that it is extremely important to implement an effective organisational control system of segmenting the market, evaluating the profitability of different segments of customers and regularly measuring the relationship between satisfaction, profitability and loyalty. This will assist the organisation in differentiating between high-profitability, loyal customers and low-value, opportunistic clients, thereby facilitating the organisation in designing and implementing well-targeted marketing mix strategies.

**Figure 5.5: Customer satisfaction and value**
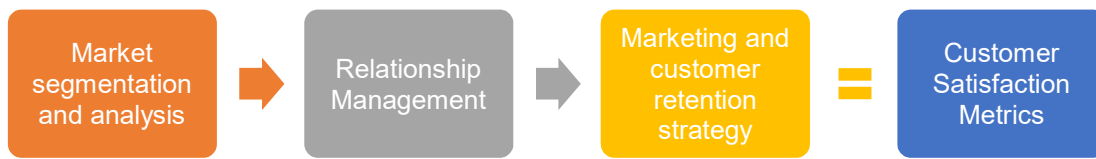


Source: Researcher's own construction

## 5.3.2 Market segmentation and value market segmentation and analysis

According to Rao and Wang (1995), to develop a more efficient and effective segmentation strategy, organisations should rely first on the clustering-based segmentation designs such as those based on benefits sought or customer buying behaviours. The key at this stage is to identify variables that adequately capture the variance in buying behaviour. The second stage is to describe effectively the resulting segments in terms of traditional segmentation variables such as demographic descriptors (for example geography and SIC code). For these segment descriptors to be meaningful and effective, statistical analysis should be conducted to make sure that they are significant identifiers for distinct market segments.

## 5.3.3 Marketing and customer retention strategy

Rust, Lemon and Zeithaml (2004) emphasise that top managers are constantly faced with the problem of how to trade off competing strategic marketing initiatives. For example, should the organisation increase advertising, invest in a loyalty program, improve service quality or engage in none of these activities? Such high-level decisions are typically left to the judgment of the chief marketing or chief executive officers, but these executives frequently have little to base their decisions on other than their own experience and intuition. They further propose that organisations achieve this financial accountability by considering the effect of strategic marketing expenditures on their customer equity and by comparing the improvement in customer equity to the expenditure required to achieve it. They further define customer equity as the total of the discounted lifetime values summed over all the organisation's current and potential customers.

Stahl et al. (2012) examine the role of marketing actions in this context, both as generators of brand equity and controls for ensuring the apparent relationship between brand equity and CLV. The overall findings are as follows:

- Brand equity has a predictable and meaningful impact on customer acquisition, retention and profitability.
- The relationship stands even after controlling for a broad array of marketing activities that affect CLV both directly and indirectly through brand equity.
- The components of brand equity exert different effects on acquisition, retention and profit, suggesting that brand equity indeed is a multi-dimensional construct.

For example, there is a positive interaction between relevance and esteem with respect to customer acquisition. This suggests that esteem by itself does not woo customers as the product must be relevant to customer needs to translate that respect into purchase.

Finally, differentiation is a double-edged sword. As a brand becomes more differentiated, it increases profit margin, but experiences decline in acquisition and retention. This means that the battle for the hearts and minds of customers is meaningful and has quantifiable ramifications for customer profitability. Their results also show that brand equity is a useful indicator for the effectiveness of marketing instruments. However, brand equity only partially mediates the link between marketing activities and profitability. Accordingly, other drivers of success should also be considered.

### 5.3.4   Customer satisfaction metrics

Stahl et al. (2012) found that marketing efforts exert indirect impact on CLV through brand equity. Simulations show that changes in marketing or exogenous changes in brand equity can exert important effects on CLV. Overall, the findings suggest that the soft and hard sides of marketing need to be managed in a coordinated way.

Rust, Lemon and Zeithaml (2004) provide a broad framework for evaluating return on marketing. This enables them to make marketing financially accountable and to trade off competing strategic marketing investments based on financial return. They build customer equity projections from a new model of customer lifetime value (CLV), one that permits the modelling of competitive effects and brand-switching patterns. Customer equity provides an information-based, customer-driven, competitor-cognizant and financially accountable strategic approach to maximizing the organisation's long-term profitability.

### 5.3.5    SM Metrics currently used by MNE

Below is a list of metrics (sourced from the corporate headquarters of the MNE)

**Table 5.1: SM Metrics currently used by MNE**

| Market development | Customer |
|---|---|
| • New product sales as a % of total (5 years or less)<br>• Major new product introductions<br>• Number of patent idea disclosure/applications<br>• Number of acquisition/alliance leads (signed NDA) | • Number of technical papers, presentations or trade articles<br>• Sales by market code (actual vs. plan and last year)<br>• Margin by market code (actual vs. plan and last year)<br>• Customer complaint frequency (due to sales/marketing) |
| **Financial** | **Customer service** |
| • Total sales (actual vs. plan and last year)<br>• Total bookings (actual vs. last year)<br>• Gross profit (actual vs. plan and last year)<br>• SM expense (actual vs. plan and last year) | • Call volume (calls per day)<br>• PLP price change index (%)<br>• Return material authorization (% of occurrences)<br>• New parts added (#) |

| Domestic orders by month (# of orders/shipments) | International marketing metrics |
|---|---|
| • Domestic quotes by month (#) <br><br> • Monthly and YTD financial results by industry (sales, GM, %) <br><br> • Month-end bookings by market (actual, budget, %) <br><br> • Volume/price analysis (volume change, price change, product mix change, total change) <br><br> • Top 15 customers by industry (sales, GM, %) <br><br> • Sales by family code and by part (month, year) <br><br> • Marketing department period expenses <br><br> • Advertising and sales promotion details <br><br> • New product sales: sales, GM %, GM $, units <br><br> • Monthly and YTD new product results by market <br><br> • YTD new product results by market <br><br> • Customer service call analysis <br><br> • Return goods analysis: gross value, number of occurrences | • By subsidiary and by region <br><br> • Net sales (local, USD; actual, budget, %; monthly, YTD) <br><br> • Gross margin <br><br> • Period expenses <br><br> • Net profit <br><br> • Net profit and net royalties <br><br> • Inter-company business <br><br> • YTD consolidated sales <br><br> • YTD consolidated margins <br><br> • Market segment reports <br><br> • Sales (3 years and budget) <br><br> • Gross margin (3 years, budget, %) <br><br> • Monthly and YTD consolidated |
| Transmission marketing metrics | International export sales – customer |
| • Number of projects (by subsidiary and project status) <br><br> • Quotation amounts (by subsidiary and project status) <br><br> • Total order amounts (by subsidiary | • Customer rating <br><br> • Customer complaints <br><br> • Customer complaints cost, shipping related |

| | |
|---|---|
| and country) <br> • International export sales – financial <br> • Net sales to budget – YTD <br> • Gross margin to budget – YTD <br> • Share of regions meeting individual YTD forecasts <br> • Minimum mark-up on sales <br> • Period expenses to budget | • Customer complaints cost, product related <br> • Quote response time <br> • New customers <br> • International export sales – people and learning <br> • Customer product training |

## 5.4    CONCLUSION TO CHAPTER FIVE

In chapter five, SM was researched and the association to the LTS Model in Figure 3.1 was explored. It was found that as with financial metrics, SM metrics have a significant role to play, considering their relationship to the LTS Model as described in Figure 3.1 again, it becomes apparent that there is no particular metric or a set of elements which can be used to determine long-term sustainability of an MNE, rather the combination of the elements is a more measured and logical method of determination.

As marketers, considering the LTS Model in Figure 3.1, Mintz and Currim (2012: 17) admit that they do not speak the same language as either senior managers nor FMs, so it remains imperative that senior managers can bridge this divide on behalf of their subordinates. Institutions such as the Institute for the Study of Business Markets (ISBM) have continually advocated developing marketing metrics and the linking of marketing-mix activities with financial metrics.

Mintz and Currim (2012: 17) assert that practitioners have recognized the demands for marketing accountability. A 2007 Deloitte study indicates that 83% of marketing managers are increasing their emphasis on marketing metrics and Lenskold/Group (2009) report that 79% of managers indicate greater need for employing financial metrics to assess marketing-mix performance.

As with the financial elements, SM metrics and elements are of equal importance in contribution towards the LTS and contribute towards all aspects of meeting the long-term goals, vision and mission of the MNE. Therefore, all elements are considered to be of equal importance.

# CHAPTER SIX
# MANUFACTURING AND OPERATIONS
# CONTRIBUTION TO THE LTS OF AN MNE

## 6.1    INTRODUCTION

This chapter will examine OM theory currently used in industry, as well as new ideas that are presently being explored. It is prudent to mention at this stage, that the field of OM is extremely large and complex, and the research is limited to what is pertinent to the MNE being researched in the case study. The relevant theories will be compared with existing practices within the MNE, thereby allowing for the development of a system that can be employed to both identify potential areas of improvement, as well as to improve the status quo within the MNE. Figure 6.1: shows the manufacturing and operations elements deemed relevant to this case study. These are explored in the context of the case study and the OM element of the Sustainability Model will be investigated. The OM elements comprise various aspects, which will be discussed next.

**Figure 6.1: Operation elements**
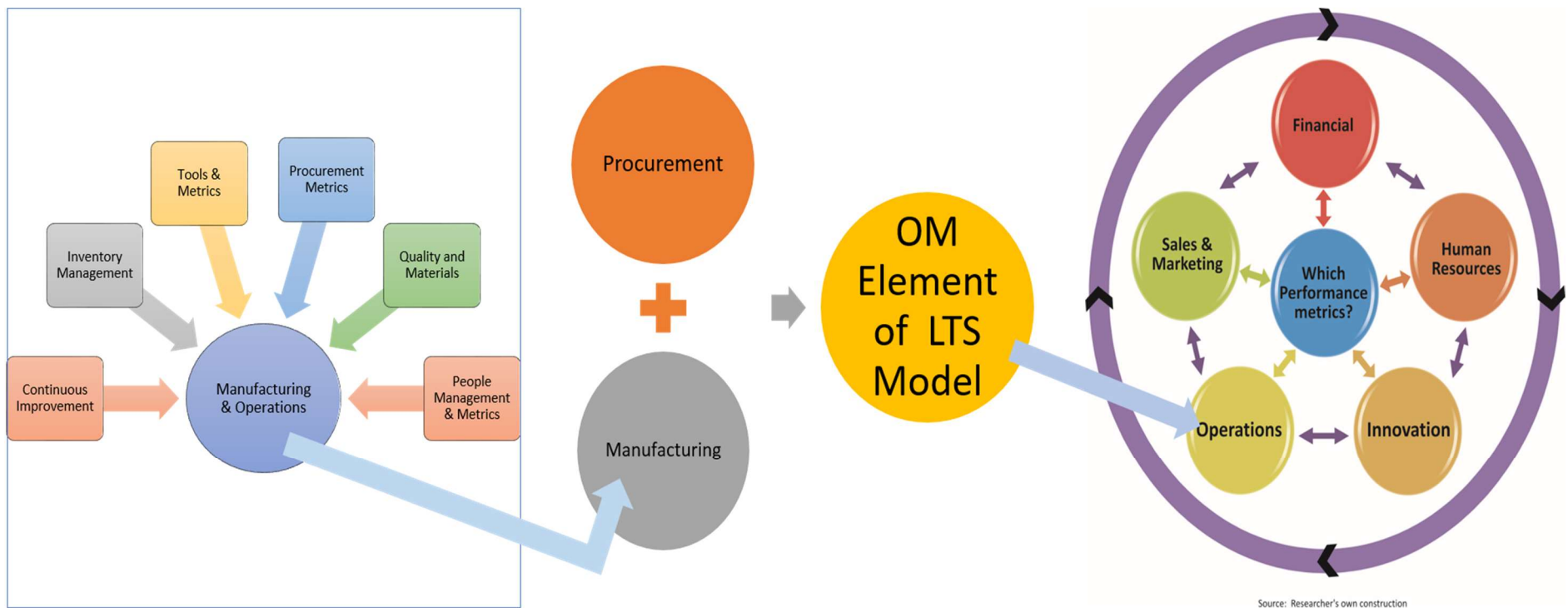


Source: Researcher's own construction

## 6.2 THE MANUFACTURING METRICS

**Figure 6.2: The manufacturing elements**



Source: Researcher's own construction

As briefly discussed in chapter three, theories may be applied to assist with improvements in all areas of the business, including office efficiency. The aforementioned methodologies are well documented, widely used and have proven to be successful when properly implemented in organisations. However, tailoring is required to ensure that it is suitable to the organisation where being implemented.

In the industrial week census of a manufacturer's document, differences are highlighted in the ways corporate-level manufacturing executives and their plant-level counterparts perceive the American manufacturing landscape. The corporate suite and the shop floor, however, share views in two important areas, namely that both quality management and CI efforts are the driving forces behind any endeavour to achieve manufacturing excellence (Jusko, 1999).

**Figure 6.3: CI Metrics**



Source: Researcher's own construction

### 6.2.1 LM and CI

Below are some basic definitions which according to Rabino and Mann (2009), describe the methods that were used at Anderson Corporation to implement a lean process and more specifically what approach and methods were used and implemented.

The outcomes of the initiative were that more than 1000 ideas were implemented per year amounting to six per employee, and that employees consequently requested involvement in quality circles and kaizen activities, therefore exchanging ideas and discovering best practices to implement in their workplace.

- Kaizen: continuous and incremental improvement to remove waste variance and overburden.

- Teian Kaizen: system used for gathering and implementing employee ideas with a special focus on the rate of implementation rather than the dollar value of the ideas.

- Waste: everything that is not adding value in the eyes of the customer (think transportation, inventory, motion, waiting, overproduction, over processing, defects).

At the Arkansas Manufacturing Solutions Company, consultants discuss the rationale behind the use of lean tools in the general office environment and describe the process briefly in their work on lean office wastes (https://www.mfgsolutions.org/resources/). According to these consultants, LM typically is thought of as a manufacturing improvement process, but the methodology, principles and techniques should not be limited to a production facility. General offices, shipping and receiving, engineering, services organisation and other departments can also benefit from lean techniques. With the mention of very similar areas of focus, it stands to reason that the focus areas of LM remain almost identical in either office or manufacturing environments and that the same type of methodologies can be applied to both. To further support the lean office principle, Markovitz (2009) discusses the office as an area where LM needs to be applied and added to this, focuses on areas such as the inbox of the employee.

Barber and Tietje (2008) hypothesize that lean thinking has become pervasive in manufacturing, but its use in sales remains exploratory. In their paper, they demonstrate the sales application of an essential tool for lean management called value stream mapping. They state that we conceptualize sales as a process in which a buyer and seller jointly participate in creating value, and using a case study, they demonstrate how this process can be mapped and analysed. They finally discuss opportunities and challenges for future research, particularly the importance of customer-centric value metrics. They believe that value stream mapping is the first tool to use in LM and that this process can be applied in the office as well as in a manufacturing environment.

Langstrand and Drotz, (2015); Rao and Wang, (1995); Scalera, Dumitrescu and Talpová, (2012) argue in support of the notion that lean tools are transferable to both administration and manufacturing, applicable to a wide range of institutions and organisations. Furthermore, the competitive scenario in which companies are currently operating is being largely affected by international recessions, increasing competitiveness, new ideas and technology. Some of these influences include the crisis involving the Euro, Brexit and the wars in the Middle East. They discuss that currently, companies are being called upon to ensure quality and innovation of products as well as to supply the customer with services at competitive prices. These are possible only by removing waste and improving production efficiency. However, a distinction must be made between manufacturing companies and service companies. In the study being conducted, the focus is on the manufacturing type of organisation with relevance to MNEs.

## 6.2.2   The 5S and 6S Management System

The 5S system was initially based on the Japanese acronyms of seiri (organisation), seiton (neatness), seiso (cleaning), seiketsu (standardisation) and shitsuke (discipline) Gapp, Byrne, (2013: 81); Fisher and Kobayashi, (2008: 565–579); Kumar, Chauhan, Chaudhary and Juneja, (2017). In Table 6.1 is a short description of the five meanings of the management system translated into English.

**Table 6.1 The 5S Management System**

| 1. Seiri or sort | To throw away what is not needed |
|---|---|
| 2. Seiton or straighten | To create and maintain order |
| 3. Seiso or shine | To clean |
| 4. Seriketsu or standardise | To develop rules to maintain the first three S's |
| 5. Shitsuke or sustain | To maintain the discipline of the first four S's |

The 5S system depicted in Table 6.1 is used as a platform for developing an integrated management system. In some organisations, it is an accepted practice to add an additional S to embody safety as a key management objective and the acronym then becomes 6S.

A framework of applying 5S within a business, as opposed to a personal philosophy or way of life, was first formalised in the early 1980s by Takashi Osada. The practice of 5S aims to embed values in an organisation of neatness, cleaning, standardisation and discipline in the workplace (Byrn, ( 2013); Kumar et al., (2017); Osada, (1991: 120–128). The Toyota Production System provides a well-known example of 5S principles in practice, the technique whereby standard work is a reference and is considered one of the most important Damiani, (2012: 27–28); Osada, (1991)). Figure 6.4 below is an example of a 6S workplace checklist which has been constructed using the 5S system with an additional section on safety in the workplace and is used to determine the level of compliance, of a section or area in the workplace, within an organisation. This example is constructed in such a way that a score is determined to gauge the level of adherence to an expected standard.

The workplace scan checklist in Figure  6.4 is used as part of a larger scorecard shown below in Figure 6.5. This document is an example of a scorecard used in a subsidiary of the MNE being researched. In the case study, the colour codes are a visual tool to express the outcome of the scores in an easily understandable format and the three colours pertain to the performance criteria. The green colour

means that the area appraised is of a high standard. The yellow colour is an acceptable standard but still requires some work and the red colour shows that the area is below an acceptable standard and significant work is required to bring the area up to the organisation's required standard.

**Figure 6.4: Example of 6S Workplace scan checklist**

# Workplace Scan Checklist

| Number of Problems | Rating Level | Month: |
|---|---|---|
| 5 + | Level 0 | |
| 3-4 | Level 1 | **Year:** |
| 2 | Level 2 | |
| 1 | Level 3 | |
| None | Level 4 | |

| Category | Item | Level |
|---|---|---|
| **Sort** | **Distinguish between what is needed and not needed** | |
| | Unneeded items in the workarea are present | |
| | Unneeded or outdated items are on walls, bulletin boards, etc. | |
| | Items are present in the aisle ways. | |
| | Unneeded inventory, supplies, parts, or materials are present | |
| **Set In Order** | **A place for everything and everything in its place** | |
| | Identified places for items are not obvious | |
| | Items are not in their correct places | |
| | Aisle ways, workplaces, equipment locations are not indicated | |
| | Items are not put away immediately after use | |
| **Shine** | **Cleaning, and looking for ways to keep clean and organized** | |
| | Floors, walls and surfaces are not free of dust, oil, and grease | |
| | Equipment is not kept clean and free of dust, oil, and grease | |
| | Cleaning materials are not easily accessible | |
| | Lines, labels, signs, etc. are not clean and unbroken | |
| **Standardize** | **Maintain and monitor the first three categories** | |
| | Nesessary information is not visible (Machine settings, visual management tools) | |
| | All standards are not known and visible (ISO procedures & work instructions) | |
| | Checklists don't exist for all cleaning and maintenance jobs | |
| | All quantities and limits are not easily recognizable (Raw material levels on the floor) | |
| **Sustain** | **Stick to the rules** | |
| | How many workers have not had 6S training? | |
| | How many times are personal belongings not stored in the proper location? | |
| | How many times are job aids not available or up to date? | |
| | How many times last week were daily 6S inspections not performed? | |
| **Safety** | **Eliminate Safety Hazards** | |
| | How many fire extinguishers are blocked and are not accessible? | |
| | How many exit routes are blocked and are not clearly marked? | |
| | How many machine guards are not in place? | |
| | How many chemicals are not properly labled? | |
| | **Total** | 0 |

Source: Researcher's own construction

# Figure 6.5: Example of a subsidiary wide scorecard

| | | 2016 | Jan | Feb | Mar | Apr | May | Jun | Jul | Aug | Sep | Oct | Nov | Dec |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | | | | | | | | | |
| 80 + % | Area 1 | Workshop | 81 | 75 | 71 | 75 | 85 | | | | | | | |
| 66 -79% | Area 2 | Incoming Goods | 88 | 87 | 95 | 93 | 93 | | | | | | | |
| 65 - % | Area 3 | Forming/Degreasing | 82 | 86 | 64 | 61 | 74 | | | | | | | |
| | Area 4 | Gluing/Gritting/ Cabling | 79 | 93 | 76 | 89 | 80 | | | | | | | |
| | Area 5 | Bending/ ball-end/C.T. centre | 77 | 77 | 82 | 68 | 76 | | | | | | | |
| | Area 6 | Consumable stores | 80 | 80 | 75 | 88 | 94 | | | | | | | |
| | Area 7 | Factory offices/Canteen | 89 | 76 | 77 | 89 | 93 | | | | | | | |
| | Area 8 | Foundry & Tool room | 92 | 91 | 79 | 76 | 90 | | | | | | | |
| | Area 9 | PVC Centre/presses/ PG-AWS Centre | 83 | 83 | 85 | 61 | 75 | | | | | | | |
| | Area 10 | Finished Goods/ Basement | 81 | 81 | 95 | 79 | 89 | | | | | | | |
| | Area 11 | Test Laboratory | 82 | 77 | 84 | 88 | 91 | | | | | | | |
| | Area 12 | Office block | 79 | 76 | 97 | 81 | 92 | | | | | | | |
| | Overall | Overall PLP SA Score | 83 | 83 | 82 | 79 | 86 | | | | | | | |
| | | | | | | | | | | | | | | |

Source: Researcher's own construction

In the current competitive scenario, characterised by a deep international recession, it seems increasingly clear that an organisation's competitiveness is critically important. With a view to customer satisfaction, the critical success factors such as minimised costs, time taken in the production of goods, service supply, improved quality and increased organisational flexibility must be strictly fulfilled.

Organisations use many methods to measure metrics within their respective operations. These can keep people focused and pulling in the same direction and, to make an organisation's purposes tangible, managers translate the organisation's mission and values that contribute particularly to its existence, into a set of goals and performance measures that make success understandable for everyone. This is the real bottom line for every organisation, whether it's a business, school or hospital (Melnyk et al., 2004: 209–217).

In Figure 6.6 below is an example from an MNE used to measure the subsidiaries performance by the use of metrics.

**Figure 6.6: An example of metrics used in an MNE**
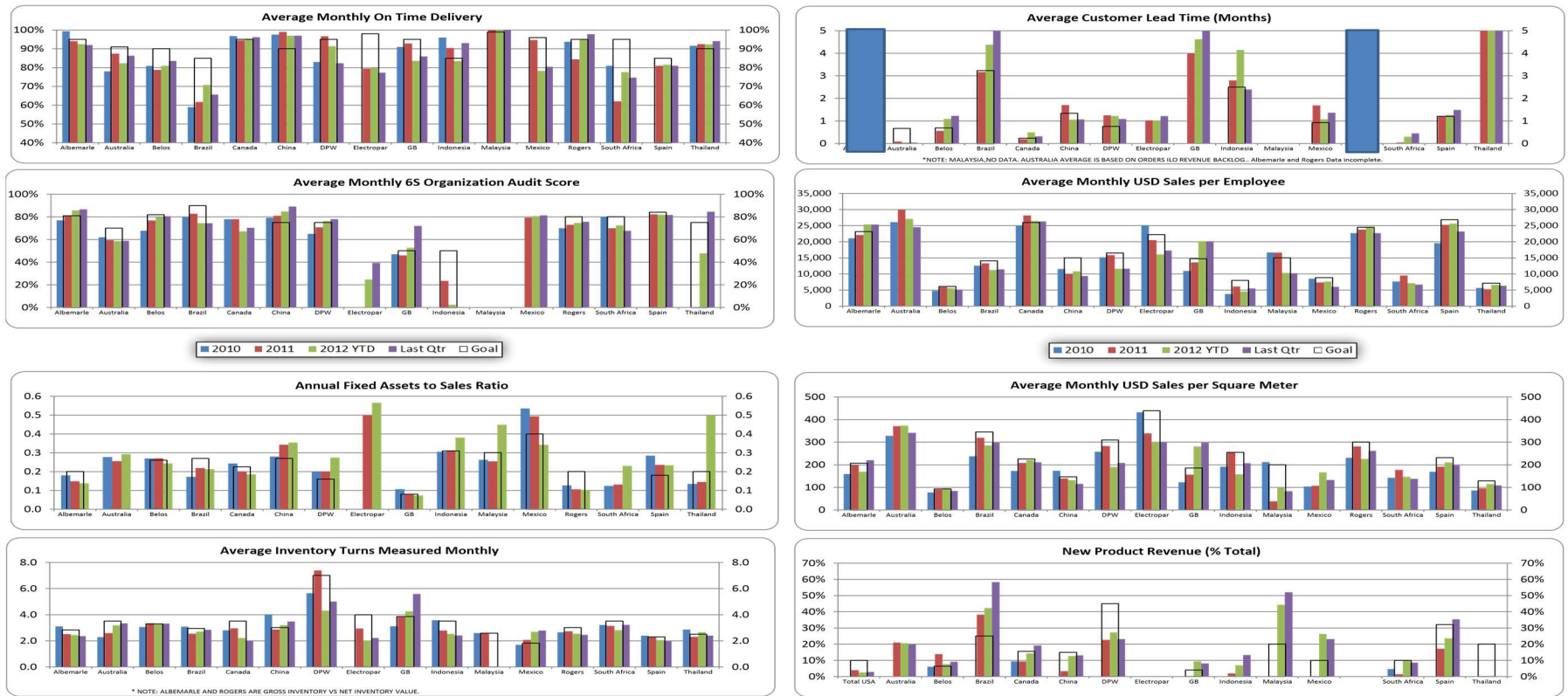


Source: Researcher's own construction

### 6.2.3    Manufacturing tools and methods

The question arises as how to measure the effectiveness of the tools if one assumes that they are being used and secondly if these tools are making a substantial difference to the desired outcome. The measuring of these benefits must surely have a financial impact on the organisation and therefore the measure of success must be determined in monetary terms to the benefit of stakeholders.

Saurin, Marodin and Ribeiro (2011), in their work on assessing lean production principles, claim that the development of the framework includes four stages: (a) defining LP practices applicable to manufacturing cells; (b) defining attributes for each practice; (c) defining a set of evidence and sources of evidence for assessing the existence of each attribute; and (d) drawing up a model of the relationships among the LP practices, based on a survey with LP experts. This model supports the identification of improvement opportunities in MC performance, based on the analysis of their interfaces. They further conclude that there are two innovative characteristics: (a) it focuses on assessing the extent to which LP practices are used at the cell level, unlike previous methods of lean assessment that have focused on lean principles and/or outputs in the plant as a whole; and (b) it includes a model of the relationships among lean practices, which helps to put into practice the so-called necessity of understanding LP from a systemic view. The most time-consuming of the assessment stage, proved to be observing cell functioning. Nevertheless, the observations were essential for a better understanding of how each practice worked. The interviews were most useful for assessing attributes that could not be discerned easily and visually, such as that of CI. The feedback meeting supported the identification of factors that had an impact on compliance with the established requirements, since this provided the main opportunity to discuss the results with employees.

Fernando and Cadavid (2007) emphasise that LM was developed by Toyota Motor Company to address their specific needs in a restricted market in times of economic trouble and that the concepts have been studied and proven to be transferrable and applicable in a wide variety of industries. Their work aims to

integrate a set of metrics that have been proposed by different authors in such a way that they are consistent with the different stages and elements of LM implementations. To achieve this, they believe that two frameworks for lean implementation are pertinent and the main factors for success are used as the basis to propose metrics that measure the advance in these factors. A tabular display of the impact of Lean activities on the metrics is presented, proposing that many assumptions about the benefits on several different levels of improvement should be accurate.

They further conclude that LM implementation requires the establishment of an environment that makes the rest of the elements of the process possible. This environment (set up by management), will ensure that employees feel empowered, have the necessary tools to gain product and process ownership, engage in focused team work and autonomy in the development of solutions and process improvements. Five main dimensions can be measured to assess the degree of evolution in a Lean transformation. These are elimination of waste, CI, continuous flow and pull driven systems, multi-functional teams and information systems. Four or five metrics were defined for each of the dimensions.

It is commonly known, according to (Asim, (2017); Damiani, (2012); Netland, 2015; Scalera et al, (2012), that the origins of LM principles are derived mostly from the Toyota Model with its modern evolution represented by World Class Manufacturing (WCM). This allows a rapid and continuously improving organisation-wide logistics-production cycle, through the elimination of any kind of waste and loss (Muda). This is only possible if an appropriate and disciplined approach is formulated throughout the culture of the organisation. In recent years, this has led to a resurgence of interest in LM.

### 6.2.4 Time variances, work studies and standard times

Haas, Wallace and Waltmans (2007) discuss that currently, both micro-standard data and macro-standard data systems are used in industry. The micro-systems are better known as pre-determined time systems and include among others, Methods-Time Measurement (MTM), Work Factor, Basic Motion Time-Study (BMT) and Motion-Time Analysis (MTA). The older macro-systems are based on

time study, while recent ones are based upon a pre-determined time system. The better-known and more popular macro-systems are based upon MTM.

Gupta, Ganesan and Sivakumar (2009) emphasise that minimizing cycle time variance helps in safe predictions of the completion of job production and thus in providing the same quality of service to customers. In their paper, they conclude that to allow an improved ability to meet the due dates reliably, there must be a greater coordination with further downstream operations on wafers.

The study observes that the waiting time of the job in the system has a very significant effect on the minimization of cycle time variance of jobs in dynamic systems. For normal levels of utilization factor 0.7, 0.8, and 0.9, processing times of jobs have a significant effect on the minimization of cycle time variance along with waiting times. However, for high levels of utilization, the waiting times of jobs dominate the processing times and hence rules using only waiting time information perform well. It therefore stands to reason that time from variance standards play a significant role and contribute positively to the outcome of a sustainable production system, making it an imperative to measure and report on variance metrics.

### 6.2.5 Manufacturing metrics and tools

Fernando and Cadavid (2007) reinforce that LM is much more than a manufacturing technique. It is a different way of viewing the labour relationships, the way operations are done, and the way value is added. Therefore, different methods of measurement should be used. Their work presents some of the commonly used performance metrics in the research literature.

Within the MNE, many metrics are already in use and there is a lot of data supporting the theory concerning standard time vs variance. This theory, having been developed over a significant period states that if measured consistently, the data can determine if there is any significant improvement on standard time.

According to Gupta et al. (2009), in the quest to improve manufacturing performance, a number of broad-based operations management philosophies such as Total Quality Management (TQM), Just-in-Time (JIT), Lean Manufacturing (LM), Theory of Constraints (TOC) and more recently Six Sigma (SS) and Supply Chain Management (SCM) have been proposed in the literature and are being implemented in practice. It is widely held that the successful implementation of these philosophies requires systems thinking, functional integration and flatter organisational structures. From the OM's perspective, these practices require managers to work on cross-functional implementation teams and participate in cross-functional decision-making processes.

It therefore stands to reason, that these changes can be measured and will invariably deliver changes to the CI process (LM, TOC, Variances etc.). considering this, these changes can elicit positive changes in the morale and attitude of the workforce (human resource based) when attending to specific work or tasks.

In a paper on manufacturing in a Japanese environment, Umble, Umble and Murakami (2006) talk about TOC performance measurement systems being based on the principles of throughput accounting, which are incorporated through the implementation of concepts such as throughput, inventory, operating expense, throughput dollar day and inventory dollar days. Audit processes/guidelines such as the categories of legitimate reservation and the layers of resistance are of further importance. They cite Goldratt's five focusing steps as being:

- Identify the system's constraint(s).
- Decide how to exploit the system's constraint.
- Subordinate everything else to the above decisions.
- Elevate the system's constraint.
- If a constraint is broken, go back to step 1.

More specifically, these five focusing steps are utilised to guide the improvement process, incorporating the TOC knowledge embodied in VAT classification theory

(V-shaped process flow, A-shaped process flow, AT plant-numerous combination process flow), the specific applications and the throughput accounting principles as appropriate. In many cases, this approach is sufficient to generate significant system-wide improvements.

Gupta and Boyd, (2008); Puche et al. , (2016); Campdesuñer et al. , (2017); and Tao, Xia and Xi ,(2017) suggest that TOC can be used as a unifying theory in operations management. This is not necessarily industry or sector dependant. Further to this, a significant amount of journal articles have been written to support this notion that suggests that the basic concepts of TOC have not changed significantly over the past decade nor are they limited to special areas within industries.

Gupta and Boyd, (2008); Puche et al., (2016); and Tao et al., (2017) believe that the use of TOC offers a new paradigm in operations management and that it replaces an over-riding concern for efficiency within the achievement of organisations goals and can focus on the bottlenecks which occur in systems, allowing managers to focus on the elimination of these hindrances.

### 6.2.6    CI Scorecard / Metrics

The measurement below in Graph 6.1 shows a graph of the labour efficiency data collected from the MNE over a period of six years. The graph also demonstrates that since monitoring of the situation began in 2010, a significant improvement has been seen in efficiency, the measurements were started in 2007 with negative value (currency losses) improving to a positive efficiency in 2012 (positive currency gains) . This confirms the saying that, "if you don't measure you don't know!" This phrase is used extensively throughout the MNE being researched.

**Graph 6.1: Labour Efficiency data collected from MNE**
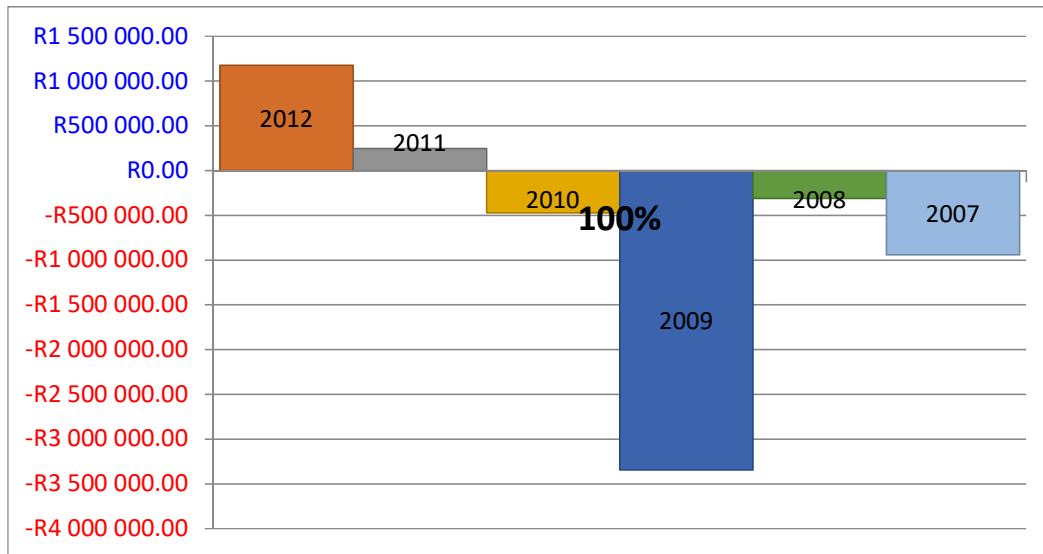


Source: Researcher's own construction

Graph 6.1 is a representation and an in-depth look at the improvement of labour efficiency trend on a month-to-month basis over a period of 72 months. A positive trend shows a cost saving against a standard efficiency measurement, in the graph taking this into consideration, it is noteworthy that the trend shows a positive improvement in labour variances measured against standards for the years shown, and that with a concerted and consistent approach to solving the issues, from both an operational and a human resource standpoint, a significant improvement can be achieved. It is also noteworthy that there are periods where there are lapses and upon further investigation, these lapses when analysed in detail can be reversed, this is achieved by focused management, for example, the analysis can direct the MNE management team to focus on specific areas of concern, determine the reason for the sudden reversal and then intervene to prevent further slide and in most cases reverse this adverse situation.

**Graph 6.2: Graph of improvement trends**
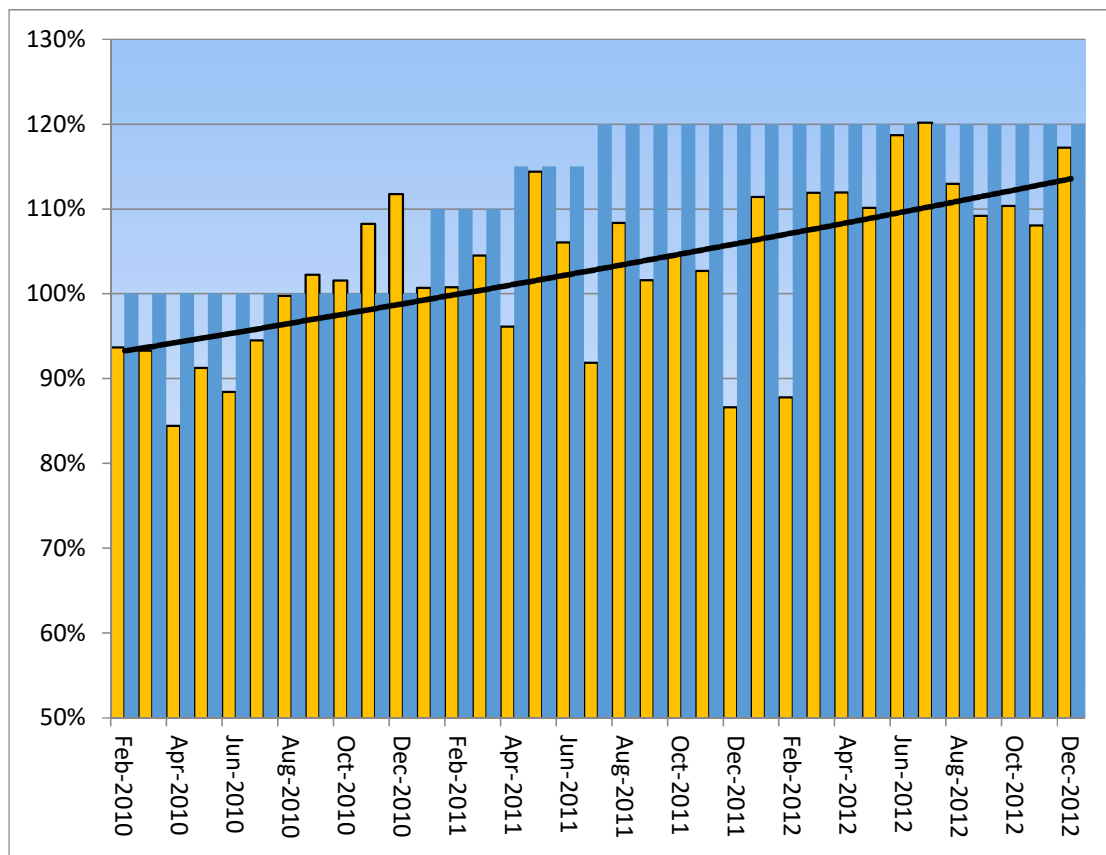
Graph 6.2 is an example taken from a subsidiary of the MNE. In the graph, a process change has made a significant contribution to the overall improvement of a manufacturing work cell. The cell has been sustained over a long enough period to satisfy senior management that intervention created a long-term sustainable improvement. The improvement is a contribution to the overall advancement of the organisation. However, as is seen in the graph nothing is perfect as there were periods where lapses meant that management intervention was necessary. During November to December 2010, an equipment malfunction meant that the upgraded technology could not be used, and the employees had no option but to revert to the old methods of manufacture, which although acceptable, nevertheless, had a negative effect on the outcome of the manufacturing process. These influences were negative both financially and in delivery to the end user or customer and therefore had a negative impact on the on-time-delivery metric.

**Graph 6.3: Graph of process change**



PAINT/ASSEMBLY-LABOUR MINUTES
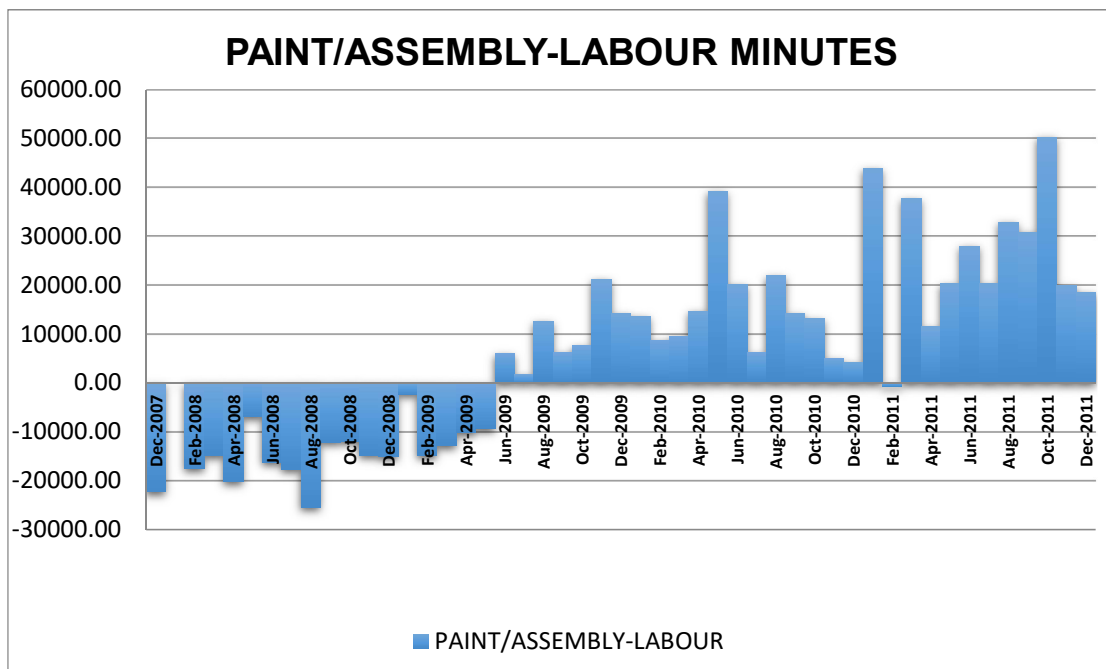
Source: Researcher's own construction

Graph 6.3 is an example of an erratic pattern of labour variances against the standard. It was determined to be both operational and labour related. There was an intervention and an improvement were expected but this would only occur if there was sufficient training, equipment maintenance and a significant change in the attitude of employees towards their work ethic. The outcome of this intervention remains to be seen.

As discussed above, the impact is detrimental to the long-term sustainability of the organisation as it has a financial as well as customer centricity effect, due to on time delivery. The effect this problem has on the organisation's ability to convert goods also requires consideration.

A further negative impact is financial, and it could be problematic if the negative effect on the cash flow of the organisation cannot be brought under control. So, in summary it can be argued that processes not brought under control can have a significant negative effect on the long-term sustainability of an MNE.

Petersen (2010) makes use of an example of the case of Ohio and Pennsylvania-based Elyria Hodge Foundries Co., an organisation with more than 100 years of experience in the industry. They recently undertook a massive change in the way they operate, based on the concepts of LM, to bring new concepts to one of the oldest manufacturing industries to distinguish itself in an increasingly tight marketplace. "Faced with the external pressures of China and some of the other lower cost manufacturers globally, the need to have a competitive advantage needs to be on the operations side because it's not going to be on the low labour rate side" (Petersen, 2010: 76). They embarked on a process with the application of Kaizen events or CI workshops. A cross-function team of hourly and salaried workers examined bottlenecks in the plant's production processes, searching for time wasted on non-value-added activities. These employees looked for defects, overproduction, waiting time, excess motion, inventory and extra transportation.

The LM produced good measurable results as well as more manufacturing space (a further financial consideration), and markedly a reduction in lead-time thus improving customer satisfaction.

**Graph 6.4: Graph representing foundry-labour**
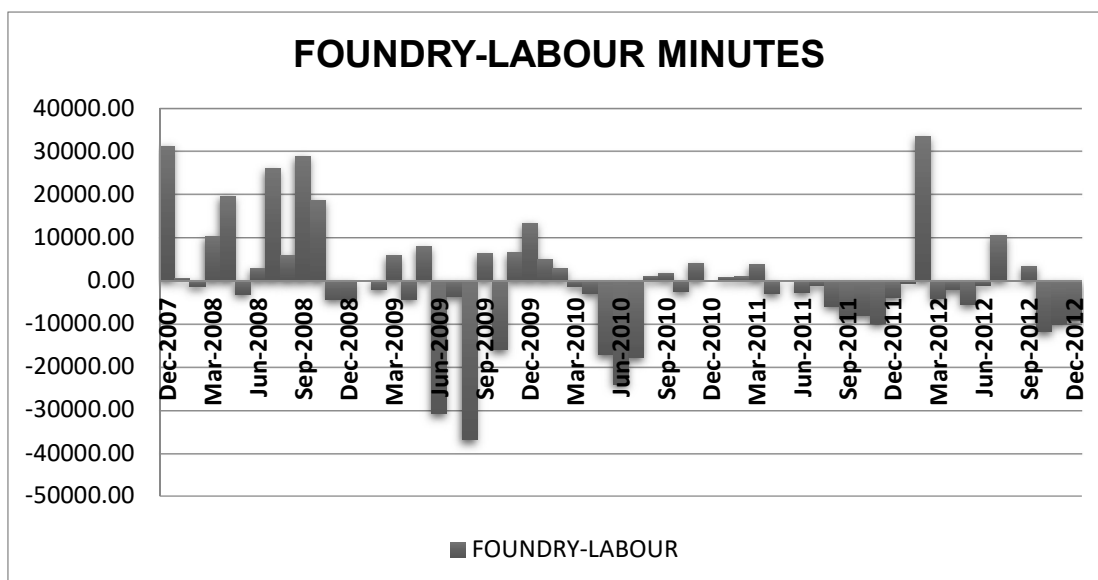


Source: Researcher's own construction

### 6.2.7    Quality and performance metrics

Quality performance metrics, such as first-pass quality yield, scrap and rework costs (as a percentage of sales) and warranty costs are better suited to plants that have implemented quality programs (Jusko, 1999).

**Figure 6.7: Quality and performance metrics**



Source: Researcher's own construction

Li, Su and Chen (2011) briefly describe the Supply Chain Operations Reference (SCOR) Model. It was introduced by the Supply Chain Council (SCC), an independent, not-for-profit, global corporation interested in applying and advancing the state-of-the-art in supply chain management systems and practices. They further postulate that according to the SCC, the SCOR Model integrates the concept of business process re-engineering, benchmarking and process measurement into a cross-functional framework.

The model spans all customer interactions from order entry to paid invoice, product transactions from supplier's supplier to customer's customer, as well as all market interactions from the understanding of aggregate demand to the fulfilment of each order. According to Li et al. (2011), once an effective management process is captured in standard process reference model form, it can be implemented effectively to achieve competitive advantage and be tuned to a specific purpose.

The five SCOR components namely plan, source, make, deliver and return prove effective. Each of the components is considered both an important intra-organisational function and a critical inter-organisation process. The framework can be viewed as a strategic tool for describing, communicating, implementing, controlling and measuring complex supply chain processes to achieve good performance.

Further to this, they highlight in their findings that decision-making is more important to the internal-facing quality performance than to the customer-facing business performance. This result suggests that effective production standards and statistical process control can avoid defects to reduce the cost of goods sold. In addition, it suggests that communication among trading partners on demand, and production capacity can help to improve capacity utilisation and increase return on assets. The results also indicate that commitment to quality standards contributes to revenue improvement.

Therefore, there is a strong conviction that the measurement of quality is imperative to the CI process and that this contributes to the long-term sustainability of an MNE. Further to this, it would stand to reason that the correct metrics must be determined with the MNE to measure appropriate results or contributions to results. Table 6.2 represents an example of measurable quality metrics.

### 6.2.8    Quality measurement metrics

**Table 6.2: Measurable quality metrics**

| Indicator | Dec-12 | Nov-12 | Oct-12 | Sep-12 | Aug-12 | Jul-12 |
|---|---|---|---|---|---|---|
| Foundry scrap rate: | 6.28% | 5.44% | 2.20% | 1.30% | 3.48% | 2.90% |
| Helical scrap rate: | 12.0% | 6.35% | 3.54% | 4.12% | 3.47% | 4.36% |
| OTD delivery: | 62% | 78.50% | 87.00% | 76.50% | 85.92% | 88.2% |

Source: Researcher's own construction

**Figure 6.8: Foundry scrap metric**
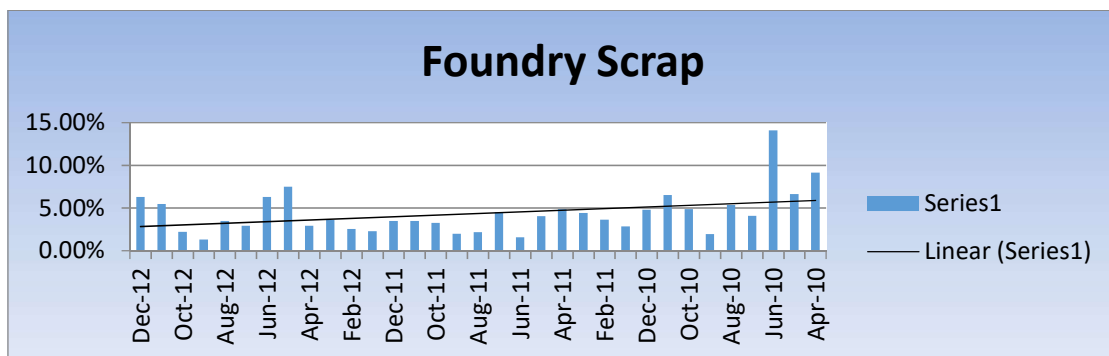


Source: Researcher's own construction

**Figure 6.9: Helical scrap metric**
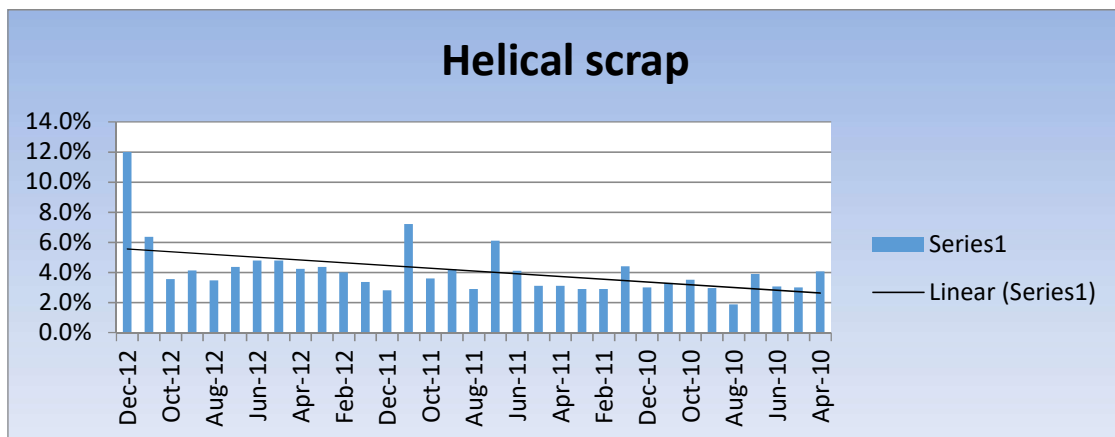


Source: Researcher's own construction

**Figure 6.10: OTD Metric**
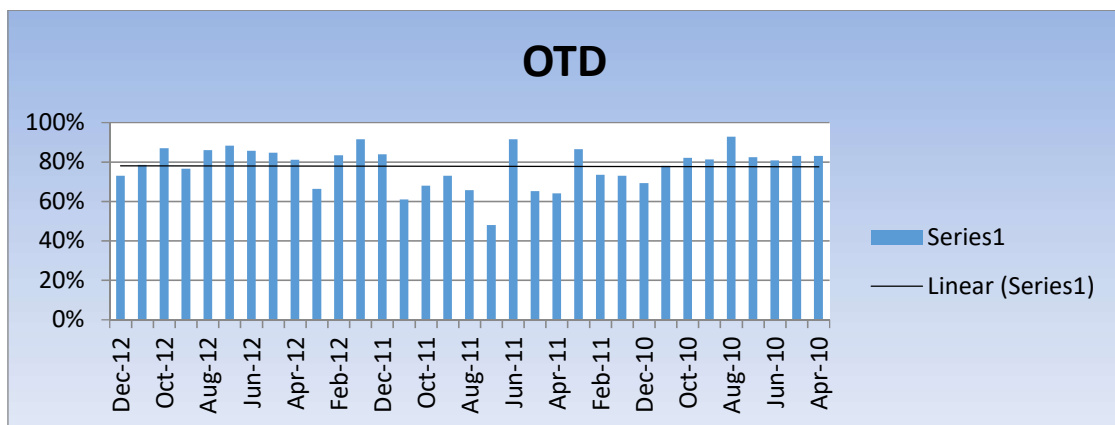


Source: Researcher's own construction

## 6.3 STRATEGIC PURCHASING

Purchasing is an activity that happens everywhere. As an activity, it is practised by almost everyone who engages at some stage in the purchase of items from shops, catalogues, the internet and many other sources. There are also multiple reasons for the purchasing of goods, involving many emotional and practical reasons. However, purchasing for a business or corporation is handled very differently to the general day-to-day purchasing of private goods for private households.

Even within the realms of corporate purchasing, there are different levels of procurement. For example, there will be different methods and procedures for the purchase of stationary, capital equipment and raw materials for the running of a manufacturing plant Figure 6.11 shows how the strategic purchasing elements fit into the OM elements, which in turn form part of the LTS Model of the MNE.

Importantly in a manufacturing environment, the procurement of raw materials (input materials) is one of the most significant factors in gaining a competitive advantage. In simple terms, if the raw material is too expensive, then the finished goods will also be expensive and no matter how much money is saved on efficiency, there will always be a strong likelihood that the organisation will be uncompetitive. It is also important to note that the procurement of any materials is not a static process as it requires skill in many areas and the most notable is the ability to adapt to changes in the industry, which is the source of the goods required. This means that a top-class procurement specialist needs to be attuned to the markets that are responsible for the materials required by an MNE.

Leveraged purchasing is increasingly viewed as an important activity. The impact this can have on competitive advantage seems obvious and extends beyond pure savings-based programs. Procurement incorporates the wider issue of adding more value and growing revenues. For example, procurement now includes the management of supplier risk, as it has a procurement process that involves a legal department (Atkinson, 2007).

Strategic purchasing has evolved with organisational growth and improvements in technology have contributed to the ability of MNEs to extend their purchasing strategy beyond country borders. Improved communication between companies' subsidiaries has paved the way for collective bargaining techniques to leverage on supply chains, thereby extracting value and enhancing competitive advantage where possible.

**Figure 6.11: Strategic purchasing elements**
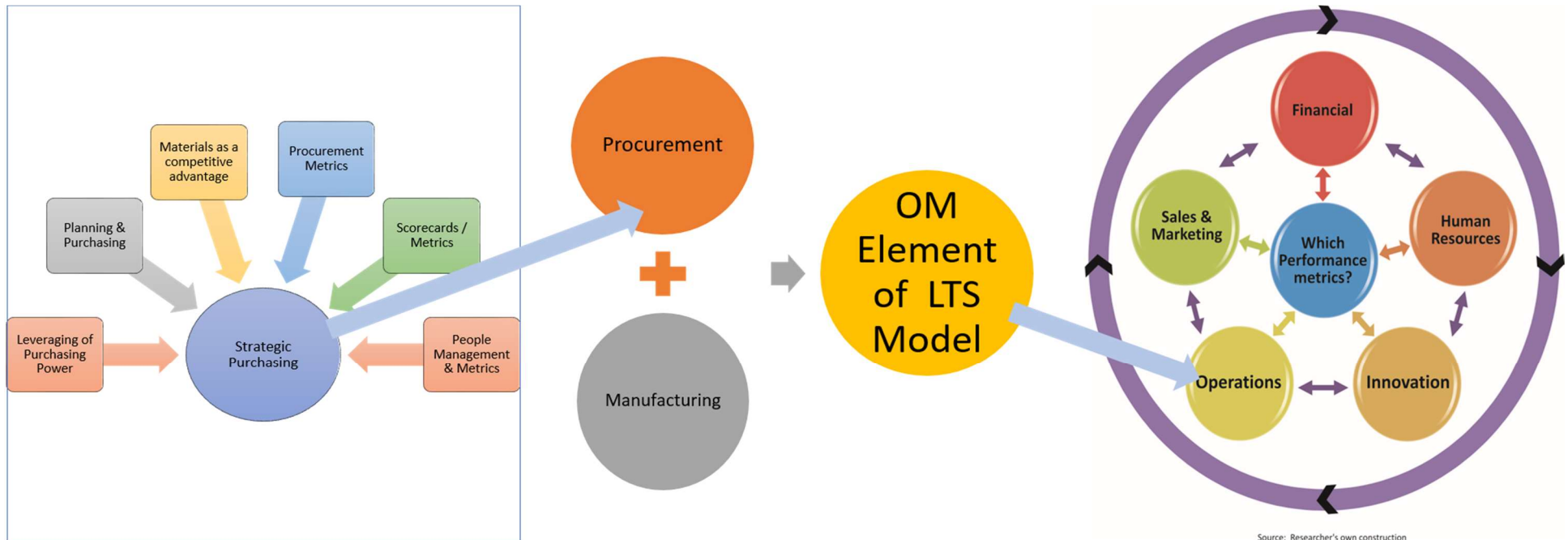


Source: Researcher's own construction

According to Hugo and Badenhorst-Weiss (2011), purchasing refers to deciding what, when and how much to purchase, the act of purchasing it and the process ensuring that what is required is received on time, in the quantity and quality specified. However, strategic purchasing is defined as the process of planning implementing, evaluating and controlling strategic and operating decisions for directing all activities of the purchasing function towards opportunities consistent with the organisation's capabilities to achieve its long-term goals.

Lawson, Cousins, Handfield and Petersen (2009) argue that purchasing is increasingly seen as an important strategic activity of the organisation. There is little evidence of work done around the effects of strategic purchasing on an organisation's inter-organisational supply management practices and performance. They also determined from their hypothesis that strategic purchasing was found to have an indirect, but significant effect on improving buyer performance, acting through supplier integration. Strategic purchasing also had a noteworthy effect on the use of socialisation mechanisms, but not on supplier responsiveness. Their research further uncovered an indication that close, long-term supplier relationships can lead to the creation of relational rents. They conclude that strategic purchasing leads to improved supplier integration and socialisation mechanisms, providing overall improvements in buyer performance. Having a supply chain that can react quickly, efficiently and effectively to intense market pressures would appear to be key to maintaining a sustainable competitive advantage.

Certain performance metrics are certainly more advantageous than others. Morgan (2000) asserts that the most unwanted metrics include purchase orders per buyer/staff member, line items per buyer/staff member, dollars committed per buyer/staff member, average open dollar commitment and cost avoidance or cost savings per purchasing dollar spent. Morgan (2000) further highlights the difficulty most respondents experience in describing what new or revised metrics should look like. Moreover, the most sought-after metrics include a few well-chosen metrics that establish (for procurement and suppliers) performance in quality control, on-time delivery and cost reduction.

There is little evidence regarding the effects of strategic purchasing on an organisation's inter-organisational supply management practices and performance. There is therefore, a need to undertake research on an ongoing basis, both inside, outside the organisation and on a truly international basis. This would clarify which countries are likely to remain politically stable, tackle environmental issues and provide a base for outsourcing. Such countries are likely to offer the most appropriate opportunities for supplier base development, represent end-user markets and potential with respect to trade offset deals and present potential for technology transfer. Progressive governments are likely to encourage local companies to forge strategic alliances with companies based overseas, thereby increasing their standing within the industry by developing a sustainable competitive advantage (Trim, 2005).

Lawson et al. (2009) discuss strategic procurement and their analysis concludes that strategic purchasing has a positive impact on both supply management practices, as well as the returns from the supplier relationship. Their research indicates that organisations can gain collaborative advantage and extract relational rents from building a distinctive capability in strategic purchasing. The results suggest that significant value can be created through improved supplier relationship management long after contracts have been finalised (Lawson et al., 2009).

From the discussion above it is evident that those metrics derived to measure strategic procurement will significantly contribute to the LTS of the MNE.

**Figure 6.12: Strategic purchasing**



Source: Researcher's own construction

### 6.3.1    Leveraging of purchasing power

It is obvious that price is an important element in any procurement decision, but it is questionable if price is everything. Trade-offs in quality and even delivery times may also be part of good practice in the procurement process.

Even price can be deceptive. For example, if raw materials are purchased offshore, then a comparison between the price of local goods in the warehouse, needs to be compared via the same comparison to the imported goods, where a myriad of hidden expenses may need to be uncovered. Some of these include but are not limited to transportation from the port of arrival, all shipping costs, customs duties, off-loading charges, port charges, agency fees and transportation to the warehouse. Therefore, it is imperative that the procurement department is aware of these expenses so that the responsible person can make the correct procurement decision.

There is a need to undertake research on an ongoing basis, both inside the organisation and externally on an international basis. This would clarify which countries are likely to remain politically stable, tackle environmental issues and provide a base for out-sourcing. Such countries are likely to offer the most appropriate opportunities for supplier base development, represent end-user markets and potential with respect to trade offset deals and current potential for technology transfer. Progressive governments are likely to encourage local companies to forge strategic alliances with companies based overseas and increase their standing within the industry by developing a sustainable competitive advantage.

### 6.3.2    Organisational planning and purchasing

Planning is essentially the process determining the objectives and then deciding on what should be done to achieve these objectives. In essence, purchasing planning includes decision-making on what the supply objectives are, then determining a plan of action aimed at achieving the objectives within an expected or predicted future business environment (Hugo and Badenhorst-Weiss, 2011).

### 6.3.3    Materials as a competitive advantage

As mentioned previously, input raw material pricing is one of the most important facets of a manufacturing business. In simple terms, an increased competitive advantage can be achieved the more one can save. This equates to improved profit margins. There is a strong correlation in manufacturing between the ability to be sustainable in the long-term and the ability to exercise buying power to improve chances of remaining competitive. This can be measured in many different ways. The simplest way of measuring savings is by searching for the best price, but more important than the quick savings approach, is to determine the other benefits from the procurement of the material. These may include lead times, quality of material, backup and support. All of these lead to an improved customer - supplier relationship.

### 6.3.4    Procurement Scorecard / Metrics

A competitive, intelligence planning system should be developed that contains data and information from specific buyer - seller network arrangements and can be used to facilitate collaboration with key suppliers. Figure 6.13 is an example of this. The strategic objectives of both the organisation and the key suppliers should be monitored. When purchasing staff are given a higher platform within the organisation, it is essential that senior management prepare them to take on the extra responsibilities. Attention needs to be paid to changing market conditions to establish what skills and knowledge are required in the years ahead. Research and intelligence gathering need to have a clear focus and gaps in staff development need to be identified and accommodated. Training is an ongoing process and should be refocused to produce purchasing strategists who are better able to work with staff from marketing, finance and operations. This will ensure that purchasing staff can operate at higher levels of accountability and responsibility within the organisation and play a pro-active role in strategy formulation (Trim, 2005).

Morgan (2000) writes about the importance of having an appropriate measurement and performance system to identify the effectiveness of a specific

system. He, however, cautions against the use of metrics that are subjective and therefore cannot contribute to an effective valuation system. He recommends the use of on-time-delivery, cost reduction and quality control metrics as important metrics, but also that these metrics need to be agreed on with the suppliers to create a stronger supplier – customer relationships with transparent, honest and open communication.

**Figure 6.13: Suppliers (vendors) rating list**

| Material | Supplier | Price | | | Quality | | | On time delivery | | | BEE Score | | | Total Score | QMS | APPROVAL LEVEL |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | M | W | S | M | W | S | M | W | S | W | S | S | | | QMS (PREFERRED) |
| | | | 0.4 | 0 | | 0.3 | 0 | | 0.2 | 0 | 0.1 | 0 | | | | |
| GALV STEEL WIRE | XIANYANG | 2 | 0.4 | 0.8 | 2 | 0.3 | 0.6 | 2 | 0.2 | 0.4 | 0 | 0.1 | 0 | 1.8 | SPEC | B |
| | CAPE GATE | 3 | 0.4 | 1.2 | 1 | 0.3 | 0.3 | 2 | 0.2 | 0.4 | 1 | 0.01 | 0.01 | 1.9 | ✓ | B |
| | SCAW | 1 | 0.4 | 0.4 | 3 | 0.3 | 0.9 | 2 | 0.2 | 0.4 | 2 | 0.1 | 0.2 | 1.9 | ✓ | B |
| ALUMINIUM WIRE | MIDAL | 2 | 0.4 | 0.8 | 3 | 0.3 | 0.9 | 3 | 0.2 | 0.6 | 0 | 0.1 | 0 | 2.3 | SPEC | A |
| | APAR | 3 | 0.4 | 1.2 | 1 | 0.3 | 0.3 | 1 | 0.2 | 0.2 | 0 | 0.1 | 0 | 1.7 | SPEC | B |
| ZINC INGOTS | M.R ZINC | 2 | 0.4 | 0.8 | 3 | 0.3 | 0.9 | 3 | 0.2 | 0.6 | 1 | 0.1 | 0.1 | 2.4 | ✓ | A |
| | AMANDLA METALS | 1 | 0.4 | 0.4 | 3 | 0.3 | 0.9 | 2 | 0.2 | 0.4 | 2 | 0.1 | 0.2 | 1.9 | | B |
| ALUM CASTINGS | MALLEABLE CASTING | 2 | 0.4 | 0.8 | 1 | 0.3 | 0.3 | 2 | 0.2 | 0.4 | 0 | 0.1 | 0 | 1.5 | ✓ | B |
| U BOLT MATERIAL | MACSTEEL | 3 | 0.4 | 1.2 | 2 | 0.3 | 0.6 | 2 | 0.2 | 0.4 | 2 | 0.1 | 0 | 2.2 | ✓ | A |
| CARTONS | COROKRAFT | 3 | 0.4 | 1.2 | 3 | 0.3 | 0.9 | 2 | 0.2 | 0.4 | 1 | 0.1 | 0.1 | 2.6 | ✓ | A |
| | CORROSEAL | 2 | 0.4 | 0.8 | 1 | 0.3 | 0.3 | 2 | 0.2 | 0.4 | 2 | 0.1 | 0.2 | 1.7 | | B |
| | NAMPAK | 2 | 0.4 | 0.8 | 2 | 0.3 | 0.6 | 1 | 0.2 | 0.2 | 2 | 0.1 | 0.2 | 1.8 | | B |
| RLP03/AWD | KAYMAC | 2 | 0.4 | 0.8 | 2 | 0.3 | 0.6 | 2 | 0.2 | 0.4 | 1 | 0.1 | 0.1 | 1.9 | ✓ | B |
| FASTENERS | LIBERTY BOLT | 3 | 0.4 | 1.2 | 2 | 0.3 | 0.6 | 2 | 0.2 | 0.4 | 3 | 0.1 | 0.3 | 2.5 | RETAIL | A |
| | BOLT N NUT CENTRE | 2 | 0.4 | 0.8 | 3 | 0.3 | 0.9 | 2 | 0.2 | 0.4 | 2 | 0.1 | 0 | 2.1 | RETAIL | A |
| PVC MATERIAL | CONTINENTAL | 2 | 0.4 | 0.8 | 3 | 0.3 | 0.9 | 2 | 0.2 | 0.4 | 2 | 0.1 | 0.2 | 2.3 | | A |
| ALUM INGOTS | INSIMBI ALLOYS | 2 | 0.4 | 0.8 | 3 | 0.3 | 0.9 | 2 | 0.2 | 0.4 | 1 | 0.1 | 0.1 | 2.2 | ✓ | A |
| | A.C.P | 2 | 0.4 | 0.8 | 3 | 0.3 | 0.9 | 2 | 0.2 | 0.4 | 0 | 0.1 | 0 | 2.1 | ✓ | A |
| | WINSOR METAL | 2 | 0.4 | 0.8 | 2 | 0.3 | 0.6 | 2 | 0.2 | 0.4 | 1 | 0.1 | 0.1 | 1.9 | | B |
| PALLETS/CRATES | WOODRITE | 3 | 0.4 | 1.2 | 2 | 0.3 | 0.6 | 2 | 0.2 | 0.4 | 2 | 0.1 | 0.2 | 2.4 | ✓ | A |
| | TWDM PRODUCTS | 1 | 0.4 | 0.4 | 2 | 0.3 | 0.6 | 2 | 0.2 | 0.4 | 3 | 0.1 | 0 | 1.4 | | C |
| EXTRUSIONS | HULAMIN | 1 | 0.4 | 0.4 | 3 | 0.3 | 0.9 | 3 | 0.2 | 0.6 | 1 | 0.1 | 0.1 | 2 | ✓ | A |
| GLUE | HENKEL | 2 | 0.4 | 0.8 | 2 | 0.3 | 0.6 | 2 | 0.2 | 0.4 | 1 | 0.1 | 0.1 | 1.9 | ✓ | B |
| | MELTON | 2 | 0.4 | 0.8 | 3 | 0.3 | 0.9 | 3 | 0.2 | 0.6 | 3 | 0.1 | 0.3 | 2.6 | ✓ | A |
| GRIT | WILEC | 1 | 0.4 | 0.4 | 3 | 0.3 | 0.9 | 2 | 0.2 | 0.4 | 2 | 0.1 | 0.2 | 1.9 | ✓ | B |
| | PMB INDUSTRIAL | 3 | 0.4 | 1.2 | 3 | 0.3 | 0.9 | 3 | 0.2 | 0.6 | 2 | 0.1 | 0.2 | 2.9 | | A |
| | W.D ABRASIVES | 2 | 0.4 | 0.8 | 1 | 0.3 | 0.3 | 3 | 0.2 | 0.6 | 2 | 0.1 | 0.2 | 1.9 | | B |
| COPPER WIRE | MALESELA | 2 | 0.4 | 0.8 | 3 | 0.3 | 0.9 | 2 | 0.2 | 0.4 | 2 | 0.1 | 0.2 | 2.3 | ✓ | A |
| SHACKLES/EWI | EBERHARDT MARTIN | 2 | 0.4 | 0.8 | 2 | 0.3 | 0.6 | 2 | 0.2 | 0.4 | 1 | 0.1 | 0.1 | 1.9 | ✓ | B |
| CR70 COMPOUND | NRC BELTING | 2 | 0.4 | 0.8 | 2 | 0.3 | 0.6 | 3 | 0.2 | 0.6 | 0 | 0.1 | 0 | 2 | ✓ | A |
| ALUM/COPPER GRIT | BELMONT METAL | 3 | 0.4 | 1.2 | 3 | 0.3 | 0.9 | 2 | 0.2 | 0.4 | 0 | 0.1 | 0 | 2.5 | SPEC | A |
| PLASTIC THIMBLES/SHEEVE | KLIP N THINGS | 3 | 0.4 | 1.2 | 3 | 0.3 | 0.9 | 3 | 0.2 | 0.6 | 2 | 0.1 | 0.2 | 2.9 | PROCESS | A |
| | JR. TRADING | 2 | 0.4 | 0.8 | 3 | 0.3 | 0.9 | 2 | 0.2 | 0.4 | 0 | 0.1 | 0 | 2.1 | | A |
| STAINLESS STEEL WIRE | WIRE PRODUCTS | 2 | 0.4 | 0.8 | 3 | 0.3 | 0.9 | 2 | 0.2 | 0.4 | 0 | 0.1 | 0 | 2.1 | ✓ | A |
| GALVANISERS | PHOENIX GALV-DBN | 2 | 0.4 | 0.8 | 2 | 0.3 | 0.6 | 3 | 0.2 | 0.6 | 2 | 0.1 | 0.2 | 2.2 | ✓ | A |
| | E R GALVANISERS | 3 | 0.4 | 1.2 | 3 | 0.3 | 0.9 | 2 | 0.2 | 0.4 | 0 | 0.1 | 0 | 2.5 | ✓ | A |
| NEOPRENE INSERTS | BLP RUBBER | 3 | 0.4 | 1.2 | 1 | 0.3 | 0.3 | 1 | 0.2 | 0.2 | 2 | 0.1 | 0.2 | 1.9 | ✓ | B |
| SPACER BARS (UBOLTS) | DBN STEEL | 3 | 0.4 | 1.2 | 3 | 0.3 | 0.9 | 2 | 0.2 | 0.4 | 2 | 0.1 | 0.2 | 2.7 | | A |

Source: Researcher's own construction

**Figure 6.14: Suppliers contact list**

| DIV | DESCRIPTION | PALCE | TEL NO: | CONTACT PERSON | BBBBEE SCORE | QA SYSTEM |
|---|---|---|---|---|---|---|
| PMB | COPPER WIRE | VEREENIGING - JHB | 016-4508344 | GIOVANNA REYNHARDT | 4 | ISO 9001:2008 |
| PMB/JHB | HOUSINGS/ MTC70/BRACKETS | GERMISTON - JHB | 011-8221503 | NASEERA/JOE FLETCHER | | SANS 936:2008 |
| PMB | AWD/RPL03 | BIRMINGHAM RD-PMB | 033-3871507 | GREG VISICK/GLEN CHETTY | 6 | ISO 14001:2004 |
| | OVERSEAS- GALV STEEL WIRE | | | | | 0 |
| | INTERCOMPANY | | | | | 0 |
| JHB | STEEL RODS | DUNSWART-BOKSBURG | 011-8975000 | DEREK MURPHY | 4 | ISO 9001: 2008 |
| PMB | STEEL RODS | PROSPECTON-DBN | 031-9132600 | JUNAID ESSOP | 4 | ISO 9001 |
| | IMPORT CLEARING AGENT | | | | 5 | ISO 9001:2008 |
| PMB | GALV STEEL WIRE- 5.22mm | GERMISTON - JHB | 011-6200251 | LORNA | 4 | ISO 9001:2000 |
| | LOCAL TRANSPORT | | | | LETTER IN FILE | |
| PMB/JHB | ALUM INGOTS | JACOBS- DBN | 031-4651022 | SEAMESH | 6 | ISO 9001:2008 |
| | LOCAL TRANSPORT | | | | to email | |
| | OVERSEAS- ALUM WIRE | | | | | |
| PMB/JHB | DSK120 - DISK SHACKLE | NEWLANDS - JHB | 011-2880050 | DARRYL WATSON | 7 | ISO 9001:2008 |
| | INTERCOMPANY | | | | | |
| PMB | CARTONS | NEW GERMANY -DBN | 031-7052700 | SUE NAIDOO | 8 | ISO 9001:2008 |
| | INTERCOMPANY | | | | | |
| PMB/JHB | ALUM INGOTS | GERMISTON - JHB | 011 0219223 | ROB HALLABY | | ISO 9001:2008 |
| PMB | FASTENERS | GREYLING STREET-PMB | 033-3429101 | MELANIE WILLIAMS | 3 | RETAILS - TEST CERTS FROM ACCREDITED COMPANY |
| PMB | PLPCR70 - COMPOUND WRAPLOCK | WILLOWTON-PMB | 033-3871330 | CALVIN | | ISO 9001:2008 |
| | OVERSEAS- ALUM/COPPER GRIT | | | | | |
| PMB | WOODEN CRATES/PALLETS | MASONS MILL-PMB | 033-3980571 | COLIN LOVE | 3 | ISPM CERTIFICATION |

Source: Researcher's own construction

### 6.3.5   Methods of measurement in strategic procurement

**Figure 6.15: Materials savings graph/metric**
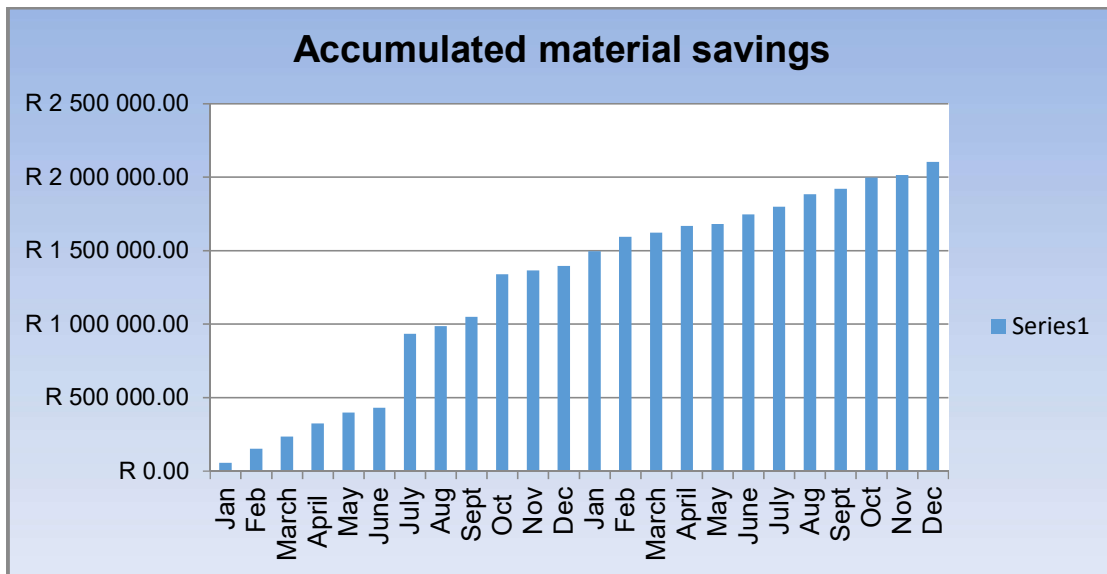


Source: Researcher's own construction

## 6.4   CONCLUSION TO CHAPTER SIX

In chapter six, it was evident that there is a multitude of tools and measurements that can be engaged to determine the effectiveness of a manufacturing facility. Some of these have been discussed in this chapter. According to Bühler, Wallenburg and Wieland (2016) and Dörnhöfer, Schröder and Günthner (2016), efficient manufacturing and logistics processes are key to competitive advantage.

The ability to supply the right product at the right time or On-time Delivery in Full (OTDIF) to the customer with an optimum lead-time takes precedence. The obvious challenge is to determine the correct metrics, which can ultimately contribute to the long-term sustainability of the MNE. As covered in this research, the heart of an excellent manufacturing business is in the efficiency of its operations and the people who manufacture the products, the level of motivation of the workforce and the innovation shown by its engineering. No specific division in an organisation can claim to be of importance over and above other divisions.

In chapter six, the theory of the measurements pertaining to operations managements was researched and discussed. From the research, a questionnaire was constructed and distributed among the target group within the operations environment so that their collective view on the appropriate metrics could be assimilated for analysis and interpretation.

It is important at this point to emphasise that the measurements in manufacturing and operations are vast and vary from simple to complex. The question of which metrics determine the long-term sustainability of an MNE will become more evident when the responses to the questionnaires are analysed in the conclusion of this research in chapters nine and ten.

# CHAPTER SEVEN
# THE HUMAN RESOURCE CONTRIBUTION
# TO THE LTS OF AN MNE

## 7.1    INTRODUCTION

Chapter seven will examine HRM theory currently used in industry, as well as new ideas that are being explored. There is agreement that HRM contributes to the success of organisations, both short and long- term (Melton and Meier, 2016; Oke, 2016). As HRM concerns the management of people, it is prudent to mention that the field of HRM is large and complex.

The research undertaken was limited to what was pertinent to the MNE researched in the case study. The comparison of relevant theories with existing practices within the MNE can facilitate the development of a system that can be employed to identify potential areas of development, as well as improve the status quo within the MNE. These were explored in the context of the study and the HRM element of the Sustainability Model was investigated. The HRM elements in Figure 7.1 comprises of various aspects and theories that will be expanded.

## 7.2    HRM METRICS

The dimension of regulatory frameworks in different countries directly influences human resource strategies. This differs from one organisation to the next and between various countries. There is no doubt that modern organisations operate in volatile business environments and they are affected by internal and external issues, so therefore they have to adapt where necessary. These influences may even include external governance practices (Oyewunmi, Osibanjo, Falola and Olujobi, 2017). According to Oke (2016), it is the human element that plans, organizes, directs, controls, trains and maintains people towards achieving organisational goals and objectives.

**Figure 7.1: The HR Element**
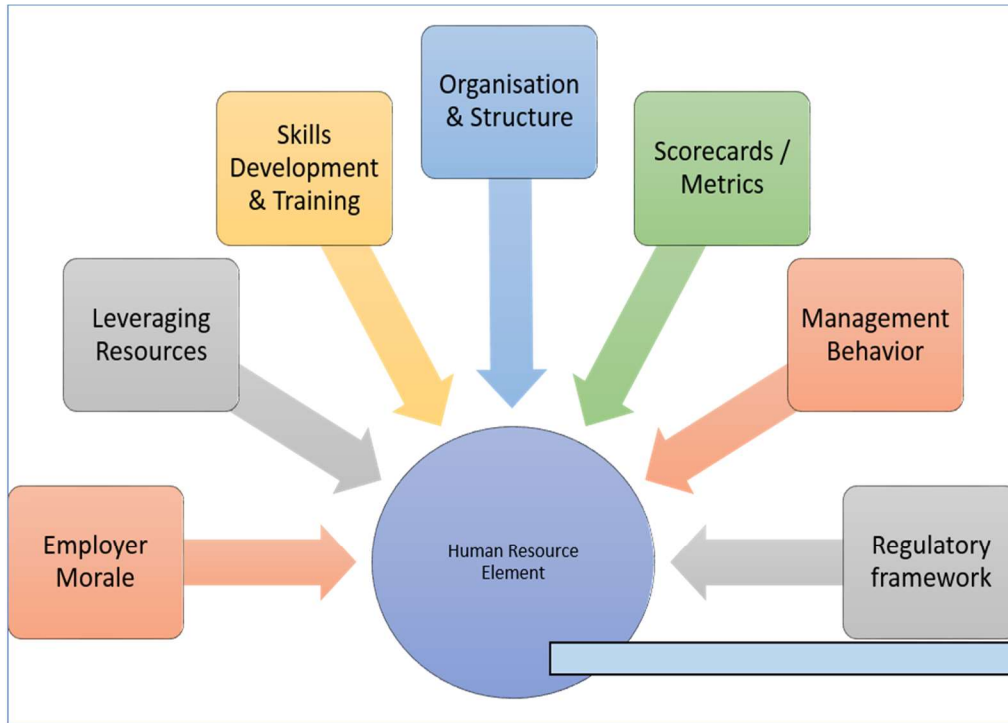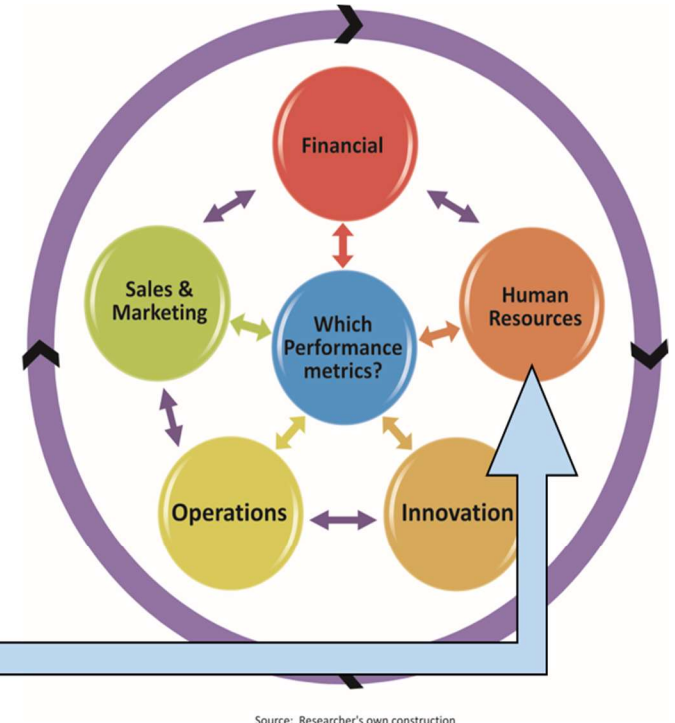


Source: Researcher's own construction

When considering external influences, American MNEs operating in Europe found that whilst the European community is a single market, any attempt to provide common labour standards and laws for employees remains incomplete (Lee, 1994). Moreover, rapid changes in these organisations' product and labour markets are far more fascinating than the effect of the incomplete social dimension, therefore human resource management will respond to economic, rather than social legislation (Lee, 1994).

Fitz-enz (2007) states that quantitative formulas to measure and report human resource work were non-existent before 1980. However, currently, human capital management is a new, slowly evolving movement. Further to this Fitz-enz (2007) explains that at the turn of the 21st century, people began discussing employee commitment and talent management, but even now these terms are not yet well defined. If HR is going to become a strategic contributor to any organisation, it needs an operating model that integrates its various functions, has predictive capability and a measurement system.

From a South African perspective, it is important to have a strategy to comply with Broad-based Black Economic Empowerment (BBBEE). Additionally, the organisation's BBBEE status should be certified on a BBBEE scorecard by a recognised verification agency. Arguably, this has an impact on competitiveness; however, literature mostly argues that the incorporation of this code of practice in the South African context will have a positive effect on an organisation's competitiveness when dealing with local government and parastatal organisations.

Both du Plessis, (2016); and Irene (2017) agree that BBBEE has not created a competitive advantage for the target group it was intended to favour. Du Plessis (2016) further postulates that in both the financial and industrial sectors, BBBEE non-compliant organisations out-performed BBBEE compliant companies. The findings and analysis also showed that industrial BBBEE compliant organisations were less risky than non-compliant organisations in the same sector. The opposite was found to be true of the financial sector with the non-compliant organisations being less risky. Irene (2017) focused findings on the small

business sector and in particular on black female participants, the outcomes were generally adversarial. This largely answers the question in that being BBBEE compliant, does not necessarily have a positive effect on global competitiveness.

According to Harzing and Sorge (2003), divergence is synonymous with the embeddedness of organisations and other actors in societies that differ either at regional or national level or in other more distinctive local arrangements. Societies have characteristics and specific elements, such as a normative institutional order, the cultural disposition of various actors across the board, and economic and industrial structures. Convergence implies a relative degree of dis-embeddedness of practices or structures, overriding more specific regional and national institutions or behavioural predispositions. Different organisational influences, resulting from localised rules and regulations regarding labour and industrial relations, may render a positive or prohibitive effect on long- term sustainability (Harzing & Sorge, 2003).

Currently, MDs acknowledge that human capital management is critical to the fundamental success of the business (78% of respondents). About half of the MDs (52%) believe measurement is key to the delivery of human capital management and only 30 percent believe shareholders, while investors are concerned about people reports and measures. Over half (52%) of the HR professionals used external benchmarking, while only 13 percent said they do not use benchmark studies. Competitive benchmarking was important to keep up with competitors and to compare the efficiency of Human Resource Metrics (HCM) processes. Those who felt it was less important said it was not a priority or they had few competitors (Weiss, Knightsbridge & Finn, 2005).

**Figure 7.2: Human Resource Management Metrics**



Source: Researcher's own construction

## 7.3    IMPROVING EMPLOYMENT MORALE

Cunningham (2016) in her work on key drivers used to promote employee motivation elaborates on employee engagement being vital for organisational success. However, working in the manufacturing environment can often be repetitive and mind numbing. Repetitive work, if not addressed correctly can have negative impacts on individuals and society. It can cause stress-related mental and physical health problems, employee dissatisfaction and turnover, dysfunctional union/management relationships and large social class differences in wealth. Managers must rely on human potential to improve their employees' overall performance. When an employee withdraws from their task, engagement levels decrease, and this leads to burnout. Job Characteristics Theory explains via its framework that improved employee engagement is possible with the interplay between the job components and the person's psychological-living aspects.

## 7.4    LEVERAGING OF RESOURCES AND SKILLS RETENTION

For many organisations, key skills retention, employee motivation and attendance are crucial operational or even strategic issues in that they impact directly on organisational costs, productivity and business performance. Richard Branson quoted "Clients do not come first. Employees come first. If you take care of your employees, they will take care of the clients," (Branson, 2014). Taking a holistic view of the key elements of the business is therefore most likely to impact team engagement, motivation, attendance and retention, linking individual assessment directly to the key drivers of the business. Furthermore, recognizing that key talent is likely to thrive on experience-based career leverage opportunities is vital in today's highly competitive environment. A Personnel Today employer branding survey, which included responses from 1,900 senior respondents in the UK, indicated that employee retention initiatives are foremost in the minds of people tasked with developing their organisations as employers of choice. Retaining key organisational talent requires combined thinking, a clear business-driver link and a good deal of understanding and energy (Glen, 2006).

According to Ramlall (2004), critical factors of relevant motivation theories and the implications for developing and implementing employee retention practices are based on employee needs or their individual, family and cultural values. In addition, these needs depend on the current and desired economic, political, and social status, career aspiration, the need to balance career, family, education, community, religion and other factors, as well as a general feeling of one's satisfaction with the current and desired state of being. Successful management of talent and employee retention leads to organisations achieving and maintaining a long-term strategic advantage and as such, attaining a competitive edge (Van Zyl, Mathafena and Ras, 2017). The study highlights that improved talent management leads to increased productivity, motivated staff, innovation and high employee contribution towards the organisation.

Employees want to work in an environment that is productive and respectful, provides a feeling of inclusiveness and offers a friendly setting. Given that an employee feels competent to perform in a more challenging capacity and has previously demonstrated such competencies, they may require additional responsibilities with fair and equitable reward. Supervisors, managers and other leaders more frequently than others, feel a need to teach, coach and develop others. In addition, these individuals would seek to influence the organisation's goals, objectives and strategies designed to achieve the mission of the organisation. Fairness and equity are important as employees want to be treated and rewarded in a fair and equitable manner regardless of age, gender, ethnicity, disability, sexual orientation, geographic location or other similarly defined categories. With increased effort and higher performances, employees also expect to be rewarded more significantly than their counterparts who provide output at or below the norm. The employee's effort and performance at any level is influenced by their individual goals and objectives and this would vary between people. The concept of talent management (TM), investigated by Gallardo-Gallardo, Thunnissen and Scullion, (2017); and van Zyl et al., (2017) found that there is little doubt that it is currently a contentious issue. Some of their conclusions include that, in TM, a strong focus is directed towards the private sector, particularly multinational companies. TM also has critics who believe that

when implementing these strategic types, little attention is paid to national, cultural and labour legislation differences within countries and scant detail is given to the size of the organisation and the environmental issues.

An outcome or reward that is perceived to be highly significant and important can result in a higher level of effort and performance by the individual employee. Even though employees may exert higher levels of effort into a position, based on a perceived significant reward, this could be a short-term success if the task itself does not challenge or provide satisfaction to the employee.

From an employee development perspective, an employee prefers to function in an environment that provides challenges, offers new learning opportunities and they are able to contribute significantly to the organisation's success. Of further significance is if the organisation offers opportunities for advancement and personal development, based on success and demonstrated interest in an area.

In their work on conceptualizing and researching employer branding, Backhaus and Tikoo, (2004); O'Brien, (2017) and Vinayak, Khan and Jain, (2017), emphasise that employer branding represents an organisation's efforts to promote, both from within and outside the organisation. This provides a clear view of what makes the organisation different and desirable as an employer and employees then internalize the organisational values. Employer branding also facilitates employee retention, which has started to gain popularity among practicing managers in recent years. Given this managerial interest, the research presents a framework to initiate the scholarly study of employer branding. All agree that there is an essential competitive advantage to employer branding and that a consistent focus on such a strategy to align individual and organisational needs enables an organisation to achieve its LTS goals. Combining a resource-based view with brand equity theory, a framework is used to develop testable propositions. This work encapsulates the relationship between employer branding and organisational career management. Finally, it outlines research issues that need to be addressed to develop employer branding as a useful organizing framework for strategic human resource management.

As brands are among an organisation's most valuable assets, it stands to reason that the physical brand can be further leveraged and used as a tool to promote itself as a desirable organisation to work at. As a result, brand management being a key strategy in most organisations, can be used to promote in human resource management. The application of branding principles to human resource management has been termed "employer branding" Backhaus and Tikoo, (2004); O'Brien, (2017); Vinayak et al., (2017). Increasingly, organisations are using employer branding to attract recruits and assure that current employees are engaged in the culture and strategy of the organisation.

Although employer branding is a relatively new approach to recruiting and retaining the best possible human talent within an employment environment, it is becoming increasingly competitive. Generally, employer branding refers to a promise to an organisation's prospective and current employees and is considered as a method of differentiation between the organisation and others when the organisation positions itself as an employer of choice. Employer branding has the potential to be a valuable concept for managers. Managers can use employer branding as an umbrella under which they can channel different employee recruitment and retention activities into a coordinated human resource strategy. Employer branding can be especially valuable in the search for an organizing framework for strategic human resource management.

Love and Singh (2011) believe workplace branding seems destined to continue as an organisational strategy in the future. To strengthen their argument, they write that it is apparent that the benefits derived from having a best employer workplace brand provide an organisation with a competitive advantage. This statement is also affirmed by the work of other authors such as Backhaus and Tikoo, (2004); O'Brien, (2017); and Vinayak et al., (2017).  It has become of great interest to organisations, especially among practitioners in the HR community, as they strive to continue to implement the appropriate processes and tools to attract and retain employees.

## 7.5    REGULATORY FRAMEWORK

Most countries are governed by a set of rules and regulations around which HRMs and organisations need to position themselves and operate within. Unfortunately, this complex environment changes from country to country and sometimes from state to state. The impact therefore is different and varied.

Olckers and van Zyl, (2016); Wöcke and Sutherland, (2008) in their work published on South Africa, investigate the impact of employment equity legislation on the psychological employment contracts of the three main employee groupings in South African society, namely Africans, Asians and Whites. They found that the legislation has impacted differentially on the three groupings, mainly in terms of their loyalty to stay with their organisations, their focus on their career development in terms of the external labour market and the degree to which they felt they had been impacted by the legislation. Additionally, they found that the perceived linkage between job satisfaction and labour turnover is significantly weakened by labour market legislation in the case of the beneficiaries of the legislation but may not be the case for those negatively affected by the legislation.

The findings have noteworthy implications for HR management practices of multinationals operating in societies with significant labour market regulatory interventions. Literature and findings on the effects of regulation and government intervention are plentiful and diverse, sometimes being country and regionally specific. However, as these are not relevant to this research study, there is no reason to elaborate any further on this topic.

In a paper on offshoring, multinationals and labour market reviews, Crinò (2009), discusses the empirical literature on the effects of offshoring and foreign activities of MNEs on developed countries' labour markets. It is suggested that material offshoring worsens wage inequality between skilled and unskilled workers and it seems to make employment more volatile, raising the elasticity of labour demand and the risk of job losses. Service offshoring exerts at most small, negative effects on total employment and changes the composition of the workforce in favour of

highly skilled white-collar employees. Multinationals tend to substitute domestic and foreign labour in response to changes in relative wages across countries. Substituting is weak and is mainly driven by horizontal, market-seeking foreign direct investments.

According to Standing (2011), most labour market interventions in developing countries have suffered from common failings. These include a lack of transparency, high fiscal cost, a woeful lack of accountability, chronic inefficiency in the sense of a misuse of resources in reaching those, for which the schemes are intended, as well as an extraordinary record of failure to reach the poorest and most insecure and a failure to reduce inequalities in the labour markets.

Standing (2011) further postulates that developing countries are still being encouraged to examine previous mechanisms of industrialised countries and many continue to refer to the Swedish Model as a system that is both desirable and feasible as if it were still in existence. The real message should be that labour market policies are better at helping labour markets function more efficiently in various ways than in overcoming poverty and eradicating economic insecurity. Labour markets are part of the broader economic system. Policymakers would be better advised to examine social policies to tackle poverty and the mal-distribution of income rather than expect that in the near or distant future, labour markets will deal with these fundamental features of a market economy.

## 7.6    HUMAN RESOURCE MANAGEMENT SCORECARD / METRICS

Fitz-enz (2007) questions what would be the most valuable thing to know about the organisation and the role of the HR function. Of further importance would be knowledge of the future, specifically in terms of what is most likely to happen in hiring, paying, developing, engaging and retaining talent.

Unfortunately, there is not a way that anyone can accurately predict the future and if this were possible, competitive advantage would be an enormous gain. The closest to this that one can come is to use any means possible to determine a vision of the future state of an organisation or event. Even with a high confidence

estimate, one would be ahead of continually reacting to the latest news, competitor move or internal crisis. This is where analytics and predictability come in. There are two ways to build the prediction capability. One is with a new operating model and the other is through useful data that is focused on the future.

In 2006 Human Capital Source, through its research affiliate Workforce Intelligence Institute, conducted a study of 740 human resource departments and gathered field research from 70 research centres and universities throughout North America. The objective was to find evidence that HR services could influence organisational outcomes. Through statistical analysis, this was proven conclusively. For example, the study found that organisations that maintained a succession-planning program and updated it annually also increased revenue per employee.

It was also found that investments in learning and development correlated with productivity and service improvements, which in profit-making companies led to revenue growth. The results further indicated that organisations that aligned management and professional objectives with organisational goals and paid for the achievement of the objectives enjoyed significantly better operating results than those that did not.

Elliot, Shell, Henry and Maier, (2005); Sommet and Elliot, (2017) researched the effect of the achievement of goals on performance attainment and the moderating role of performance contingencies. The results from both sets of experiments strongly suggest that there is a correlation between mastery goals and beneficial outcomes. In the first instance, Elliot et al. (2005) conducted a study which supported the authors' hypotheses. Performance-avoidance goals undermined performance relative to performance-approach and mastery goals, regardless of contingency condition. Performance-approach goals had a more positive effect on performance than did mastery goals in the presence, but not in the absence, of a contingency. Furthermore, the presence of a contingency accentuated the effects of performance-based goals on performance and had little impact on the effect of mastery goals on performance. These results speak directly to a current conundrum in the achievement goal literature and highlight the need for a rigorous, systematic examination of the link between achievement goals and

performance that takes into consideration features of the achievement task, context and situation.

In the second instance, Sommet and Elliot (2017) conclude that in Self Determination Theory (SDT), there is a continuum of possible goal motives. Their research suggests that achievement goals, reasons for goal pursuit and achievement goal complexes all make independent contributions to experiential and self-regulated learning outcomes in achievement settings. This is seen as a promising avenue for a full and complete account of competence motivation.

Weiss et al. (2005) write about the main metrics currently used. However, they do not really focus on HCM and that they can inform strategic decisions critical to future success. Managers on the most part, examine basic operational and historical measures such as headcount changes, hiring, termination and total compensation. Most organisations (82%) reported HCM information as statistical data with narrative comment. However, the MDs were more likely to receive only narrative comment (only 32% receive data). The implication is that HR professionals are not providing the detailed backup reports to validate the narrative comments they offer to executives.

According to Weiss et al. (2005), it is of interest that the HR professionals do not believe that the transactional metrics such as headcount changes, hires and terminations and total compensation will be included in the top 10 metrics that they will report to senior management in the future. The preferred future reporting requirement according to Weiss et al. (2005), is in the area of employee motivation (77%), followed by leadership team capability (76%) and employee competency and training and development return (each at 70%). The MDs show a somewhat different pattern. Leadership team capability is also their most desired metric for the future (69%). This is followed by employee motivation (68%).

A second type of leading indicator can be found within what are called intangibles. These activities cannot be measured with a number, such as the cost of something. Typical intangibles are leadership, planning and employee

commitment. These are concepts. One cannot physically see leadership, but leadership behaviour of people can be observed. Through observation, it can be stated that people who provide a vision, make it a point to be visible in the workspace, encourage new ideas, listen to employees and recognize performance are good leaders.

Through observation and surveys, data can be gathered regarding the ability of a leader. The same applies to planning whereby people gather, organise and analyse data. They prepare reports, deliver the plan on time and completed.

Kaplan and Norton (2004) advocate that most organisations have different methods of communication, alignment and implementation, but that the use of BSCs is an effective way for non-profits and public-sector organisations to communicate strategies for creating value to their employees.

The BSC includes the lagging indicators of financial performance and customer value proposition, and the leading indicators of internal processes as well as learning and growth. Kaplan and Norton (1996) in their work on researching the linking of the BSC to strategy proposed that many managers and consultants who agree on the basic rationale for a BSC believe they have created one when they supplement traditional financial measures with non-financial measures. They hypothesised that many of the most popular non-financial measures such as customer satisfaction and employee attitudes, have some of the same limitations as financial measures.

Firstly, there are lagging measures, reporting how well the organisation's strategy worked in the past period but providing little guidance on how to navigate to the future. Second, the non-financial measures they use are generic and are not related to specific strategic objectives that will provide sustainable competitive advantage.

Scorecards built upon lagging, non-strategic indicators represent only a limited application of the full power of the BSC.

# Figure 7.3: Example of BSC

## Sales Managers Scorecard for 2017

| Objective | Measurement Criteria | | | | Jan Points | Score | Feb Points | Score | Mar Points | Score | Apr Points | Score | May Points | Score | Jun Points | Score | Jul Points | Score | Aug Points | Score | Sep Points | Score | Oct Points | Score | Nov Points | Score | Dec Points | Score | % | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Grow Telecom Closure market by 10% | > R10 M | R9.5 M | R8.5 M to R9.5 M | >R10 M = 1 R9m=0.75 > R8.5 to 9.5M = 0.5 | R 917 108.58 | 1 | R1 581 025.00 | 0.5 | R2 397 651.32 | 0.5 | | 0 | | 0 | | 0 | | 0 | | 0 | | 0 | | 0 | | 0 | | 0 | 17% | |
| To Achieve Overhead Communications Hardware Budget per month Jan & Dec 2.7K and 5.4K Feb to Nov | > R10 M | R9.5 M | R8.5 M to R9.5 M | >R10 M = 1 R9m=0.75 > R8.5 to 9.5M = 0.5 | R 1 130 868.06 | 0 | R4 840 063.95 | 1 | R6 143 084.14 | 1 | | 0 | | 0 | | 0 | | 0 | | 0 | | 0 | | 0 | | 0 | | 0 | 17% | |
| To grow Fibreline Market by 10% | > R10 M | R9.5 M | R8.5 M to R9.5 M | >R10 M = 1 R9m=0.75 > R8.5 to 9.5M = 0.5 | R 57 753.67 | 0 | R 596 899.78 | 0 | R1 800 798.92 | 0 | | 0 | | 0 | | 0 | | 0 | | 0 | | 0 | | 0 | | 0 | | 0 | 0% | |
| Datacom business plan and KPI as discussed | Y = Yes | | N = No | | y | 1 | y | 1 | y | 1 | | 0 | | 0 | | 0 | | 0 | | 0 | | 0 | | 0 | | 0 | | 0 | 25% | |
| YTD Telecoms Expenses below budget. | -10% | 0% | Above budget | -10%=1 0%=0.5 <0%=0 | -10% | 1 | -10% | 1 | -10% | 1 | | 0.5 | | 0.5 | | 0.5 | | 0.5 | | 0.5 | | 0.5 | | 0.5 | | 0.5 | | 0.5 | 63% | |
| **Monthly Score Telecom Sales** | | | | | **60%** | | **70%** | | **70%** | | **10%** | | **10%** | | **10%** | | **10%** | | **10%** | | **10%** | | **10%** | | **10%** | | **10%** | | | |

Left-hand vertical labels: Sales — 50 % of KPI's — 24%

Right-hand vertical labels: Average calculation of operations Performance 24% of Target KPI's — 24%

| Annual Bonus Calculation Individual score | 95% | 90% | less than 90% | 95-100%= 100 % 90-94 % = 75 % < 90 %= 0 % |
|---|---|---|---|---|
| **24%** | **0** | | | |

Source: Researcher's own construction

Figure  is an example of a BSC used by the MNE researched in the case study. The measures should include both outcome measures as well as the individual's own personal KPIs.

## 7.7    ORGANISATIONAL STRUCTURE METRICS

Currently, the debate began by Chandler in the 1960s continues. This debate concerns whether strategy follows structure or if structure is determined by strategy. In spite of doubts about the continuing validity of the Chandler school of thought, Galan and Sanchez-Bueno (2009) indicate that these phenomena existed in the 1990s and continue to exist into the 21st century. Recent expectations suggest significant changes since Chandler's time, such as the emergence of new structures due to globalisation and technological change. In this respect, it is possible that the present-day forms of organisation can challenge the classic multi-divisional structure. Nevertheless, literature reveals that the characteristics of these new organisational forms can coexist with those of traditional forms. However, there may not be a fundamental difference between traditional and innovative organisational structures. Chandler's theory may not be considered as obsolete, but rather it is possible that it broadens to accommodate current circumstances. The relationship between a diversification strategy and multi-divisional structure, as postulated by Chandler focuses on administrative efficiency and remains applicable to current markets and technological economies. Therefore, it could be exploited.

Pleshko and Nickerson (2008) assert that strategic orientations implemented by organisations are not associated with the types of structural configurations used nor do the interactions of strategy and structure have an impact on overall performance or organisational adaptability. Moreover, it is the strategic orientation, rather than the structural configuration of organisations, which is relevant to overall performance and adaptability. In terms of a best strategy for industrial organisations it appears that, analysers are the most appropriate, being the highest performers in both overall performance and adaptability. It may be possible for other strategic types to improve performance by altering their strategy profiles. However, caution should be used when generalizing the views of Pleshko and Nickerson (2008) to other organisations.

Freel (2000) claims that innovators spend a significantly greater proportion of turnover on research and development, tend towards greater internal control and reactivity and are more willing to assume long-term debt. However, they are less likely to access it successfully. These innovators are more likely to be associated with universities and support organisations and tend to depend on a small number of customers for a significant component of total sales revenue (Freel, 2000). In addition, the pre-eminence of vertical value-chain linkages over horizontal or third-party linkages is a further striking feature of the organisation's articulation with their external environments. These and many other theories challenge the organisation whilst at the same time giving reference to the theory that structure is a definite advantage or disadvantage when determining long-term strategic success and sustainability.

**Figure 7.4: Organisational Structure Metrics**



Source: Researcher's own construction

## 7.8    ORGANISATION AND MANAGEMENT BEHAVIOUR

**Figure 7.5: A basic framework of organisational behaviour**
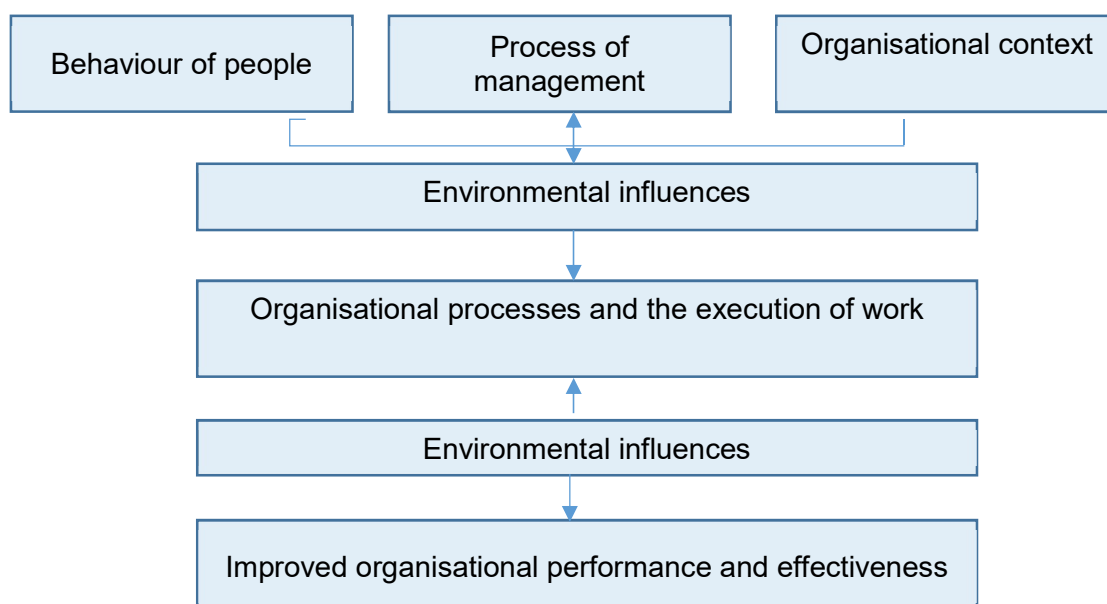


Source: Mullins (1996)

The people in an organisation cannot be seen in isolation and need to be understood in the context of their interrelationships and other variables that comprise the elements of the total organisation. According to Mullins (1996), it is necessary to understand the behaviour of people, the process of management, the organisational context in which the process of management takes place and recognise the organisational process and the execution of work. These interactions with the external environment in which the organisation is part, create influences on the behaviour within organisations.

Of further importance are the mediating and moderating processes through which human resource management practices are linked with behavioural outcomes. Alfes, Shantz, Truss and Soane (2013) posit that the effect of perceived human resource management practices based on organisational citizenship behaviour and turnover intentions, suggests that the enactment of positive behavioural outcomes, due to engagement, largely depends on the wider organisational climate and employees' relationships with their line managers. Moreover, their research illuminate's employee engagement as a mechanism that accounts for the relationship between Human Resource Management practices and individual behaviour. Individuals who have a positive perception of the practices in their organisation are more likely to be engaged with their jobs, have a higher propensity to enact organisational citizenship behaviour and remain with the organisation.

Organisational culture suggests that similar assumptions, values and norms are established within an organisation that then provides the setting for the conduct of organisational behaviour, relationships and decision making (Corfield and Paton, 2016). Further to this, it is suggested that knowledge management plays an important role in organisational culture and behaviour and that the continuation of rapid change makes the challenge of understanding the intricate relationships between KM and organisational culture all the more essential.

In their work in the Swedish fashion industry Pedersen et al. (2016), examine the relationship between business model innovation, corporate sustainability and the underlying organisational values and how these three dimensions correlate with

corporate financial performance. They concluded that companies with innovative business models are more likely to address corporate sustainability. Both business model innovation and corporate sustainability are typically found in organisations rooted in values of flexibility and discretion. There is a relationship between business model innovation and corporate sustainability, which influences organisational values and corporate financial performance.

As noted by Bocken, Rana and Short (2015), various pressures on businesses to operate sustainably are increasing. This requires companies to adopt a systemic approach, seeking to integrate consideration of the three dimensions of sustainability (social, environmental and economic) in a manner that generates shared value creation for all stakeholders, including the environment and society. Business models are often perceived from a value creation perspective that focuses on satisfying customer needs, economic return and compliance. For sustainability thinking, this focus is too narrow and raises the need for a more holistic view of the value that integrates social and environmental goals, to ensure balancing or ideally, the alignment of all stakeholder interests to deliver sustainable value creation.

## 7.9    STRATEGY AND STRUCTURE

As an organisation or subsidiary grows, new products are developed, and new product lines are brought into the organisation to be manufactured, so the organisation must adapt to suit this environment. It stands to reason that the structure of the organisation must grow and develop to meet the needs and demands of the evolving business environment. This means that new specialised skills and methods need to be developed.

There are many examples of companies that have either succeeded or failed in the implementation of new strategies. It is important to understand the current structure, the development of human resource capital to cope with these changes in structure and the ability to implement change within the organisation by developing a clear and transparent strategy.

In the disguised case of Wyler Oil Co., the author Zand (2009) looks at the process of structural renewal at the organisation, which was one of the biggest companies in its industry segment that was lulled into complacency by prospects of seemingly steady growth. Initially, management only sought to determine how to operate more efficiently and minimize duplication of costly services.

In the case study mentioned, it was recommended that when a radical change in organisational structure is envisaged, it is essential that key managers get to know each other, identify and develop solutions to anticipated problems before they implement the change. These processes will assist in the development of effective working relationships among peers so that unanticipated problems that emerge can be resolved quickly. In summary, Wyler Oil Co., prospered because of restructuring into three smaller, profit-centre divisions that effectively managed the organisation.

Three important lessons emerge from the Wyler case:

1. Management needs to monitor continually the gap between implemented and intended strategy, which often increases as the organisation evolves into a specialized structure to pursue near-term gains as a primary function.

2. Management needs to modify structure periodically to keep the gap between implemented and intended strategy within reasonable bounds.

3. To modify an organisation's structure rapidly and effectively to align with its intended strategy, management needs to foster a culture of willing, constructive collaboration.

Birkinshaw and Morrison (1995) researched the parallel growth of the two lines of strategy and structure and found that in testament to their common empirical and in many cases theoretical roots, a lack of work that specifically addresses the linkages between the two. This is surprising. The former stream has focused on the meaning of strategy in the MNC subsidiary, while the latter has emphasized structure. If it is accepted that the interdependence between strategy and structure is one of the cornerstones of strategic management, then clearly the

explicit reconciliation of these two bodies of work is a valuable contribution. Birkinshaw and Morrison (1995) proposed a simple three-item typology of subsidiary roles and maps with prior typologies.

**The Local Implementer.** This subsidiary has limited geographic scope, typically a single country and severely constrained product or value-added scope. In this context, the subsidiary's role is to adapt global products to the needs of the local market. It is typically found (though not exclusively) in a multi-domestic strategy (Porter, 1990).

**The Specialized Contributor.** This subsidiary has considerable expertise in certain, specific functions or activities, but its activities are tightly coordinated with the activities of other subsidiaries. Thus, it is characterized by a narrow set of value activities and high levels of interdependence with affiliated subsidiaries.

**The World Mandate.** The subsidiary has worldwide or regional responsibility for a product line or entire business and typically has unconstrained product scope and broad value-added scope. In this way, it achieves decentralized centralization. Activities are integrated worldwide, but managed from the subsidiary, not head office.

Differentiation and costs strategies do not seem to be incompatible with one another. In fact, an organisation can develop both in a complementary way to increase its performance. Organisational structure influences the development of hybrid competitive strategy. Therefore, managers must recognize the strategic value of their organisational structure as it directly impacts hybrid competitive strategy and indirectly impacts organisational performance. In this regard, organic and flexible structures should incorporate mechanistic elements in the design of the organisation (Claver-Cortés, Pertusa-Ortega & Molina-Azorín, 2012).

In their study involving three important implications for managers and researchers, considering debate around strategy and structure, Wolf and Egelhoff (2002) discuss the traditional fits of international strategy-structure

theory, which still remain relevant for MNCs today. Despite recent changes in strategy and organisational design, the study shows that strategy-structure fit is not some past or vestigial property of organisations, but an attribute that is currently being created by managers and selected by competitive environments. The study further extends traditional theory by including two new elements of strategy, namely the level of inter-organisation transfers and the size of foreign R&D.

While the influence of traditional elements of strategy-structure theory remain important, they miss much of the variety and richness that exists in today's international strategies. The level of inter-organisation transfers and size of foreign R&D capture new trends in sourcing strategies and generation of knowledge. The study further extends traditional strategy-structure theory to explain matrix structures. The study suggests that structural diversity in international organisations may be increasing, as more types of structure appear, the robustness of traditional strategy-structure knowledge, even when it is applied to more complex structures still hold true.

## 7.10   CONCLUSION TO CHAPTER SEVEN

In chapter seven, the HR element of the LTS Model was depicted in Figure 7.1. The researcher found that committed employees are those who have a low absence rate, work effectively with co-workers, contribute ideas for better ways to work, produce more than the average worker, speak well of the organisation and do not quit. A short list of leading indicators and intangibles are as follows: employer of choice, job satisfaction, leadership, engagement, commitment, competence, performance, intelligence, goal achievement and initiative. This is relevant to the MNE in the case study in that it is understood that people are the most important and valuable resource in the MNE, but at the same time are complex in nature and difficult to manage. It was Richard Branson who quoted, "Train people well enough so they can leave, treat them well enough so they don't want to," (Branson, 2014).

The uncertainty of the world makes managing any enterprise a high-risk challenge. Although lagging indicators are useful and sometimes necessary, leading indicators are necessary for future effective management. It is time to move beyond benchmarking operating variables and focus on more strategic issues. Leading indicators and intangibles are where the future values exist. As technology and information continue to replace physical assets as primary drivers, the importance of intangibles becomes more evident. Managing tomorrow today is more than a catchphrase. It is an imperative for any organisation wishing to keep pace with the markets it presently serves, as well as those it aims to serve in the short and long-term future.

# CHAPTER EIGHT
# INNOVATION AND ITS CONTRIBUTION
# TO THE LTS OF AN MNE

## 8.1    INTRODUCTION

This chapter will examine innovation and its contributions towards the LTS of an MNE. Furthermore, innovation currently used in industry is explored, as well as new ideas to measure metrics which impact on innovation will be discussed.

As innovation management is the part of management encompassing the collective and individual creativity of people, it is by implication complex and requires containment to the MNE being researched in the case study. There is agreement that innovation contributes to the development of new products and ideas and is of prime importance to the LTS of any organisation in the long-term (2014); Andersson et al,.(2015); Autio,et al,.(2014); De Faria, Lima and Santos, (2010). When relevant theories are compared with existing practices within the MNE, this can allow for the development of a system that can be employed to both identify potential areas of improvement, as well as improve the status quo within the MNE.

These are explored in the context of the study and the innovation element of the LTS Model is depicted in Figure 8.1, the connection to innovation is investigated. The innovation elements comprise various aspects and theories that are further deliberated on in the subsequent section.

**Figure 8.1: Research and development (innovation) elements**
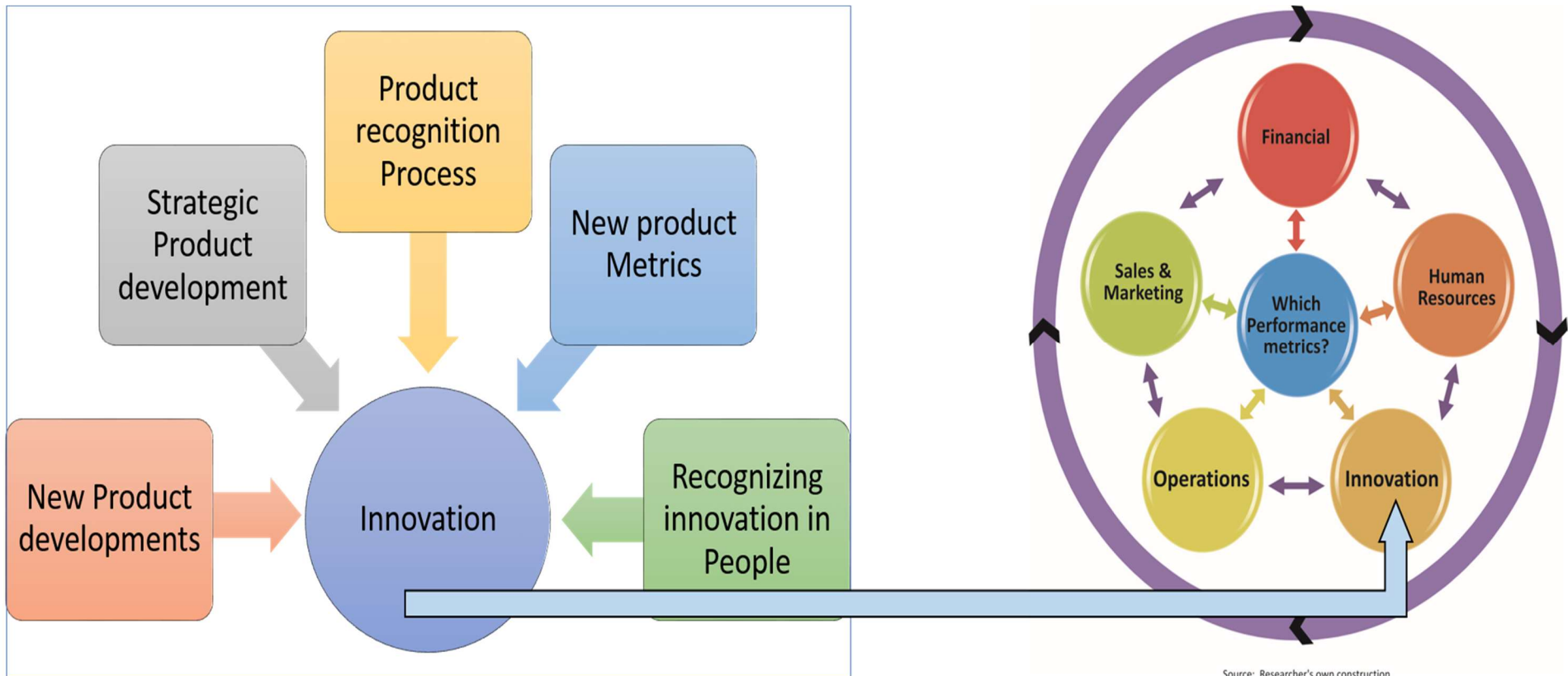


Source: Researcher's own construction

## 8.2    INNOVATION AND NEW PRODUCT DEVELOPMENT METRICS

**Figure 8.2: Innovation Metrics**



Source: Researcher's own construction

Currently, more than ever before, companies must exploit their innovative capabilities to develop new businesses if they are to confront the disruptive effects of emerging technologies, empowered customers, new market entrants, shorter product life cycles, geo-political instability and market globalization in a successful manner. Indeed, the development of innovative capabilities is the only means by which companies can sustain a competitive advantage. Until now, innovation has been somewhat of a black art as managers currently lack the requisite metrics to make informed decisions about their innovation programs. Some metrics have been developed for new product development, but these metrics are limited. Managers have only a vague sense of their organisation's overall innovation capabilities and they have little or no means to assess the effectiveness and efficacy of an innovation program. They need tools with which to diagnose impediments (Muller, Valikangas & Merlyn, 2005).

When looking at financial metrics such as return on investment, it is an accepted joke that this translates to restraint on innovation, less risk taking and little use of initiative because ROI-based assessments tend to embrace short-term thinking and exclude the development of long-term breakthrough and intermittent ideas and projects. Premature use of ROI to measure innovation thus endangers development and the problem is deciding what to include or disregard in the research plan (Morris, 2008).

More than 70 % of Wall Street analysts consider an organisation's ability to innovate consistently a key determinant of its value. However, only one in three of these analysts claim confidence in measuring innovation. Chief executives similarly, realize that to maintain competitive advantage, their organisations need to be able to innovate and not just occasionally, but consistently (Collins & Smith, 1999, Goleman 2017).

Companies such as Amazon, Uber, Google and Skype have become business strategy icons. They have developed reputations for being innovators in a new world with novel and inventive ways of doing business. Companies that are innovative and different tend to explore the field of business model innovation and this has become the cornerstone of competitiveness and success for these organisations (Casadesus-Masanell and Zhu, 2013; Gassmann, Frankenberger & Sauer, 2017; Morris, 2008).

The ability to measure innovation remains a challenge. In particular, questions arise around which metrics to use and what impact they will have on maintaining a sustainable competitive advantage. As old habits die hard, traditional forms of measurement remain locked in organisations' paradigms. Unfortunately, paradigms of past successes can stifle future growth, becoming hindrances to the future success, growth and LTS of the organisation.

Suggestions from Oman, Tumer, Wood and Seepersad, (2013) include a two method proposal method to assess creativity using metrics. The methods are Comparative Creativity Assessments (CCA) and Multipoint Creativity Assessments (MPCA). The concept and metrics are constructed to determine the most creative product or concept in a set of designs.

A useful definition for creativity and innovation of engineering products is provided by Cropley and Cropley (2005). Creativity is defined as a four-dimensional, hierarchical model that must exhibit relevance and effectiveness, novelty, elegance and be able to be generalised (Cropley and Cropely, 2005). In this regard, relevance must be satisfied and refers to a product simply solving the problem it is intended to.

## 8.3    NEW PRODUCT DEVELOPMENT

Dr Rowan Gilmore of the Australian Institute for Commercialisation, in his presentation titled "Overview of New Product Development", depicted in Table 8.1 presents the four types of innovation.

**Table 8.1: Overview of new product development**

| Product Innovation | Process Innovation | Marketing Innovation | Management Innovation |
|---|---|---|---|
| **New products or services** | Improving processes within the organisation business process innovation | Related to the marketing functions of promotion, pricing and distribution | The way the organisation is managed e.g. organisational structure, leadership, work environment, culture |
| **Enhancing existing products** | For example, operations, HRM, finance, better way of communicating, knowledge management system | Product related (for example packaging, advertising) | Cross functional work teams - team-based decision-making approach |
| **Technological innovation** | Focus on improving organisational effectiveness and efficiency | Creating a new market or marketing system e.g. Amazon.com many products were invented before their time | Business Model Innovation |

Source: Gilmore (2017, nn. 1-36)

The New Construct Development Model in Figure 8.3 below has been used over many years and in many different formats. The NCD was first developed by Koen

et al. in 1996 and has been used extensively since then Booz, Allen & Hamilton, (1982: 1-3); Darroch, (2003: 41–54); Koen et al., (1996: 1-32); Koen, Bertels & Kleinschmidt, (2014: 25-35); Nasiopoulos et al., (2015: 63).

**Figure 8.3: The New Construct Development (NCD)**
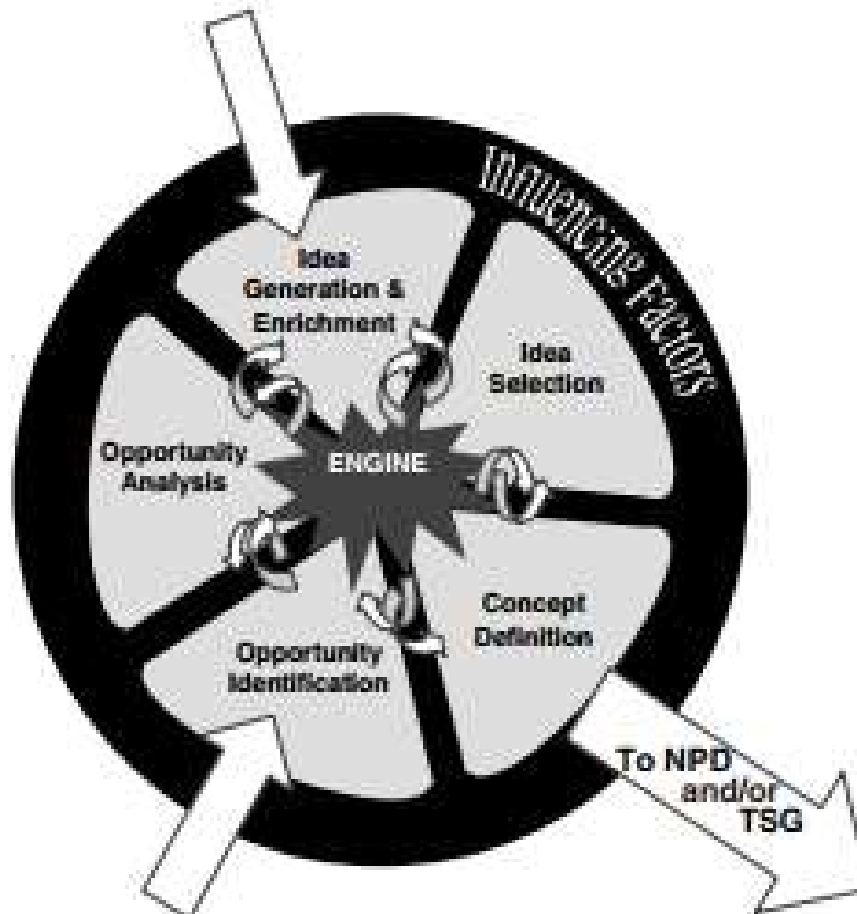


Source: Koen et al. (1996)

It is obvious that continuous product development must always remain an important objective in an organisation's long-term sustainability. A successful product development program will assist in creating an increase in market share, new customers, new markets, lower costs and better quality. Measuring and metrics are therefore important to determine the amount of success that comes with such development programs.

**Figure 8.4: Frequency of top product development metrics**
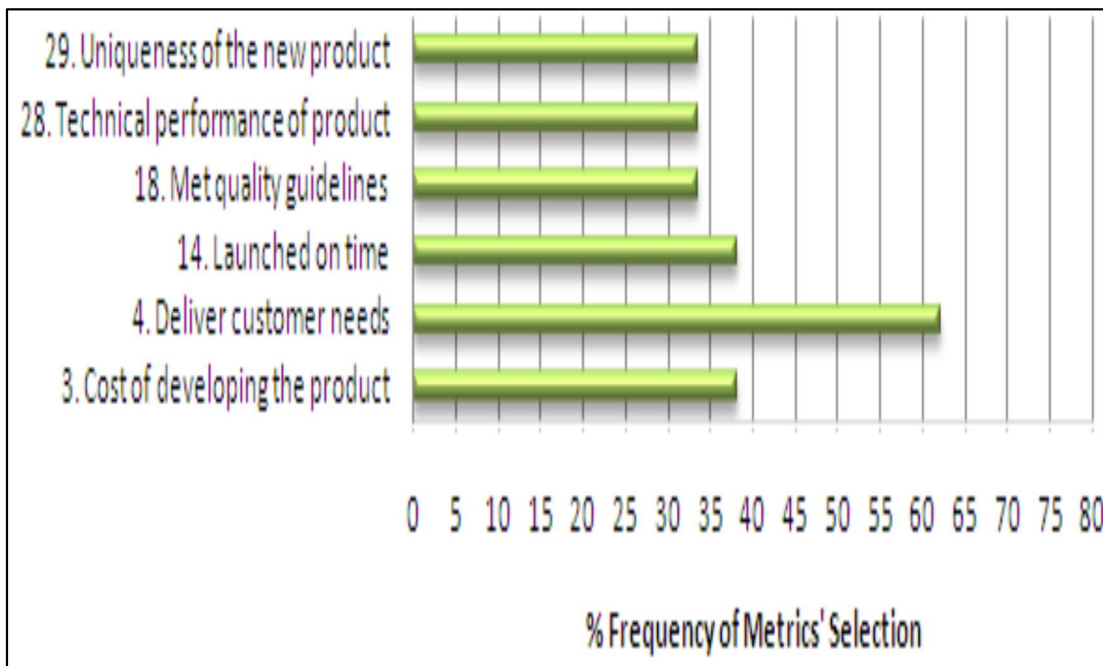


Source: Kazerouni, Achiche, Hisarciklilar and Thomson (2011)

In Figure 8.4 above, Kazerouni et al. (2011) show the results of research conducted on the selection of the six top metrics to determine new product development success. They postulate that as these six metrics show positive results then the product should be considered for actual production and the evaluations can facilitate the introduction of a successful new product according to customer expectations, the organisation's strategies and the meeting of the organisational standards.

## 8.4    STRATEGIC PRODUCT DEVELOPMENT

Competition in dynamic product markets and the concept of strategic flexibility in product competition depend jointly on the resource flexibility of the product creation resources available to an organisation and the coordination flexibility of the organisation in using its available resources in product markets. Two recent technological innovations affecting product creation processes are CADD and CIM systems and modular product design. These are argued to have greatly increased the potential flexibilities of key product creation resources.

Managerial innovations in the use of these technologies have also led to important new coordination flexibilities. The combination of recently achievable

resource and coordination flexibilities is argued to have transformed the competitive environments of many product markets, leading to new kinds of product strategies, new organisational forms and a new dominant logic for competing in dynamic product markets (Sanchez, 1995: 135-159).

Speed to market of a new product stream has evolved into an important strategic and competitive advantage for organisations that have been willing to harness this new knowledge and invest in the infrastructure. Flexibility and meeting customer demands in tailor making of products is a prerequisite to achieving this competitive advantage over the more traditional manufacturing organisations that are losing ground to companies with the ability to innovate and adapt.

Bhuiyan (2011: 746-770) postulates that New Product Development (NPD) is important in that its contribution to the growth of companies, its influence on profit performance and its role as a key factor in business planning are important contributions. These lead to employment, economic growth, technological progress and improved standards of living. NPD can be defined as activities carried out by organisations when developing and launching products into markets.

## 8.5    PRODUCT RECOGNITION PROCESS

The question arises as to which products should be designed to suit the markets in which the organisation is competing. In addition, it is prudent to consider the type of business involved. Manufacturing entities are always investigating quicker and more cost effective measures to use to compete in the markets they serve Johnson, Christensen and Kagermann, (2008: 57-68): Porter, (1998: 7); Sharp, Irani and Desai, (1999: 155-169). A numerical taxonomy of agile manufacturing strategies was developed recently by Zhang (2011: 303-312), based on a large scale questionnaire study of UK industry. The taxonomy suggested the existence of three basic types of agility strategies:

1. Quick: represents an organisation with short product life cycles, deriving revenues from early product lives and focusing on niche markets' responsiveness. It is a proactive strategy.

2. The responsive case: involves an organisation with relatively long product life cycles, operating at the mature stages of products (with frequent improvement), with a market involving both mature and niche elements. Competition is multi-faceted (rather than dominated by new product development as in the quick case). The organisation is a market follower that does not have enough technical ability to take a lead.

3. The proactive case: similar in terms of characteristics and top concerns to the responsive case. However, as a market leader the organisation adopts a strategy that not only places importance on quickness, flexibility and responsiveness, but also on proactively creating changes and partnering with suppliers and customers.

## 8.6    CONCLUSION TO CHAPTER EIGHT

In chapter eight, the tools, strategies and measurements that can be considered when determining the effectiveness of a manufacturing organisation were discussed. Although there are many more, some of these have been discussed and described in this chapter and most of these are relevant to the LTS of the MNE being researched in the case study. The obvious challenge to the MNE is to determine the correct metrics that can ultimately contribute to the long-term sustainability of the MNE. As covered before, the heart of an excellent manufacturing business is in the efficiency of its operations, the people who manufacture the products, the level of motivation of the workforce and the innovation shown by its engineering. No single person or department in an organisation can claim to be of greater importance than any other

In chapter eight, the metrics and measurements related to operations management were researched and discussed. From the research, a questionnaire was designed and constructed. This questionnaire was sent out to

the target group within the manufacturing and operations managers of the MNE so that their collective view on the appropriate metrics could be collected for analysis and interpretation.

It is important at this point to emphasise that the metrics considered may vary from simple to complex, as well as which metrics contribute to the LTS of the MNE. The responses to the questionnaires and data collected and analysed were analysed and will be discussed further in chapters nine and ten of this research.

# CHAPTER NINE
# RESULTS FROM DATA COLLECTION

## 9.1    INTRODUCTION

In chapter nine, the examination of the results and the analysis of the data collection are discussed in detail. Stemming from this, all of the results from the elements of FM, SM, OM, HRM and innovation are presented. The outcome from the questionnaires distributed to respondents is analysed and their contribution towards the LTS of an MNE is measured.

### 9.1.1    Introduction and explanation of statistics used in data analysis

**Table 9.1: Overview of question layout**
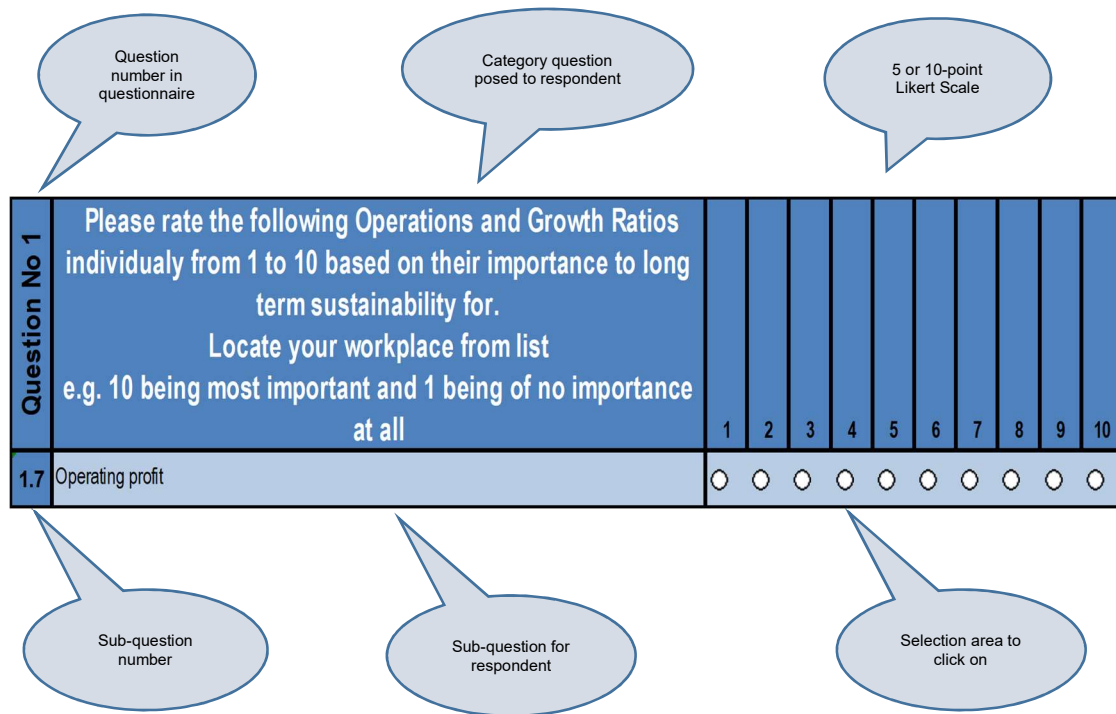


Source: Researcher's own construction

The general layout shown in Table 9.1 was the format used for the questionnaires distributed among the targeted respondents. It was created in a simple, easy to use way and was complimented with pull down sheets to fill in the subsidiary, position held and other pertinent information in an understandable format. From

feedback received, not many questions were asked, and this indicated that the information was easily understood and that the instructions were clear.

**Table 9.2: Raw data for statistical analysis**



| Question No 1 | Average Score | Ave MD's | Ave FM's | Difference | Possible Score | STD Deviation | Confidence Norm | Median | Skew | Kurtosis |
|---|---|---|---|---|---|---|---|---|---|---|
| 1.7 | 9.043 | 9.231 | 8.800 | 0.431 | 10 | 1.461 | 0.597 | 9.500 | -1.998 | 3.732 |

Source: Researcher's own construction

The researcher collected the data and created a series of tables for analysis. These were represented in the format shown in the example in Table 9.2. The statistics decided upon were determined by the author, based on research gathered though the literature review Weisstein, (2016), from Westfall's (2014) information on Kurtosis and the three different main measurements, from the use of statistics in business (McCormick & Denny, 2003).

**Table 9.3: Test for reliability and validity of questions**

| ANOVA | | | | | | |
|---|---|---|---|---|---|---|
| *Source of Variation* | *SS* | *df* | *MS* | *F* | *P-value* | *F crit* |
| Rows | 184.5826087 | 22 | 8.390118577 | 7.47927025 | 1.76582E-16 | 1.596302808 |
| Columns | 10.78695652 | 9 | 1.198550725 | 1.068433622 | 0.387758632 | 1.927404828 |
| Error | 222.1130435 | 198 | 1.121783048 | | | |
| | | | | | | |
| Total | 417.4826087 | 229 | | | | |
| | | | | | | |
| **Cronbach's alpha** | **0.86629712** | | | | | |

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A test of reliability of data is to group questions together. As the data collected is a small sample, it was decided to only calculate the Cronbach's Alpha for each construct (Table average). Cronbach's alpha can be used with continuous and non-dichotomous data and it can be used for testing questionnaires using a Likert Scale. Table 9.3: above is the calculation that is used to determine Cronbach's alpha and below is the formula used to calculate Cronbach's Alpha. Cronbach's alpha estimates the internal consistency of responses in multi-item bipolar scales.

$$\alpha = \frac{N}{N-1}\left(\frac{\sigma_x^2 - \sum_{i=1}^{N} \sigma_{y_i}^2}{\sigma_x^2}\right)$$

Where:

N = the number of survey items in the scale

$\sigma_x^2$ = the variance of the observed total scores

$\sigma_{Y_i}^2$ = the variance of item i for person y

Table 9.4 below is the explanation of the statistical measurements chosen for the analysis.

**Table 9.4: Description of statistics used in research**

| | |
|---|---|
| **Average score** | This was the average score of all of the respondents who participated in the research by completing a questionnaire. This was split into different disciplines that included financial, operations, SM and HRM. |
| **Average MDs** | This was the average score of the MDs' responses to the individual questions within the questionnaire. The MDs were asked to respond to all questionnaires within the series, as they are general managers with the responsibility of the overall success of the MNE. |
| **Average FMs, OMs, HRMs, SMs** | This was the average score of the "other manager "in response to the individual questions within the questionnaire. These managers were either financial, operational, SM or human resource practitioners depending on the series where they had the overall responsibility. |

| | |
|---|---|
| **Difference** | This represents the difference of the averages between the MDs and the practitioner in the respective area of responsibility. |
| **Possible score** | This is the highest individual score that can be obtained in a sub-question within a questionnaire. |
| **STD deviation** | This represents the statistical standard deviation and is a quantity expressing by how much the members of a group differed from the mean value for the group. The standard deviation is a measure of how widely values are dispersed from the average value (the mean), (McCormick & Denny, 2003: 96). |
| **Confidence norm** | This returns the confidence interval for a population mean, using a normal distribution. The confidence interval is a range of values. The sample mean, x, is at the centre of this range and the range is x ± CONFIDENCE.NORM For example, if x is the sample mean of delivery times for products ordered through the mail, x ± CONFIDENCE.NORM is a range of population means, (McCormick & Denny, 2003: 606 - 613). |
| **Median** | This denotes or relates to a value or quantity at the midpoint of a frequency distribution of observed values or quantities, such that there is an equal probability of falling above or below it, situated in the middle especially of the body. The median value of a range of values, (McCormick & Denny, 2003: 82 - 83). |
| **Skewness** | In probability theory and statistics, skewness is a measure of the asymmetry of the probability distribution of a real-valued random variable about its mean. The skewness value can be positive, negative or undefined. The qualitative interpretation of the skew is complicated and unintuitive (Westfall, 2014; Weisstein, 2016). |
| **Kurtosis** | Mesokurtic: Distributions with zero excess Kurtosis are called mesokurtic. The most prominent example of a mesokurtic distribution is the normal distribution family, regardless of the values of its parameters. A few other well-known distributions can be mesokurtic, depending on parameter values: e.g. the binomial distribution is mesokurtic. Leptokurtic: A distribution with positive excess Kurtosis is called leptokurtic, or leptokurtotic. A leptokurtic distribution has fatter tails. Platykurtic: A distribution with negative excess Kurtosis is called platykurtic. "Platy" means "broad" and a platykurtic distribution has thinner tails. Examples of platykurtic distributions include the continuous or discrete uniform |

| | distributions and the raised cosine distribution (Westfall, 2014: 191 - 195; Weisstein, 2016: 1 - 2). |
|---|---|
| **Cronbach's alpha** | This alpha is a calculation used to determine reliability and will generally increase when the correlations between the items increase. For this reason, the coefficient measures the internal consistency of the test. Its maximum value is 1 and usually its minimum is 0, although it can be negative. A commonly accepted rule of thumb is that an alpha of 0.6 shows a low, but acceptable reliability, 0.7 indicates acceptable reliability and 0.8 or higher indicates good reliability. Very high reliability (0.95 or higher) is not necessarily desirable, as this indicates that the items may be entirely redundant. Reliability of scores is a means to determine the consistency of a section of a questionnaire. The method of calculation used in the research was to begin by running MS Excel's ANOVA: Two Factor without Replication data analysis tool using the data range of the section of the questionnaire and then calculating Cronbach's alpha using the formula: $$\propto = 1 - {MS\ error}/{MS\ rows}$$ |

Source: Researcher's own construction

## 9.2   FINANCIAL DATA ANALYSIS

Financial data collection depicted in Table 9.5 below shows the results of the financial data collection responses. In summary, 23 were returned out of 29 possible responses. This amounts to an overall 79% response rate with one subsidiary not contributing to the study in any way. In Table 9.5 is also a list of abbreviations that describes the work function of the respondents.

The questionnaire that was distributed entitled, "Financial Questionnaire" is listed in Appendix III. The statistical reference is listed in Appendix I, entitled "Financial Statistics Tables", and is accompanied by relevant information and graphs to display frequency of responses, among others. Questions posed were split up into sub-sections and the analysis of the questions and sub-questions in their specific categories are listed below. This is followed by an overview of the findings of the questionnaire and the rationale behind the questions. The results are analysed, and the relevant conclusions are presented in the section below.

**Table 9.5: Financial data collection responses**

| Country | VPF | VPI | OCFM | OFP | SMD | SFM | Respondents | Possible Respondents | Responses % |
|---|---|---|---|---|---|---|---|---|---|
| **Corp HQ** | YES | YES | YES | | | | 3 | 3 | 100% |
| **Plant Rogers** | | | | | N/A | N/A | 0 | 0 | |
| **Plant Albemarle** | | | | | N/A | N/A | 0 | 0 | |
| **DPW** | | | | | YES | YES | 2 | 2 | 100% |
| **Spain** | | | | | NO | NO | 0 | 2 | 0% |
| **Poland** | | | | | YES | YES | 2 | 2 | 100% |
| **G Britain** | | | | | YES | YES | 2 | 2 | 100% |
| **Indonesia** | | | | | YES | YES | 2 | 2 | 100% |
| **Canada** | | | | | YES | NO | 1 | 2 | 50% |
| **Thailand** | | | | | YES | NO | 1 | 2 | 50% |
| **Australia** | | | | | YES | NO | 1 | 2 | 50% |
| **China** | | | | | N/A | YES | 1 | 1 | 100% |
| **Mexico** | | | | | YES | YES | 2 | 2 | 100% |
| **Brazil** | | | | | YES | YES | 2 | 2 | 100% |
| **N Zealand** | | | | | YES | YES | 2 | 2 | 100% |
| **Argentina** | | | | | | n/a | | 0 | |
| **Malaysia** | | | | | NO | YES | 1 | 2 | 50% |
| **S Africa** | | | | | N/A | YES | 1 | 1 | 100% |
| **Count** | | | | | | | 23 | 29 | 79% |

| Key | |
|---|---|
| **VPF** | Vice-President Finance |
| **VPI** | Vice-President International |
| **OCFM** | Other Corporate FMs |
| **OFP** | Other Financial Practitioners |
| **SMD** | Subsidiary MDs |

Source: Researcher's own construction

## 9.2.1 Cronbach's alpha for financial questionnaire

In Graph 9.1 below are the series of results to the financial questions answered by the respondents. These are calculated in Appendix IV, using Cronbach's alpha as a test of reliability.

**Graph 9.1: Cronbach's alpha graph financial questionnaire**
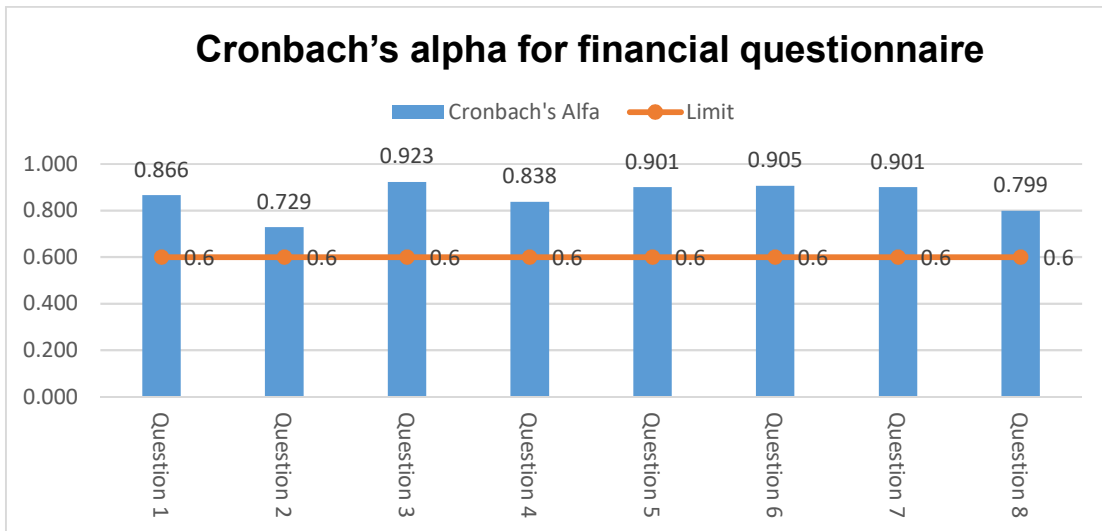


The graph shows that all the question sections indicate a limit above 0.6, which is an acceptable level of reliability and that question number 3 at 0.923 is close to the top of the range and thus, has the highest level of reliability.

**9.2.2    Analysis and rationale behind the financial questions posed**

**Graph 9.2: Q.1 - Operational and growth ratios**



| | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 |
|---|---|---|---|---|---|---|---|---|---|---|
| Average Score | 8.478 | 8.783 | 8.435 | 8.348 | 8.652 | 8.739 | 9.043 | 8.826 | 8.826 | 8.957 |
| Ave MD's | 8.231 | 8.846 | 8.308 | 8.385 | 8.615 | 8.692 | 9.231 | 9.000 | 9.077 | 9.000 |
| Ave FM's | 8.778 | 8.667 | 8.600 | 8.300 | 8.700 | 8.800 | 8.800 | 8.600 | 8.500 | 8.900 |
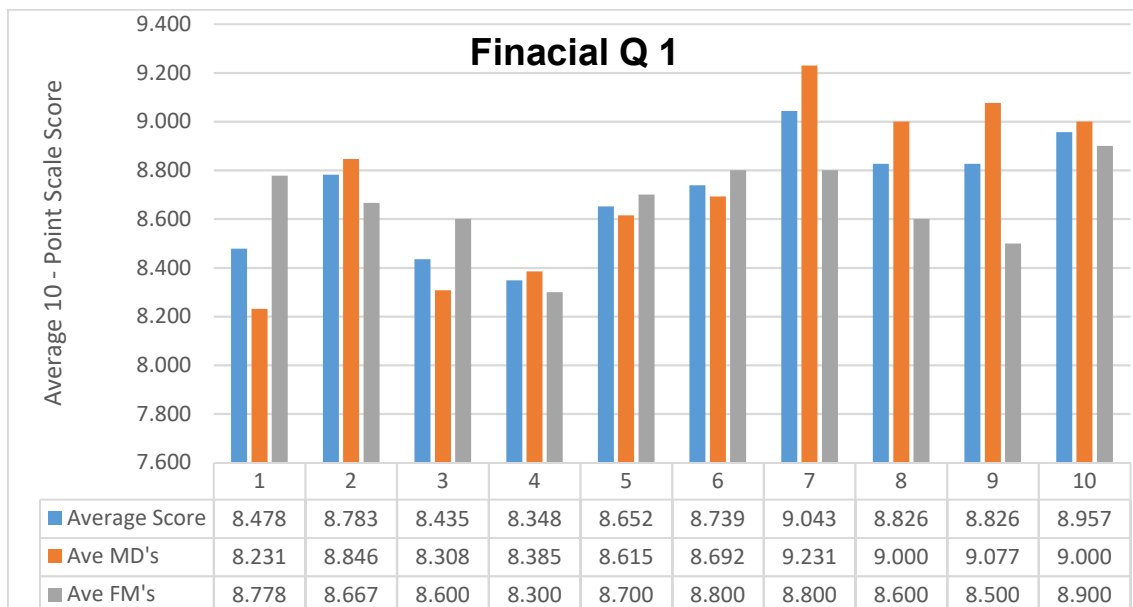
**Summary Analysis: Question 1**

In Graph 9.2 above, which is derived from the statistics shown in Appendix III, the following is depicted. Question 1.7, which was operating profit, achieved the highest average. The FMs prized Question 1.10 the highest, which was net profit growth, meaning that they placed more emphasis on net profit than operational issues. The responses were drawn from a 10-point Likert Scale. This group recognised that generating profit is more important than high turnover.

In Appendix I, Question 1.7 has a Kurtosis calculation of 3.0732, which is very close to a standard normal distribution. The data has a skewness of -1.98, which indicates that the data is skewed left demonstrating slight disagreement. This is shown in the frequency graph, which is represented in Appendix II. Cronbach's alpha calculated in Appendix IV and above in Graph 9.1 was 0.866 for the series, indicating good reliability.

**Conclusion:** Question 1.7, operating profit was of highest importance to the LTS of an MNE in this section.

**Q.2. Operational and growth ratios**

**Graph 9.3: Q.2 - Operational and growth ratios**



Financial Q 2

| | 1.000 | 2.000 | 3.000 | 4.000 | 5.000 | 6.000 | 7.000 | 8.000 | 9.000 | 10.000 | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| ■ Average Score | 4.174 | 4.565 | 4.391 | 4.174 | 4.435 | 4.522 | 4.609 | 4.348 | 4.304 | 3.870 | 4.391 |
| ■ Ave MD's | 3.923 | 4.538 | 4.385 | 4.154 | 4.385 | 4.462 | 4.615 | 4.462 | 4.385 | 3.692 | 4.368 |
| ■ Ave FM's | 4.500 | 4.600 | 4.400 | 4.200 | 4.500 | 4.600 | 4.600 | 4.200 | 4.200 | 4.100 | 4.422 |
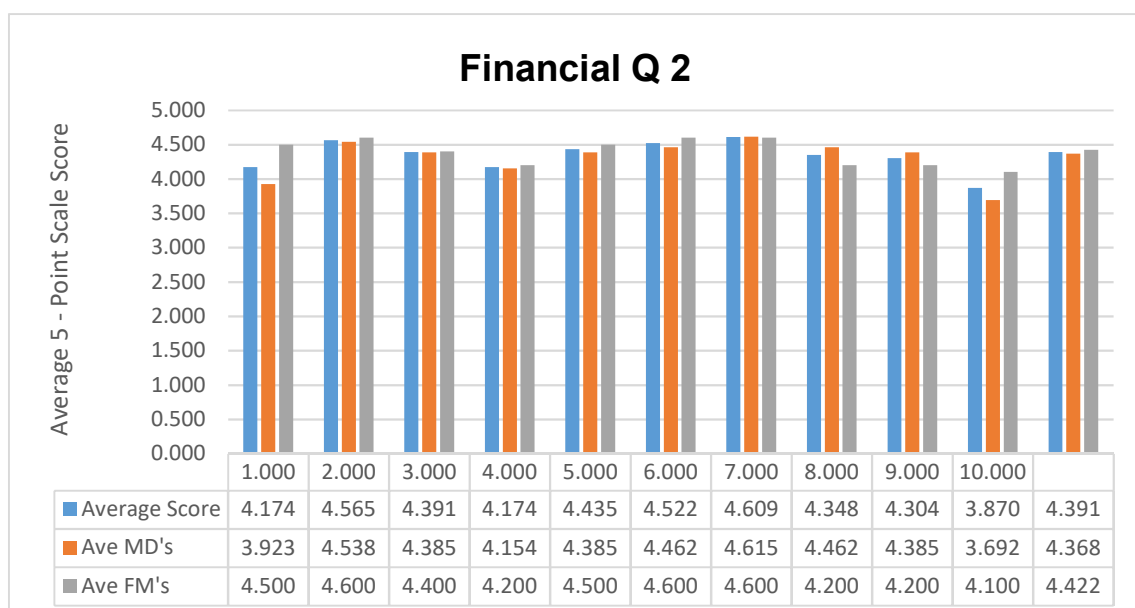
**Summary Analysis: Question 2**

Graph 9.3 above, derived from the statistics shown in Appendix I, was constructed to determine the importance that was placed on the operations and growth metrics. The responses were based on a 5-point Likert Scale. This section of the research questionnaire was set up in this way to determine the metrics of most importance to the FMs and MDs and to see if they agree on the same or similar measurements in gauging long-term sustainability.

Appendix I, Question 2.7 refers to operating profit being a long-term financial, sustainable operational and growth ratio with the highest average and a Kurtosis calculation of 1.196. This is a bit further from a normal distribution and it has a skewness of -1.496 indicating that the data is skewed left, representing a level of disagreement with the statement. This is shown in the frequency graph represented in Appendix II. Cronbach's alpha in Appendix IV and in Graph 9.1 for the series was 0.729, indicating acceptable reliability.

**Conclusion:** Question 2.7, operating profit was of the highest importance to the LTS of the MNE.

**Graph 9.4: Q.3 - Rate of Return Ratios**

**Finanancial Q3**

| | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 |
|---|---|---|---|---|---|---|---|---|---|---|
| Average Score | 6.682 | 6.957 | 6.652 | 7.478 | 5.478 | 5.478 | 6.739 | 6.348 | 6.391 | 6.783 |
| Ave MD's | 6.583 | 7.308 | 6.692 | 7.846 | 4.923 | 4.846 | 6.769 | 6.692 | 6.385 | 6.769 |
| Ave FM's | 6.800 | 6.500 | 6.600 | 7.000 | 6.200 | 6.300 | 6.700 | 5.900 | 6.400 | 6.800 |

*Average 10 - Point Scale Score*
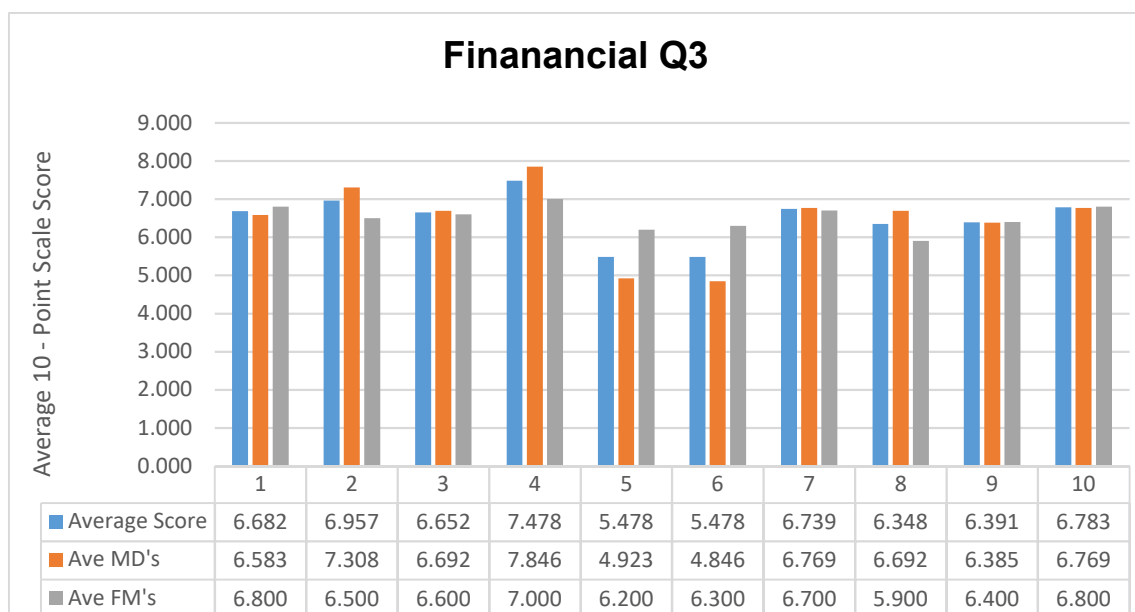
**Summary Analysis: Question 3**

Graph 9.4 above, derived from the statistics shown in Appendix I, was constructed to determine the importance that was placed on the rate of return metrics. The responses were based on a 10-point Likert Scale. These metrics would be important to investors who are expecting reward for the perceived risk they are taking by investing in the MNE. This section of the research questionnaire is set up in this way to find the metrics of most importance to the financial and administrative heads, as they are directly responsible to the investors in the enterprise and to see if they agree in using the same or similar measurements in gauging long-term sustainability.

The highest priority for the respondents was Question 4, Return on Total Assets, making the assets work hard for the advancement of the MNE and is considered to contribute to LTS.

In Appendix I, the standard deviation is spread, and the Kurtosis is 1.407. A positive Kurtosis indicates a peaked distribution and skewness is -1.497, so it is slightly left of a normal distribution. Although there is an overall agreement, the opinions differ slightly. The Cronbach's alpha (Appendix IV) and in Graph 9.1 was 0.923 for the series, thus indicating very high reliability.

**Conclusion:** Question 4, ROTA was of highest importance to the LTS of an MNE in this section.

**Graph 9.5: Q.4 - Rate of Return Ratios**



| | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 |
|---|---|---|---|---|---|---|---|---|---|---|
| Average Score | 3.348 | 3.652 | 3.391 | 4.435 | 3.739 | 3.739 | 3.304 | 4.391 | 3.435 | 3.609 |
| Ave MD's | 2.923 | 3.692 | 3.308 | 4.231 | 3.154 | 3.154 | 3.154 | 4.077 | 3.154 | 3.308 |
| Ave FM's | 3.900 | 3.600 | 3.500 | 4.700 | 4.500 | 4.500 | 3.500 | 4.800 | 3.800 | 4.000 |
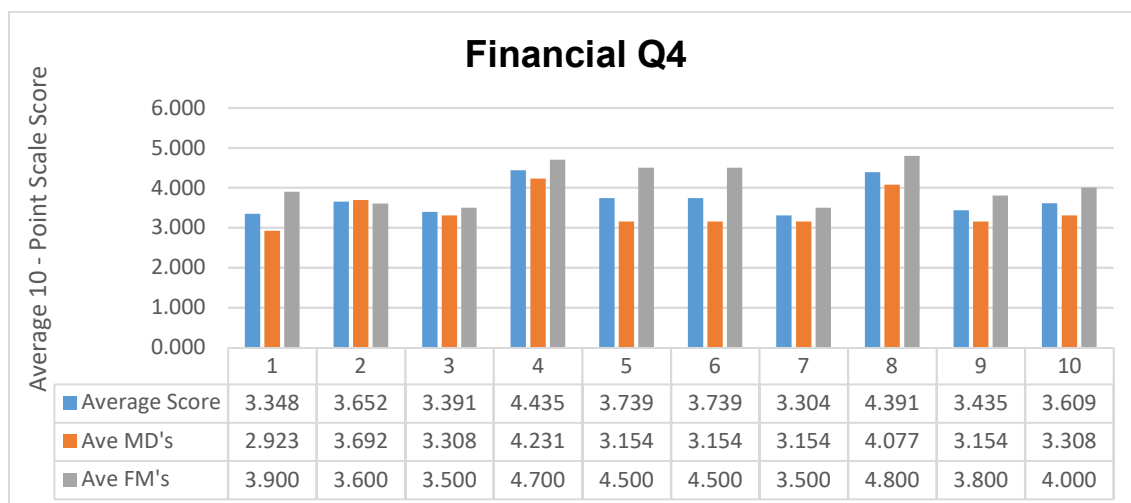
**Summary Analysis: Question 4**

Graph 9.5 above, derived from the statistics shown in Appendix I, is based on a 5-point Likert Scale. It was constructed to determine the importance of the use of the rate of return metrics within the MNE. These metrics are important to investors, MDs and FMs. The question's objective was to determine how strong the links were between investors and the respondents.

As a group, the respondents placed the highest priority on Question 4.4 and agreed that NOPAT is of huge importance to an MNE.

In Appendix I, the standard deviation is 1.248 and is a narrow spread. The Kurtosis is -0.345 (Platykurtic). A negative Kurtosis indicates a flatter distribution and skewness is -0.007, so is very slightly left of a normal distribution, showing overall agreement. Cronbach's alpha (Appendix IV) and in Graph 9.1 was 0.838 for the series, thus indicating good reliability.

**Conclusion:** Question 4.4, NOPAT was most important to the LTS of an MNE in this section.

**Graph 9.6: Q.5 - Liquidity Ratios**



| | 1 | 2 | 3 | 4 | 5 | 6 |
|---|---|---|---|---|---|---|
| Average Score | 7.652 | 6.913 | 7.391 | 7.261 | 6.348 | 6.261 |
| Ave MD's | 7.615 | 7.077 | 7.538 | 7.077 | 6.308 | 6.231 |
| Ave FM's | 7.700 | 6.700 | 7.200 | 7.500 | 6.400 | 6.300 |

**Summary Analysis: Question 5**

Graph 9.6 above was constructed to determine the importance of the use of liquidity ratios within the MNE. The graph is derived from the statistics shown in Appendix III and the responses are based on a 10-point Likert Scale. These metrics are important to investors and the managers inside the subsidiaries, as it is important to maintain good cash flow and create a balance between the needs of the MNE, the subsidiary and its operational managers.

Question 5.1 has the highest average with a current ratio (current assets/current liabilities) that is of significance to the MNE. The current ratio determines the organisations ability to pay its debts.

Appendix I, Question 5.1, shows the smallest standard deviation, which is consistent with the findings. The Kurtosis is 1.292 (Leptokurtic) and it indicates a peaked distribution. The skewness is -1.053, slightly left of a normal distribution, so there is an overall agreement. Cronbach's alpha (Appendix IV) and in Graph 9.1 was 0.901 for the series, thus indicating very high reliability.

**Conclusion:** Question 5.1, current ratio was of highest importance to the LTS on the MNE.

**Graph 9.7: Q.6 - Liquidity Ratios**



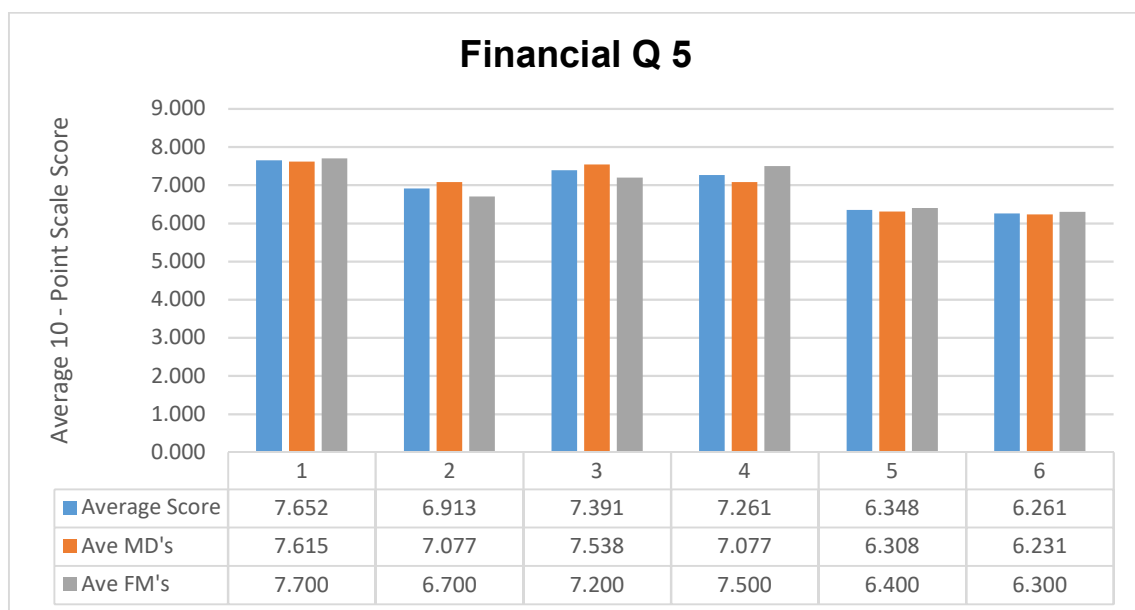| | 1 | 2 | 3 | 4 | 5 | 6 |
|---|---|---|---|---|---|---|
| Average Score | 4.217 | 3.870 | 4.261 | 4.087 | 3.739 | 3.826 |
| Ave MD's | 3.846 | 3.308 | 4.231 | 4.154 | 3.308 | 3.462 |
| Ave FM's | 4.700 | 4.600 | 4.300 | 4.000 | 4.300 | 4.300 |
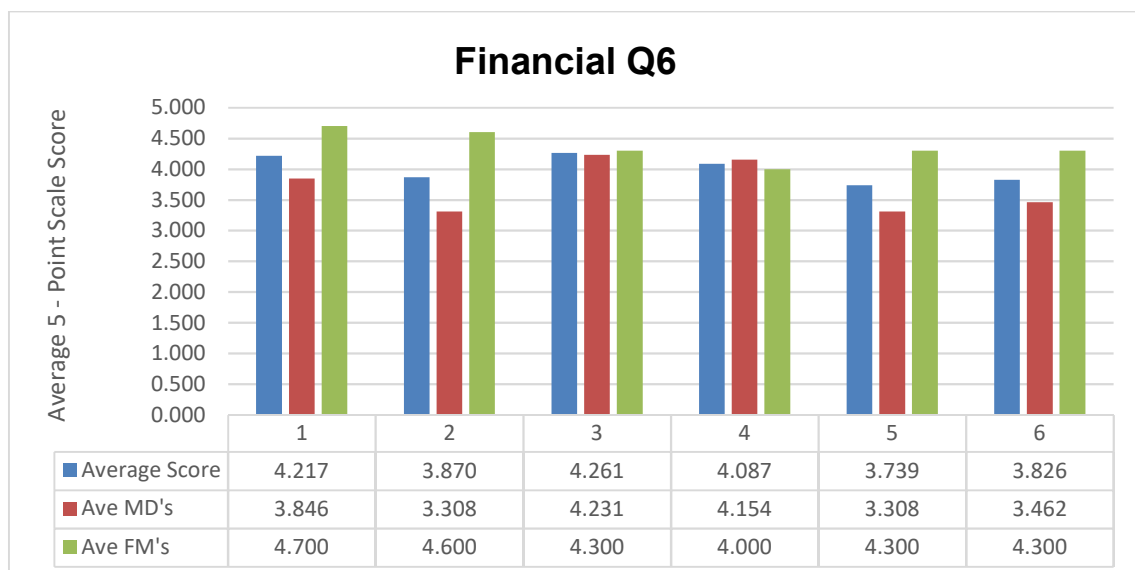
**Summary Analysis: Question 6**

Graph 9.7 above derived from the statistics shown in Appendix I and based on a 5-point Likert Scale, was constructed to determine the importance of liquidity ratios within the MNE. These metrics would be important to investors and the managers inside the subsidiaries to maintain good cash flow and create a balance between the needs of the MNE, the subsidiary and its operational managers.

The respondents as a group placed the highest priority on Question 6.3, which is debtors' collection and calculates the amount of time it takes to collect a debt. Appendix I, Kurtosis calculation is -0.284 (Platykurtic), which indicates a flatter distribution further from a normal distribution. As the calculated value is low, the spread is not far from the normal distribution and the skewness is close to zero, thus reinforcing this finding. This is also shown in the frequency graphs in Appendix II. Cronbach's alpha (Appendix IV) and in Graph 9.1 was 0.905 for the series, thus indicating very high reliability.

**Conclusion:** Question 6.3, debtors' collection was of highest importance to the LTS on the MNE.

**Graph 9.8: Q.7 - Cash Flow Ratios**



| | 1 | 2 | 3 | 4 | 5 |
|---|---|---|---|---|---|
| Average Score | 6.565 | 5.522 | 7.652 | 7.739 | 5.565 |
| Ave MD's | 7.154 | 5.923 | 7.846 | 8.077 | 5.615 |
| Ave FM's | 5.800 | 5.000 | 7.400 | 7.300 | 5.500 |

**Summary Analysis: Question 7 of the Questionnaire**

Graph 9.8 above, derived from the statistics shown in Appendix I and based on a 10-point Likert Scale, was constructed to determine the importance the use of cash flow ratios has within the MNE. These metrics would be important to the managers inside the subsidiaries when managing cash flow and creating a balance between the needs of the MNE, the subsidiary, its operational managers and suppliers.

The respondents as a group placed the highest priority on Question 7.4, which was quality of income, related to the interaction with paying customers and associated with customer relationships.

In Appendix I, Kurtosis calculation for Q7.4 is 4.051 (Leptokurtic), which indicates a peaked distribution. This is also very close to a normal distribution and the skewness is -1.88, which indicates a skewedness to the left, reinforcing this finding. This is also shown in the frequency graphs in Appendix II. Cronbach's alpha in Appendix IV and in Graph 9.1 was 0.901 for the series, thus illustrating very high reliability.

**Conclusion:** Question 7.4, quality of income was of highest importance to the LTS on the MNE.

**Graph 9.9: Q.8 - Cash Flow Ratios**



**Financial Q 8**

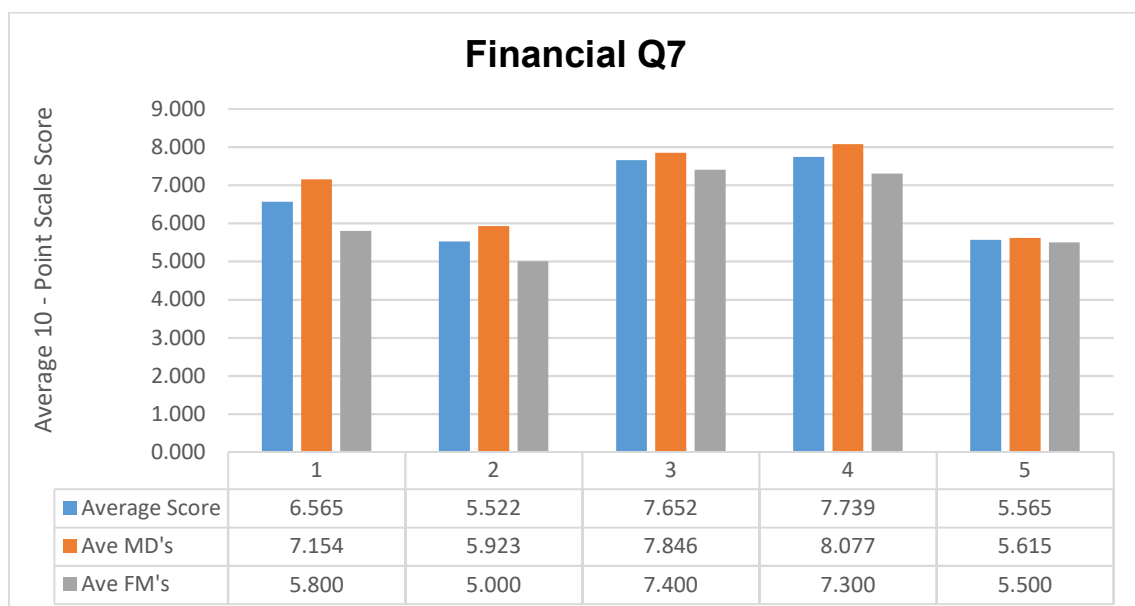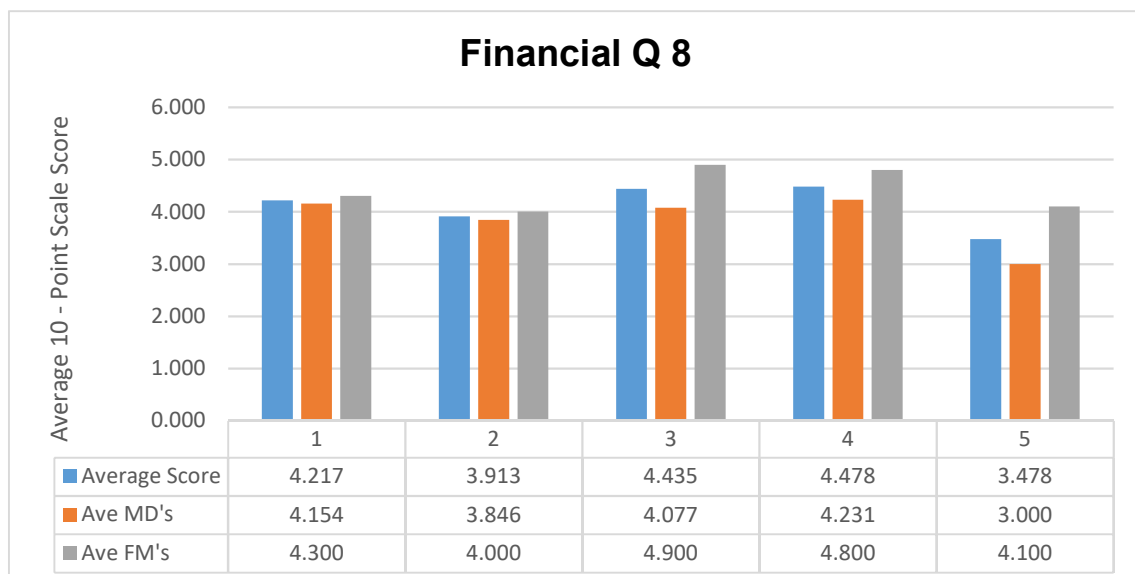| | 1 | 2 | 3 | 4 | 5 |
|---|---|---|---|---|---|
| Average Score | 4.217 | 3.913 | 4.435 | 4.478 | 3.478 |
| Ave MD's | 4.154 | 3.846 | 4.077 | 4.231 | 3.000 |
| Ave FM's | 4.300 | 4.000 | 4.900 | 4.800 | 4.100 |

**Summary Analysis: Question 8**

Graph .9.9 above derived from the statistics shown in Appendix I and is based on a 5-point Likert Scale, it was constructed to determine the importance the use of cash flow ratios has within the MNE. As emphasised above in Q7, these metrics would be important to the managers inside the subsidiaries when managing cash flow and creating a balance between the needs of the MNE, the subsidiary, its operational managers and suppliers.

The respondents as a group placed the highest priority on Question 8.4, which was quality of income, related to the interaction with paying customers and associated with customer relationships.

In Appendix I, the Kurtosis calculation for Question 8.4 is -0.486 (Platykurtic), which indicates a flatter distribution and is a bit further from a normal distribution. The skewness is closer (-0.543) and this indicates skewness to the left of normal. This is shown in the frequency Graph 9.1 in Appendix II. Cronbach's alpha in Appendix IV, in Graph 9.1 indicates a Cronbach's alpha of 0.799 for the series, thus indicating acceptable reliability.

**Conclusion:** Question 8.4, quality of income, was of highest importance to the LTS of an MNE in this section.

**Summary Analysis: Question 9**

**Question 9: Open-ended question**

The objective was to determine if there were any other important metrics used by the subsidiaries in determining the LTS of the MNE. Furthermore, it was important to establish any common themes that could be derived by this line of questioning that could determine or differentiate between what was being measured by the more successful subsidiaries where LTS is concerned. Below are the responses and the common threads from the recorded responses.

**Question 9: Open-ended question - Financial measures**

- Period or fixed expenses as a percentage of sales period expenses/sales.
- New product sales as a percentage of total sales (products released in the previous five years).
- Gross margin by product family.
- R&E expense as a percentage of sales.
- Cash flow, growth cash conversion cycle, cash flow return on gross capital (CFROC), net cash cycle - efficiency of cash management.
- Headcount/sales, sales per employee - to improve overall operating efficiency, rolling 12-month operating profit/employee.
- Debt to equity ratio.
- Sales/order intake ratio - market scale-position vs. organisational speed.
- ROIC - ability to generate profit for investors.
- Slow moving over total inventory ratio.
- Organisation (not product) breakeven point - when gross margin equals fixed costs, so the organisation has no profits and no losses. This metric is given by dividing fixed costs by gross margin percentage.

**Question 9: Open-ended question - Non-financial measures**

- Pipeline management and conversion rate (non-financial).
- Customer complaints - to improve customer relationships/retention, quality = complaints/total, customer complaints - to improve customer relationships/retention, quality = complaints/total shipments.
- OTD - improve customer relationships/retention = late shipments/total shipments, lead times - improve customer retention and sales tool for getting new customers, delivery in full and on-time rate, project cost variance, innovation pipeline strength, time to market and re-work level, OTD - improve customer relationships/retention = late shipments/total shipments.
- Lead times - improve customer retention and sales tools for getting new customers.
- Conversion rate and brand equity.
- Capacity utilisation rate.

**Question 10: Open-ended question**

The objective was to determine which metrics the respondents believed were most important to the study from their perspective.

Table 9.6 below shows the frequency of the responses received. From this table, it is deduced that in order of importance the top six metrics of importance to the FMs and MDs of the MNE are sales growth, cash flow, gross profit margin, operating profit, return on equity and lastly new product sales. Therefore, it is believed that there should be a relentless perusal of sales growth and that this is the highest contributor to sustainable growth within the MNE. The shareholder interests are at a significantly lower priority as is growth from new products.

**Table 9.6: Frequency response to Question 10**

| Metric Description | Frequency Response |
|---|---|
| Sales turnover | 11 |
| Cash flow | 8 |
| Gross profit margin | 6 |
| Operating profit | 6 |
| Return on equity | 5 |
| New product sales | 4 |
| Fixed expenses | 3 |
| EVA® | 3 |
| Current ratio | 2 |
| Net profit | 2 |
| Working capital | 1 |
| Breakeven | 1 |
| Dividend yield | 1 |
| Quick ratio | 1 |
| Labour and overheads | 1 |
| Retained income | 1 |
| Material margin | 1 |

### 9.2.3    Overall conclusion of financial data findings

**Table 9.7: Highest responses Financial Questionnaire**

| Question Number | Section | Likert Scale | Highest Average | Metric |
|---|---|---|---|---|
| 1 | 7 | 10 | 9.043 | Operating profit |
| 2 | 7 | 5 | 4.609 | Operating profit |
| 3 | 4 | 10 | 7.478 | Return on total assets |
| 4 | 4 | 5 | 4.435 | Net Operating Profit after Tax (NOPAT) |
| 5 | 1 | 10 | 7.615 | Current ratio |
| 6 | 3 | 5 | 4.261 | Debtors collection |
| 7 | 4 | 10 | 7.739 | Quality of income |
| 8 | 4 | 5 | 4.478 | Quality of income |
| 9 | N/A | N/A | | No metric to measure |
| 10 | | N/A | | Sales turnover |

Table 9.7 has the highest responses to the financial questionnaire. A copy of this is included in Appendix III. Appendix I contains the statistics tables and they reflect the importance the respondents attached to each section of the questionnaire.

The highest ranked response based on a 10-point Likert Scale was Question 1.7, which was operating profit, considered the most important metric for the LTS of an MNE.

The highest ranked response based on a 5-point Likert Scale was Question 2.7, which was also operating profit as the most important metric for the LTS of an MNE.

All of the questions, when calculated using Cronbach's alpha for the series, were above the threshold limit of 0.6, thus indicating acceptable reliability. Conclusions will follow in chapter ten.

## 9.3     SM DATA ANALYSIS

### 9.3.1     SM data collection

Table 9.8 below shows the results of the SM data collection responses. In summary, 11 were returned out of 36 possible responses. This amounts to an overall 31% response rate with eight subsidiaries not contributing in any way. A list of abbreviations, also in the table, describes the work function of the respondents. The questionnaire that was distributed is listed as Appendix III and is titled SM Questionnaire. The statistical reference is also listed in Appendix IV and is titled SM Data for Analysis. It is accompanied by relevant information and graphs to display frequency of responses etc. Questions posed are split into sub-sections and the analysis of the questions and sub-questions in their specific categories are listed below. This will subsequently be followed by an overview of the findings of the questionnaire and the rationale behind the questions as well as the determination of the results will be analysed with relevant results.

**Table 9.8: Responses SM**

| Country | VPSM | VPI | OCSM | OSP | SMD | SSM | Respondents | Possible Respondents | Response % |
|---------|------|-----|------|-----|-----|-----|-------------|----------------------|------------|
| **Corp HQ** | YES | NO | | | | | 1 | 2 | 50% |
| **Plant ROG** | | | NO | | N/A | NO | 0 | 2 | 0% |
| **Plant ALB** | | | NO | | N/A | NO | 0 | 2 | 0% |
| **DPW** | | | NO | | NO | NO | 0 | 3 | 0% |
| **Spain** | | | | | NO | NO | 0 | 2 | 0% |
| **Poland** | | | | | YES | YES | 2 | 2 | 100% |
| **G Britain** | | | | | YES | YES | 2 | 2 | 100% |
| **Indonesia** | | | | | NO | NO | 0 | 2 | 0% |
| **Canada** | | | | | NO | NO | 0 | 2 | 0% |
| **Thailand** | | | | | NO | NO | 0 | 2 | 0% |
| **Australia** | | | | | YES | YES | 2 | 2 | 100% |
| **China** | | | | | NO | YES | 1 | 2 | 50% |
| **Mexico** | | | | | YES | NO | 1 | 2 | 50% |
| **Brazil** | | | | | NO | NO | 0 | 2 | 0% |
| **N Zealand** | | | | | NO | NO | 0 | 2 | 0% |
| **Argentina** | | | | | NO | NO | 0 | 2 | 0% |
| **Malaysia** | | | | | N/A | NO | 0 | 1 | 0% |
| **S Africa** | | | | | N/A | YES | 1 | 1 | 100% |
| **Russia** | | | | | YES | N/A | 1 | 1 | 100% |
| **Totals** | | | | | | | 11 | 36 | 31% |

| Key | |
|---|---|
| **VPF** | Vice-President SM |
| **VPI** | Vice-President International |
| **OCSM** | Other Corporate Sales Managers |
| **OSP** | Other Sales Practitioners |
| **SMD** | Subsidiary MDs |
| **SSM** | Subsidiary SMMs |

Source: Researcher's own construction

## 9.3.2    Cronbach's Alpha for the Sales and Marketing questionnaire

In Table 9.9: below, are the series of questions answered by the respondents to the Sales and Marketing questions.

**Graph 9.10: Cronbach's alpha graph - Sales and Marketing Questionnaire**
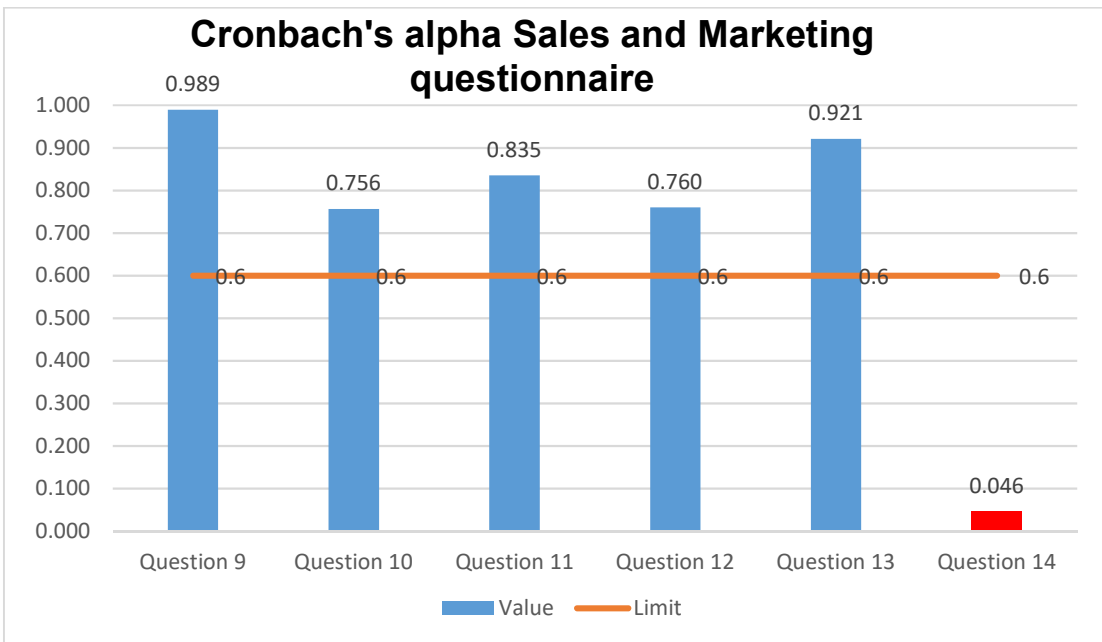


Graph 9.10 above shows that, with the exception of Question 14, all of the question sections display an above (0.6) limit, therefore an acceptable level of reliability is achieved. Question 9 at 0.989 has the highest level of reliability and the calculations are presented in Appendix VIII. All of the questions are analysed under the relevant section in the chapter.

Questions 1 to 8 in Sections 1 and 2 were not calculated using Cronbach's alpha as they were not Likert Scale type questions, but rather multiple choice based. They were analysed accordingly.

### 9.3.3 Analysis and rationale behind the SM questions posed

Questions 1 to 15 of the SM questionnaire were constructed to determine what metrics were being used by the SM practitioners. At the same time, an effort was made to understand how the subsidiary metrics would impact on the LTS of the MNE, the subsidiary and the SM department. Of further importance, was to determine how the role of SM contributes to the LTS of an MNE. The different views of the MDs of the subsidiaries as well as the opinions of the SMMs on this topic were also of interest.

**Summary Analysis: Questions 1 to 8**

Questions 1 to 8 of the SM questionnaire were in two parts. These were formulated to determine the SMM's involvement in the functions that should make up the day-to-day routine of a SM department. The first part was a yes or no response and the second part determined the frequency of reporting and therefore attention to detail. There was also a section to provide feedback in the method of formula used to determine the metrics.

**Table 9.9: Q1 to Q8 - SM statistics for analysis**

| Ques No | Replies | Y | N | Question | Month | Every Quarter | Once /Year |
|---|---|---|---|---|---|---|---|
| 1 | 11 | 8 | 3 | Do you conduct any form of sales forecasting? | 8 | 1 | 2 |
| 2 | 11 | 8 | 3 | Does the sales and marketing department have any input into the inventory management? | 6 | 5 | 0 |
| 3 | 11 | 8 | 3 | Do you conduct customer surveys? | 8 | 1 | 2 |
| 4 | 11 | 10 | 1 | Do you measure customer relationships? | 6 | 2 | 3 |
| 5 | 11 | 11 | 0 | Do you measure inter-company sales and relationships? | 10 | 0 | 1 |
| 6 | 11 | 10 | 1 | Do you measure external (bought out excluding inter-company sales) partnerships and their relationships? | 8 | 0 | 3 |
| 7 | 11 | 11 | 0 | Does your subsidiary (company) make use of market segmentation as an analysis tool? | 7 | 3 | 1 |
| 8 | 11 | 7 | 4 | Does your subsidiary (company) have a customer retention strategy? | 6 | 2 | 3 |

Table 9.9: represents the responses from the first eight questions. The multiple-choice type questions required individual analysis.

**Conclusion:** From questions 1 to 8 of the questionnaire, the respondents believed that inter-company customer retention, combined with market segmentation, were most important for the LTS of the MNE as the strategy to pursue.

**Graph 9.11: Q.9 - SM corporate and subsidiary strategy**



**Sales and Marketing Q9**

| | 1.000 | 2.000 | 3.000 | 4.000 | 5.000 | 6.000 | 7.000 | 8.000 | 9.000 | 10.000 | 11.000 | 12.000 | 13.000 | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Average Score | 3.545 | 4.000 | 3.909 | 4.273 | 4.000 | 4.000 | 4.182 | 4.091 | 4.273 | 4.000 | 4.000 | 3.909 | 4.000 | 4.014 |
| Ave MD's | 4.167 | 4.500 | 4.333 | 4.667 | 4.500 | 4.333 | 4.500 | 4.667 | 4.667 | 4.333 | 4.333 | 4.167 | 4.500 | 4.436 |
| Ave SM's | 2.800 | 3.400 | 3.400 | 3.800 | 3.400 | 3.600 | 3.800 | 3.400 | 3.800 | 3.600 | 3.600 | 3.600 | 3.400 | 3.508 |
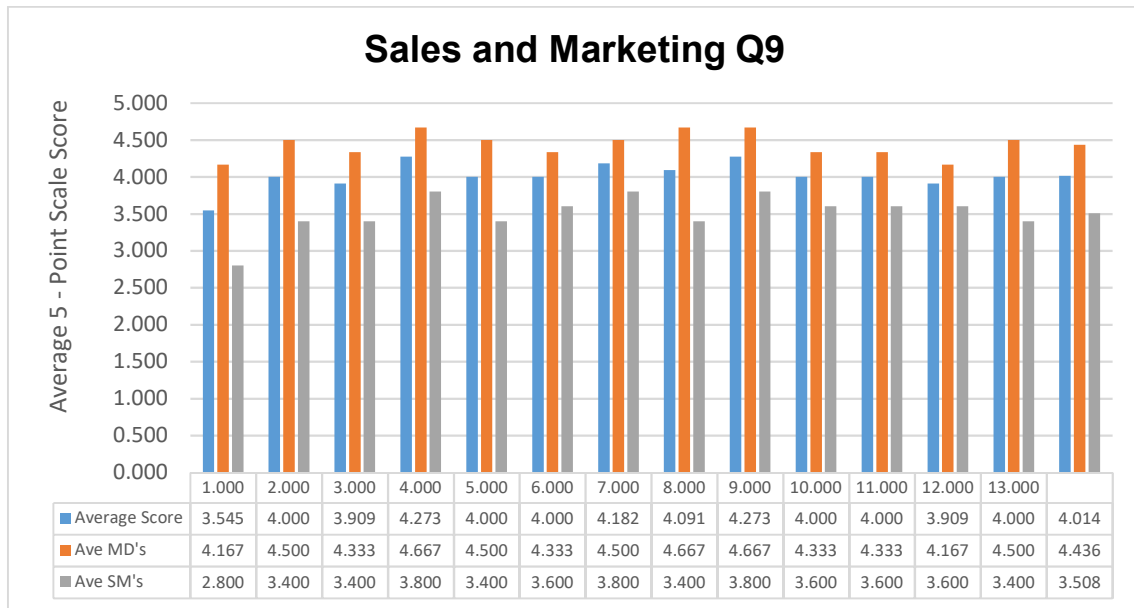
**Summary Analysis: Question 9**

In Graph 9.11 above, derived from the statistics shown in Appendix V, was based on a 5-point Likert Scale. The graph refers to the SM Management's belief in structure and strategy. Strongly disagree was the lowest value of 1 and strongly agree was the highest value at 5.

The analysis of the data from the questions in the graph indicates the highest average score was achieved for questions 4 and 9: Our values are made clear to us and Price is considered an important strategic objective.

In Appendix V, both questions are of equal importance and show a positive Kurtosis of 6,446 (Leptokurtic). In both cases, this indicates a flat distribution. The skewness is -2.376 and the negative indicates that the tail of the distribution is to the left of the scale demonstrating some disagreement to this statement. This is

highlighted in the frequency graphs, which are in Appendix VI. Cronbach's alpha in Appendix VIII and in Graph 9.10 was 0.989 for the series, thus indicating high reliability.

**Conclusion:** Questions 9.4 and 9.9 are of highest importance to the LTS of an MNE in this section.

**Graph 9.12: Q.10 - Sales cycle and performance metrics**

**Sales and Marketing Q10**

| | 1 | 2 | 3 | 4 | 5 | 6 | 7 |
|---|---|---|---|---|---|---|---|
| ■ Average Score | 7.545 | 9.182 | 7.273 | 7.818 | 8.455 | 8.909 | 8.273 |
| ■ Ave MD's | 7.000 | 8.667 | 7.333 | 7.667 | 8.333 | 8.667 | 8.333 |
| ■ Ave SM's | 8.200 | 9.800 | 7.200 | 8.000 | 8.600 | 9.200 | 8.200 |
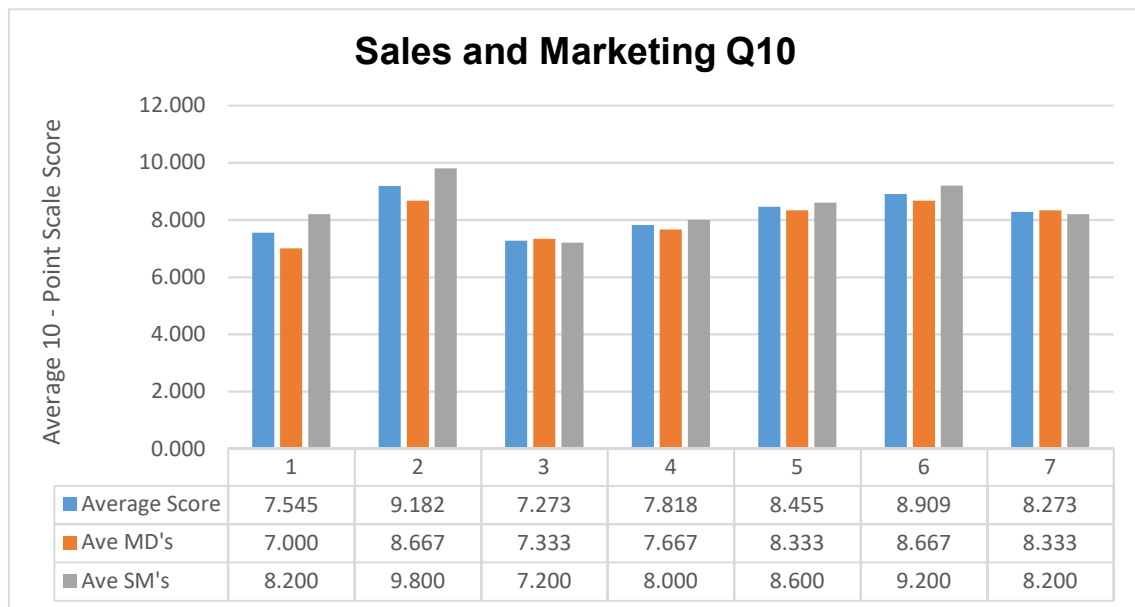
**Summary Analysis: Question 10**

Graph 9.12 above, derived from the statistics shown in Appendix V, was based on a 10-point Likert Scale. This graph refers to the SM Management's belief in sales cycle and performance metrics and their relationship. One was of least importance and 10 of greatest importance.
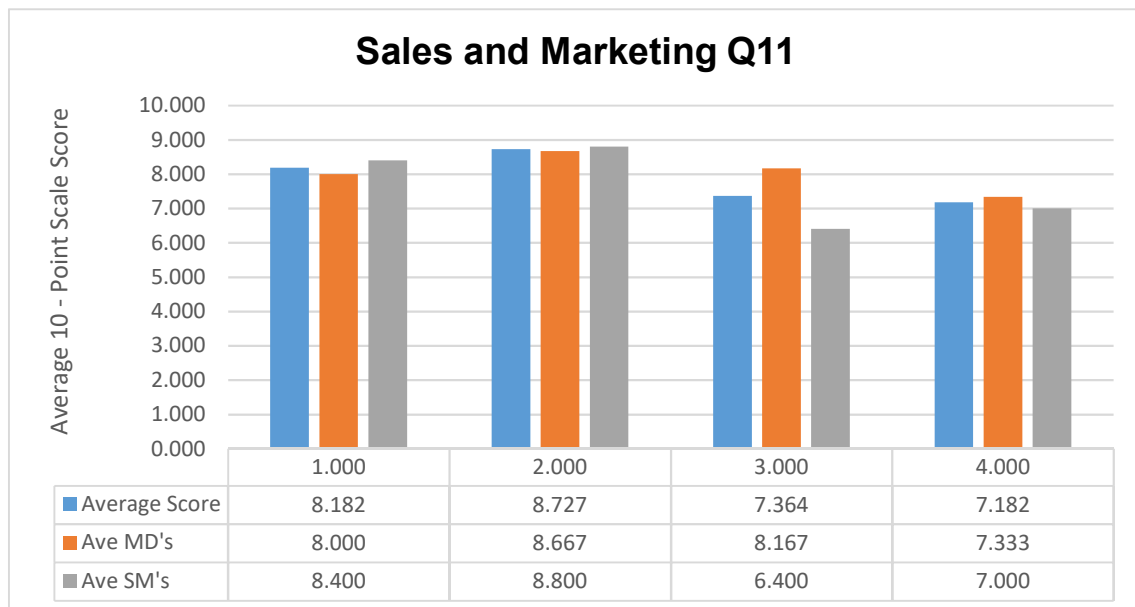
From the analysis of the averages of the data collection, the highest average score was achieved for Q10.2, order intake.

In Appendix V, the negative Kurtosis of -1,387 (Platykurtic) indicates a flat distribution. The skewness is negative, and this indicates that the tail of the distribution is to the left of the scale, representing a level of disagreement to the

statement. This is highlighted in the frequency graphs, which are in Appendix VI. The Cronbach's alpha calculation in Appendix VIII and in Graph 9.10 was 0.756 for the series, thus indicating reasonable reliability.

**Conclusion:** Question 10.2, order intake, is of highest importance to the LTS of an MNE in this section.

**Graph 9.13: Market Development Metrics**



## Sales and Marketing Q11

| | 1.000 | 2.000 | 3.000 | 4.000 |
|---|---|---|---|---|
| ■ Average Score | 8.182 | 8.727 | 7.364 | 7.182 |
| ■ Ave MD's | 8.000 | 8.667 | 8.167 | 7.333 |
| ■ Ave SM's | 8.400 | 8.800 | 6.400 | 7.000 |

**Summary Analysis: Question 11**

Graph 9.13 above, derived from the statistics shown in Appendix V, was based on a 10-point Likert Scale. This graph refers to the SM management's assessment of market development metrics and the outcome of their subsidiary or scope of influence on the LTS. The lowest value was 1 as the least important and the most important was the highest at 10.

From the analysis of the averages of the data collection from the questions in Graph 9.13, the highest average score was achieved for Q11.2, major new product introductions. There was agreement between the MDs and SMMs on the importance of the statement.

In Appendix V, the negative Kurtosis of -0.647 (Platykurtic) indicates a flat distribution. The skewness is -0.693, the negative indicating that the tail of the distribution is to the left of the scale, demonstrating some disagreement to this statement. This is highlighted in the frequency graphs, which are in Appendix VI. The Cronbach's alpha calculation in Appendix VIII and in Graph 9.10 was 0.835 for the series, thus indicating good reliability.

**Conclusion:** Question 11.2, major new product introductions, is of highest importance to the LTS of an MNE in this section.

**Graph 9.14: Customer Relationship Metrics**



**Sales and Marketing Q12**

| | 1.000 | 2.000 | 3.000 | 4.000 |
|---|---|---|---|---|
| ■ Average Score | 7.000 | 8.909 | 9.091 | 9.182 |
| ■ Ave MD's | 6.833 | 9.333 | 9.333 | 9.333 |
| ■ Ave SM's | 7.200 | 8.400 | 8.800 | 9.000 |
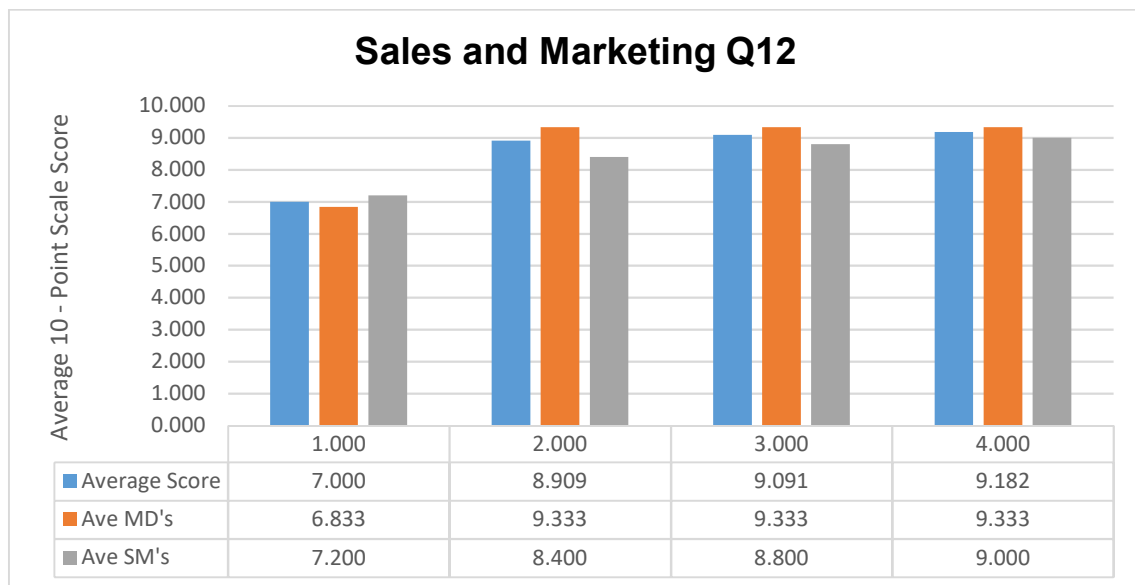
**Summary Analysis: Question 12**

Graph 9.14 above, derived from the statistics shown in Appendix V, was based on a 10-point Likert Scale, with least important being the lowest value of 1 and the most important being the highest value of 10. SM Questions 12, 1 to 4, reflected the SM's assessment of customer relationship metrics and their outcome on the LTS of their subsidiary or scope of influence.

From the analysis of the averages of the data collected from the questions in Graph 9.14, the highest average score was achieved for Q12.3, margin by market code. There was agreement between the MDs and SMMs on the importance of the statement.

The positive Kurtosis of 1.206 (Leptokurtic), in Appendix V, indicates a peaked distribution. The skewness is -1.081 and a negative value indicates that the tail of the distribution is to the left of the scale demonstrating some disagreement to this statement. This is highlighted in the frequency graphs, which are in Appendix VI. The Cronbach's alpha calculation in Appendix VIII and in Graph 9.10 was 0.760 for the series, thus indicating reasonable reliability.

**Conclusion:** Question 12.3, margin by market code is of highest importance to the LTS of an MNE in this section.

**Graph 9.15: Customer Service Metrics**



**Sales and Marketing Q13**

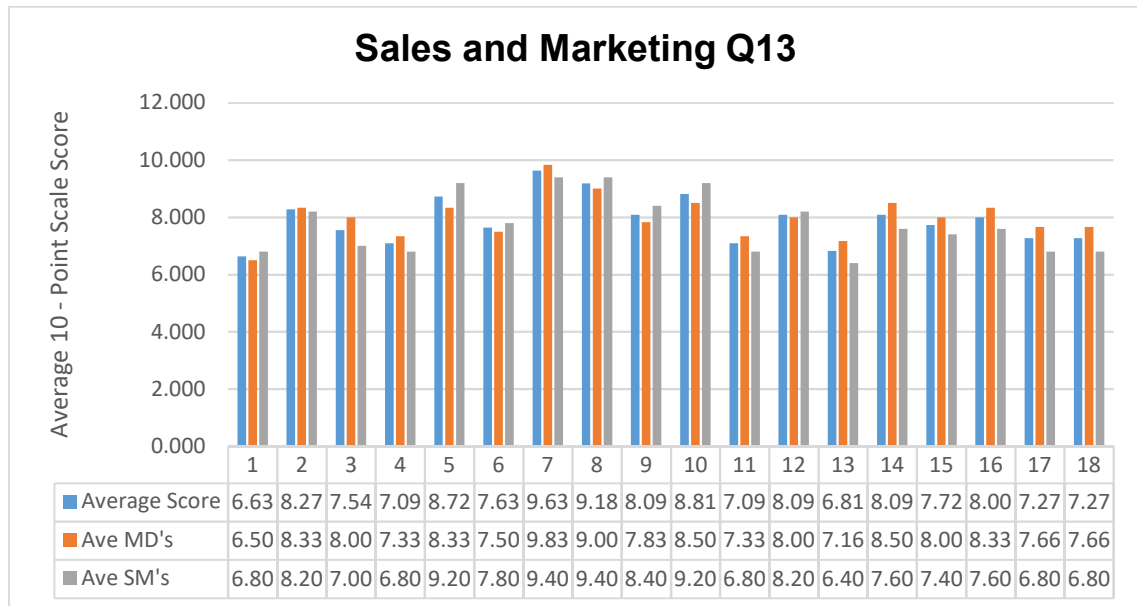| | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 | 13 | 14 | 15 | 16 | 17 | 18 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| ■ Average Score | 6.63 | 8.27 | 7.54 | 7.09 | 8.72 | 7.63 | 9.63 | 9.18 | 8.09 | 8.81 | 7.09 | 8.09 | 6.81 | 8.09 | 7.72 | 8.00 | 7.27 | 7.27 |
| ■ Ave MD's | 6.50 | 8.33 | 8.00 | 7.33 | 8.33 | 7.50 | 9.83 | 9.00 | 7.83 | 8.50 | 7.33 | 8.00 | 7.16 | 8.50 | 8.00 | 8.33 | 7.66 | 7.66 |
| ■ Ave SM's | 6.80 | 8.20 | 7.00 | 6.80 | 9.20 | 7.80 | 9.40 | 9.40 | 8.40 | 9.20 | 6.80 | 8.20 | 6.40 | 7.60 | 7.40 | 7.60 | 6.80 | 6.80 |

**Summary Analysis: Question 13**

Graph 9.15 above, was derived from the statistics shown in Appendix V and was based on a 10-point Likert Scale, with 1 being least important to 10 being of greatest importance. The graph was constructed to determine the importance the use of customer service metrics has within the MNE. The series of questions refers to the sales management's confidence in these metrics and their outcome on the LTS of their subsidiary or scope of influence.
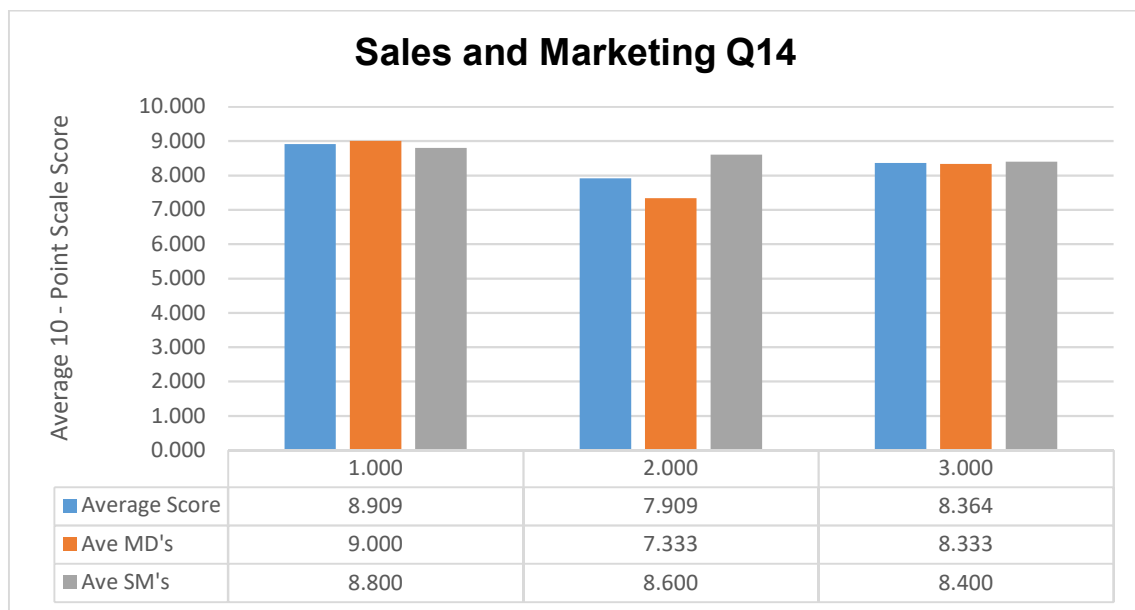
The respondents as a group placed the highest priority on Question 13.7, which was monthly and YTD financial results by industry (sales, GM, %), related to the

interaction with customer sales and gross margins, associated with customer relationships.

From the analysis in Appendix V, the positive Kurtosis of 2.611 (Leptokurtic), indicates a peaked distribution. Skewness is -1.800, so tends towards the left of the distribution indicating that there is some disagreement with the statement. This is highlighted in the frequency graphs, which are in Appendix VI. Cronbach's alpha in Appendix VIII and in Graph 9.10 was 0.921 for the series, thus indicating high reliability.

**Conclusion:** Question 13.7, monthly and YTD financial results by industry (sales, GM, %) are of highest importance to the LTS of an MNE in this section.

**Graph 9.16: Market Segment Metrics**

**Sales and Marketing Q14**

| | 1.000 | 2.000 | 3.000 |
|---|---|---|---|
| Average Score | 8.909 | 7.909 | 8.364 |
| Ave MD's | 9.000 | 7.333 | 8.333 |
| Ave SM's | 8.800 | 8.600 | 8.400 |

*Average 10 - Point Scale Score*

**Summary Analysis: Question 14**

Graph 9.16 above, derived from the statistics shown in Appendix V, was based on a 10-point Likert Scale, with 1 being least important to 10 being of greatest importance. The graph was constructed to determine the importance the use of Market Segment Metrics has within the MNE. The series of questions refers to the sales management's confidence in these metrics and their outcome on the

LTS of their subsidiary or scope of influence.

The respondents as a group placed the highest priority on Question 14.1, which was number of projects awarded to the subsidiary and is a measure of turnover derived from large-scale projects.

From the analysis in Appendix V, the positive Kurtosis is 0.199 (Leptokurtic) and indicates a peaked distribution. Skewness is -0.663, which tends towards the left of the distribution with no significant amount of disagreement. This is highlighted in the frequency graphs, which are in Appendix VI. Cronbach's alpha, in Appendix VIII and in Graph 9.10, was 0.046 for the series, thus indicating very low reliability.

**Conclusion:** The data sample, being very small, is irrelevant. Although the researcher agrees that projects are important to subsidiaries, this metric will be negated.

### 9.3.4    Overall conclusion of SM data findings

**Table 9.10: Highest responses to sales and marketing questionnaire**

| Question Number | Section | Likert Scale | Highest Average | Metric |
|---|---|---|---|---|
| 1 - 8 | N/A | N/A | N/A | Inter-company customer retention |
| 1 - 8 | N/A | N/A | N/A | Market segmentation |
| 9 | 4 | 5 | 4.273 | Our values are made clear to us |
| 9 | 9 | 5 | 4.273 | Price is considered an important strategic objective |
| 10 | 2 | 10 | 9.182 | Order intake |
| 11 | 2 | 10 | 8.727 | Major new product introductions |
| 12 | 3 | 10 | 9.091 | Margin by market code |
| 13 | 7 | 10 | 9.636 | Monthly and YTD financial results by industry |
| 14 | 1 | 10 | 8.909 | Number of projects awarded to the subsidiary, from analysis, question and result are disregarded due to low reliability using Cronbach's alpha. |

In Table 9.10, are the highest responses to the sales and marketing questionnaire, a copy of which is included in Appendix VII. Appendix V contains the statistics tables as they reflect the importance the respondents attached to each section of the questionnaire.

The highest ranked responses based on a 5-point Likert Scale were from Questions 9.4 and 9.9, which concerned inter-company customer retention and market segmentation, being equally important to the LTS of the MNE.

The highest ranked response based on a 10-point Likert scale was Question 13.7, which was monthly and YTD financial results by industry, considered the most important metric for the LTS of an MNE.

All of the questions when calculated using Cronbach's alpha for the series, were above the threshold limit of 0.6 indicating acceptable reliability, except for Question 14, which was disregarded in the final analysis of the sales and marketing section. Conclusions will follow in chapter ten.

## 9.4    OPERATIONS DATA ANALYSIS

### 9.4.1    Operations data collection

In Table 9.11 below, are the results of the operations data collection responses. In summary, 21 responses were returned out of a possible 34 responses and two of these were blank, so they were not included for analysis purposes. This amounts to an overall 62% response rate with one subsidiary not contributing to the study in any way. In the table is also a list of abbreviations which describes the work function of the respondents. The questionnaire that was distributed is listed as Appendix V and is titled Operations Questionnaire. The statistical reference is listed in Appendix VI and is titled Operations Data for Analysis. This is accompanied by relevant information and graphs to display frequency of responses among others.

The questions posed were divided into sub-sections and the analysis of the questions and sub-questions in their specific categories are listed below. This is followed by an overview of the findings of the questionnaire and the rationale behind the questions as well as the determination of the results, which are analysed below with the relevant results.

**Table 9.11: Operations data collection response**

| Country | VPOM | VPI | OCOM | OFP | SMD | SOM | Respondents | Possible Respondents | Response % |
|---------|------|-----|------|-----|-----|-----|-------------|----------------------|------------|
| Corp HQ | YES | YES | | | | | 2 | 2 | 100% |
| Plant ROG | | | YES | | N/A | YES | 2 | 2 | 100% |
| Plant ALB | | | YES | | N/A | NO | 1 | 2 | 50% |
| DPW | | | YES | | NO | | 1 | 2 | 50% |
| Spain | | | | | NO | NO | 0 | 2 | 0% |
| Poland | | | | | NO | YES | 1 | 2 | 50% |
| G Britain | | | | | YES | YES | 2 | 2 | 100% |
| Indonesia | | | | | NO | YES | 1 | 2 | 50% |
| Canada | | | | | YES | NO | 1 | 2 | 50% |
| Thailand | | | | | NO | NO | 0 | 2 | 0% |
| Australia | | | | | YES | YES | 2 | 2 | 100% |
| China | | | | | YES | NO | 1 | 2 | 50% |
| Mexico | | | | | YES | YES | 2 | 2 | 100% |
| Brazil | | | | | YES | YES | 2 | 2 | 100% |
| N Zealand | | | | | YES | YES | 2 | 2 | 100% |
| Argentina | | | | | NO | NO | 0 | 2 | 0% |
| Malaysia | | | | | N/A | NO | 0 | 1 | 0% |
| S Africa | | | | | | YES | 1 | 1 | 100% |
| | | | | | | | 21 | 34 | 62% |

| Key | |
|-----|-----|
| **VPF** | Vice-President Finance |
| **VPI** | Vice-President International |
| **OCOM** | Other Corporate OMs |
| **OFP** | Other Operations Practitioners |
| **SMD** | Subsidiary MDs |
| **SOM** | Subsidiary OMs |

Source: Researcher's own construction

## 9.4.2 Cronbach's alpha for operations questionnaire

In Graph 9.17 below, are the series of questions answered by the respondents to the operations questions.

**Graph 9.17 Cronbach's alpha graph - Operations Questionnaire**
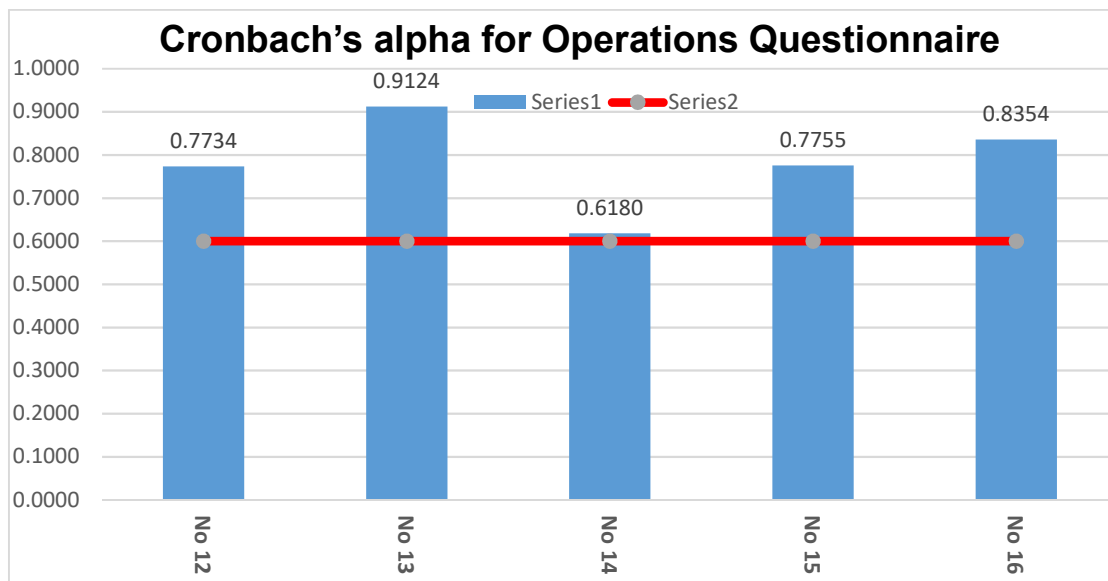


Graph 9.17 above, shows that all of the question sections have limits above 0.6, which is an acceptable level of reliability. Question number 13 at 0.9124 has the highest level of reliability. The calculations are in Appendix XII. All the questions will be analysed under the appropriate section in the chapter below.

Questions 1 to 11, Sections 1, 2 and 3 were not calculated using Cronbach's alpha as they were not Likert Scale type questions, but were multiple choice based. They will be analysed accordingly.

### 9.4.3    Analysis and rationale behind the operations questions posed

Questions 1 to 16 of the operations management questionnaire were constructed to determine what metrics were being used by the OMs. At the time, an effort was made to understand the subsidiary operations' metrics and their impact on the LTS of the MNE. Of further importance was to determine the role and contribution of operations management to the LTS of an MNE. The different views of the MDs of the subsidiaries as well as the opinion of the OMs on this topic were also of interest.

**Summary Analysis: Question 1 - 11**

Questions 1 to 11 in Table 9.12 of the operations questionnaire are three-part questions. These were formulated to determine the involvement of the OMs in the functions that should make up the day-to-day routine of an operations department. The first part is a yes or no response, the second part determines the measurement and the third part indicates the frequency of measurement and thus the performance of the subsidiary.

**Table 9.12: Q1 – 11 Operations statistics for analysis**

| Ques No | Replies | Y | N | Question | Measurement | Frequency |
|---|---|---|---|---|---|---|
| 1 | 19 | 19 | 0 | On time delivery commitment to customers | 90 days | Monthly |
| 2 | 19 | 15 | 4 | On time delivery in full | 85 days | Monthly |
| 3 | 19 | 19 | 0 | 6s audits are done regularly | N/A | Weekly |
| 4 | 19 | 19 | 0 | Scheduled maintenance program | | Monthly |
| 5 | 19 | 18 | 1 | Average lead time measured | Monthly | Monthly |
| 6 | 19 | 19 | 0 | Sales per employee measured | $110 000 | $125 000 |
| 7 | 19 | 19 | 0 | Profit per employee measured | $24 000 | $28 000 |
| 8 | 19 | 4 | 15 | Sales per square meter | Not important | Not important |
| 9 | 19 | 15 | 4 | Inventory turns measured | 110 days | 90 days |
| 10 | 19 | 7 | 12 | Shippable backlog measured | 6 days | 5 days |
| 11 | 19 | 17 | 2 | Lean and Kaizen training done | 17 hours | 14 hours |

Table 9.12 above represents the responses to the yes or no section of the questionnaires. For the table regarding the financial questions, Cronbach's alpha does not work well for these types of questions, as they require individual analysis being multiple-choice type questions.
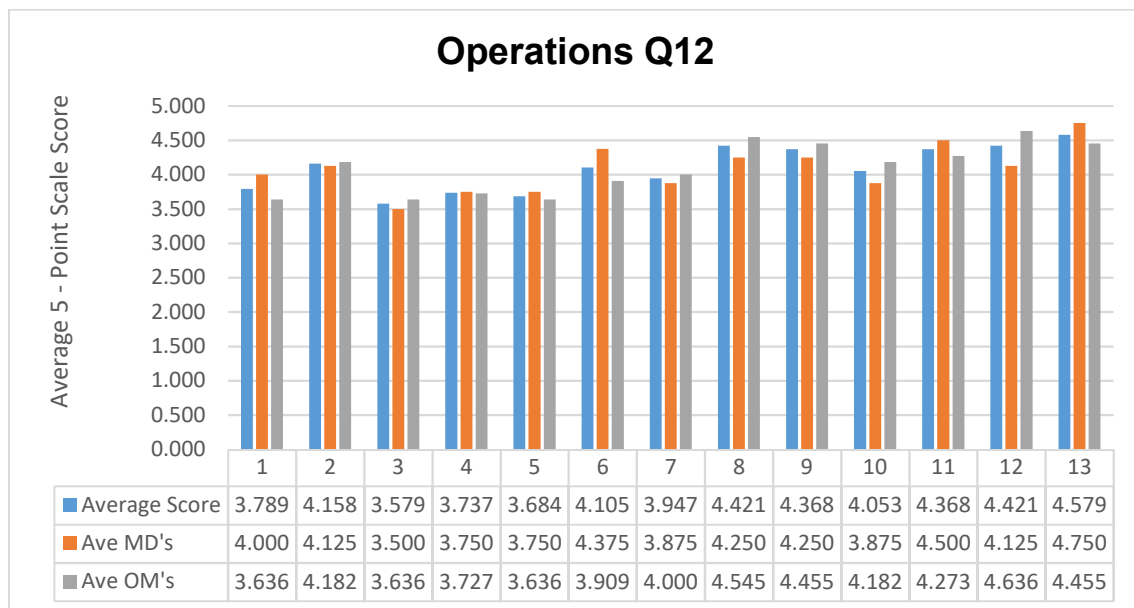
**Conclusion:** The Operations Managers and the MDs agreed that Q1, Q3, Q4, Q6 and Q7 are the most important metrics and that Q8 is of the least importance. As Q1 is based on on-time delivery to customers as a commitment metric and is of paramount importance, it is interesting that it corresponds with the same metric deemed important to the Account Managers.

Question 3 focused on the 6s audits being done regularly and contributing to the overall CI and safety foundation of the subsidiary. This was important based on the principles of LM and maintaining neatness and tidiness in the factory according to standards.

Question 4 was about having a scheduled maintenance program. This is an important and logical operations initiative because if the equipment is not properly maintained then it will break down causing a loss of income due to the non-production of goods.

Question 6 dealt with sales per employee measured and Question 7 was about profit per employee measured. These are metrics used to determine the efficiency of the employees of the subsidiary and their capacity to produce goods.

**Graph 9.18 Corporate and subsidiary strategy**



**Operations Q12**

| | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 | 13 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Average Score | 3.789 | 4.158 | 3.579 | 3.737 | 3.684 | 4.105 | 3.947 | 4.421 | 4.368 | 4.053 | 4.368 | 4.421 | 4.579 |
| Ave MD's | 4.000 | 4.125 | 3.500 | 3.750 | 3.750 | 4.375 | 3.875 | 4.250 | 4.250 | 3.875 | 4.500 | 4.125 | 4.750 |
| Ave OM's | 3.636 | 4.182 | 3.636 | 3.727 | 3.636 | 3.909 | 4.000 | 4.545 | 4.455 | 4.182 | 4.273 | 4.636 | 4.455 |

**Summary Analysis: Question 12**

Graph 9.18 above, derived from the statistics shown in Appendix IX, was based on a 5-point Likert Scale. Strongly disagree was the lowest value 1 and strongly agree was the highest value 5. This graph was constructed to determine the importance that was placed on corporate and subsidiary strategy. The research
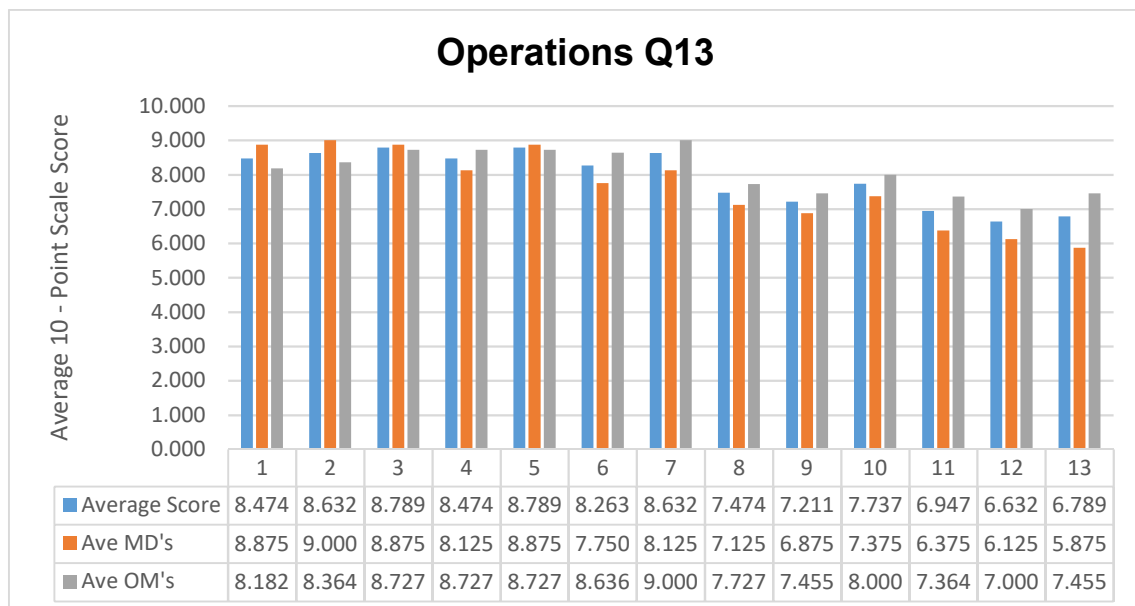
questionnaire section was set up in this way so that the metrics of most importance to the OMs and MDs could be determined as well as their agreement on the same or similar measurements in gauging long-term sustainability.

The highest priority for the respondents was Question 13, which related to the management of people. Both MDs and OMs as a group agreed that this is the most important metric and strategic objective.

In Appendix IX, the standard deviation for Q13 is 0.607, which is a narrow spread. The Kurtosis is 0.582 and a positive Kurtosis (Leptokurtic), indicates a peaked distribution. The skewness is -0.168, so is slightly left of a normal distribution and even though there is an overall agreement, the opinions differ slightly. Cronbach's alpha in Appendix XII and in Graph 9.17 was 0.773 for the series, thus indicating acceptable reliability.

**Conclusion:** Question 13, management of people is considered an important strategic objective and is of highest importance to the LTS of an MNE in this section.

**Graph 9.19: Financial Metrics in operations**



**Operations Q13**

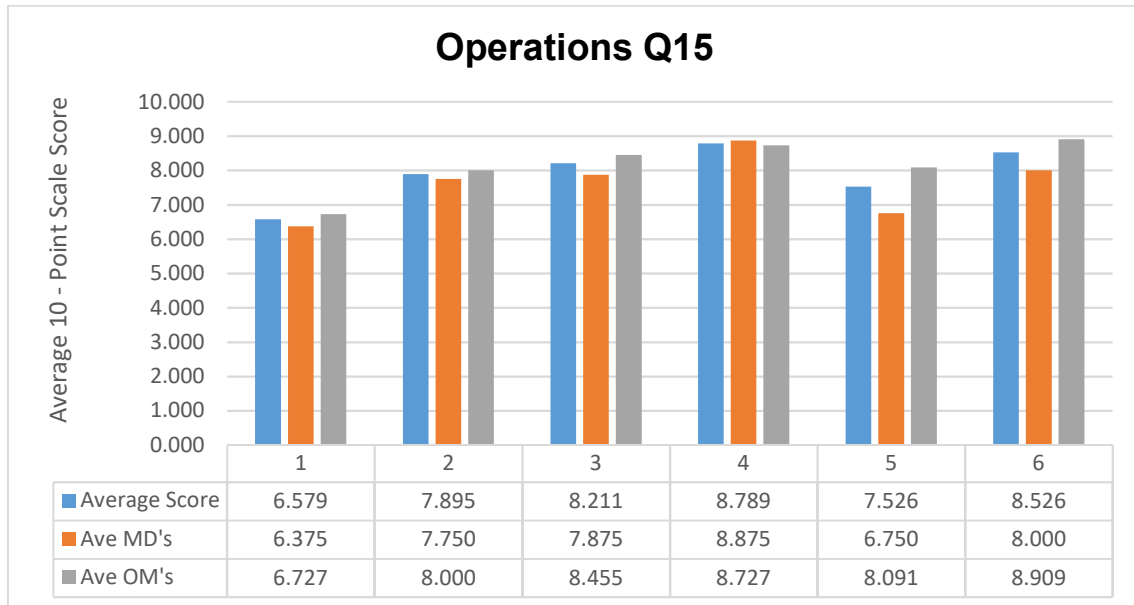| | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 | 13 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Average Score | 8.474 | 8.632 | 8.789 | 8.474 | 8.789 | 8.263 | 8.632 | 7.474 | 7.211 | 7.737 | 6.947 | 6.632 | 6.789 |
| Ave MD's | 8.875 | 9.000 | 8.875 | 8.125 | 8.875 | 7.750 | 8.125 | 7.125 | 6.875 | 7.375 | 6.375 | 6.125 | 5.875 |
| Ave OM's | 8.182 | 8.364 | 8.727 | 8.727 | 8.727 | 8.636 | 9.000 | 7.727 | 7.455 | 8.000 | 7.364 | 7.000 | 7.455 |

**Summary Analysis: Question 13**

Graph 9.19 above, derived from the statistics shown in Appendix IX, was based on a 10-point Likert Scale. The graph was constructed to determine the importance of the use of financial metrics in the operations environment and further to this, the OMs' understanding of these metrics. The series of questions referred to the OMs' confidence in these metrics and their outcome on the LTS of their subsidiary or scope of influence.

The highest priority for the respondents was gauged in Questions 3 and 5, which related to Gross Margin and Operating Profit. Both MDs and OMs as a group agreed that this is the most important metric, which aligned with the MNE's LTS objectives.

In Appendix IX, the standard deviation for Question 3 and Question 5 was 0.148, which is a narrow spread. The Kurtosis for Question 3 was -1.125 (Platykurtic), indicating a flat distribution or spread across scales. The skewness was -0.211 and the negative indicates that the tail of the distribution is to the left of the scale, demonstrating slight disagreement with this statement.

In Question 5, the Kurtosis was 2.654 (Leptokurtic), which is a more peaked distribution towards agreement. The skewness is -1.531 and the negative indicates that the tail of the distribution is to the left of the scale demonstrating more disagreement with this statement.

This is highlighted in the frequency graphs in Appendix X. Cronbach's alpha in Appendix XII and in Graph 9.17 was 0.9124 for the series, thus indicating high reliability.

**Conclusion:** Question 3 Gross Margin, followed by Question 5 Operating Profit, are considered important strategic objectives and are of highest importance to the LTS of an MNE in this section.

**Graph 9.20: Super 8 Operations Metrics**



Operations Q14

| | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 |
|---|---|---|---|---|---|---|---|---|
| Average Score | 9.737 | 7.947 | 6.632 | 7.684 | 8.579 | 7.842 | 5.579 | 7.895 |
| Ave MD's | 9.750 | 7.875 | 6.250 | 8.375 | 8.375 | 7.625 | 5.250 | 7.875 |
| Ave OM's | 9.727 | 8.000 | 6.909 | 7.182 | 8.727 | 8.000 | 5.818 | 7.909 |
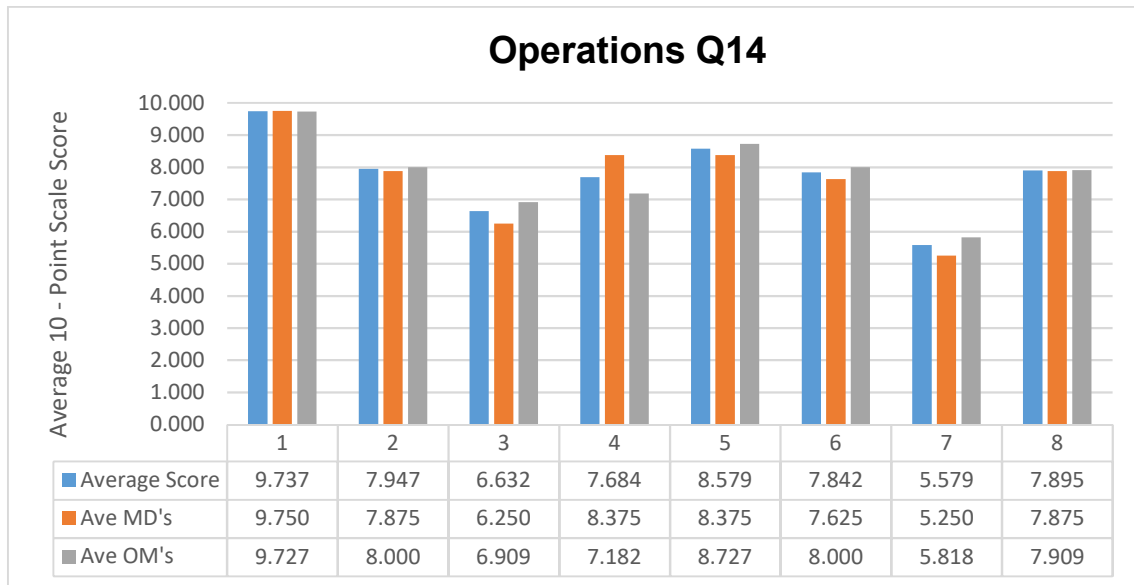
**Summary Analysis: Question 14**

Graph 9.20 above, derived from the statistics shown in Appendix IX was based on a 10-point Likert Scale. The graph was constructed to determine the importance of the Super 8 metrics, which were constructed by the corporate head office of the MNE. These metrics are used by the corporate to assess the efficiency of the operations environment. The series of questions referred to the OMs' confidence in these metrics and their outcome on the LTS of their subsidiary or scope of influence.

The highest priority for the respondents was Question 1, which related to average monthly on time delivery. Both MDs and OMs as a group agreed that this was the most important strategic Super 8 metric, which aligned with the MNE's LTS objectives.

From the analysis in Appendix IX, the negative Kurtosis of -0.718 (Platykurtic), indicated a flat or broader distribution. Skewness was -1.170, tending towards the left of the distribution indicating that there was some disagreement with the statement. This is highlighted in the frequency graphs that are in Appendix X, Cronbach's alpha in Appendix XII and in Graph 9.17 as 0.6180 for the series, thus indicating low but above limit reliability.

**Conclusion:** Question 1, average monthly on time delivery, is considered an important strategic objective and is of highest importance to the LTS of an MNE in this section.

**Graph 9.21: Lean Manufacturing and continuous improvement**



**Operations Q15**

| | 1 | 2 | 3 | 4 | 5 | 6 |
|---|---|---|---|---|---|---|
| Average Score | 6.579 | 7.895 | 8.211 | 8.789 | 7.526 | 8.526 |
| Ave MD's | 6.375 | 7.750 | 7.875 | 8.875 | 6.750 | 8.000 |
| Ave OM's | 6.727 | 8.000 | 8.455 | 8.727 | 8.091 | 8.909 |

**Summary Analysis: Question 15**

Graph 9.21 above, derived from the statistics shown in Appendix V, was based on a 10-point Likert Scale, with 1 being least important to 10 being of greatest importance. The graph was constructed to determine the importance of the use of Lean Manufacturing and Continuous Improvement metrics have within the MNE. The series of questions refer to the OMs understanding and confidence in these metrics and their outcome on the LTS of their subsidiary or scope of influence.

The highest priority for the respondents was Question 1, which related to Question 4, labour efficiency. Both MDs and OMs as a group agreed that this is the most important metric, which aligned with the MNE's LTS objectives.

The positive Kurtosis was 0.768 (Leptokurtic) and indicated a peaked distribution in Appendix IX. The skewness was -1.072, a negative value that indicated that the tail of the distribution was to the left of the scale demonstrating some

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disagreement with this statement. This is highlighted in the frequency graphs in Appendix X. The Cronbach's alpha calculation in Appendix XII and in Graph 9.17 was 0.7755 for the series, thus indicating reasonable reliability.

**Conclusion:** Question 4, labour efficiency was considered an important strategic objective and of highest importance to the LTS of an MNE in this section.

**Graph 9.22: Quality Measurement Metrics**



**Operations Q16**

| | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 |
|---|---|---|---|---|---|---|---|---|---|---|
| Average Score | 7.895 | 8.158 | 9.684 | 9.263 | 8.368 | 7.684 | 7.211 | 8.947 | 8.474 | 8.474 |
| Ave MD's | 8.375 | 8.125 | 9.375 | 9.375 | 8.375 | 8.000 | 7.125 | 9.500 | 8.875 | 8.375 |
| Ave OM's | 7.545 | 8.182 | 9.909 | 9.182 | 8.364 | 7.455 | 7.273 | 8.545 | 8.182 | 8.545 |
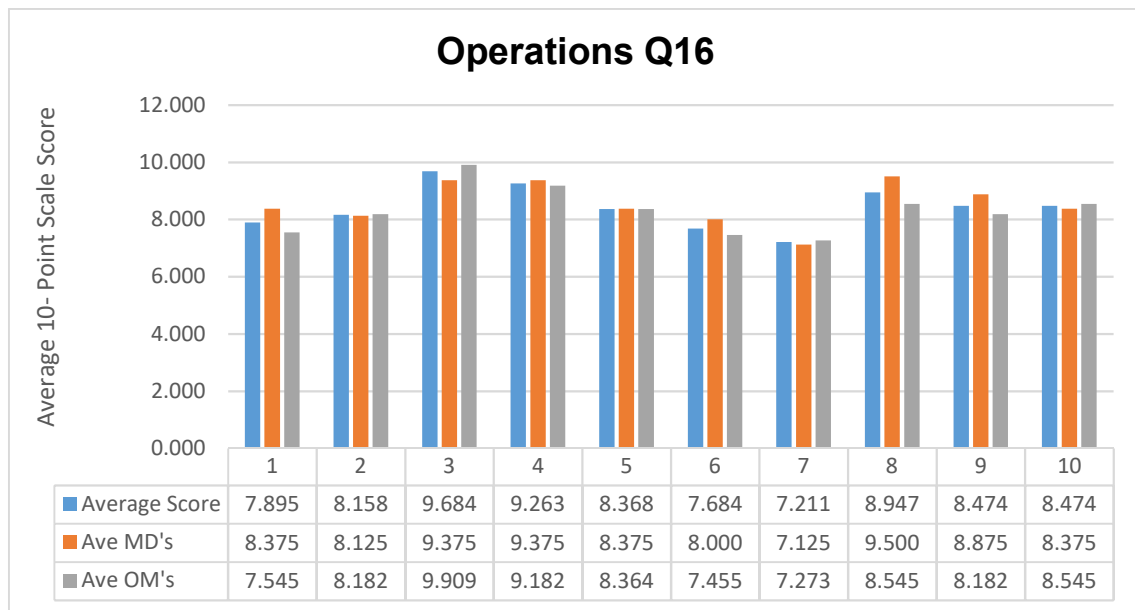
**Summary Analysis: Question 16**

Graph 9.22 above, derived from the statistics shown in Appendix IX, was based on a 10-point Likert scale. The graph was constructed to determine the importance of quality measurement metrics, which were constructed by the corporate head office of the MNE. These metrics were used by the corporate head office to assess the efficiency of the operations environment. The series of questions referred to the OMs' confidence in these metrics and their outcome on the LTS of their subsidiary or scope of influence.

The highest priority for the respondents was Question 3, which related to on time delivery. Both MDs and OMs as a group agreed that this was the most important metric, which aligned with the MNE's LTS objectives.

The positive Kurtosis of 2.540 (Leptokurtic) in Appendix IX, is very close to a perfect distribution. The skewness was -1.766, a negative value indicating that the tail of the distribution is to the left of the scale demonstrating some disagreement to this statement. This is highlighted in the frequency graphs in Appendix X. The Cronbach's alpha calculation in Appendix XII and in Graph 9.17 was 0.8354 for the series, thus indicating good reliability.

**Conclusion:** Question 3, on time delivery, is considered an important strategic objective and of highest importance to the LTS of an MNE in this section.

**Q17 - Other operational metrics used that are not included**

Questions 17 and 18 were included to determine if there were any other metrics that had not been considered, which may have a profound impact on the LTS of the MNO being analysed. From the analysis, there are six main themes as follows:

- Health and safety.
- Inventory.
- Labour.
- LM.
- Human Resource Management.
- Maintenance.

From the responses, no items were included in the analysis that would lead to any further discussion, as the data did not indicate any overriding or apparent omission from that already collected.

### 9.4.4 Overall conclusion of operational data findings

**Table 9.13: Highest responses to operations questionnaire**

| Question Number | Section | Likert Scale | Highest Average | Metric |
|---|---|---|---|---|
| 1-11 | 1 | N/A | N/A | On time delivery to customers |
| 1-11 | 3 | N/A | N/A | 6s audits completed |
| 1-11 | 4 | N/A | N/A | Scheduled maintenance program |
| 1-11 | 6 | N/A | N/A | Sales per employee |
| 1-11 | 7 | N/A | N/A | Profit per employee |
| 12 | 13 | 5 | 4.579 | Management of people |
| 13 | 3 | 10 | 8.789 | Gross margin |
| 13 | 5 | 10 | 8.789 | Operating profit |
| 14 | 1 | 10 | 9.737 | Average monthly on time delivery |
| 15 | 4 | 10 | 8.789 | Labour efficiency |
| 16 | 3 | 10 | 9.684 | On time delivery |

In Table 9.13 are the highest responses to the operations questionnaire, a copy of which is included in Appendix XI. Appendix XIII contains the statistics tables and they reflect the level of importance the respondents attached to each section of the questionnaire.

The highest ranked response based on a 5-point Likert Scale was Question 12.13, which was management of people, being important to the LTS of the MNE.

The highest ranked response based on a 10-point Likert Scale was Question 14.1, which was average monthly on time delivery. This metric was highlighted by the operations management group several times, emphasising its importance to the LTS of the MNE.

All of the questions, when calculated using Cronbach's alpha for the series, were above the threshold limit of 0.6, thus indicating acceptable reliability. Only Question 1 Part 2 was below the threshold limit, which was not relevant as it did not form part of a Likert Scale type question and was analysed separately. Conclusions will follow in chapter ten.

## 9.5    HR DATA ANALYSIS

### 9.5.1    HR data collection

In Table 9.14 below are the results of the HR data collection responses. In summary in Table 9.14, 21 were returned out of 35 possible responses. This amounted to an overall 60% response rate with three subsidiaries (highlighted in yellow) not contributing to the study in any way. After Table 9.14 is a key, which is a list of the abbreviations describing the posts held by the respondents.

**Table 9.14: Human resource data collection responses**

| Country | VPHR | VPI | OCHRM | OPM | PHRM | SMD | SHRM | Respondents | Possible Respondents | Responses % |
|---------|------|-----|-------|-----|------|-----|------|-------------|---------------------|-------------|
| Corp HQ | NO | YES | YES | YES | | | | 3 | 4 | 75% |
| Plant ROG | | | | YES | YES | | | 2 | 2 | 100% |
| Plant ALB | | | | NO | YES | | | 1 | 2 | 50% |
| DPW | | | | | | NO | YES | 1 | 2 | 50% |
| Spain | | | | | | NO | NO | 0 | 2 | 0% |
| Poland | | | | | | YES | YES | 2 | 2 | 100% |
| G Britain | | | | | | YES | YES | 2 | 2 | 100% |
| Indonesia | | | | | | YES | NO | 1 | 2 | 50% |
| Canada | | | | | | YES | NO | 1 | 2 | 50% |
| Thailand | | | | | | NO | YES | 1 | 2 | 50% |
| Australia | | | | | | YES | NO | 1 | 2 | 50% |
| China | | | | | | NO | NO | 0 | 2 | 0% |
| Mexico | | | | | | YES | YES | 2 | 2 | 100% |
| Brazil | | | | | | NO | YES | 1 | 2 | 50% |
| N Zealand | | | | | | NO | NO | 0 | 2 | 0% |
| Argentina | | | | | | YES | N/A | 1 | 1 | 100% |
| Malaysia | | | | | | N/A | YES | 1 | 1 | 100% |
| S Africa | | | | | | N/A | YES | 1 | 1 | 100% |
| | | | | | | | | 21 | 35 | 60% |

| Key | |
|-----|-----|
| **VPF** | Vice-President Finance |
| **VPI** | Vice-President International |
| **OCHRM** | Other Corporate HRMs |
| **OPM** | Other Plant Managers |
| **PHRM** | Plant HRMs |
| **SMD** | Subsidiary MDs |
| **SHRM** | Subsidiary HRMs |

Source: Researcher's own construction

### 9.5.2 Cronbach's alpha for HRM Questionnaire

In Graph 9.23 below are the series of answers from the respondents to the HRM questions.

**Graph 9.23: Cronbach's alpha graph - HRM Questionnaire**
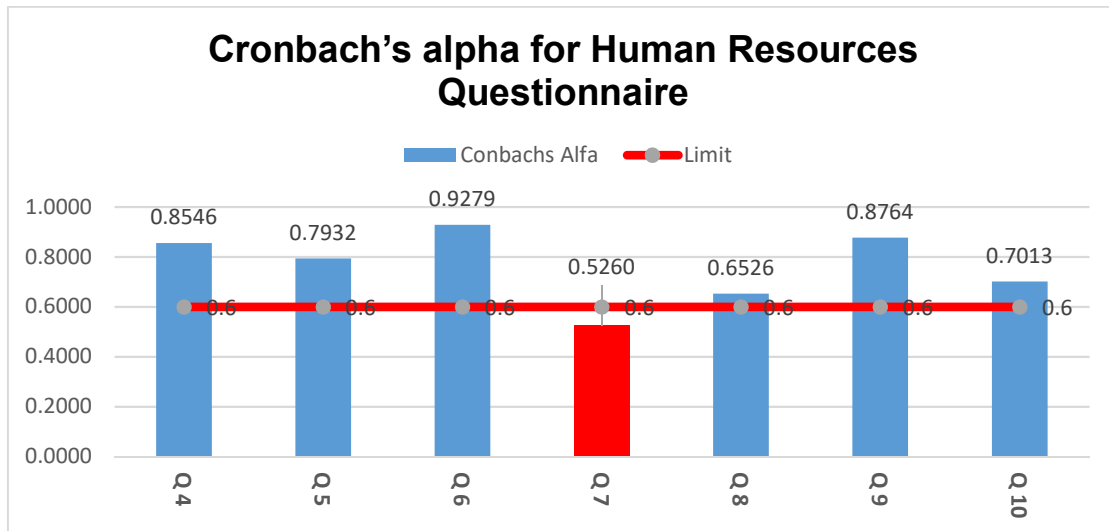


Graph 9.23 above shows that all of the question sections have a limit above 0.6, which is an acceptable level of reliability, except for question 7, question number 3. Question 6 at 0.9279 has the highest level of reliability. The calculations for Cronbach's alpha are in Appendix XVI. All of the questions will be analysed under the appropriate section in the chapter below.

Questions 1 to 3, sections 1 and 2, were not calculated using Cronbach's alpha as they were not Likert Scale type questions, but multiple-choice based. These results were analysed accordingly.

### 9.5.3 Analysis and rationale behind the HR questions posed

Questions 1 to 10 of the HR questionnaire were constructed to determine which metrics were being used by the HR practitioners. Of additional importance was an understanding of the subsidiary metrics and their impact on the LTS of the MNE, the subsidiary and the HR department. It was also important to determine

how the role of HR contributed to the LTS of an MNE. The different view of the MDs of the subsidiaries as opposed to the opinion of the Human Resource managers on this topic was of further interest.

**Summary Analysis: Questions 1 to 3**

Questions 1 to 3 of the HRM questionnaire were two part questions. These were formulated to determine the HRMs' involvement in the functions that should comprise the day-to-day routine of a HR department. The first part was a yes or no response and the second part determined the frequency of reporting and therefore attention to the detail. There was also a section to provide feedback in the method of formula used to determine the metrics.

**Table 9.15: Q1 to 3 HRM statistics for analysis**

| Ques No | Replies | Y | N | Question |
|---------|---------|----|---|----------|
| 1 | 21 | 12 | 9 | We have a human resources strategy in place |
| 2 | 21 | 17 | 4 | We have a Performance Management system in place |
| 3 | 21 | 18 | 3 | We have a full time Human Resource Manager as part of the management team |

With reference to Table 9.15, Q1.1 was asked to determine if there was an HR strategy in place and if this was communicated within the subsidiary. Of further importance was whether reporting was done and if this was a form of communication to the employees of the subsidiary. From the responses in most cases, there was a HR strategy in place, but it was known that the three non-responsive subsidiaries did not have HR delegated as a responsibility.

Q1.2 related to a PMS being in place and despite some subsidiaries not having an HR strategy in place, they did have a PMS in place.

Most MDs and HRMs, with very few exceptions, confirmed that people are an important asset to the company. Unfortunately, as the response rate was only 60%, there may be skewness in this data amongst the non-respondents, as it was already known to the researcher that the three subsidiaries that did not respond did not have HR or PM as a strategic or LTS objective.

**Conclusion:** From Questions 1 to 3 of the questionnaire, the respondents believed that a human resources strategy must be in place and that Performance Management contributes to and is an important part of the LTS of the MNE.

**Graph 9.24: Q4 - Corporate subsidiary strategy in HR environment**



**Human Resources Q4**

| | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 | 13 | 14 | 15 | 16 | 17 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Average Score | 3.85 | 3.90 | 3.90 | 3.80 | 4.09 | 4.00 | 4.19 | 4.80 | 4.28 | 4.33 | 4.47 | 4.52 | 4.52 | 4.23 | 4.19 | 4.28 | 4.14 |
| Ave MD's | 4.00 | 4.00 | 4.10 | 4.10 | 4.40 | 4.00 | 4.30 | 4.90 | 4.30 | 4.30 | 4.50 | 4.80 | 4.60 | 4.40 | 4.30 | 4.30 | 4.20 |
| Ave HRM's | 3.72 | 3.81 | 3.72 | 3.54 | 3.81 | 4.00 | 4.09 | 4.72 | 4.27 | 4.36 | 4.45 | 4.27 | 4.45 | 4.09 | 4.09 | 4.27 | 4.09 |
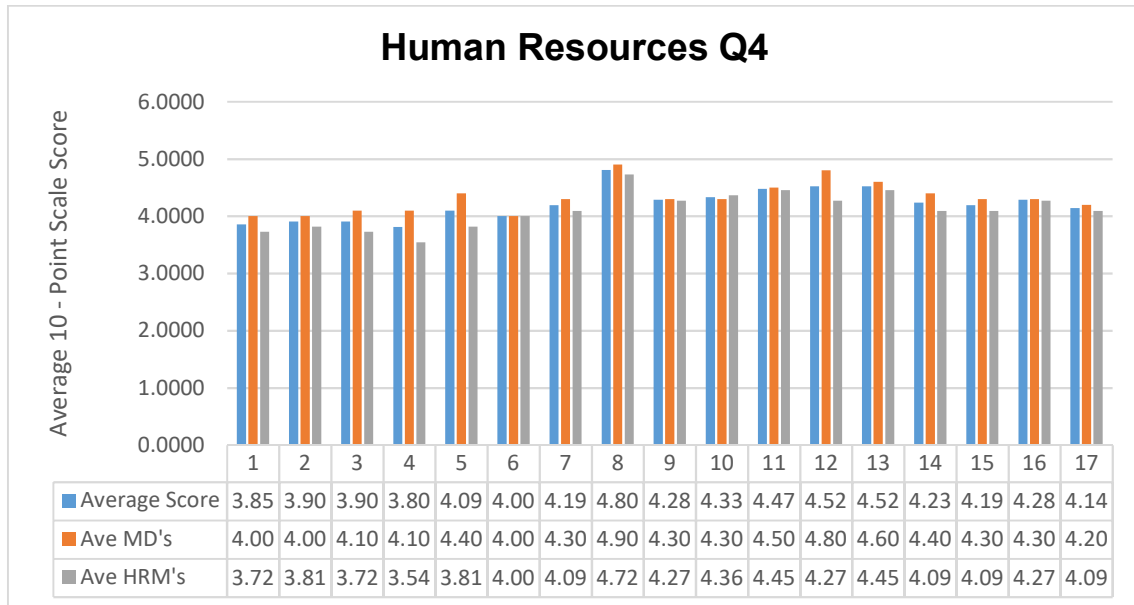
**Summary Analysis: Question 4**
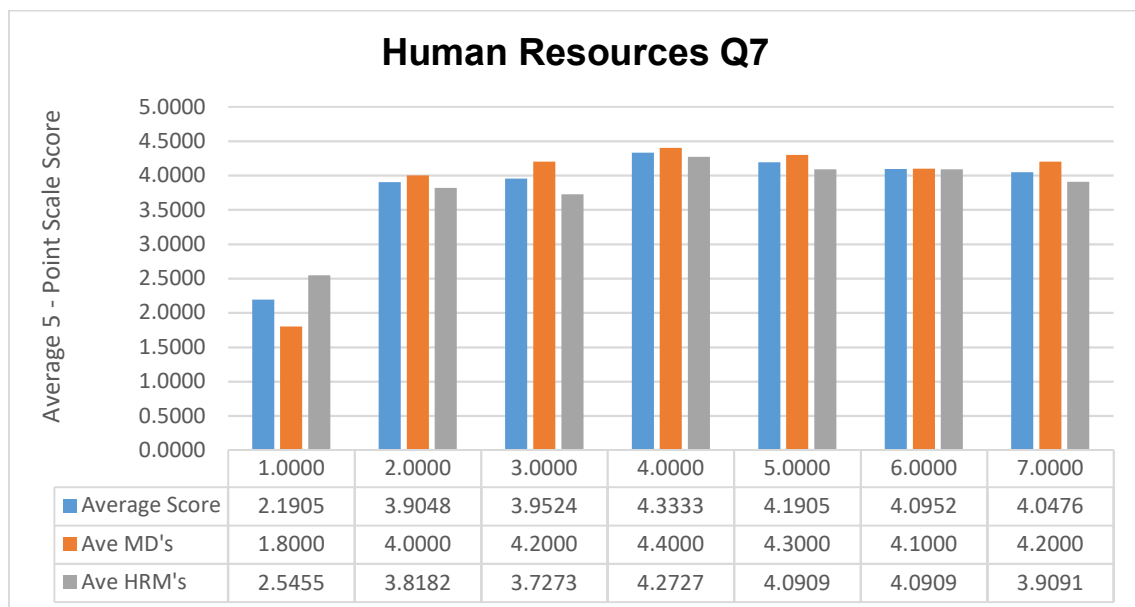
Graph 9.24 above, derived from the statistics shown in Appendix XIII, was based on a 5-point Likert Scale and was constructed to determine the importance of corporate strategy in the HR environment. These metrics were constructed to determine if there was alignment between the subsidiary and the corporate headquarters on MNE strategy objectives and their outcome on the LTS of their subsidiary or scope of influence.

The highest priority for the respondents was Question 8, which related to quality, and is considered an important strategic objective. Both MDs and OMs as a group agreed that this was the most important metric, which aligned with the MNEs LTS objectives.

The positive Kurtosis was 0.975 (Leptokurtic), in Appendix XVI, indicating a peaked distribution. The skewness was -1.7004, a negative value indicating that

the tail of the distribution being to the left of the scale, thus demonstrating some disagreement with this statement. This is highlighted in the frequency graphs which are in Appendix XIV. The Cronbach's alpha calculation in Appendix XII and in Graph 9.23 was 0.8546 for the series, thus indicating good reliability.

**Conclusion:** Question 8 - Quality is considered an important strategic objective, was considered an important strategic objective and was of highest importance to the LTS of an MNE in this section.

**Graph 9.25 Long-term sustainability**

Human Resources Q5

Average 10 - Point Scale Score

| | 1.0000 | 2.0000 | 3.0000 | 4.0000 | 5.0000 | 6.0000 | 7.0000 | 8.0000 | 9.0000 | 10.0000 | 11.0000 | 12.0000 | 13.0000 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Average Score | 4.6190 | 4.4762 | 3.9048 | 4.2381 | 2.6190 | 4.2381 | 3.2381 | 3.1905 | 4.0476 | 4.1905 | 3.6190 | 3.4286 | 4.0000 |
| Ave MD's | 4.8000 | 4.7000 | 3.9000 | 4.4000 | 2.6000 | 4.3000 | 3.1000 | 3.1000 | 3.5000 | 3.7000 | 4.2000 | 3.7000 | 4.2000 |
| Ave HRM's | 4.4545 | 4.2727 | 3.9091 | 4.0909 | 2.6364 | 4.1818 | 3.3636 | 3.2727 | 3.7273 | 3.1818 | 3.8182 | 3.1818 | 3.8182 |

**Summary Analysis: Question 5**

Graph 9.25 above, derived from the statistics shown in Appendix XIII, was based on a 5-point Likert Scale. The graph was constructed to determine the HRMs' understanding of the LTS. These metrics were constructed to determine if there was alignment between the subsidiary and the corporate headquarters on the MNE's LTS metrics.

The highest priority for the respondents was Question 1, which related to Human Resource Management being a strategic contributor to the MNE. Both MDs and OMs as a group agreed that this was an important metric, which aligned with the MNE's LTS objectives.
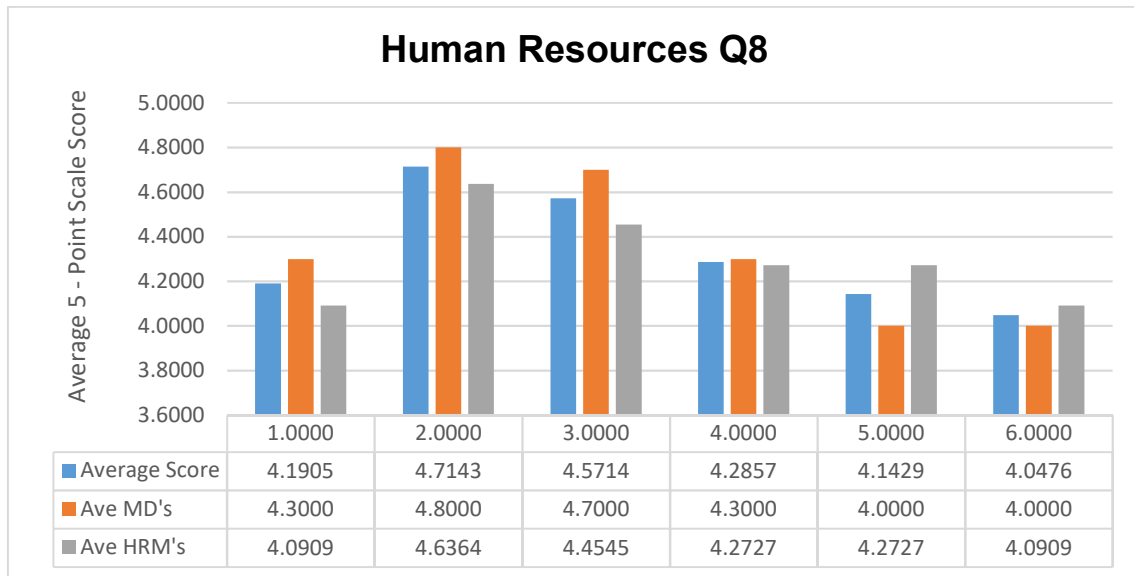
The positive Kurtosis was 1.4285 (Leptokurtic), in Appendix XVI, indicating a peaked distribution close to a perfect distribution. The skewness was -1.5884, a negative value indicating that the tail of the distribution being to the left of the scale demonstrating some disagreement with this statement. This is highlighted in the frequency graphs, which are in Appendix XIV. The Cronbach's alpha calculation in Appendix XVI and in Graph 9.23 was 0.7932 for the series, thus indicating reasonable reliability.

**Conclusion:** Question 1 - Human Resource Management is a strategic contributor to the enterprise, was considered an important strategic objective and of highest importance to the LTS of the MNE in this section.

**Graph 9.26: Q6 - Not important to the LTS of the MNE**



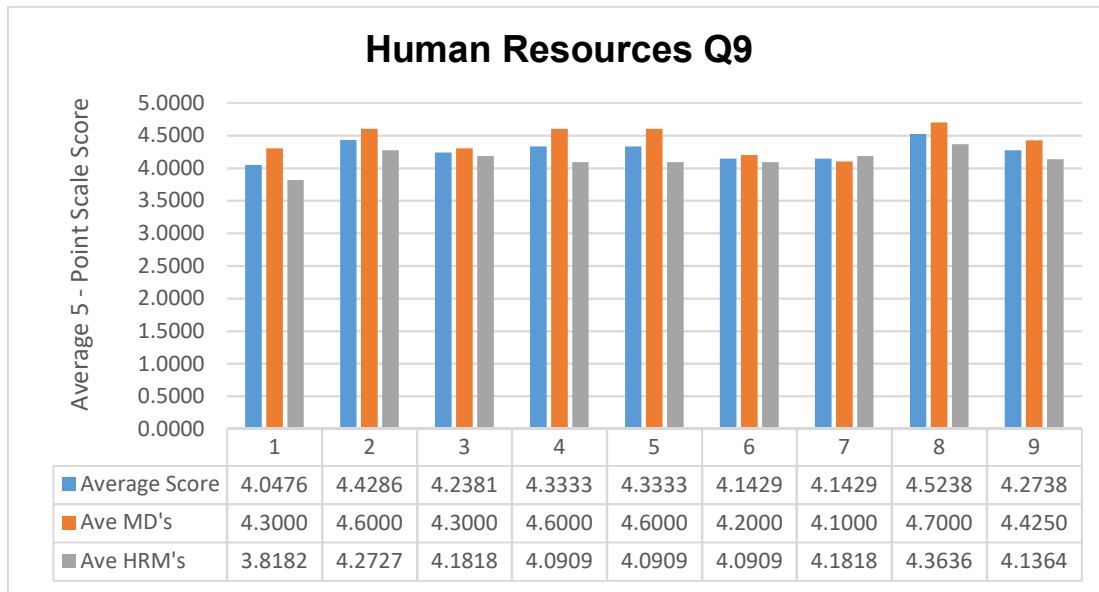| Human Resources Q6 | 1.0000 | 2.0000 | 3.0000 | 4.0000 | 5.0000 | 6.0000 | 7.0000 |
|---|---|---|---|---|---|---|---|
| Average Score | 2.1429 | 2.6667 | 2.4762 | 1.9524 | 2.2857 | 1.8571 | 1.8571 |
| Ave MD's | 2.0000 | 2.7000 | 2.4000 | 1.7000 | 2.2000 | 1.5000 | 1.4000 |
| Ave HRM's | 2.2727 | 2.6364 | 2.5455 | 2.1818 | 2.3636 | 2.1818 | 2.2727 |
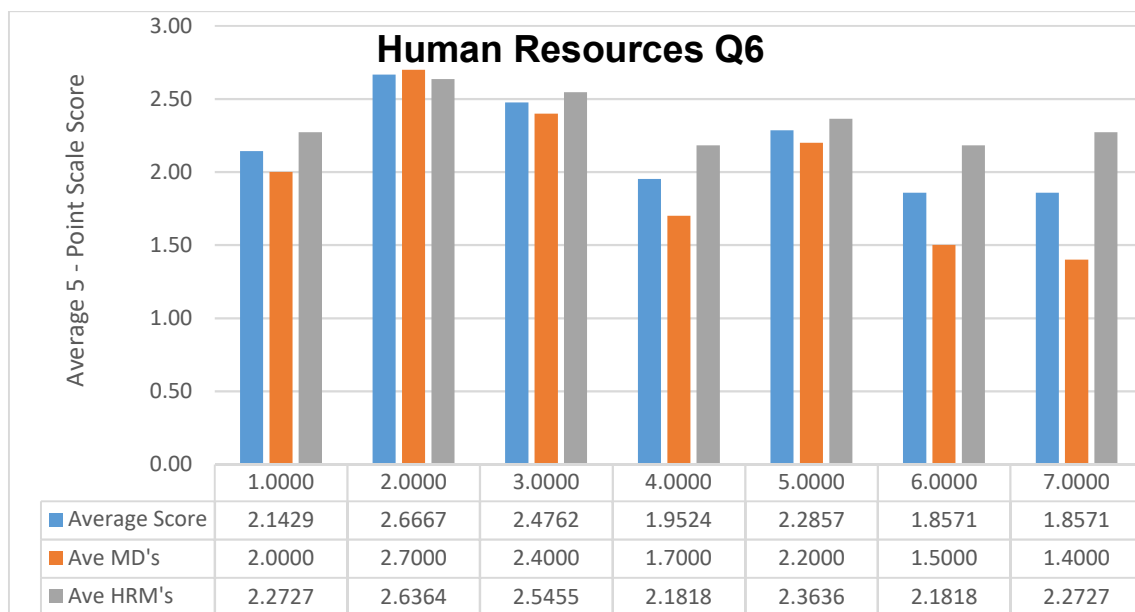
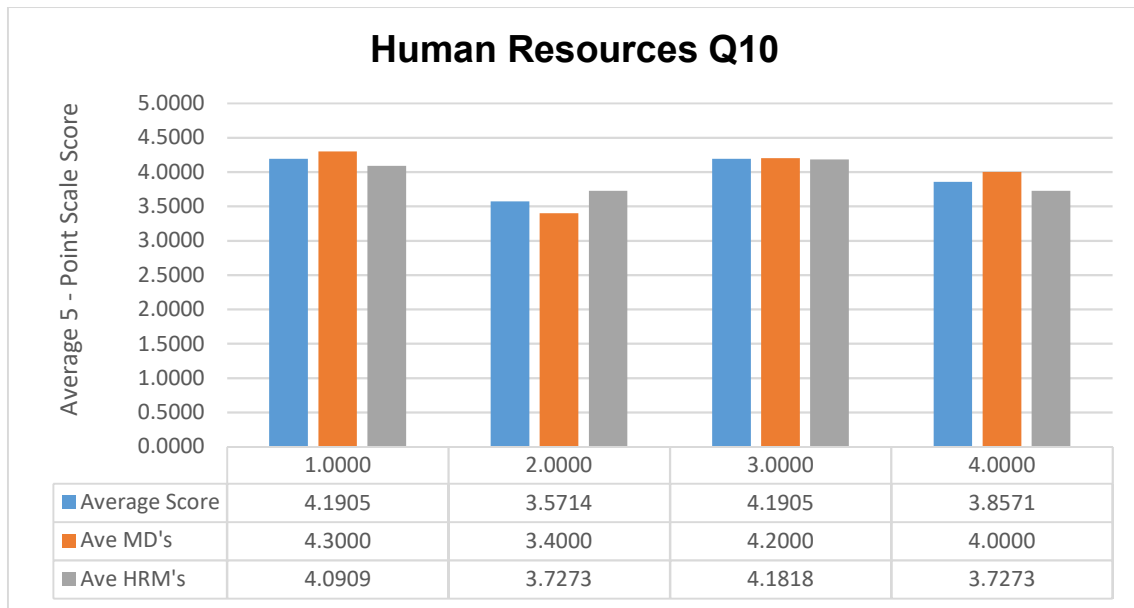**Summary Analysis: Question 6**

Graph 9.26 above, derived from the statistics shown in Appendix XIII, was based on a 5-point Likert Scale. The graph was constructed to determine the HRMs' understanding of LTS. These metrics were constructed in the negative, to determine in reverse the least to the most important metrics. The question with the lowest average score is therefore of the most significance.

The lowest priority for the respondents was Questions 6 and 7, which related to employee motivation, and employee training and development contributor to the MNE. Both MDs and OMs, as a group, agreed that these important metrics align with the MNE's LTS objectives.

The positive Kurtosis was 2.1951 for Question 6 and 2.0451 for Question 7 (both Leptokurtic) in Appendix XIII, indicating a peaked distribution close to a perfect distribution. The skewness was 1.5256 for Question 6 and 1.6041 for Question 7. A positive value indicates that the tail of the distribution is to the right of the scale demonstrating some disagreement with these statements. This is highlighted in the frequency graphs, which are in Appendix XIV. The Cronbach's alpha calculation in Appendix XVI and in Graph 9.23 was 0.9279 for the series, thus indicating high reliability.

**Conclusion:** Questions 6 and 7 - Employee motivation and employee training and skills development, were considered important strategic objectives and of highest importance to the LTS of an MNE in this section.

**Graph 9.27: Leadership of senior management team**



| | 1.0000 | 2.0000 | 3.0000 | 4.0000 | 5.0000 | 6.0000 | 7.0000 |
|---|---|---|---|---|---|---|---|
| Average Score | 2.1905 | 3.9048 | 3.9524 | 4.3333 | 4.1905 | 4.0952 | 4.0476 |
| Ave MD's | 1.8000 | 4.0000 | 4.2000 | 4.4000 | 4.3000 | 4.1000 | 4.2000 |
| Ave HRM's | 2.5455 | 3.8182 | 3.7273 | 4.2727 | 4.0909 | 4.0909 | 3.9091 |

**Summary Analysis: Question 7**

Graph 9.27 above, derived from the statistics shown in Appendix XIII, was based on a 5-point Likert Scale. The graph was constructed to determine the HRM's opinion of the leadership from the senior management group of the subsidary of the MNE.

The highest priority for the respondents was Question 4, which related to the encouragement of new ideas from the management team being a strategic contributor to the MNE. Both MDs and OMs, as a group agreed that this an important leadership characteristic, which aligned with the MNE's LTS objectives.

The negative Kurtosis of -0.5368 (Platykurtic), in Appendix XIII, indicates a flat or broad distribution. The skewness was -0.1276, a negative value indicating that the tail of the distribution is to the left of the scale, demonstrating some disagreement with this statement.

This is highlighted in the frequency graphs, which are in Appendix XIV. The Cronbach's alpha calculation in Appendix XVI and in Graph 9.23 was 0.5260 for the series, thus indicating reliability under the threshold. If question 1 is removed from the calculation, then the value changes to 0.7876, which is reasonable reliability.

Therefore, Q1 was ignored as it made no difference to the outcome and thus made the construct more reliable.

**Conclusion:** Question 4 - Human Resource Management is a strategic contributor to the enterprise, was considered an important strategic objective and was of highest importance to the LTS of an MNE in this section.

**Graph 9.28: Workers' attitudes**



**Human Resources Q8**

| | 1.0000 | 2.0000 | 3.0000 | 4.0000 | 5.0000 | 6.0000 |
|---|---|---|---|---|---|---|
| ■ Average Score | 4.1905 | 4.7143 | 4.5714 | 4.2857 | 4.1429 | 4.0476 |
| ■ Ave MD's | 4.3000 | 4.8000 | 4.7000 | 4.3000 | 4.0000 | 4.0000 |
| ■ Ave HRM's | 4.0909 | 4.6364 | 4.4545 | 4.2727 | 4.2727 | 4.0909 |

Y-axis: Average 5 - Point Scale Score

**Summary Analysis: Question 8**

Graph 9.28 above, derived from the statistics shown in Appendix XIII, was based on a 5-point Likert Scale. The graph was constructed to determine the HRMs' perceptions of the workforce commitment within the subsidiaries and their view on the subsidiaries' role in the cooperation of the senior management group of the subsidiary of the MNE in this respect.

The highest priority for the respondents was Question 2, which related to the cooperation between workers

The negative Kurtosis of -1.0643 (Platykurtic), in Appendix XIII, indicates a flat or broad distribution. The skewness was -1.0233, a negative value indicating the tail of the distribution being to the left of the scale, demonstrating some disagreement with the statement. This is highlighted in the frequency graphs in Appendix XIV. The Cronbach's alpha calculation in Appendix XVI and in Graph 9.23 was 0.6526 for the series, thus indicating low but above limit reliability.

**Conclusion:** Question 2 - Work effectively with co-workers, was considered an important strategic objective and of highest importance to the LTS of the MNE in this section.

**Graph 9.29 HRM and morale building in the workplace**

**Human Resources Q9**

| | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 |
|---|---|---|---|---|---|---|---|---|---|
| ■ Average Score | 4.0476 | 4.4286 | 4.2381 | 4.3333 | 4.3333 | 4.1429 | 4.1429 | 4.5238 | 4.2738 |
| ■ Ave MD's | 4.3000 | 4.6000 | 4.3000 | 4.6000 | 4.6000 | 4.2000 | 4.1000 | 4.7000 | 4.4250 |
| ■ Ave HRM's | 3.8182 | 4.2727 | 4.1818 | 4.0909 | 4.0909 | 4.0909 | 4.1818 | 4.3636 | 4.1364 |

(Y-axis: Average 5 - Point Scale Score)

**Summary Analysis: Question 9**

Graph 9.29 above, derived from the statistics shown in Appendix XIII, was based on a 5-point Likert Scale. The graph was constructed to determine the HRM's perceptions of the subsidiaries' role in morale building of the senior management group of the subsidiary of the MNE.

The highest priority for the respondents was Question 8, which related to the MNE's reputation as an important asset aligning with the MNE's LTS objectives.

The negative Kurtosis of -2.2105 (Platykurtic), in Appendix XIII, indicates a flat or broad distribution. The skewness was -0.1028, a negative value indicating that the tail of the distribution was to the left of the scale, demonstrating some disagreement with this statement. This is highlighted in the frequency graphs in Appendix XIV. The Cronbach's alpha calculation in Appendix XVI and in Graph 9.23 was 0.8764 for the series, thus indicating acceptable reliability.

**Conclusion:** Question 8 - The organisation's reputation is an important asset, was considered an important strategic objective and of highest importance to the LTS of an MNE in this section.

**Graph 9.30: Structure and strategy**

**Human Resources Q10**

| | 1.0000 | 2.0000 | 3.0000 | 4.0000 |
|---|---|---|---|---|
| ■ Average Score | 4.1905 | 3.5714 | 4.1905 | 3.8571 |
| ■ Ave MD's | 4.3000 | 3.4000 | 4.2000 | 4.0000 |
| ■ Ave HRM's | 4.0909 | 3.7273 | 4.1818 | 3.7273 |

*Y-axis: Average 5 – Point Scale Score (0.0000 to 5.0000)*

**Summary Analysis: Question 10**

Graph 9.30 above, derived from the statistics shown in Appendix XIII, was based on a 5-point Likert Scale. The graph was constructed to determine the HRM's perceptions of the subsidiaries' structure and strategy when considering the LTS of the MNE.

The highest priority for the respondents was Questions 1 and 3, which related to the MNE's structure and strategy being interlinked and having an overall impact on the organisation's adaptability and performance.

The negative Kurtosis of -0.0995 (Platykurtic), in Appendix XIII, for both questions indicates a flat or broad distribution. The skewness is -0.0714 for both questions. A negative value indicates that the tail of the distribution is to the left of the scale demonstrating some disagreement with this statement. This is highlighted in the frequency graphs, which are in Appendix XIV. The Cronbach's alpha calculation in Appendix XVI and in Graph 9.23 was 0.7013 for the series, thus indicating reasonable reliability.

**Conclusion:** Questions 1 and 3 - Structure and strategy are interlinked. The interactions of strategy and structure impact overall performance or organisational adaptability are considered important strategic objectives and of highest importance to the LTS of an MNE in this section.

### 9.5.4    Overall conclusion of HR data findings

**Table 9.16: Highest responses to HR data findings**

| Question Number | Section | Likert Scale | Highest Average | Metric |
|---|---|---|---|---|
| 1-3 | 1 | N/A | N/A | We have a human resources strategy in place |
| 1-3 | 2 | N/A | N/A | We have a Performance Management System in place |
| 1-3 | 3 | N/A | N/A | We have a full time Human Resource Manager as part of the management team |
| 4 | 8 | 5 | 4.8095 | Quality is considered an important strategic objective |
| 5 | 1 | 5 | 4.6190 | Human Resource Management is a strategic contributor to the enterprise |
| 6 | 6 | 5 | 1.8571 | Employee motivation |
| 6 | 7 | 5 | 1.8571 | Employee training and skills development |
| 7 | 4 | 5 | 4.3333 | Encourage new ideas |
| 8 | 2 | 5 | 4.7143 | Work effectively with co-workers |
| 9 | 8 | 5 | 4.5238 | The organisation's reputation is an important asset |
| 10 | 1 | 5 | 4.1905 | Structure and strategy are interlinked |
| 10 | 3 | 5 | 4.1905 | The interactions of strategy and structure have an impact on overall performance or organisational adaptability |

Table 9.16 contains the highest responses to the HRM questionnaire, a copy of which is included in Appendix XV. Appendix XIII contains the statistics tables and they reflect the level of importance the respondents attached to each section of the questionnaire. Questions 1 to 3 were analysed separately.

The highest ranked response based on a 5-point Likert Scale was Question 4.8 which was 'Quality is considered an important strategic objective', being important to the LTS of the MNE.

All of the questions, when calculated using Cronbach's alpha for the series, were above the threshold limit of 0.6 indicating acceptable reliability. However, in Question 7, section 1 was removed to achieve an acceptable reliability limit. The removal of this question from the section had no significant effect on the outcome of the questions in this section. Conclusions will follow in chapter ten.

## 9.6    CONCLUSION TO CHAPTER NINE

**Figure 9.1: LTS Model**



Source: Researcher's own construction

## 9.7    FINANCIAL DATA CONCLUSION

Previously, the financial elements of the LTS of the MNE represented in Figure 9.2 were explored. This was the basis for the financial component of this analysis.

**Figure 9.2: Financial elements of the LTS Model**
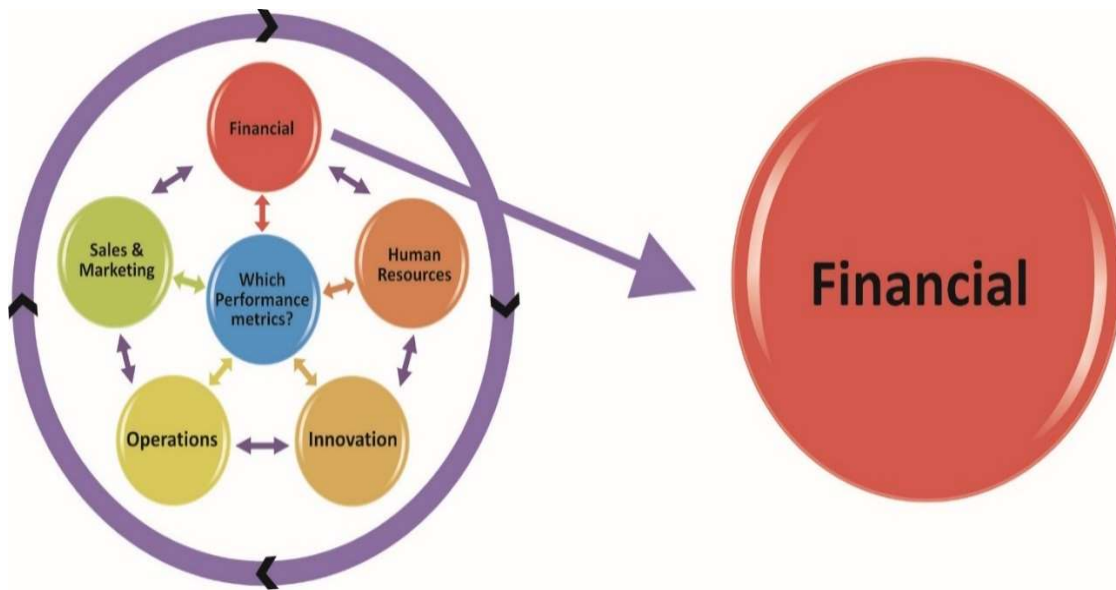


Source: Researcher's own construction

The summary of the results is based on the responses to the financial questionnaire in Appendix III and its relationship to the LTS Model that forms the nucleus of this case study. The financial elements, along with all of the other elements represented, are equally important to the LTS of the MNE.

As was expected based on the responses, the financial professionals within the subsidiaries represented in Table 9.5 of the financial questionnaire had a strong disposition towards financial metrics to determine the LTS of the organisation.

This is highlighted in the literature review (Green, 1978; Yap et al., 2011; Maina and Sakwa, 2017). The FMs did not place much emphasis on other metrics and this emphasises the financial professionals' reliance on financial analysis as the only metric able to determine the LTS. Contrary to this, it is both the researcher's opinion, as well as the groups of study participants that a combination of both financial and non-financial metrics contributed to the LTS of the MNE. The FMs' opinions are also antithetical to a portion of the literature research, as there was general consensus by the authors reviewed (Ittner and Larcker, 2003; Kihn, 2007; Paulson Gjerde and Hughes, 2009; Bourne et al., 2013; O'Connell and O'Sullivan, 2016), who all postulated that the combination of financial and non-financial metrics contributed towards LTS. In Table 9.7, the highest responses to

the financial questionnaires were discussed. The summary and conclusions to the research follow in chapter ten.

## 9.8    SALES AND MARKETING CONCLUSION

Previously, the FM element of the LTS of the MNE was explored. Figure 9.3 diagrammatically represents the relationship between the SM component of this analysis and the other elements that have been researched.

**Figure 9.3: SM element of the LTS Model**
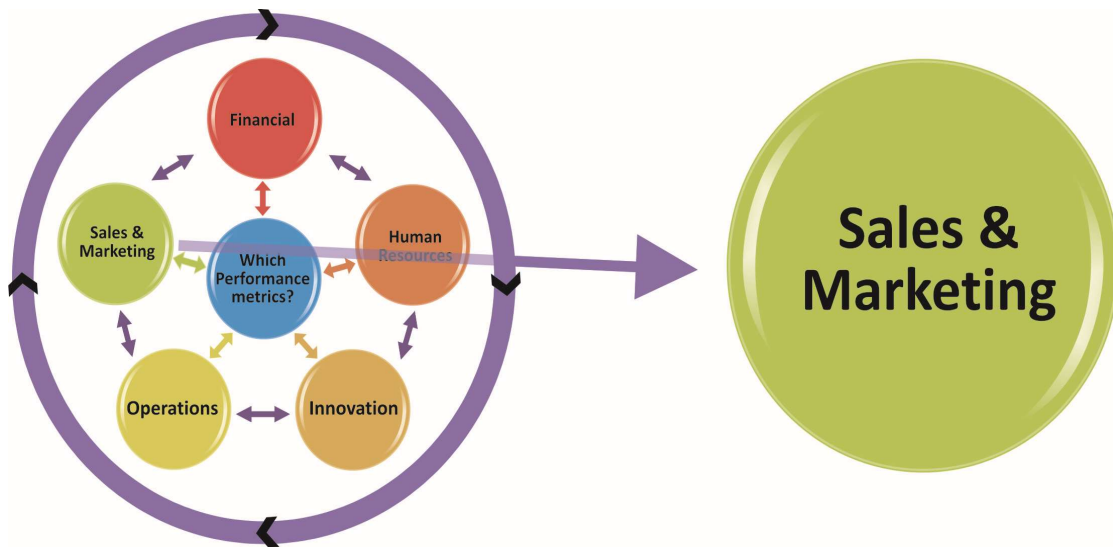


Source: Researcher's own construction

The summary of the results is based on the responses to the SM questionnaire found in Appendix VII and its relationship to the LTS Model that forms the nucleus of this case study. The financial elements, along with all of the other elements represented, are equally important to the LTS of the MNE.

The SM group of respondents represented in Table 9.8, tended towards a more holistic approach when addressing the questionnaire and there was a lot of emphasis on the marketing metrics, which would be expected due to the natural bias towards protection of their own dominant interests. The SM respondents did, however, rely on metrics from other areas of the business and realised that they required input and cooperation from others to assist in their own interpretation of the LTS. The financial and innovation metrics were pertinent to the marketing

environment. The introduction of new products would interest the marketing and sales group as it presents them with new opportunities and thus new revenue streams. The financial metrics help inculcate the rate of success and the LTS of the organisation, so invariably these are tied to rewards for this group. SM respondents realised that they required input and cooperation from others to assist in their own self-interest when considering the LTS of the MNE. In Table 9.10, the highest responses to the SM were discussed. The summary and conclusions to the research follow in chapter ten.

## 9.9    MANUFACTURING AND OPERATIONS CONCLUSION

Previously, the FM and SM elements of the LTS of the MNE were explored. Figure 9.4 diagrammatically illustrates the relationship between the manufacturing and operations sections of the analysis and the other elements that have been researched.

**Figure 9.4: Operations element of the LTS Model**
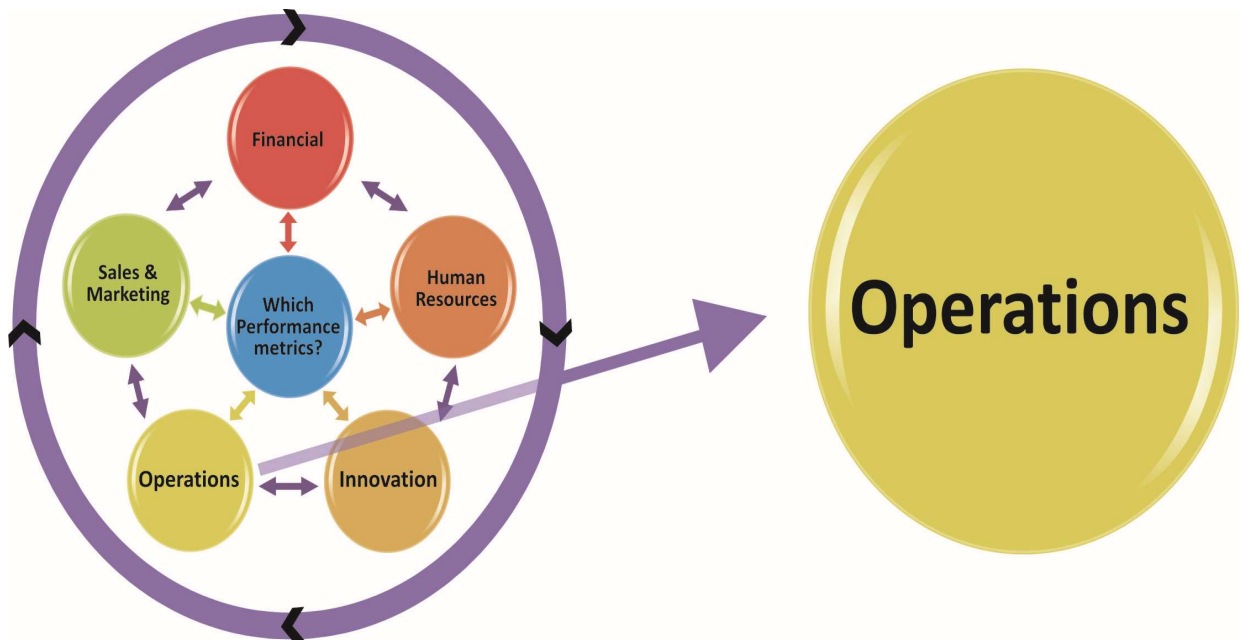


Source: Researcher's own construction

The summary of the results is based on the responses to the operations questionnaire in Appendix VI and its relationship to the LTS Model that forms the nucleus of this case study along with all the other elements shown in Figure 9.4.

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And based their answers to the operations questionnaire, represented in Appendix VI, and showed a strong leaning towards the OTDIF metric and people management. This is not surprising as it was also relevant in the literature that people management, although difficult, was of utmost importance (Weiss et al., 2005; Branson, 2014; Cunningham, 2016; Oke, 2016), as is alignment to the success of the LTS of an MNE.

The operations respondents relied on metrics from other areas of the business and they realised that they required input and cooperation from others to assist in their own interpretation of the LTS. The operations respondents thus suggested that the combination of both financial and non-financial metrics were important to them and that in considering some of these important metrics, strategic alliances with other groupings within business contributed towards their own success when considering the LTS of an MNE. In Table 9.13, the highest responses to the OM questionnaires were discussed. The summary and conclusions to the research follow in chapter ten.

## 9.10 HUMAN RESOURCES CONCLUSION

Previously the FM, SM and OM elements of the LTS of the MNE were explored. Figure 9.5 is a diagrammatical illustration of the relationship between the HR section of the analysis and the other elements researched.

**Figure 9.5: HR Element of the LTS Model**
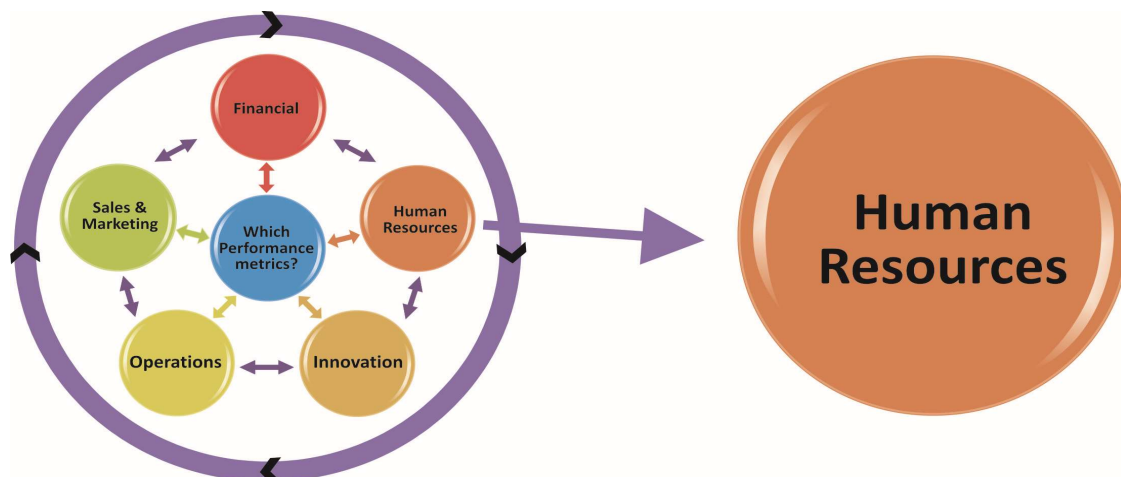


Source: Researcher's own construction

The summary of the results is based on the responses to the HR questionnaire in Appendix XV by the respondents and is represented in Table 9.14. Of importance is their relationship to the LTS Model that forms the nucleus of this case study along with all of the other elements shown in Figure 9.5.

The HR Management Team within the subsidiaries depicted a broad approach when considering the LTS of an MNE. This team considered HR metrics such as people management, morale, working effectively with co-workers, training and development, which were expected. However, the team additionally recognised the importance and contributions made in operations, innovation, organisational reputation and quality of product and showed a strong leaning towards the OTDIF metric, these being non-HRM metrics.

The HR respondents did not place great importance on any financial measures, but rather relied on the non-financial metrics as being of prime importance to them. They considered metrics and strategic with other areas of the business as contributing meaningfully towards their own success when considering the LTS of an MNE. In Table 9.16, are the highest responses to the financial questionnaires. The summary and conclusions to the research follow in chapter ten.

# CHAPTER TEN
# SUMMARY, CONCLUSIONS AND RECOMMENDATIONS

## 10.1   INTRODUCTION

In chapter ten, the conclusions from the research and the summary examination of the analysis from the data collection are presented and recommendations are made from these findings. With reference to the LTS Model in Figure 10.1 below, it is important to consider all the elements and assimilate them in a format that aligns with the outcome of the analysis of the research undertaken and ultimately answers the question contributing to: *A performance metric system for the long-term sustainability of a multinational enterprise.*

**Figure 10.1: Influences on the LTS of an MNE**
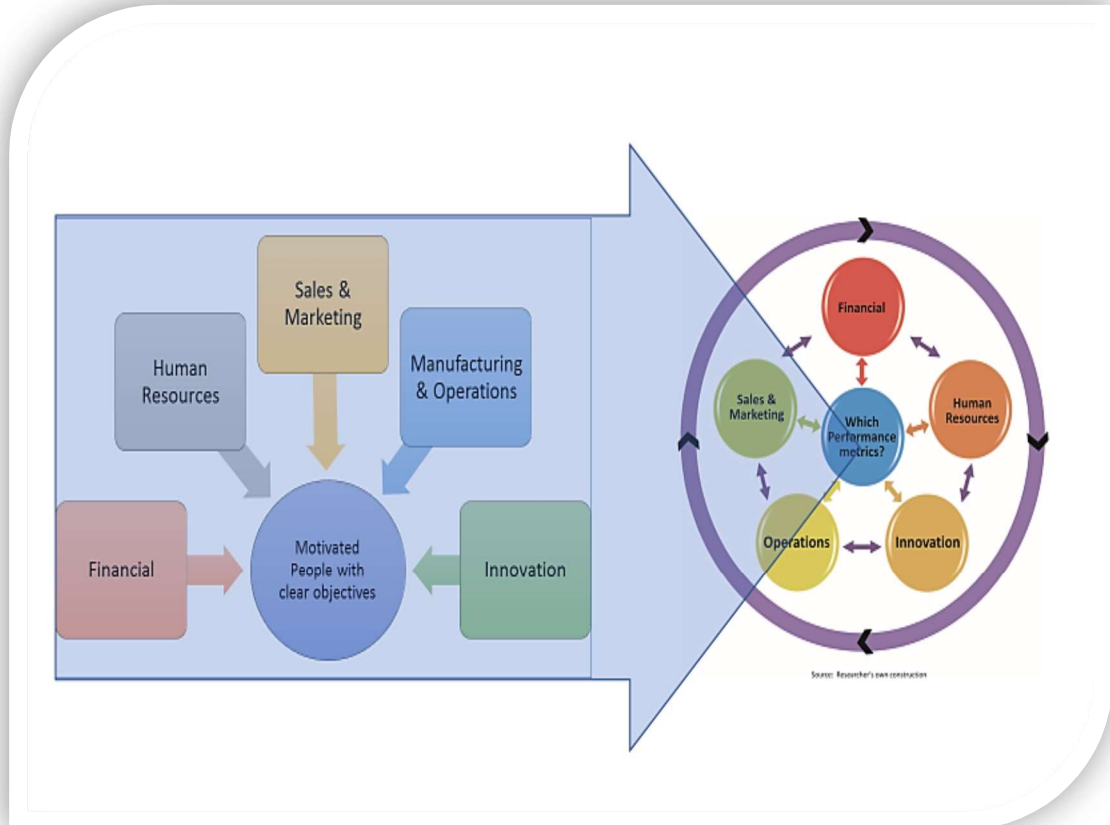


Source: Researcher's own construction

## 10.2   SUMMARY

The objective of this study was to determine those metrics that are most beneficial to MNEs in improving overall LTS through better performance. This was done by establishing the best performance metrics for the LTS of an MNE. A model, as shown in Figure 10.2, was developed at the commencement of the study. Through literature research, internal investigations and a small pilot study, the research case study was developed, before submission of the original proposal for approval.

Thereafter, a more comprehensive study was undertaken through a literature review and personal interviews with key staff. An important consideration was the investigation of the literature on research methods for analysing data Creswell, (2013); Collis et al., (2009); Elman et al., (2016); Hancock and Algozzine, (2006); Smith, (2008); Turner et al., (2017). The decision was taken to embark on a case study method, based on the flexibility required to carry out this research. This also enabled the researcher to approach the case study using a quantitative approach and incorporate a qualitative template when and where required.

One of the key points that emerged from the literature review was that there is a maximum amount of metrics that can be understood and this amount should not exceed 20 metrics (Brown, 1996). Management systems have become high priority on business agendas, using techniques such as the BSC  and EFQM ( Uygur and Sumerli, 2013; Wongrassamee et al., 2003). Financial and non-financial metrics should be investigated when deliberating on the LTS of an MNE ( Abdel-Maksoud et al., 2015; De Leeuw and Van Den Berg, 2011).

The LTS Model in Figure 10.2, as proposed by the researcher, formed the nucleus of this study. This model was considered as a prime element when constructing and designing the questionnaires, which were distributed to the respondents within the specific elements of the case study to determine the LTS of the MNE.

**Figure 10.2: LTS Model**



Source: Researcher's own construction

The questionnaires were collected, and the responses were statistically analysed to determine the highest rated responses to the questions posed. From the responses to the questionnaires, further analysis was undertaken in chapter nine. The data was formulated into MS Excel spreadsheets, shown in Appendices I to XVI that are attached to this study. The statistics were further checked for reliability. This reliability took into consideration the amount of data collected due to the data sample being relatively small. The validity of the data was determined, and this statistical calculation is described in Table 9.

The data was accumulated from the questionnaires distributed to the groups of respondents who were selected based on their position and responsibilities within the MNE. The analysis of the data was engineered using statistics and more specifically, data findings were analysed and ranked in order of value. By using this method, various conclusions were made for the separate elements researched in the case study.

From the data collected from the respondents within the individual elements, (see Figure 10.1 and Figure 10.2) the highest rated responses, considered those that the respondents believed to be most important to the LTS of the MNE, were tabulated and explained. From the results of the individual elements, a summary of all the elements was created in Tables 10.1 to 10.3 below. From these tables, BSCs were developed as shown in Figure10.4 through to. Figure 10.9 As discussed earlier chapter one, with reasons presented, methods of communicating and measurement using BSCs, derived from Kaplan and Norton (1996) and taking into account further use of the model by other authors including Cooper et al., (2017); Kaplan and Norton, (2004); Gomes and Romão, (2017); and Tizroo et al.,(2017) and EFQM Uygur and Sumerli, (2013); Wongrassamee et al., (2003), are considered the best tool to use when measuring outcomes. The reason for this is that it is an already familiar and accepted measurement tool within the MNE.

## 10.3   CONCLUSIONS

Figure 10.2 displays a representation of the interrelationships of the LTS Model and how all of the individual elements contributed to the LTS of the MNE. Richard Branson reiterated the importance of individual contributions by people and stated that "If you look after your staff, they'll look after your customers. It's that simple," Branson, (2014), further to this believes that one should "train people well enough so they can leave, treat them well enough so they don't want to". This was considered when the literature from different sources was reviewed.

**Table 10.1: Top Financial Responses**

| Highest-ranking Question Financial Data Collection | |
|---|---|
| **1.7** | Operating Profit |
| **2.7** | Operating Profit |
| **3.4** | Return on Total Assets |
| **4.4** | Net Operating Profit after Tax (NOPAT) |
| **5.1** | Current Ratio |
| **6.3** | Debtors Collection |
| **7.4** | Quality of Income |
| **8.4** | Quality of income |
| **9** | No metric to measure |
| **10** | Sales Turnover |

**Table 10.2: Top Sales and Marketing Responses**

| Highest-ranking Question Sales & Marketing Data Collection | |
|---|---|
| 1-8 | Intercompany customer retention |
| 1-8 | Market segmentation |
| 9 | Our values are made clear to us |
| 9 | Price is considered an important strategic objective |
| 10 | Order intake |
| 11 | Major New Product Introductions |
| 12 | Margin by Market Code |
| 13 | Monthly and YTD Financial Results by industry |
| 14 | Question and result are disparaged due to low reliability using Cronbach's alpha |

**Table 10.3: Top Operations Responses**

| Highest-ranking Question Operations Data Collection | |
|---|---|
| 11.1, 14.1 & 16.3 | On-time Delivery |
| 11.1 | 6's Audits completed |
| 11.1 | Scheduled Maintenance Program |
| 11.1 | Sales per employee |
| 11.1 | Profit per employee |
| 12.13 | Management of people |
| 13.3 | Gross Margin |
| 13.5 | Operating profit |
| 15.4 | Labour efficiency |

**Table 10.4: Top HRM Questions**

| Highest-ranking Question HRM Data Collection | |
|---|---|
| 1-3 | We have a Human Resources Strategy in place |
| 1-3 | We have a Performance Management System in place |
| 1-3 | We have a fulltime HRM as part of our management team |
| 4.8 | Quality is considered an important strategic objective |
| 5.1 | Human Resource Management is a strategic contributor to the enterprise |
| 6.6 | Employee Motivation |
| 6.7 | Employee Training and Development |
| 7.4 | Encourage new ideas |

| 8.2 | At our subsidiary, we believe our committed employees are those who work effectively with co-workers |
|------|------|
| 9.8 | The organisation's reputation is an important asset |
| 10.1 | Structure and strategy are interlinked |
| 10.3 | The interactions of strategy and structure have an impact on overall performance or firm adaptability |

Tables 10.1 to 10.4 have the top ripostes to the questions and these are placed into an easily understandable, tabular format. This enabled the creation of BSCs aimed towards: *'A performance measurement system for the long-term sustainability of a multinational enterprise',* which was the objective of the research undertaking.

**Table 10.5: Top Financial Metrics**

|  | Finance | SM | Operations | HRM |
|------|:---:|:---:|:---:|:---:|
| **Operating Profit** | ☑ | ☑ | ☑ |  |
| **NPAT** | ☑ |  | ☑ |  |
| **Current Ratio** | ☑ |  |  |  |
| **Debtors Collection** | ☑ |  |  |  |
| **Quality of Income** | ☑ |  |  |  |
| **Gross Margin** |  | ☑ | ☑ |  |
| **Monthly and YTD financial results by industry** |  | ☑ |  |  |
| **Sale per employee** |  |  | ☑ |  |
| **Profit per employee** |  |  | ☑ |  |

**Table 10.6: Top Operations and Sales and Marketing Metrics**

|  | Finance | SM | Operations | HRM |
|------|:---:|:---:|:---:|:---:|
| **OTD** | ☑ | ☑ | ☑ |  |
| **Market Segmentation** |  | ☑ |  |  |
| **Intercompany Customer Retention** |  | ☑ |  |  |
| **Sales Turnover** | ☑ | ☑ |  |  |
| **Price is important** |  |  |  |  |
| **Order Intake** |  | ☑ |  |  |
| **Major New Product Introductions** |  | ☑ |  |  |

| | | | | |
|---|---|---|---|---|
| **Margins by Market** | | | | |
| **6s Audits** | | | ☑ | |
| **Scheduled Maintenance Program** | | | ☑ | |
| **Labour Efficiency** | | | ☑ | |
| **Quality** | | | ☑ | ☑ |

**Table 10.7: Top Leadership and Strategic Metrics**

| | Finance | SM | Operations | HRM |
|---|---|---|---|---|
| **People Management** | | | ☑ | ☑ |
| **Labour Efficiency** | | | ☑ | |
| **Human Resource strategy in Place** | | | | ☑ |
| **Performance Management System** | | | | ☑ |
| **Clear Values** | | ☑ | | |
| **HR as a LTS Strategy** | | | | ☑ |
| **Employee Motivation** | | | | ☑ |
| **Employee Training and Skills Development** | | | | ☑ |
| **Work Effectively with Co-workers** | | | | |
| **Brand & Reputation** | | | | ☑ |
| **Structure, Strategy, Performance & Adaptability** | | | | ☑ |

In Table 10.5, Table 10.6 and Table 10.7 above, there is a combination of FM, OM, SM, leadership and strategic metrics which contribute to the LTS of an MNE. These metrics are the respondents' answers to the original goal of the case study which was to discover and create: *A performance metric system for the long-term sustainability of a multi-national enterprise,* using the LTS Model in Figure 10.2.

At this stage, it is noteworthy to mention that the individual groups of respondents e.g. FM, SM, OM and HRM represented in the LTS Model in Figure 10.2 and in the flow of leadership concept shown in Figure 10.3, responded more favourably to the questions that were in their sphere of influence and were part of their individual responsibility. Second to this, the HRM, SM and OM groups also included a broader range of other metrics they considered important. The FM

group maintained a narrower focus on the financial metrics and did not place any importance on metrics outside of the financial measurements that may contribute to LTS.

When considering the LTS Model in Figure 10.2, it was one of the objectives derived from the literature review to investigate a method of metric measurement. This could create dependent areas of responsibility, specific to the management of individuals within a management group and/or department.

An overriding BSC (Kaplan and Norton, 1996 and 2004) would be significant and bind the individuals as a management team to contribute to the general management of the organisation as the preferred method of metric measurement. Byrne (2013) talks about stretch goals in his work on lean turnarounds and elaborates that one needs to have these to challenge the organisation's human resource capital with purposeful goals.

When looking at goal setting, Locke and Latham (2013) emphasize that goals are motivational, and people work harder for more challenging goals. Variations in ability do impact goal-related performance gains and self-efficacy and related belief systems influence goal achievement. Feedback interacts with goal success; goal commitment moderates the impact of goal setting and goals direct attention and affect activity selection.

In the case of the MNE and the individual and general management stretch goals, below are BSCs, which have been constructed as ways in which the metrics derived from the study are assimilated to motivate the individuals within the organisation into working together for the betterment and LTS of the MNE. As a word of caution at this stage, there is an area of research that mentions that stretch goals may be a cause of neurosis, where they constitute a radical management tool and if the goals are never good enough to meet the escalating expectations, which are unrealistically set, overambitious and impossible to achieve, constitute a recipe for failure Pina e Cunha, Giustiniano, Rego and Clegg, (2017). Making the impossible possible is best described by Cameron and Lavine (2010) when they explain the scenario faced at Rocky Flats as an

extremely hazardous site in North America due to the amount of radioactive materials, explosive devices, and volatile chemicals stored there. In addition, the high levels of contamination at the site and in the surrounding land and groundwater, posed extreme danger. The area was cleaned in record time, as a stretched goal that management had previously thought was impossible.

The task was surprisingly completed by a team who were clear about the task, undertook tasks that added value and was led by a whole-brain leadership team. This team included visionaries, implementers and tacticians characterised by clear meaning and purpose, and effective relationships with trust and credibility among everyone. The employees displayed great attitudes, had external constituency support and embodied a culture of innovativeness, with multiple sources of leadership. It is the researcher's opinion that this example of appropriate leadership is the desired route to follow to create purpose within a progressive organisation.

To be able to inculcate this type of leadership and direction of which some examples are referenced above, it is important to provide leadership and direction. Below in Figure 10.3, is a diagram portraying the flow of leadership through a subsidiary of the MNE using BSCs. The aim of the diagram is to communicate with realistic goals and metrics, the measurement system for the LTS of an MNE's subsidiary.

The BSC is only complete for a short while, so it must therefore remain dynamic. There are always improvements to cogitate and changing dynamics will have an impact on any organisation and will dictate further inclusions and deletions from the current BSC.

While the BSC is being designed, there is an opportunity to add KPIs to tailor-make the scorecard for an individual or group within the MNE. BSCs are also considered as a method of performance management, which is viewed as an integral part of the HRM response to the questionnaires. This was also highlighted by the people management aspect that the operations respondents included as important in their questionnaire and it encompassed all departments

within an MNE. Performance management evaluation can include review and analysis of models that contain the metrics when calculating outcomes, taking into consideration the LTS of the MNE.

**Figure 10.3: Flow of leadership**
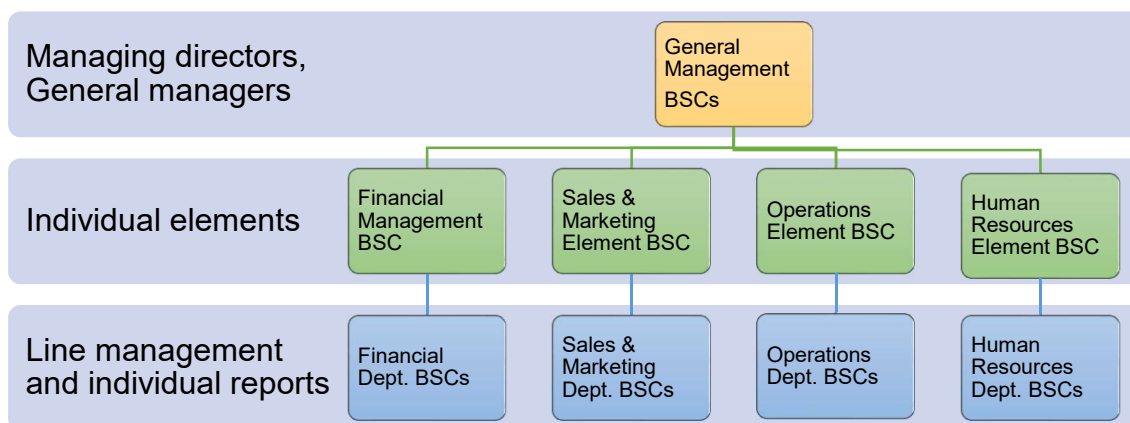
Developing capability requirements may be viewed as part of the strategy formulation stage. Moreover, a strategy may be developed to assign priorities as aligned with business objectives. In adopting a structured approach to meeting capability requirements, the use of a balanced scorecard and decision-making techniques may form part of the strategy. The degree to which capabilities have been achieved may be captured within the balanced scorecard and adjustments made to business activities and system measures to respond to an environment where capability requirements change (Jonkers, 2016).

### 10.3.1  FM Conclusions using BSC Method

The financial scorecard example shown in Figure 10.4  is a sample of a scorecard that can be used in a financial management or director's role to evaluate the effectiveness of the team and themselves. The objective of the scorecard is to present a FM with a list of measurable metrics, which not only satisfy the needs of the department, but also has measurable metrics relevant to the LTS of the MNE in Figure 10.2 and the flow of leadership depicted in Figure 10.3.

These metrics are firmly within their sphere of influence and responsibility. The metrics are not just financial, but include metrics from other disciplines, as a combination of financial and non-financial metrics are considered to be more effective (De Leeuw and Van Den Berg, 2011; Abdel-Maksoud et al., 2015). There are 11 metrics, keeping in mind that a person cannot manage more than 20 metrics at any given time (Brown, 1996). The metrics are also flexible and can be changed should the need arise to do so and the goals are also stretch goals (Byrne, 2013; Locke & Latham, 2013).

The recommended practice is to empower all individuals to complete their individual scorecards monthly and return this to the FM in the guise of a one-on-one frank discussion. In turn, these scorecards must be discussed with the MD by the departmental manager on behalf of the subordinate using the same terms, on a quarterly basis.

Scorecards such as the example shown in Figure 10.4 can also be used, combined with an incentive system, so that the objectives and rewards are clear to the manager and the subordinate. Caution must be taken to ensure there is a clear understanding and proper agreement on the measurement and expectations from the reward system. It is the researcher's opinion that there is no such thing as the perfect incentive/bonus scheme. To substantiate this statement, a paper produced by Bénabou and Tirole (2016) discusses that in recent years there has been an 'explosion of pay' and a demand for large bonuses and salaries. To retain talent without any apparent benefit to the organisation sometimes results in poor actual performance, severe moral hazard and even outright fraud. The misplacement or misapplication of compensation, whether in financial or non-financial terms, would not only affect the individual and the organisation, but society as a whole (Asaju, 2016; Bénabou and Tirole, 2016). Thus, the emphasis on the BSC and the rewards might not be appropriate to the needs of the worker. The challenge remains as to how and when a manager would know or understand the correct mix of incentives that would encourage staff members to contribute to the LTS of the MNE, whether as individual or as a group.

**Figure 10.4: Financial Management Scorecard**

## Finance Team Scorecard for 2017

| | | Objective | Measurement Criteria | | | | Jan Score | Feb Score | Mar Score | Apr Score | May Score | Jun Score | Jul Score | Aug Score | Sep Score | Oct Score | Nov Score | Dec Score | Total Score | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| COMPANY | Finance Metrics | Operating Profit | R 1150K | R1000K | < R 950 K | R1150K=100% R1000K=50% >R950K=0% | | | | | | | | | | | | | 0% | 0% | Average calculation of Team Performance 0% of Target KPI's |
| | | Gross Margin | 45% | 40% | < 39% | 45%=100% 40%=50% = >39%=0% | | | | | | | | | | | | | 0% | | |
| | | NPAT | 110% | 100% | 90% | 110%=1 100%=.75 90%=0 | | | | | | | | | | | | | 0% | | |
| | | Current Ratio | 1+ | 1 | Less Than 1 | >1=100% 1=50% <1=0% | | | | | | | | | | | | | 0% | | |
| | | Debtors Collection | 55 Days | 60 Days | 60+ Days | 55 Days=100% 56-60 Days=50% <60 Days=0% | | | | | | | | | | | | | 0% | | |
| | | Quality Of Income | 1+ | 1 | Less Than 1 | >1=100% 1=50% <1=0% | | | | | | | | | | | | | 0% | | |
| | Ops & Sales Metrics | Sales Turnover | 95% - 100% | 94 - 90% | less than 90% | 95-100%= 100 % 90-95 % = 75 % < 90 %=0 % | | | | | | | | | | | | | 0% | | |
| | | ON-TIME Delivery target achieved | 95% - 100% | 94 - 90% | less than 90% | 95-100%= 100 % 90-95 % = 75 % < 90 %=0 % | | | | | | | | | | | | | 0% | | |
| | | Quality Of Product | Y = Yes | | N = No | | | | | | | | | | | | | | 0% | | |
| | Leadership & Strategic Metrics | People Management | Y = Yes | | N = No | | | | | | | | | | | | | | 0% | | |
| | | Effectively working with Co-workers | Y = Yes | | N = No | | | | | | | | | | | | | | 0% | | |
| | | **Monthly Score Team** | | | | | | | | | | | | | | | | | | | |

Source: Researcher's own construction

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This study therefore examined the intricacies of incentives with a view to understanding what types of incentives, and when and how to apply them to motivate employees to greater performance to achieve the LTS of the MNE.

## 10.3.2  SM Conclusions using BSC Method

The SM scorecard example shown in Figure 10.5 is a sample of a scorecard to be used in a SM environment by a sales manager or director to evaluate the effectiveness of their team and themselves. The objective of the scorecard is to present a SM with a list of measurable metrics, that not only satisfy the department, but also with measurable metrics that are relevant to the LTS of the MNE, within their sphere of influence. Again there are 11 metrics, keeping in mind that a person cannot manage more than 20 metrics at any given time (Brown, 1996). The metrics are different to those of a FM as more emphasis is placed on S&M. The metrics remain flexible and can be changed should the need arise to do so. The changes can also be tailor-made for the individual responsibilities of employees within a group and stretch goals are taken into consideration (Byrne, 2013; Locke & Latham, 2013).

The recommended practice is to empower all individuals to complete their individual scorecard monthly and return this to the S&M Manager in the guise of a one-on-one frank discussion. In turn, these scorecards must be discussed with the MD by the departmental manager on behalf of the subordinate using the same terms, on a quarterly basis.

As discussed previously when referring to financial scorecards, the same applies in this context. A combination of metrics is required to determine the LTS of an MNE and not only the metrics that are directly related to the SM group. Scorecards such as the example shown in Figure 10.5 can also be used, combined with an incentive system so that the objectives and rewards are clear to the manager and the subordinate.

Caution must be taken to ensure there is a clear understanding and agreement on the measurement and reward system. The theory concerning incentives holds true, as discussed previously.

**Figure 10.5: SM Scorecard**



| | | Objective | Measurement Criteria | | | | Jan Score | Feb Score | Mar Score | Apr Score | May Score | Jun Score | Jul Score | Aug Score | Sep Score | Oct Score | Nov Score | Dec Score | Total Score | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| COMPANY | Finance Metrics | Operating Profit | R 1150K | R1000K | < R 950 K | R1150K=100% R1000K=50% >R950K=0% | | | | | | | | | | | | | | 0% | 0% | Average calculation of Team Performance 0% of Target KPI's |
| | | NPAT | 110% | 100% | 90% | 110%=1 100%=.75 90%=0 | | | | | | | | | | | | | | 0% | | |
| | | Gross Margin | 45% | 40% | < 39% | 45%=100% 40%=50% = >39%=0% | | | | | | | | | | | | | | 0% | | |
| | Ops & Sales Metrics | Sales Turnover | 95% - 100% | 94 - 90% | less than 90% | 95-100%= 100 % 90-95 % = 75 % < 90 %= 0 % | | | | | | | | | | | | | | 0% | | |
| | | ON-TIME Delivery target achieved | 95% - 100% | 94 - 90% | less than 90% | 95-100%= 100 % 90-95 % = 75 % < 90 %=0 % | | | | | | | | | | | | | | 0% | | |
| | | Projects Awarded | 95% - 100% | 94 - 90% | less than 90% | 95-100%= 100 % 90-95 % = 75 % < 90 %=0 % | | | | | | | | | | | | | | 0% | | |
| | | Order Intake | 95% - 100% | 94 - 90% | less than 90% | 95-100%= 100 % 90-95 % = 75 % < 90 %=0 % | | | | | | | | | | | | | | 0% | | |
| | | New Products as % of Turnover | 6% + | 5% | less than 5% | | | | | | | | | | | | | | | 0% | | |
| | | Customer Complaints | Less Than 2 | 2 | More Than 2 | <2=100% 2=50% >2=0% | | | | | | | | | | | | | | 0% | | |
| | Leadership & Strategic Metrics | People Management | Y = Yes | | N = No | | | | | | | | | | | | | | | 0% | | |
| | | Effectively working with Co-workers | Y = Yes | | N = No | | | | | | | | | | | | | | | 0% | | |
| | | **Monthly Score Team** | | | | | | | | | | | | | | | | | | | | |

Source: Researcher's own construction

### 10.3.3  OM Conclusions using BSC Method

The SM scorecard example shown in Figure 10.6 is a sample of a scorecard that can be used in an operations management environment by an operations manager or director to evaluate the effectiveness of their team and themselves. The objective of the scorecard is to present an OM with a list of measurable metrics, which not only satisfy the department, but also measurable metrics relevant to the LTS of the MNE within their sphere of influence.

Here, there are only eight metrics to measure, which would suggest that the scorecard would be very easy to manage, again keeping in mind that a person cannot manage more than 20 metrics at one given time (Brown, 1996)

The metrics are different to those shown in other scorecards as more emphasis is placed on operational requirements. The metrics remain flexible and can be changed should the need arise to do so. The changes can also be tailor-made for the individual responsibilities of employees within a group and again stretch goals have been taken into consideration (Byrne, 2013; Locke & Latham, 2013).

The recommended practice is to empower all individuals to complete their individual scorecard monthly and return this to the OM Manager in the guise of a one-on-one frank discussion. In turn, these scorecards must be discussed with the MD by the departmental manager on behalf of the subordinate using the same terms, on a quarterly basis.

Scorecards such as the example shown in Figure 10.6 can also be used in combination with an incentive system so that the objectives and rewards are clear to the manager and the subordinate. Caution must be taken to ensure there is a clear understanding and agreement on the measurement and reward system. The theory related to incentives discussed previously holds true. As discussed 10.3.1, when referring to financial scorecards, the same applies in this context, that a combination of metrics is required to determine the LTS of an MNE and not only metrics that are directly related to the OM group.

**Figure 10.6: Operations Scorecard**

<table>
<tr><th colspan="16" style="text-align:center">Operations Team Scorecard for 2017</th><th></th><th></th></tr>
<tr><th colspan="3"></th><th>Jan</th><th>Feb</th><th>Mar</th><th>Apr</th><th>May</th><th>Jun</th><th>Jul</th><th>Aug</th><th>Sep</th><th>Oct</th><th>Nov</th><th>Dec</th><th>Total</th><th></th><th></th></tr>
<tr><th>Objective</th><th colspan="4">Measurement Criteria</th><th>Score</th><th>Score</th><th>Score</th><th>Score</th><th>Score</th><th>Score</th><th>Score</th><th>Score</th><th>Score</th><th>Score</th><th>Score</th><th>Score</th><th>Score</th><th></th></tr>
</table>

| | | Objective | Measurement Criteria | | | | Jan Score | Feb Score | Mar Score | Apr Score | May Score | Jun Score | Jul Score | Aug Score | Sep Score | Oct Score | Nov Score | Dec Score | Total Score | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| COMPANY | Finance Metrics | Operating Profit | R 1150K | R1000K | < R 950 K | R1150K=100% R1000K=50% >R950K=0% | | | | | | | | | | | | | 0% | 0% | Average calculation of Team Performance 0% of Target KPI's |
| | | NPAT | 110% | 100% | 90% | 110%=1 100%=.75 90%=0 | | | | | | | | | | | | | 0% | | |
| | | Gross Margin | 45% | 40% | < 39% | 45%=100% 40%=50% = >39%=0% | | | | | | | | | | | | | 0% | | |
| | Ops & Sales Metrics | ON-TIME Delivery target achieved | 95% - 100% | 94 - 90% | less than 90% | 95-100%= 100 % 90-95 % = 75 % < 90 %=0 % | | | | | | | | | | | | | 0% | | |
| | | 6S Audit score | 95% - 100% | 94 - 90% | less than 90% | 95-100%= 100 % 90-95 % = 75 % < 90 %=0 % | | | | | | | | | | | | | 0% | | |
| | | Labour Efficiency | 95% - 100% | 94 - 90% | less than 90% | 95-100%= 100 % 90-95 % = 75 % < 90 %=0 % | | | | | | | | | | | | | 0% | | |
| | Leadership & Strategic Metrics | People Management | Y = Yes | | N = No | | | | | | | | | | | | | | 0% | | |
| | | Effectively working with Co-workers | Y = Yes | | N = No | | | | | | | | | | | | | | 0% | | |
| | | **Monthly Score Team** | | | | | | | | | | | | | | | | | | | |

Source: Researcher's own construction

It would be advisable to use a different system of measurement and performance management for the blue-collar workforce, as the roles and responsibilities change considerably as do the levels of commitment and risk sharing (Fanti & Buccella, 2015).

### 10.3.4 HR Conclusions using BSC Method

The HRM scorecard example shown in Figure 10.7 is a sample of a scorecard that can be used in an HRM environment by a Human Resources practitioner or director to evaluate the effectiveness of their team and themselves. The objective of the scorecard is to present a Human Resources Manager with a list of measurable metrics that not only satisfy the department, but also with measurable metrics that are relevant to the LTS of the MNE, within their sphere of influence. There are 11 metrics to measure, keeping in mind that a person cannot manage more than 20 metrics at any given time (Brown, 1996). The metrics are different to those shown in other scorecards as more emphasis is placed on human resource issues and requirements. The metrics remain flexible and can be changed should the need arise to do so, and the changes can be tailor-made for individual responsibilities of employees within a group.

The recommended practice is to empower all individuals to complete their individual scorecard monthly and return this to the HRM in the guise of a one-on-one frank discussion. In turn, these scorecards must be discussed with the MD by the departmental manager on behalf of the subordinate using the same terms, on a quarterly basis.

Scorecards such as the example shown in Figure 10.7 can also be used in combination with an incentive system so that objectives and rewards are clear to the manager and the subordinate. However, caution must be taken to ensure that there is a clear understanding and agreement on the measurement and the reward system.

**Figure 10.7: HR scorecard**

## Human Resources Team Scorecard for 2017

| COMPANY | | Objective | Measurement Criteria | | | | Jan Score | Feb Score | Mar Score | Apr Score | May Score | Jun Score | Jul Score | Aug Score | Sep Score | Oct Score | Nov Score | Dec Score | Total Score | 0% | Average calculation of Team Performance 0% of Target KPI's |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | **Finance Metrics** | **Operating Profit** | R 1150K | R1000K | < R 950 K | R1150K=100% R1000K=50% >R950K=0% | | | | | | | | | | | | | 0% | | |
| | | **NPAT** | 110% | 100% | 90% | 110%=1 100%=.75 90%=0 | | | | | | | | | | | | | 0% | | |
| | | **Gross Margin** | 45% | 40% | < 39% | 45%=100% 40%=50% = >39%=0% | | | | | | | | | | | | | 0% | | |
| | **Ops & Sales Metrics** | **ON-TIME Delivery target achieved** | 95% - 100% | 94 - 90% | less than 90% | 95-100%= 100 % 90-95 % = 75 % < 90 %=0 % | | | | | | | | | | | | | 0% | | |
| | | **Quality Rejects** | less than 1% | 1% | More than 1% | | | | | | | | | | | | | | 0% | | |
| | **Leadership & Strategic Metrics** | **People Management** | Y = Yes | | N = No | | | | | | | | | | | | | | 0% | | |
| | | **HR as a Strategy** | Y = Yes | | N = No | | | | | | | | | | | | | | 0% | | |
| | | **Hiring Statistics** | less than 1% | 1% | More than 1% | Resignations or Dismissals | | | | | | | | | | | | | 0% | | |
| | | **Leadership & New Ideas (New Products as % of Turnover)** | 6% + | 5% | less than 5% | | | | | | | | | | | | | | 0% | | |
| | | **Brand & Reputation Surveys done & Actions Taken** | Y = Yes | | N = No | | | | | | | | | | | | | | 0% | | |
| | | **Effectively working with Co-workers** | Y = Yes | | N = No | | | | | | | | | | | | | | 0% | | |
| | | **Monthly Score Team** | | | | | | | | | | | | | | | | | | | |

Source: Researcher's own construction

When referring to financial scorecards, a combination of metrics is required to determine the LTS of an MNE and not only those metrics directly related to the HR group. The theory regarding incentives, discussed previously, holds true.

### 10.3.5  General management conclusions using BSC Method

It is it important to create direction to provide effective leadership and some examples were referenced above. In Figure 10.8 below, is a BSC that aims to communicate with realistic goals and metrics, a measurement system for the LTS of an MNE department, manager, director or subsidiary MD.

The BSC is only complete for a short while and must remain dynamic. There are always improvements to cogitate and changing dynamics that impact on any organisation will dictate further inclusions and deletions. After the BSC is designed, there is an opportunity to add KPIs to modify it for an individual person or group within the MNE. BSCs are also considered as a method of performance management, which is viewed as an integral part of the HRM response to the questionnaires. This was also highlighted by the people management aspect that the operations respondents included as important in their questionnaire, and it encompassed all departments within an MNE. Performance management evaluation can include the review and analysis of models that contain the metrics and calculation of outcomes when considering the LTS of the MNE.

Developing capability requirements may be viewed as part of the strategy formulation stage. Moreover, a strategy may be developed to assign priorities aligned with business objectives. In adopting a structured approach to meeting capability requirements, the use of a balanced scorecard and decision-making techniques may form part of the strategy. The degree to which capabilities have been achieved may be captured within the balanced scorecard and adjustments may be made to business activities and system measures to respond to an environment where capability requirements change (Jonkers, 2016).

The general management scorecard example shown in Figure 10.8 is a sample of a scorecard to be used in a general management role by a CEO, MD, director or GM to evaluate the effectiveness of their team and themselves. The objective

of the scorecard is to present a MD with a list of measurable metrics that not only satisfy the department, but also with measurable metrics relevant to the LTS of the MNE, within their sphere of influence.

The first observation is that there are too many metrics (the maximum should be 20) for an individual to process. Time is also a consideration, as it should be remembered that according to Brown (1996, p. 4), metrics should be short term and between 6 and 12 months. This is contradictory to determining the LTS, as these measurements promote the idea of long-term goals or strategies. From the research, it has been determined that a combination of both long-term and short-term metrics are required. The same holds true for the combination of financial and non-financial metrics, as these are essential in determining the LTS of an MNE.

**Figure 10.8: General Management Scorecard**

## General Management Team Scorecard for 2017

| | | Objective | Measurement Criteria | | | | Jan Points | Feb Points | Mar Points | Apr Points | May Points | Jun Points | Jul Points | Aug Points | Sep Points | Oct Points | Nov Points | Dec Points | Total Points | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| COMPANY | Finance Metrics | Operating Profit | R 1150K | R1000K | < R 950 K | R1150K=100% R1000K=50% >R950K=0% | | | | | | | | | | | | | | 0% | | Average calculation of Team Performance  0% of Target KPI's |
| | | Gross Margin | 45% | 40% | < 39% | 45%=100% 40%=50% = >39%=0% | | | | | | | | | | | | | | 0% | 0% | |
| | | Current Ratio | 1+ | 1 | Less Than 1 | >1=100% 1=50% <1=0% | | | | | | | | | | | | | | 0% | | |
| | | Debtors Collection | 55 Days | 60 Days | 60+ Days | 55 Days=100% 56-60 Days=50% <60 Days=0% | | | | | | | | | | | | | | 0% | | |
| | | Quality Of Income | 1+ | 1 | Less Than 1 | >1=100% 1=50% <1=0% | | | | | | | | | | | | | | 0% | | |
| | | NPAT | 110% | 100% | 90% | 110%=1 100%=.75 90%=0 | | | | | | | | | | | | | | 0% | | |
| | Ops & Sales Metrics | ON-TIME Delivery target achieved | 95% - 100% | 94 - 90% | less than 90% | 95-100%= 100 % 90-95 % =  75 % < 90 %=0 % | | | | | | | | | | | | | | 0% | | |
| | | Projects Awarded | 95% - 100% | 94 - 90% | less than 90% | 95-100%= 100 % 90-95 % =  75 % < 90 %=0 % | | | | | | | | | | | | | | 0% | | |
| | | Sales Turnover | 95% - 100% | 94 - 90% | less than 90% | 95-100%= 100 % 90-95 % =  75 % < 90 %=0 % | | | | | | | | | | | | | | 0% | | |
| | | Order Intake | 95% - 100% | 94 - 90% | less than 90% | 95-100%= 100 % 90-95 % =  75 % < 90 %=0 % | | | | | | | | | | | | | | 0% | | |
| | | New Products as % of Turnover | 6% + | 5% | less than 5% | | | | | | | | | | | | | | | 0% | | |
| | | Customer Complaints | Less Than 2 | 2 | More Than 2 | <2=100% 2=50% >2=0% | | | | | | | | | | | | | | 0% | | |
| | | 6S Audit score | 95% - 100% | 94 - 90% | less than 90% | 95-100%= 100 % 90-95 % =  75 % < 90 %=0 % | | | | | | | | | | | | | | 0% | | |
| | | Labour Efficiency | 95% - 100% | 94 - 90% | less than 90% | 95-100%= 100 % 90-95 % =  75 % < 90 %=0 % | | | | | | | | | | | | | | 0% | | |
| | | Quality Rejects | less than 1% | 1% | More than 1% | | | | | | | | | | | | | | | 0% | | |
| | Leadership & Strategic Metrics | People Management | Y = Yes | | N = No | | | | | | | | | | | | | | | 0% | | |
| | | HR as a Strategy | Y = Yes | | N = No | | | | | | | | | | | | | | | 0% | | |
| | | Hiring Statistics | less than 1% | 1% | More than 1% | Resignations or Dismissals | | | | | | | | | | | | | | 0% | | |
| | | Leadership & New Ideas (New Products as % of Turnover) | 6% + | 5% | less than 5% | | | | | | | | | | | | | | | 0% | | |
| | | Brand & Reputation Surveys done & Actions Taken | Y = Yes | | N = No | | | | | | | | | | | | | | | 0% | | |
| | | Effectively working with Co-workers | Y = Yes | | N = No | | | | | | | | | | | | | | | 0% | | |
| | | **Monthly Score Team** | | | | | | | | | | | | | | | | | | | | |

Source: Researcher's own construction

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**Figure 10.9 Management Team and General Management scorecard responsibilities**
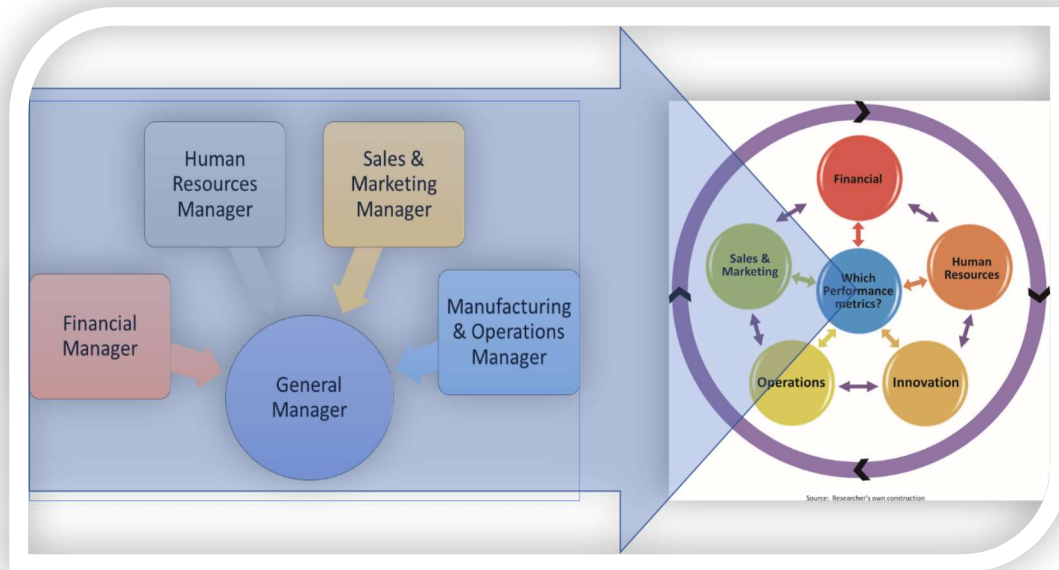


Source: Researcher's own construction

In Figure 10.9, there is a joint responsibility of all the key managers within an MNE to contribute to the LTS of the MNE. The management team is jointly responsible to the GM to determine the outcome of the scorecard and thus determine, *A performance metric system for the long-term sustainability of a multinational enterprise.*

The metrics are different to those shown in other scorecards as emphasis is placed on all aspects of the business from a general management perspective. The metrics remain flexible and can be changed should the need arise to do so and changes can be tailor-made for the individual responsibilities of the person or the group.

Scorecards such as the example shown in Figure 10.8 can also be used in combination with an incentive system so that the objectives and rewards are clear to the manager and the subordinate. However, caution must be taken to ensure a clear understanding and agreement on the measurement and reward system.

## 10.4  FINAL CONCLUSIONS

When considering the LTS Model in Figure 10.2, combined with the flow of leadership in Figure 10.3, a combination of financial and non-financial metrics is required to determine *A performance metric system for the long-term sustainability of a multinational enterprise*. These can be formulated into BSCs that combine these metrics and are tailored to suite the different departments within an MNE. The scorecard then acts as a performance management system designed to determine the individual performance of a department and the effectiveness of the manager when measuring the LTS of the MNE. A reward system can be coupled with the BSC to act as a link between the LTS metrics and the individual reward system. This will create proper stretch goals and act as an enabler for growth coupled with the LTS of the MNE as represented in Figure 10.2.

## 10.5  RECOMMENDATIONS FOR FURTHER STUDY

Based on the results of this study, the following specific recommendations are made for future research:

- As only one MNE was researched in this case study, there is a possibility that limited, and silo thinking was presented, based on the culture and values of the MNE. It would be of interest to expand this research to cover more MNEs, so that a broader base of opinions could be collected to limit bias and elicit broader thinking on the LTS of MNEs.

- LTS should not only be limited to MNEs, as the concept can be applied to almost any organisation, be it in a private or institutionalised environment.

- To gain a better understanding, future research needs to consider using a larger sample size that would provide higher reliability and improve the representativeness of the study population.

- The use of other performance measurement techniques and models may be considered to replace the BSC Kaplan and Norton, (1996) approach, as this was used due to the familiarity of the audience to this method.

## 10.6   ADVICE FROM MY EXPERIENCE IN LEARNING

> On perseverance
> "I do not think that there is any other quality as essential to success of any kind as the quality of perseverance. It overcomes almost everything, even nature."
> *John D. Rockefeller*

- The use of Likert scales should be limited to one set, for example either a 5-Point or a 10-point Likert scale, but not both as it complicates the analysis of the data unnecessarily.

- If one is targeting different departments within an organisation, try to use the exact same scorecard for everybody as this will make the data more meaningful and create data that is more robust.

- Unless one is a statistics expert, do not try to do it alone, but rather obtain assistance from a professional.

- A healthy balance between personal, business and academic commitments is important and prevents detriment.

- Be prepared to burn the candle at both ends to get through the work at times.

- Collection of data is time consuming, so have other tasks to undertake during this period.

- The use of a lot of diagrams and graphs enables ease of understanding.

- Make sure you have a comfortable chair and well-equipped home office if you are planning to complete the bulk of your work in your home environment.

- Make sure you have an endless supply of coffee and nutritional food in moderation.

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# APPENDIX I.

# FINANCIAL DATA – STATISTICS TABLES

| Country | VPF | VPI | OCFM | OFP | SMD | SFM | Respondents | Possible Resp | Reponses % |
|---|---|---|---|---|---|---|---|---|---|
| Corp HQ | YES | YES | YES | | | | 3 | 3 | 100% |
| Plant Rogers | | | | | N/A | N/A | 0 | 0 | |
| Plant Albermarle | | | | | N/A | N/A | 0 | 0 | |
| DPW | | | | | YES | YES | 2 | 2 | 100% |
| Spain | | | | | NO | NO | 0 | 2 | 0% |
| Poland | | | | | YES | YES | 2 | 2 | 100% |
| G Britain | | | | | YES | YES | 2 | 2 | 100% |
| Indonesia | | | | | YES | YES | 2 | 2 | 100% |
| Canada | | | | | YES | NO | 1 | 2 | 50% |
| Thailand | | | | | YES | NO | 1 | 2 | 50% |
| | | | | | | | | 0 | |
| Australia | | | | | YES | NO | 1 | 2 | 50% |
| China | | | | | N/A | YES | 1 | 1 | 100% |
| Mexico | | | | | YES | YES | 2 | 2 | 100% |
| Brazil | | | | | YES | YES | 2 | 2 | 100% |
| N Zealand | | | | | YES | YES | 2 | 2 | 100% |
| Argentina | | | | | | n/a | | 0 | |
| Malaysia | | | | | NO | YES | 1 | 2 | 50% |
| S Africa | | | | | N/A | YES | 1 | 1 | 100% |
| Count | | | | | | | 23 | 29 | 79% |

| Key: | |
|---|---|
| VPF: | Vice-President Finance |
| VPI: | Vice-President International |
| OCFM: | Other Corporate Financial Managers |
| OFP: | Other Financial Practitioners |
| SMD: | Subsidiary Managing Directors |

# Financial Data - Statistics Tables

| Responses |
|---|
| 23 |

| - Means FM Higher than MD's' |
|---|

## Financial Data for Analysis

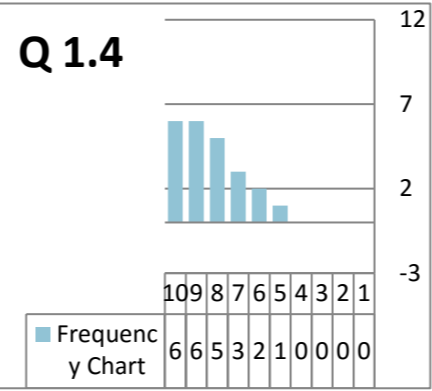| Question No 1 | Average Score | Ave MD's | Ave FM's | Difference | Possible Score | STD Deviation | Confidence Norm | Median | Skew | Kurtosis |
|---|---|---|---|---|---|---|---|---|---|---|
| 1.1 | 8.478 | 8.231 | 8.778 | -0.547 | 10 | 1.755 | 0.717 | 8.500 | -1.536 | 3.032 |
| 1.2 | 8.783 | 8.846 | 8.667 | 0.179 | 10 | 1.347 | 0.550 | 9.000 | -0.789 | -0.481 |
| 1.3 | 8.435 | 8.308 | 8.600 | -0.292 | 10 | 1.532 | 0.626 | 9.000 | -2.066 | 6.472 |
| 1.4 | 8.348 | 8.385 | 8.300 | 0.085 | 10 | 1.465 | 0.599 | 8.500 | -0.669 | -0.317 |
| 1.5 | 8.652 | 8.615 | 8.700 | -0.085 | 10 | 1.112 | 0.455 | 9.000 | -0.529 | -0.118 |
| 1.6 | 8.739 | 8.692 | 8.800 | -0.108 | 10 | 0.964 | 0.394 | 9.000 | -0.423 | -0.575 |
| 1.7 | 9.043 | 9.231 | 8.800 | 0.431 | 10 | 1.461 | 0.597 | 9.500 | -1.998 | 3.732 |
| 1.8 | 8.826 | 9.000 | 8.600 | 0.400 | 10 | 1.370 | 0.560 | 9.000 | -0.819 | -0.524 |
| 1.9 | 8.826 | 9.077 | 8.500 | 0.577 | 10 | 1.230 | 0.503 | 9.000 | -0.762 | -0.430 |
| 1.10 | 8.957 | 9.000 | 8.900 | 0.100 | 10 | 1.186 | 0.485 | 9.000 | -1.341 | 1.576 |
| **Average** | **8.681** | **8.709** | **8.638** | **0.071** | **10.000** | **1.360** | **0.556** | **8.944** | **-1.066** | **1.199** |


Fianacial Q 1
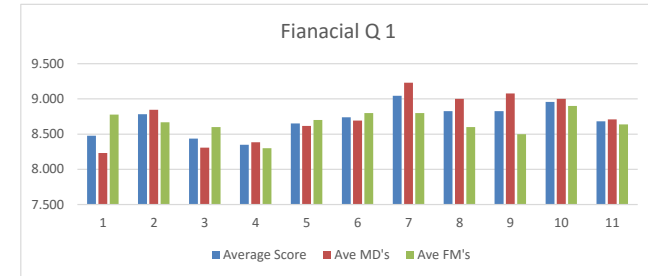
| Question No 2 | Average Score | Ave MD's | Ave FM's | Difference | Possible Score | STD Deviation | Confidence Norm | Median | Skew | Kurtosis |
|---|---|---|---|---|---|---|---|---|---|---|
| 2.1 | 4.174 | 3.923 | 4.500 | -0.577 | 5 | 0.887 | 0.362 | 4.000 | -1.224 | 1.445 |
| 2.2 | 4.565 | 4.538 | 4.600 | -0.062 | 5 | 0.507 | 0.207 | 5.000 | -0.282 | -2.113 |
| 2.3 | 4.391 | 4.385 | 4.400 | -0.015 | 5 | 0.783 | 0.320 | 4.500 | -1.474 | 2.640 |
| 2.4 | 4.174 | 4.154 | 4.200 | -0.046 | 5 | 0.778 | 0.318 | 4.000 | -0.959 | 1.422 |
| 2.5 | 4.435 | 4.385 | 4.500 | -0.115 | 5 | 0.507 | 0.207 | 4.000 | 0.282 | -2.113 |
| 2.6 | 4.522 | 4.462 | 4.600 | -0.138 | 5 | 0.730 | 0.299 | 5.000 | -1.998 | 5.306 |
| 2.7 | 4.609 | 4.615 | 4.600 | 0.015 | 5 | 0.656 | 0.268 | 5.000 | -1.496 | 1.196 |
| 2.8 | 4.348 | 4.462 | 4.200 | 0.262 | 5 | 0.935 | 0.382 | 5.000 | -1.526 | 1.751 |
| 2.9 | 4.304 | 4.385 | 4.200 | 0.185 | 5 | 0.974 | 0.398 | 5.000 | -1.331 | 0.876 |
| 2.10 | 3.870 | 3.692 | 4.100 | -0.408 | 5 | 1.290 | 0.527 | 4.000 | -1.406 | 2.274 |
| **Average** | **4.391** | **4.368** | **4.422** | **-0.055** | **5.000** | **0.751** | **0.307** | **4.611** | **-1.112** | **1.157** |


Financial Q 2
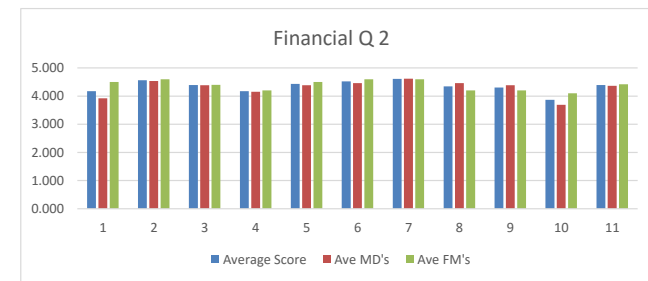
| Question No 3 | Average Score | Ave MD's | Ave FM's | Difference | Possible Score | STD Deviation | Confidence Norm | Median | Skew | Kurtosis |
|---|---|---|---|---|---|---|---|---|---|---|
| 3.1 | 6.682 | 6.583 | 6.800 | -0.217 | 10 | 2.191 | 0.895 | 8.000 | -1.764 | 3.256 |
| 3.2 | 6.957 | 7.308 | 6.500 | 0.808 | 10 | 2.325 | 0.950 | 7.000 | -1.249 | 2.433 |
| 3.3 | 6.652 | 6.692 | 6.600 | 0.092 | 10 | 2.497 | 1.021 | 8.000 | -1.732 | 2.873 |
| 3.4 | 7.478 | 7.846 | 7.000 | 0.846 | 10 | 2.842 | 1.162 | 8.000 | -1.497 | 1.407 |
| 3.5 | 5.478 | 4.923 | 6.200 | -1.277 | 10 | 2.998 | 1.225 | 5.500 | -0.021 | -0.902 |
| 3.6 | 5.478 | 4.846 | 6.300 | -1.454 | 10 | 3.058 | 1.250 | 5.500 | -0.019 | -1.050 |
| 3.7 | 6.739 | 6.769 | 6.700 | 0.069 | 10 | 2.050 | 0.838 | 7.000 | -1.973 | 4.624 |
| 3.8 | 6.348 | 6.692 | 5.900 | 0.792 | 10 | 2.838 | 1.160 | 7.000 | -1.341 | 0.527 |
| 3.9 | 6.391 | 6.385 | 6.400 | -0.015 | 10 | 2.105 | 0.860 | 6.000 | -1.403 | 2.648 |
| 3.10 | 6.783 | 6.769 | 6.800 | -0.031 | 10 | 2.194 | 0.897 | 7.500 | -1.592 | 3.006 |
| **Average** | **6.467** | **6.449** | **6.489** | **-0.039** | **10.000** | **2.545** | **1.040** | **6.889** | **-1.222** | **1.758** |
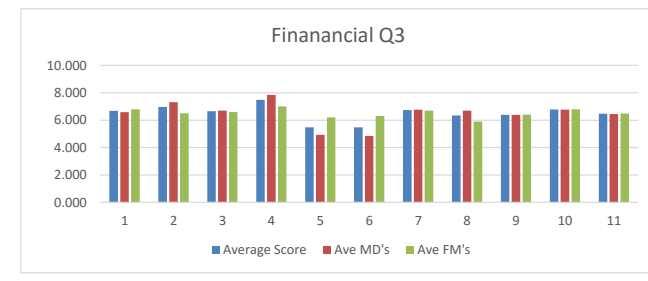

Finanancial Q3

| Question No 4 | Average Score | Ave MD's | Ave FM's | Difference | Possible Score | STD Deviation | Confidence Norm | Median | Skew | Kurtosis |
|---|---|---|---|---|---|---|---|---|---|---|
| 4.1 | 3.348 | 2.923 | 3.900 | -0.977 | 5 | 1.191 | 0.487 | 3.500 | -0.222 | 0.385 |
| 4.2 | 3.652 | 3.692 | 3.600 | 0.092 | 5 | 1.369 | 0.559 | 4.000 | -0.466 | -0.524 |
| 4.3 | 3.391 | 3.308 | 3.500 | -0.192 | 5 | 1.270 | 0.519 | 4.000 | -0.244 | -0.205 |
| 4.4 | 4.435 | 4.231 | 4.700 | -0.469 | 5 | 1.080 | 0.441 | 5.000 | -0.528 | -0.324 |
| 4.5 | 3.739 | 3.154 | 4.500 | -1.346 | 5 | 1.573 | 0.643 | 3.000 | 0.320 | -1.469 |
| 4.6 | 3.739 | 3.154 | 4.500 | -1.346 | 5 | 1.630 | 0.666 | 3.500 | 0.117 | -1.335 |
| 4.7 | 3.304 | 3.154 | 3.500 | -0.346 | 5 | 1.185 | 0.484 | 3.000 | 0.245 | -0.007 |
| 4.8 | 4.391 | 4.077 | 4.800 | -0.723 | 5 | 0.988 | 0.404 | 4.000 | 0.331 | -0.781 |
| 4.9 | 3.435 | 3.154 | 3.800 | -0.646 | 5 | 0.945 | 0.386 | 3.500 | 0.382 | 1.157 |
| 4.10 | 3.609 | 3.308 | 4.000 | -0.692 | 5 | 1.033 | 0.422 | 4.000 | 0.088 | 0.106 |
| **Average** | **3.715** | **3.427** | **4.089** | **-0.662** | **5.000** | **1.248** | **0.510** | **3.722** | **-0.007** | **-0.345** |
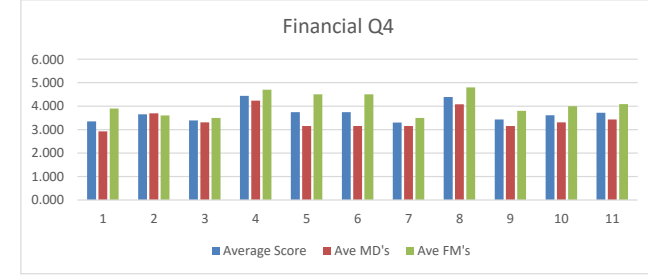

Financial Q4

| Question No 5 | Average Score | Ave MD's | Ave FM's | Difference | Possible Score | STD Deviation | Confidence Norm | Median | Skew | Kurtosis |
|---|---|---|---|---|---|---|---|---|---|---|
| 5.1 | 7.652 | 7.615 | 7.700 | -0.085 | 10 | 1.695 | 0.693 | 8.000 | -1.053 | 1.292 |
| 5.2 | 6.913 | 7.077 | 6.700 | 0.377 | 10 | 2.193 | 0.896 | 7.000 | -1.578 | 3.568 |
| 5.3 | 7.391 | 7.538 | 7.200 | 0.338 | 10 | 2.536 | 1.036 | 8.000 | -1.638 | 2.162 |
| 5.4 | 7.261 | 7.077 | 7.500 | -0.423 | 10 | 2.544 | 1.040 | 8.000 | -1.499 | 1.729 |
| 5.5 | 6.348 | 6.308 | 6.400 | -0.092 | 10 | 3.200 | 1.308 | 7.500 | -0.857 | -0.661 |
| 5.6 | 6.261 | 6.231 | 6.300 | -0.069 | 10 | 2.832 | 1.157 | 7.000 | -0.843 | 0.023 |
| Average | 6.971 | 6.974 | 6.967 | 0.008 | 10.000 | 2.500 | 1.022 | 7.583 | -1.245 | 1.352 |
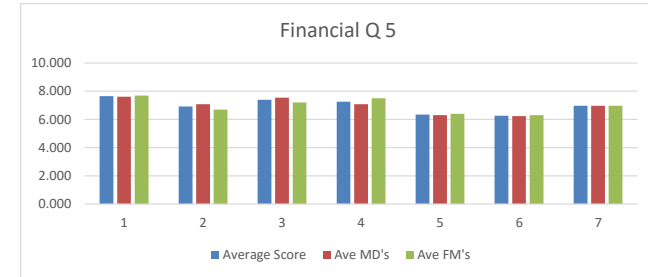


Financial Q 5

| Question No 6 | Average Score | Ave MD's | Ave FM's | Difference | Possible Score | STD Deviation | Confidence Norm | Median | Skew | Kurtosis |
|---|---|---|---|---|---|---|---|---|---|---|
| 6.1 | 4.217 | 3.846 | 4.700 | -0.854 | 5 | 1.242 | 0.507 | 4.000 | -0.295 | -0.460 |
| 6.2 | 3.870 | 3.308 | 4.600 | -1.292 | 5 | 1.486 | 0.607 | 4.000 | -0.029 | -0.728 |
| 6.3 | 4.261 | 4.231 | 4.300 | -0.069 | 5 | 1.054 | 0.431 | 4.000 | -0.065 | -0.284 |
| 6.4 | 4.087 | 4.154 | 4.000 | 0.154 | 5 | 1.164 | 0.476 | 4.000 | 0.006 | -0.578 |
| 6.5 | 3.739 | 3.308 | 4.300 | -0.992 | 5 | 1.389 | 0.568 | 3.500 | 0.402 | -0.934 |
| 6.6 | 3.826 | 3.462 | 4.300 | -0.838 | 5 | 1.435 | 0.586 | 4.000 | 0.030 | -0.710 |
| Average | 4.000 | 3.718 | 4.367 | -0.649 | 5.000 | 1.295 | 0.529 | 3.917 | 0.008 | -0.616 |
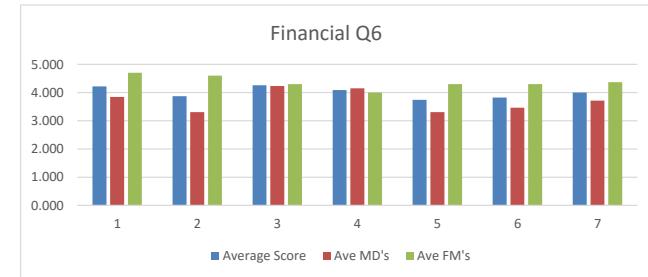


Financial Q6

| Question No 7 | Average Score | Ave MD's | Ave FM's | Difference | Possible Score | STD Deviation | Confidence Norm | Median | Skew | Kurtosis |
|---|---|---|---|---|---|---|---|---|---|---|
| 7.1 | 6.565 | 7.154 | 5.800 | 1.354 | 10 | 2.537 | 1.037 | 7.000 | -0.833 | 0.625 |
| 7.2 | 5.522 | 5.923 | 5.000 | 0.923 | 10 | 2.352 | 0.961 | 6.000 | -1.017 | 0.621 |
| 7.3 | 7.652 | 7.846 | 7.400 | 0.446 | 10 | 2.386 | 0.975 | 8.000 | -1.856 | 4.097 |
| 7.4 | 7.739 | 8.077 | 7.300 | 0.777 | 10 | 2.416 | 0.987 | 8.500 | -1.888 | 4.051 |
| 7.5 | 5.565 | 5.615 | 5.500 | 0.115 | 10 | 2.573 | 1.052 | 6.000 | -0.573 | -0.755 |
| Average | 6.609 | 6.923 | 6.200 | 0.723 | 10.000 | 2.453 | 1.002 | 7.100 | -1.234 | 1.728 |
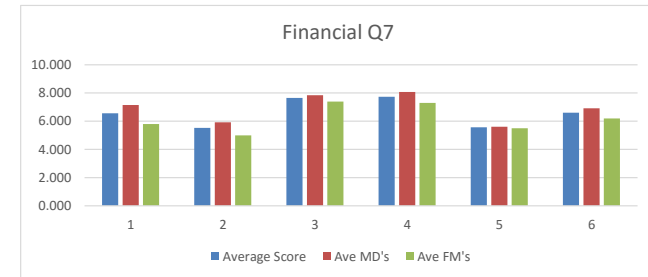


Financial Q7

| Question No 8 | Average Score | Ave MD's | Ave FM's | Difference | Possible Score | STD Deviation | Confidence Norm | Median | Skew | Kurtosis |
|---|---|---|---|---|---|---|---|---|---|---|
| 8.1 | 4.217 | 4.154 | 4.300 | -0.146 | 5 | 1.347 | 0.550 | 4.000 | -0.678 | 0.219 |
| 8.2 | 3.913 | 3.846 | 4.000 | -0.154 | 5 | 1.535 | 0.627 | 4.000 | 0.159 | -1.329 |
| 8.3 | 4.435 | 4.077 | 4.900 | -0.823 | 5 | 0.945 | 0.386 | 5.000 | -0.680 | 0.805 |
| 8.4 | 4.478 | 4.231 | 4.800 | -0.569 | 5 | 0.994 | 0.406 | 5.000 | -0.543 | 0.486 |
| 8.5 | 3.478 | 3.000 | 4.100 | -1.100 | 5 | 1.275 | 0.521 | 4.000 | 0.125 | -0.089 |
| Average | 4.104 | 3.862 | 4.420 | -0.558 | 5.000 | 1.219 | 0.498 | 4.400 | -0.323 | 0.018 |



Financial Q 8

# APPENDIX II.

# FINANCIAL DATA – FREQUENCY GRAPHS

# Financial Data - Frequency Graphs

**Q 1.1**

| Frequency Chart | 10 | 9 | 8 | 7 | 6 | 5 | 4 | 3 | 2 | 1 |
|---|---|---|---|---|---|---|---|---|---|---|
| | 9 | 3 | 7 | 1 | 2 | 0 | 0 | 1 | 0 | 0 |

**Q 1.2**

| Frequency Chart | 10 | 9 | 8 | 7 | 6 | 5 | 4 | 3 | 2 | 1 |
|---|---|---|---|---|---|---|---|---|---|---|
| | 10 | 4 | 5 | 2 | 2 | 0 | 0 | 0 | 0 | 0 |

**Q 1.3**

| Frequency Chart | 10 | 9 | 8 | 7 | 6 | 5 | 4 | 3 | 2 | 1 |
|---|---|---|---|---|---|---|---|---|---|---|
| | 5 | 8 | 6 | 3 | 0 | 0 | 0 | 1 | 0 | 0 |

**Q 1.4**

| Frequency Chart | 10 | 9 | 8 | 7 | 6 | 5 | 4 | 3 | 2 | 1 |
|---|---|---|---|---|---|---|---|---|---|---|
| | 6 | 6 | 5 | 3 | 2 | 1 | 0 | 0 | 0 | 0 |

**Q 1.5**

| Frequency Chart | 10 | 9 | 8 | 7 | 6 | 5 | 4 | 3 | 2 | 1 |
|---|---|---|---|---|---|---|---|---|---|---|
| | 6 | 7 | 7 | 2 | 1 | 0 | 0 | 0 | 0 | 0 |

**Q 2.1**

| Frequency Chart | 1 | 2 | 3 | 4 | 5 |
|---|---|---|---|---|---|
| | 0 | 2 | 1 | 11 | 9 |

**Q 2.2**

| Frequency Chart | 1 | 2 | 3 | 4 | 5 |
|---|---|---|---|---|---|
| | 0 | 0 | 0 | 10 | 13 |

**Q 2.3**

| Frequency Chart | 1 | 2 | 3 | 4 | 5 |
|---|---|---|---|---|---|
| | 0 | 1 | 1 | 9 | 12 |

**Q 2.4**

| Frequency Chart | 1 | 2 | 3 | 4 | 5 |
|---|---|---|---|---|---|
| | 0 | 1 | 2 | 12 | 8 |

**Q 2.5**

| Frequency Chart | 1 | 2 | 3 | 4 | 5 |
|---|---|---|---|---|---|
| | 0 | 0 | 0 | 13 | 10 |

**Q 3.1**

| Frequency Chart | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 |
|---|---|---|---|---|---|---|---|---|---|---|
| | 0 | 0 | 1 | 0 | 0 | 2 | 1 | 7 | 3 | 9 |

**Q 3.2**

| Frequency Chart | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 |
|---|---|---|---|---|---|---|---|---|---|---|
| | 1 | 0 | 1 | 0 | 2 | 5 | 4 | 3 | 5 | 2 |

**Q 3.3**

| Frequency Chart | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 |
|---|---|---|---|---|---|---|---|---|---|---|
| | 1 | 2 | 0 | 1 | 0 | 1 | 2 | 5 | 6 | 5 |

**Q 3.4**

| Series2 | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 |
|---|---|---|---|---|---|---|---|---|---|---|
| | 1 | 2 | 0 | 1 | 0 | 1 | 2 | 5 | 6 | 5 |

**Q 3.5**

| Frequency Chart | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 |
|---|---|---|---|---|---|---|---|---|---|---|
| | 3 | 0 | 3 | 4 | 2 | 2 | 3 | 1 | 2 | 3 |

**Q 4.1**

| Frequency Chart | 1 | 2 | 3 | 4 | 5 | 6 |
|---|---|---|---|---|---|---|
| | 2 | 3 | 6 | 10 | 1 | 1 |

**Q 4.2**

| Frequency Chart | 1 | 2 | 3 | 4 | 5 | 6 |
|---|---|---|---|---|---|---|
| | 2 | 3 | 4 | 7 | 6 | 1 |

**Q 4.3**

| Frequency Chart | 1 | 2 | 3 | 4 | 5 | 6 |
|---|---|---|---|---|---|---|
| | 2 | 4 | 4 | 10 | 2 | 1 |

**Q 4.4**

| Frequency Chart | 1 | 2 | 3 | 4 | 5 | 6 |
|---|---|---|---|---|---|---|
| | 0 | 1 | 4 | 5 | 10 | 3 |

**Q 4.5**

| Frequency Chart | 1 | 2 | 3 | 4 | 5 | 6 |
|---|---|---|---|---|---|---|
| | 0 | 7 | 5 | 3 | 3 | 5 |

**Page 1**

# Financial Data - Frequency Graphs

## Q 1.6

| Frequency Chart | 10 | 9 | 8 | 7 | 6 | 5 | 4 | 3 | 2 | 1 |
|---|---|---|---|---|---|---|---|---|---|---|
| | 5 | 10 | 5 | 3 | 0 | 0 | 0 | 0 | 0 | 0 |

## Q 1.7

| Frequency Chart | 10 | 9 | 8 | 7 | 6 | 5 | 4 | 3 | 2 | 1 |
|---|---|---|---|---|---|---|---|---|---|---|
| | 12 | 6 | 3 | 0 | 0 | 2 | 0 | 0 | 0 | 0 |

## Q 1.8

| Frequency Chart | 10 | 9 | 8 | 7 | 6 | 5 | 4 | 3 | 2 | 1 |
|---|---|---|---|---|---|---|---|---|---|---|
| | 11 | 3 | 5 | 2 | 2 | 0 | 0 | 0 | 0 | 0 |

## Q 1.9

| Frequency Chart | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 |
|---|---|---|---|---|---|---|---|---|---|---|
| | 0 | 0 | 0 | 0 | 0 | 1 | 3 | 4 | 6 | 9 |

## Q 1.10

| Frequency Chart | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 |
|---|---|---|---|---|---|---|---|---|---|---|
| | 0 | 0 | 0 | 0 | 0 | 2 | 0 | 4 | 8 | 9 |

## Q 2.6

| Frequency Chart | 1 | 2 | 3 | 4 | 5 |
|---|---|---|---|---|---|
| | 0 | 1 | 0 | 8 | 14 |

## Q 2.7

| Frequency Chart | 1 | 2 | 3 | 4 | 5 |
|---|---|---|---|---|---|
| | 0 | 0 | 2 | 5 | 16 |

## Q 2.8

| Frequency Chart | 1 | 2 | 3 | 4 | 5 |
|---|---|---|---|---|---|
| | 0 | 2 | 1 | 7 | 13 |

## Q 2.9

| Frequency Chart | 1 | 2 | 3 | 4 | 5 |
|---|---|---|---|---|---|
| | 0 | 2 | 2 | 6 | 13 |

## Q 2.10

| Frequency Chart | 1 | 2 | 3 | 4 | 5 |
|---|---|---|---|---|---|
| | 1 | 2 | 4 | 7 | 9 |

## Q 3.6

| Frequency Chart | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 |
|---|---|---|---|---|---|---|---|---|---|---|
| | 3 | 0 | 4 | 3 | 2 | 2 | 2 | 2 | 2 | 3 |

## Q 3.7

| Frequency Chart | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 |
|---|---|---|---|---|---|---|---|---|---|---|
| | 1 | 0 | 1 | 1 | 0 | 4 | 6 | 8 | 2 | 0 |

## Q 3.8

| Frequency Chart | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 |
|---|---|---|---|---|---|---|---|---|---|---|
| | 4 | 0 | 0 | 0 | 2 | 0 | 7 | 6 | 4 | 0 |

## Q 3.9

| Frequency Chart | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 |
|---|---|---|---|---|---|---|---|---|---|---|
| | 1 | 0 | 1 | 2 | 0 | 8 | 2 | 7 | 2 | 0 |

## Q 3.10

| Frequency Chart | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 |
|---|---|---|---|---|---|---|---|---|---|---|
| | 1 | 0 | 1 | 1 | 1 | 5 | 2 | 8 | 4 | 0 |

## Q 4.6

| Frequency Chart | 1 | 2 | 3 | 4 | 5 | 6 |
|---|---|---|---|---|---|---|
| | 1 | 6 | 4 | 4 | 3 | 5 |

## Q 4.7

| Frequency Chart | 1 | 2 | 3 | 4 | 5 | 6 |
|---|---|---|---|---|---|---|
| | 1 | 5 | 7 | 7 | 2 | 1 |

## Q 4.8

| Frequency Chart | 1 | 2 | 3 | 4 | 5 | 6 |
|---|---|---|---|---|---|---|
| | 0 | 0 | 4 | 10 | 5 | 4 |

## Q 4.9

| Frequency Chart | 1 | 2 | 3 | 4 | 5 | 6 |
|---|---|---|---|---|---|---|
| | 0 | 4 | 7 | 11 | 0 | 1 |

## Q 4.10

| Frequency Chart | 1 | 2 | 3 | 4 | 5 | 6 |
|---|---|---|---|---|---|---|
| | 0 | 4 | 5 | 11 | 2 | 1 |

**Page 2**

# Financial Data - Frequency Graphs

| Chart | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 |
|---|---|---|---|---|---|---|---|---|---|---|
| Q 5.1 | 0 | 0 | 1 | 0 | 2 | 1 | 5 | 6 | 6 | 2 |
| Q 5.2 | 1 | 0 | 1 | 0 | 2 | 3 | 6 | 5 | 4 | 1 |
| Q 5.3 | 2 | 0 | 1 | 0 | 0 | 2 | 2 | 8 | 5 | 3 |
| Q 5.4 | 2 | 0 | 1 | 0 | 1 | 1 | 3 | 8 | 4 | 3 |
| Q 5.5 | 4 | 0 | 1 | 2 | 0 | 1 | 3 | 5 | 5 | 2 |
| Q 6.1 | 0 | 3 | 2 | 9 | 5 | 4 | 0 | 0 | 0 | 0 |
| Q 6.2 | 1 | 4 | 3 | 9 | 1 | 5 | 0 | 0 | 0 | 0 |
| Q 6.3 | 0 | 1 | 4 | 9 | 6 | 3 | 0 | 0 | 0 | 0 |
| Q 6.4 | 0 | 2 | 5 | 8 | 5 | 3 | 0 | 0 | 0 | 0 |
| Q 6.5 | 0 | 5 | 6 | 6 | 2 | 4 | 0 | 0 | 0 | 0 |
| Q 7.1 | 1 | 1 | 0 | 2 | 3 | 4 | 2 | 4 | 4 | 2 |
| Q 7.2 | 3 | 0 | 1 | 0 | 6 | 4 | 5 | 3 | 1 | 0 |
| Q 7.3 | 1 | 0 | 1 | 0 | 1 | 1 | 4 | 5 | 6 | 4 |
| Q 7.4 | 1 | 0 | 1 | 0 | 1 | 1 | 4 | 3 | 8 | 4 |
| Q 7.5 | 1 | 3 | 2 | 2 | 1 | 3 | 5 | 4 | 2 | 0 |
| Q 8.1 | 1 | 2 | 2 | 8 | 6 | 4 | 0 | 0 | 0 | 0 |
| Q 8.2 | 0 | 6 | 3 | 7 | 1 | 6 | 0 | 0 | 0 | 0 |
| Q 8.3 | 0 | 1 | 2 | 8 | 10 | 2 | 0 | 0 | 0 | 0 |
| Q 8.4 | 0 | 1 | 2 | 8 | 9 | 3 | 0 | 0 | 0 | 0 |
| Q 8.5 | 1 | 5 | 4 | 10 | 1 | 2 | 0 | 0 | 0 | 0 |

# Financial Data - Frequency Graphs

## Q 5.6

| Frequency Chart | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 |
|---|---|---|---|---|---|---|---|---|---|---|
| | 3 | 0 | 0 | 3 | 1 | 3 | 4 | 4 | 3 | 2 |

## Q 6.6

| Frequency Chart | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 |
|---|---|---|---|---|---|---|---|---|---|---|
| | 1 | 3 | 6 | 6 | 3 | 4 | 0 | 0 | 0 | 0 |

# APPENDIX III.

# FINANCIAL - QUESTIONNAIRE

| Financial Sustainability Metrics | |
|---|---|
| **Instructions: please choose your Current responsibilities and your location from the dropdown lists** | |
| **I am currently employed as a** | **Your current responsibilities** |
| **At** | **Locate your workplace from list** |
| **Please indicate main area of responsibility** | **Your Main Focus Area** |

**Question No 1**

Please rate the following Operations and Growth Ratios individualy from 1 to 10 based on their importance to long term sustainability for.
Locate your workplace from list
e.g. 10 being most important and 1 being of no importance at all

| | | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 |
|---|---|---|---|---|---|---|---|---|---|---|---|
| 1.1 | Sales Turnover | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ |
| 1.2 | Sales Growth Y/Y | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ |
| 1.3 | Material Margin | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ |
| 1.4 | Labour & Overhead Expenses | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ |
| 1.5 | Gross Margin | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ |
| 1.6 | Gross Profit | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ |
| 1.7 | Operating profit | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ |
| 1.8 | Pre-tax Profit | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ |
| 1.9 | Nett Profit | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ |
| 1.10 | Nett profit growth | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ |

**Question No 2**

**Long Term Financial Sustainability Operations & Growth Ratios for Locate your workplace from list**

| | | No, there are better methods | Not high on list at all | Maybe Helps a little | Of Value to us | Of HUGE Importance ! | We do not use it at all |
|---|---|---|---|---|---|---|---|
| 2.1 | Sales Turnover is crucial to determining the long term sustainability of Locate your workplace from list | ○ | ○ | ○ | ○ | ○ | ○ |
| 2.2 | Sales Growth Year on Year is crucial to determining the long term sustainability of Locate your workplace from list | ○ | ○ | ○ | ○ | ○ | ○ |
| 2.3 | Material Margin is crucial to determining our long term sustainability of Locate your workplace from list | ○ | ○ | ○ | ○ | ○ | ○ |
| 2.4 | Locate your workplace from list'S Labour & Overheads calculations are crucial to determining our long term sustainability | ○ | ○ | ○ | ○ | ○ | ○ |
| 2.5 | Gross Margin % is crucial to determining the long term sustainability Locate your workplace from list | ○ | ○ | ○ | ○ | ○ | ○ |
| 2.6 | Gross Profit % is a financial calculation that Locate your workplace from list believe is crucial to determining long term sustainability | ○ | ○ | ○ | ○ | ○ | ○ |
| 2.7 | Operating Profit % is a financial calculation that Locate your workplace from list believe is crucial to determining long term sustainability | ○ | ○ | ○ | ○ | ○ | ○ |
| 2.8 | The Pre-Tax Profit % is a crucial calculation that Locate your workplace from list uses to determine long term sustainability | ○ | ○ | ○ | ○ | ○ | ○ |
| 2.9 | The calculation of Net Profit % is crucial to Locate your workplace from list's long term sustainability | ○ | ○ | ○ | ○ | ○ | ○ |
| 2.10 | Net Profit Growth of most importance in determining the long term sustainability of Locate your workplace from list | ○ | ○ | ○ | ○ | ○ | ○ |

| Question No 3 | Please rate each of the following Rate of Return Ratios on a scale of 1 to 10 individualy based on their importance to long term sustainability of Locate your workplace from list e.g. 10 being most important and 1 being of no importance at all | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 |
|---|---|---|---|---|---|---|---|---|---|---|---|
| 3.1 | Working Capital Turnover | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ |
| 3.2 | Return on Net Assets % . (RONA) metrics are an important metric for measurment of sustainability for Locate your workplace from list | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ |
| 3.3 | Return on Total Assets %. (ROTA) | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ |
| 3.4 | Net Operating Profit After Tax (NOPAT) | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ |
| 3.5 | EVA® = | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ |
| 3.6 | EVA® NPAT= | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ |
| 3.7 | Net Asset T/O | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ |
| 3.8 | Stock Turn | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ |
| 3.9 | Working capital intensity | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ |
| 3.10 | Working capital turnover | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ |

| Question No 4 | Long Term Financial Sustainability Rate of Return Ratios For Locate your workplace from list | No, there are better methods | Not high on list at all | Maybe Helps a little | Of Value to us | Of HUGE Importance ! | We do not use it at all |
|---|---|---|---|---|---|---|---|
| 4.1 | The Working Capital Turnover ratio is uses as a measure of sustainability by Locate your workplace from list | ○ | ○ | ○ | ○ | ○ | ○ |
| 4.2 | Return on Net Assets % . (RONA) metrics are an important metric for measurment of sustainability for Locate your workplace from list | ○ | ○ | ○ | ○ | ○ | ○ |
| 4.3 | Return on Total Assets%. (ROTA) is an important measurement for determining sustainability within Locate your workplace from list | ○ | ○ | ○ | ○ | ○ | ○ |
| 4.4 | NOPAT is important to Locate your workplace from list as a sustainability measurement | ○ | ○ | ○ | ○ | ○ | ○ |
| 4.5 | it is important to Locate your workplace from list to use EVA® as a sustainability measure | ○ | ○ | ○ | ○ | ○ | ○ |
| 4.6 | it is important to Locate your workplace from list to use EVA® base on NPAT as a sustainability measure | ○ | ○ | ○ | ○ | ○ | ○ |
| 4.7 | Net Asset T/O is used by Locate your workplace from list as a measurement of sustainability | ○ | ○ | ○ | ○ | ○ | ○ |
| 4.8 | Stock Turns determine the long term sustainabilty for Locate your workplace from list from a rate of return perspective | ○ | ○ | ○ | ○ | ○ | ○ |
| 4.9 | Working capital intensity is important to Locate your workplace from list and measures long term sustainabilty | ○ | ○ | ○ | ○ | ○ | ○ |
| 4.10 | Working capital turnover is an important measurement in Locate your workplace from list'S long term strategy | ○ | ○ | ○ | ○ | ○ | ○ |

# Appendix III.        Financial - Questionnaires

| Question No 5 | Please rate the following Liquidity Ratios individualy from 1 to 10 based on their individual importance to the long term sustainability of Locate your workplace from list e.g. 10 being most important and 1 being of no importance at all | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 |
|---|---|---|---|---|---|---|---|---|---|---|---|
| 5.1 | Current Ratio | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ |
| 5.2 | Quick Ratio | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ |
| 5.3 | Debtors Collection period | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ |
| 5.4 | Creditors Collection period | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ |
| 5.5 | Solvency Ratio | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ |
| 5.6 | Retained income % | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ |

| Question No 6 | Long Term Financial Sustainability Liquidity Ratios Locate your workplace from list | No, there are better methods | Not high on list at all | Maybe Helps a little | Of Value to us | Of HUGE Importance ! | We do not use it at all |
|---|---|---|---|---|---|---|---|
| 6.1 | Current Ratios within Locate your workplace from list are used as long term sustainability metrics | ○ | ○ | ○ | ○ | ○ | ○ |
| 6.2 | Quick Ratios are calculated by Locate your workplace from list and included in our sustainabilty planning | ○ | ○ | ○ | ○ | ○ | ○ |
| 6.3 | Debtors Collection period is an important measure of long term sustainability within Locate your workplace from list | ○ | ○ | ○ | ○ | ○ | ○ |
| 6.4 | Creditors Collection periods help Locate your workplace from list in measuring sustainabilty long term | ○ | ○ | ○ | ○ | ○ | ○ |
| 6.5 | Solvency Ratios play an important role at Locate your workplace from list contributing to long term sustainability | ○ | ○ | ○ | ○ | ○ | ○ |
| 6.6 | Retained income % plays an important role for Locate your workplace from list and is used as a measure of long term sustainability | ○ | ○ | ○ | ○ | ○ | ○ |

| Question No 7 | Please rate the following Cash Flow Ratios from 1 to 10 based on their individual importance to long term sustainability of Locate your workplace from list e.g. 10 being most important and 1 being of no importance at all | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 |
|---|---|---|---|---|---|---|---|---|---|---|---|
| 7.1 | Cash Flow/debt ratio | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ |
| 7.2 | Liability settlement period Ratio | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ |
| 7.3 | Quality Of Sales | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ |
| 7.4 | Quality of income | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ |
| 7.5 | Cash profitability of Total Assets | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ |

| Question No 8 | Long Term Financial Sustainability Cash Flow Ratios for Locate your workplace from list | No, there are better methods | Not high on list at all | Maybe Helps a little | Of Value to us | Of HUGE Importance ! | We do not use it at all |
|---|---|---|---|---|---|---|---|
| 8.1 | Cash Flow/debt ratio as a measurement is important to  Locate your workplace from list'S long term development | ○ | ○ | ○ | ○ | ○ | ○ |
| 8.2 | The Liability settlement period ratio at Locate your workplace from listis an important indicator of long term sustainability | ○ | ○ | ○ | ○ | ○ | ○ |
| 8.3 | Quality Of Sales contributes significantly to  Locate your workplace from list in planning of long term sustainability | ○ | ○ | ○ | ○ | ○ | ○ |
| 8.4 | Quality of income  within Locate your workplace from list assists in determinig sustainability | ○ | ○ | ○ | ○ | ○ | ○ |
| 8.5 | Cash profitability of Total Assets  plays an important role  for determinig Locate your workplace from list'S future sustainability | ○ | ○ | ○ | ○ | ○ | ○ |

| Question No 9 | Please include other financial metrics used that are not included in the above, please provide a calculation methodology and a rationale for their use |
|---|---|
| 9.1 | |
| 9.2 | |
| 9.3 | |
| 9.4 | |
| 9.5 | |

| Question No 10 | In Your Opinion which 5 financial metrics are the most important to long term sustainability? Please list them below from most important with a brief motivation of your choice. |
|---|---|
| 10.1 | |
| 10.2 | |
| 10.3 | |
| 10.4 | |
| 10.5 | |

# APPENDIX IV.

# FINANCIAL DATA – CRONBACH'S ALPHA

| Cronbach's alpha | 0.866297116 |
|---|---|

Anova: Two-Factor Without Replication

| Question No 1 | 1.1 | 1.2 | 1.3 | 1.4 | 1.5 | 1.6 | 1.7 | 1.8 | 1.9 | 1.10 |
|---|---|---|---|---|---|---|---|---|---|---|
| | 10 | 8 | 8 | 7 | 9 | 9 | 9 | 10 | 10 | 6 |
| | 7 | 10 | 9 | 9 | 9 | 7 | 9 | 8 | 9 | 10 |
| | 10 | 10 | 10 | 10 | 10 | 10 | 10 | 10 | 10 | 10 |
| | 10 | 10 | 10 | 10 | 10 | 10 | 10 | 10 | 10 | 9 |
| | 8 | 8 | 3 | 7 | 6 | 9 | 10 | 10 | 8 | 10 |
| | 8 | 8 | 8 | 7 | 8 | 8 | 9 | 8 | 9 | 10 |
| | 10 | 8 | 9 | 9 | 9 | 9 | 10 | 10 | 10 | 9 |
| | 6 | 7 | 8 | 8 | 8 | 8 | 9 | 9 | 8 | 9 |
| | 10 | 9 | 9 | 9 | 9 | 9 | 10 | 10 | 10 | 9 |
| | 3 | 10 | 9 | 6 | 7 | 7 | 5 | 6 | 9 | 8 |
| | 8 | 10 | 7 | 8 | 8 | 9 | 10 | 7 | 7 | 8 |
| | 8 | 8 | 9 | 9 | 9 | 9 | 9 | 9 | 9 | 9 |
| | 9 | 9 | 9 | 10 | 10 | 9 | 10 | 10 | 9 | 10 |
| | 8 | 6 | 8 | 8 | 8 | 8 | 8 | 8 | 8 | 8 |
| | 10 | 10 | 9 | 9 | 9 | 9 | 9 | 9 | 6 | 10 |
| | 10 | 10 | 9 | 6 | 9 | 9 | 10 | 10 | 10 | 10 |
| | 10 | 10 | 10 | 10 | 10 | 10 | 10 | 10 | 10 | 10 |
| | 10 | 10 | 10 | 10 | 10 | 10 | 10 | 10 | 9 | 9 |
| | 8 | 6 | 8 | 8 | 8 | 8 | 8 | 8 | 7 | 6 |
| | 6 | 7 | 8 | 9 | 8 | 8 | 8 | 8 | 8 | 9 |
| | 8 | 10 | 7 | 8 | 8 | 9 | 10 | 7 | 7 | 8 |
| | 9 | 9 | 7 | 5 | 7 | 7 | 5 | 6 | 10 | 9 |
| | 9 | 9 | 10 | 10 | 10 | 10 | 10 | 10 | 10 | 10 |

| SUMMARY | Count | Sum | Average | Variance |
|---|---|---|---|---|
| Row 1 | 10 | 86 | 8.6 | 1.822222222 |
| Row 2 | 10 | 87 | 8.7 | 1.122222222 |
| Row 3 | 10 | 100 | 10 | 0 |
| Row 4 | 10 | 99 | 9.9 | 0.1 |
| Row 5 | 10 | 79 | 7.9 | 4.766666667 |
| Row 6 | 10 | 83 | 8.3 | 0.677777778 |
| Row 7 | 10 | 93 | 9.3 | 0.455555556 |
| Row 8 | 10 | 80 | 8 | 0.888888889 |
| Row 9 | 10 | 94 | 9.4 | 0.266666667 |
| Row 10 | 10 | 70 | 7 | 4.444444444 |
| Row 11 | 10 | 82 | 8.2 | 1.288888889 |
| Row 12 | 10 | 88 | 8.8 | 0.177777778 |
| Row 13 | 10 | 95 | 9.5 | 0.277777778 |
| Row 14 | 10 | 78 | 7.8 | 0.4 |
| Row 15 | 10 | 90 | 9 | 1.333333333 |
| Row 16 | 10 | 93 | 9.3 | 1.566666667 |
| Row 17 | 10 | 100 | 10 | 0 |
| Row 18 | 10 | 98 | 9.8 | 0.177777778 |
| Row 19 | 10 | 75 | 7.5 | 0.722222222 |
| Row 20 | 10 | 79 | 7.9 | 0.766666667 |
| Row 21 | 10 | 82 | 8.2 | 1.288888889 |
| Row 22 | 10 | 74 | 7.4 | 3.155555556 |
| Row 23 | 10 | 98 | 9.8 | 0.177777778 |
| | | | | |
| Column 1 | 23 | 195 | 8.47826087 | 3.079051383 |
| Column 2 | 23 | 202 | 8.782608696 | 1.814229249 |
| Column 3 | 23 | 194 | 8.434782609 | 2.347826087 |
| Column 4 | 23 | 192 | 8.347826087 | 2.146245059 |
| Column 5 | 23 | 199 | 8.652173913 | 1.23715415 |
| Column 6 | 23 | 201 | 8.739130435 | 0.928853755 |
| Column 7 | 23 | 208 | 9.043478261 | 2.134387352 |
| Column 8 | 23 | 203 | 8.826086957 | 1.877470356 |
| Column 9 | 23 | 203 | 8.826086957 | 1.513833992 |
| Column 10 | 23 | 206 | 8.956521739 | 1.407114625 |

**ANOVA**

| Source of Variation | SS | df | MS | F | P-value | F crit |
|---|---|---|---|---|---|---|
| Rows | 184.5826087 | 22 | 8.390118577 | 7.47927025 | 1.76582E-16 | 1.596302808 |
| Columns | 10.78695652 | 9 | 1.198550725 | 1.068433622 | 0.387758632 | 1.927404828 |
| Error | 222.1130435 | 198 | 1.121783048 | | | |
| | | | | | | |
| Total | 417.4826087 | 229 | | | | |

| Cronbach's alpha | 0.729 |
|---|---|

Anova: Two-Factor Without Replication

| Question 2 | 2.1 | 2.2 | 2.3 | 2.4 | 2.5 | 2.6 | 2.7 | 2.8 | 2.9 | 2.10 |
|---|---|---|---|---|---|---|---|---|---|---|
| | 5 | 4 | 5 | 2 | 4 | 4 | 4 | 4 | 5 | 3 |
| | 2 | 4 | 4 | 4 | 5 | 2 | 4 | 4 | 4 | 4 |
| | 5 | 5 | 5 | 4 | 5 | 5 | 5 | 5 | 5 | 0 |
| | 5 | 5 | 4 | 4 | 5 | 5 | 5 | 5 | 5 | 4 |
| | 4 | 5 | 3 | 5 | 4 | 5 | 5 | 5 | 4 | 5 |
| | 4 | 4 | 4 | 5 | 4 | 4 | 4 | 4 | 5 | 4 |
| | 5 | 4 | 4 | 4 | 4 | 4 | 5 | 5 | 5 | 5 |
| | 4 | 4 | 4 | 5 | 4 | 5 | 5 | 5 | 5 | 4 |
| | 3 | 5 | 5 | 3 | 5 | 5 | 5 | 5 | 3 | 3 |
| | 2 | 5 | 5 | 4 | 4 | 4 | 3 | 4 | 5 | 4 |
| | 4 | 5 | 4 | 4 | 4 | 5 | 5 | 2 | 2 | 2 |
| | 4 | 4 | 5 | 5 | 5 | 5 | 5 | 5 | 5 | 5 |
| | 4 | 5 | 5 | 5 | 4 | 5 | 5 | 5 | 4 | 5 |
| | 5 | 4 | 5 | 4 | 5 | 5 | 5 | 5 | 5 | 5 |
| | 5 | 5 | 5 | 5 | 5 | 5 | 5 | 5 | 3 | 5 |
| | 5 | 5 | 5 | 4 | 4 | 5 | 5 | 5 | 5 | 5 |
| | 4 | 4 | 4 | 4 | 4 | 4 | 4 | 4 | 4 | 4 |
| | 5 | 5 | 5 | 5 | 5 | 5 | 5 | 5 | 5 | 5 |
| | 4 | 4 | 4 | 3 | 4 | 4 | 4 | 3 | 4 | 3 |
| | 4 | 4 | 4 | 4 | 5 | 5 | 5 | 4 | 4 | 3 |
| | 4 | 5 | 2 | 4 | 4 | 4 | 5 | 2 | 2 | 2 |
| | 5 | 5 | 5 | 4 | 4 | 4 | 3 | 4 | 5 | 4 |
| | 4 | 5 | 5 | 5 | 5 | 5 | 5 | 5 | 5 | 5 |

| SUMMARY | Count | Sum | Average | Variance |
|---|---|---|---|---|
| Row 1 | 10 | 40 | 4 | 0.888888889 |
| Row 2 | 10 | 37 | 3.7 | 0.9 |
| Row 3 | 10 | 44 | 4.4 | 2.488888889 |
| Row 4 | 10 | 47 | 4.7 | 0.233333333 |
| Row 5 | 10 | 45 | 4.5 | 0.5 |
| Row 6 | 10 | 42 | 4.2 | 0.177777778 |
| Row 7 | 10 | 45 | 4.5 | 0.277777778 |
| Row 8 | 10 | 45 | 4.5 | 0.277777778 |
| Row 9 | 10 | 42 | 4.2 | 1.066666667 |
| Row 10 | 10 | 40 | 4 | 0.888888889 |
| Row 11 | 10 | 37 | 3.7 | 1.566666667 |
| Row 12 | 10 | 48 | 4.8 | 0.177777778 |
| Row 13 | 10 | 47 | 4.7 | 0.233333333 |
| Row 14 | 10 | 48 | 4.8 | 0.177777778 |
| Row 15 | 10 | 48 | 4.8 | 0.4 |
| Row 16 | 10 | 48 | 4.8 | 0.177777778 |
| Row 17 | 10 | 40 | 4 | 0 |
| Row 18 | 10 | 50 | 5 | 0 |
| Row 19 | 10 | 37 | 3.7 | 0.233333333 |
| Row 20 | 10 | 42 | 4.2 | 0.4 |
| Row 21 | 10 | 34 | 3.4 | 1.6 |
| Row 22 | 10 | 43 | 4.3 | 0.455555556 |
| Row 23 | 10 | 49 | 4.9 | 0.1 |

ANOVA

| Source of Variation | SS | df | MS | F | P-value | F crit |
|---|---|---|---|---|---|---|
| Rows | 44.548 | 22 | 2.024901186 | 3.686495562 | 4.15646E-07 | 1.596302808 |
| Columns | 10.243 | 9 | 1.138164251 | 2.072119613 | 0.033654885 | 1.927404828 |
| Error | 108.76 | 198 | 0.549275362 | | | |
| | | | | | | |
| Total | 163.55 | 229 | | | | |

| | | | | |
|---|---|---|---|---|
| Column 1 | 23 | 96 | 4.173913043 | 0.786561265 |
| Column 2 | 23 | 105 | 4.565217391 | 0.256916996 |
| Column 3 | 23 | 101 | 4.391304348 | 0.612648221 |
| Column 4 | 23 | 96 | 4.173913043 | 0.604743083 |
| Column 5 | 23 | 102 | 4.434782609 | 0.256916996 |
| Column 6 | 23 | 104 | 4.52173913 | 0.533596838 |
| Column 7 | 23 | 106 | 4.608695652 | 0.43083004 |
| Column 8 | 23 | 100 | 4.347826087 | 0.873517787 |
| Column 9 | 23 | 99 | 4.304347826 | 0.948616601 |
| Column 10 | 23 | 89 | 3.869565217 | 1.664031621 |

# Financial Data - Cronbach's Alpha

| Cronbach's alpha | 0.9227605 |
|---|---|

Anova: Two-Factor Without Replication

| Question 3 | 3.1 | 3.2 | 3.3 | 3.4 | 3.5 | 3.6 | 3.7 | 3.8 | 3.9 | 3.10 |
|---|---|---|---|---|---|---|---|---|---|---|
| | 6 | 7 | 4 | 8 | 4 | 4 | 6 | 5 | 4 | 5 |
| | 3 | 7 | 7 | 9 | 4 | 4 | 4 | 7 | 4 | 4 |
| | 3 | 3 | 0 | 10 | 4 | 3 | 3 | 5 | 3 | 3 |
| | 0 | 6 | 6 | 10 | 5 | 5 | 7 | 7 | 6 | 6 |
| | 8 | 8 | 8 | 7 | 5 | 5 | 8 | 8 | 6 | 8 |
| | 7 | 9 | 8 | 4 | 3 | 3 | 9 | 8 | 6 | 8 |
| | 8 | 9 | 8 | 10 | 7 | 7 | 6 | 7 | 8 | 8 |
| | 8 | 7 | 7 | 6 | 3 | 3 | 7 | 9 | 9 | 9 |
| | 8 | 9 | 9 | 9 | 8 | 8 | 8 | 7 | 8 | 8 |
| | 8 | 10 | 9 | 10 | 10 | 10 | 7 | 7 | 8 | 8 |
| | 8 | 8 | 8 | 2 | 1 | 1 | 8 | 1 | 6 | 6 |
| | 6 | 7 | 8 | 8 | 7 | 7 | 7 | 7 | 7 | 7 |
| | 6 | 5 | 5 | 9 | 3 | 3 | 8 | 9 | 8 | 8 |
| | 7 | 6 | 6 | 8 | 10 | 10 | 6 | 8 | 6 | 7 |
| | 9 | 9 | 9 | 9 | 9 | 9 | 8 | 8 | 9 | 9 |
| | 9 | 10 | 9 | 10 | 9 | 10 | 8 | 9 | 8 | 9 |
| | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | 8 | 5 | 8 | 8 | 7 | 8 | 8 | 1 | 8 | 8 |
| | 6 | 6 | 6 | 7 | 6 | 6 | 6 | 7 | 6 | 6 |
| | 6 | 6 | 6 | 8 | 6 | 6 | 7 | 8 | 6 | 6 |
| | 8 | 8 | 8 | 2 | 1 | 1 | 8 | 1 | 6 | 6 |
| | 8 | 9 | 8 | 9 | 10 | 9 | 7 | 8 | 8 | 8 |
| | 7 | 6 | 6 | 9 | 4 | 4 | 9 | 9 | 7 | 9 |

| SUMMARY | Count | Sum | Average | Variance |
|---|---|---|---|---|
| Row 1 | 10 | 53 | 5.3 | 2.011111111 |
| Row 2 | 10 | 53 | 5.3 | 4.011111111 |
| Row 3 | 10 | 37 | 3.7 | 6.455555556 |
| Row 4 | 10 | 58 | 5.8 | 6.177777778 |
| Row 5 | 10 | 71 | 7.1 | 1.655555556 |
| Row 6 | 10 | 65 | 6.5 | 5.611111111 |
| Row 7 | 10 | 78 | 7.8 | 1.288888889 |
| Row 8 | 10 | 68 | 6.8 | 5.066666667 |
| Row 9 | 10 | 82 | 8.2 | 0.4 |
| Row 10 | 10 | 87 | 8.7 | 1.566666667 |
| Row 11 | 10 | 49 | 4.9 | 10.54444444 |
| Row 12 | 10 | 71 | 7.1 | 0.322222222 |
| Row 13 | 10 | 64 | 6.4 | 5.377777778 |
| Row 14 | 10 | 74 | 7.4 | 2.488888889 |
| Row 15 | 10 | 88 | 8.8 | 0.177777778 |
| Row 16 | 10 | 91 | 9.1 | 0.544444444 |
| Row 17 | 10 | 0 | 0 | 0 |
| Row 18 | 10 | 69 | 6.9 | 5.211111111 |
| Row 19 | 10 | 62 | 6.2 | 0.177777778 |
| Row 20 | 10 | 65 | 6.5 | 0.722222222 |
| Row 21 | 10 | 49 | 4.9 | 10.54444444 |
| Row 22 | 10 | 84 | 8.4 | 0.711111111 |
| Row 23 | 10 | 70 | 7 | 4 |

ANOVA

| Source of Variation | SS | df | MS | F | P-value | F crit |
|---|---|---|---|---|---|---|
| Rows | 857.6869565 | 22 | 38.98577075 | 12.94673745 | 1.10427E-27 | 1.596302808 |
| Columns | 79.37391304 | 9 | 8.819323671 | 2.92879853 | 0.002781315 | 1.927404828 |
| Error | 596.226087 | 198 | 3.011242863 | | | |
| | | | | | | |
| Total | 1533.286957 | 229 | | | | |

| | Count | Sum | Average | Variance |
|---|---|---|---|---|
| Column 1 | 23 | 147 | 6.391304348 | 6.52173913 |
| Column 2 | 23 | 160 | 6.956521739 | 5.407114625 |
| Column 3 | 23 | 153 | 6.652173913 | 6.23715415 |
| Column 4 | 23 | 172 | 7.47826087 | 8.079051383 |
| Column 5 | 23 | 126 | 5.47826087 | 8.988142292 |
| Column 6 | 23 | 126 | 5.47826087 | 9.351778656 |
| Column 7 | 23 | 155 | 6.739130435 | 4.201581028 |
| Column 8 | 23 | 146 | 6.347826087 | 8.055335968 |
| Column 9 | 23 | 147 | 6.391304348 | 4.43083004 |
| Column 10 | 23 | 156 | 6.782608696 | 4.814229249 |

# Financial Data - Cronbach's Alpha

| Cronbach's alpha | 0.8377100 |
|---|---|

Anova: Two-Factor Without Replication

| Question 4 | 4.1 | 4.2 | 4.3 | 4.4 | 4.5 | 4.6 | 4.7 |
|---|---|---|---|---|---|---|---|
| | 1 | 4 | 2 | 5 | 3 | 2 | 2 |
| | 2 | 2 | 2 | 4 | 2 | 2 | 2 |
| | 1 | 1 | 1 | 5 | 2 | 1 | 2 |
| | 2 | 2 | 2 | 5 | 2 | 2 | 2 |
| | 4 | 5 | 5 | 3 | 3 | 3 | 5 |
| | 4 | 5 | 4 | 2 | 6 | 6 | 5 |
| | 4 | 4 | 4 | 3 | 3 | 3 | 3 |
| | 4 | 4 | 4 | 4 | 2 | 2 | 3 |
| | 3 | 5 | 5 | 3 | 3 | 3 | 3 |
| | 4 | 5 | 4 | 5 | 5 | 5 | 3 |
| | 3 | 3 | 3 | 6 | 6 | 6 | 3 |
| | 3 | 5 | 4 | 5 | 2 | 2 | 4 |
| | 3 | 3 | 3 | 5 | 2 | 4 | 4 |
| | 4 | 1 | 1 | 5 | 5 | 5 | 1 |
| | 4 | 4 | 4 | 5 | 4 | 4 | 3 |
| | 5 | 4 | 4 | 4 | 4 | 4 | 4 |
| | 6 | 6 | 6 | 6 | 6 | 6 | 6 |
| | 4 | 4 | 4 | 4 | 4 | 4 | 4 |
| | 2 | 2 | 2 | 3 | 2 | 2 | 2 |
| | 3 | 4 | 4 | 4 | 3 | 3 | 4 |
| | 3 | 3 | 3 | 6 | 6 | 6 | 3 |
| | 4 | 5 | 4 | 5 | 5 | 5 | 4 |
| | 4 | 3 | 3 | 5 | 6 | 6 | 4 |

| SUMMARY | Count | Sum | Average | Variance |
|---|---|---|---|---|
| Row 1 | 7 | 19 | 2.714286 | 1.904762 |
| Row 2 | 7 | 16 | 2.285714 | 0.571429 |
| Row 3 | 7 | 13 | 1.857143 | 2.142857 |
| Row 4 | 7 | 17 | 2.428571 | 1.285714 |
| Row 5 | 7 | 28 | 4 | 1 |
| Row 6 | 7 | 32 | 4.571429 | 1.952381 |
| Row 7 | 7 | 24 | 3.428571 | 0.285714 |
| Row 8 | 7 | 23 | 3.285714 | 0.904762 |
| Row 9 | 7 | 25 | 3.571429 | 0.952381 |
| Row 10 | 7 | 31 | 4.428571 | 0.619048 |
| Row 11 | 7 | 30 | 4.285714 | 2.571429 |
| Row 12 | 7 | 25 | 3.571429 | 1.619048 |
| Row 13 | 7 | 24 | 3.428571 | 0.952381 |
| Row 14 | 7 | 22 | 3.142857 | 4.142857 |
| Row 15 | 7 | 28 | 4 | 0.333333 |
| Row 16 | 7 | 29 | 4.142857 | 0.142857 |
| Row 17 | 7 | 42 | 6 | 0 |
| Row 18 | 7 | 28 | 4 | 0 |
| Row 19 | 7 | 15 | 2.142857 | 0.142857 |
| Row 20 | 7 | 25 | 3.571429 | 0.285714 |
| Row 21 | 7 | 30 | 4.285714 | 2.571429 |
| Row 22 | 7 | 32 | 4.571429 | 0.285714 |
| Row 23 | 7 | 31 | 4.428571 | 1.619048 |

ANOVA

| Source of Variation | SS | df | MS | F | P-value | F crit |
|---|---|---|---|---|---|---|
| Rows | 140.4968944 | 22 | 6.386222473 | 6.161808771 | 6.94769E-12 | 1.623519659 |
| Columns | 20.9068323 | 6 | 3.48447205 | 3.362026696 | 0.004077645 | 2.167952695 |
| Error | 136.8074534 | 132 | 1.036420102 | | | |
| | | | | | | |
| Total | 298.2111801 | 160 | | | | |

| | Count | Sum | Average | Variance |
|---|---|---|---|---|
| Column 1 | 23 | 77 | 3.347826 | 1.418972 |
| Column 2 | 23 | 84 | 3.652174 | 1.873518 |
| Column 3 | 23 | 78 | 3.391304 | 1.612648 |
| Column 4 | 23 | 102 | 4.434783 | 1.166008 |
| Column 5 | 23 | 86 | 3.73913 | 2.474308 |
| Column 6 | 23 | 86 | 3.73913 | 2.656126 |
| Column 7 | 23 | 76 | 3.304348 | 1.403162 |

# Financial Data - Cronbach's Alpha

| Cronbach's alpha | 0.90077637 |
|---|---|

Anova: Two-Factor Without Replication

| Question No 5 | 5.1 | 5.2 | 5.3 | 5.4 | 5.5 | 5.6 |
|---|---|---|---|---|---|---|
| | 8 | 8 | 9 | 7 | 4 | 4 |
| | 3 | 3 | 3 | 3 | 3 | 6 |
| | 7 | 7 | 8 | 6 | 1 | 4 |
| | 8 | 6 | 8 | 8 | 6 | 6 |
| | 8 | 8 | 7 | 7 | 9 | 8 |
| | 9 | 9 | 8 | 8 | 9 | 7 |
| | 8 | 9 | 10 | 10 | 8 | 8 |
| | 7 | 7 | 9 | 9 | 9 | 8 |
| | 9 | 8 | 10 | 8 | 9 | 7 |
| | 10 | 7 | 8 | 8 | 8 | 8 |
| | 5 | 5 | 1 | 1 | 1 | 1 |
| | 8 | 8 | 8 | 8 | 7 | 5 |
| | 9 | 7 | 9 | 9 | 8 | 9 |
| | 7 | 8 | 8 | 8 | 8 | 6 |
| | 10 | 10 | 10 | 9 | 10 | 10 |
| | 8 | 9 | 8 | 10 | 9 | 10 |
| | 9 | 0 | 9 | 9 | 0 | 0 |
| | 6 | 6 | 6 | 10 | 10 | 9 |
| | 7 | 7 | 7 | 5 | 7 | 7 |
| | 7 | 6 | 6 | 7 | 4 | 4 |
| | 5 | 5 | 1 | 1 | 1 | 1 |
| | 9 | 7 | 8 | 8 | 7 | 9 |
| | 9 | 9 | 9 | 8 | 8 | 7 |

| SUMMARY | Count | Sum | Average | Variance |
|---|---|---|---|---|
| Row 1 | 6 | 40 | 6.666667 | 4.666667 |
| Row 2 | 6 | 21 | 3.5 | 1.5 |
| Row 3 | 6 | 33 | 5.5 | 6.7 |
| Row 4 | 6 | 42 | 7 | 1.2 |
| Row 5 | 6 | 47 | 7.833333 | 0.566667 |
| Row 6 | 6 | 50 | 8.333333 | 0.666667 |
| Row 7 | 6 | 53 | 8.833333 | 0.966667 |
| Row 8 | 6 | 49 | 8.166667 | 0.966667 |
| Row 9 | 6 | 51 | 8.5 | 1.1 |
| Row 10 | 6 | 49 | 8.166667 | 0.966667 |
| Row 11 | 6 | 14 | 2.333333 | 4.266667 |
| Row 12 | 6 | 44 | 7.333333 | 1.466667 |
| Row 13 | 6 | 51 | 8.5 | 0.7 |
| Row 14 | 6 | 45 | 7.5 | 0.7 |
| Row 15 | 6 | 59 | 9.833333 | 0.166667 |
| Row 16 | 6 | 54 | 9 | 0.8 |
| Row 17 | 6 | 27 | 4.5 | 24.3 |
| Row 18 | 6 | 47 | 7.833333 | 4.166667 |
| Row 19 | 6 | 40 | 6.666667 | 0.666667 |
| Row 20 | 6 | 34 | 5.666667 | 1.866667 |
| Row 21 | 6 | 14 | 2.333333 | 4.266667 |
| Row 22 | 6 | 48 | 8 | 0.8 |
| Row 23 | 6 | 50 | 8.333333 | 0.666667 |

ANOVA

| Source of Variation | SS | df | MS | F | P-value | F crit |
|---|---|---|---|---|---|---|
| Rows | 571.2173913 | 22 | 25.96442688 | 10.07824486 | 1.50352E-17 | 1.63988424 |
| Columns | 37.27536232 | 5 | 7.455072464 | 2.893730183 | 0.017099668 | 2.296868443 |
| Error | 283.3913043 | 110 | 2.576284585 | | | |
| | | | | | | |
| Total | 891.884058 | 137 | | | | |

| | | | | |
|---|---|---|---|---|
| Column 1 | 23 | 176 | 7.652174 | 2.873518 |
| Column 2 | 23 | 159 | 6.913043 | 4.810277 |
| Column 3 | 23 | 170 | 7.391304 | 6.43083 |
| Column 4 | 23 | 167 | 7.26087 | 6.474308 |
| Column 5 | 23 | 146 | 6.347826 | 10.23715 |
| Column 6 | 23 | 144 | 6.26087 | 8.019763 |

| Cronbach's alpha | 0.9052231 |
|---|---|

Anova: Two-Factor Without Replication

| Question No 6 | 6.1 | 6.2 | 6.3 | 6.4 | 6.5 | 6.6 |
|---|---|---|---|---|---|---|
| | 5 | 2 | 5 | 3 | 2 | 2 |
| | 2 | 2 | 2 | 2 | 2 | 2 |
| | 2 | 1 | 5 | 4 | 2 | 3 |
| | 2 | 2 | 3 | 3 | 2 | 2 |
| | 4 | 4 | 4 | 3 | 5 | 4 |
| | 4 | 2 | 4 | 4 | 4 | 4 |
| | 4 | 4 | 5 | 5 | 3 | 4 |
| | 4 | 4 | 5 | 5 | 4 | 4 |
| | 3 | 6 | 3 | 6 | 3 | 3 |
| | 5 | 3 | 4 | 4 | 4 | 4 |
| | 6 | 6 | 6 | 6 | 6 | 6 |
| | 5 | 4 | 5 | 5 | 3 | 3 |
| | 4 | 3 | 4 | 4 | 3 | 4 |
| | 4 | 4 | 4 | 4 | 2 | 1 |
| | 5 | 5 | 5 | 4 | 5 | 5 |
| | 4 | 4 | 4 | 5 | 3 | 5 |
| | 6 | 6 | 4 | 4 | 6 | 6 |
| | 6 | 6 | 6 | 5 | 6 | 6 |
| | 3 | 3 | 3 | 2 | 3 | 3 |
| | 4 | 4 | 4 | 3 | 4 | 3 |
| | 6 | 6 | 6 | 6 | 6 | 6 |
| | 5 | 4 | 3 | 4 | 4 | 5 |
| | 4 | 4 | 4 | 3 | 4 | 3 |

| SUMMARY | Count | Sum | Average | Variance |
|---|---|---|---|---|
| Row 1 | 6 | 19 | 3.166667 | 2.166667 |
| Row 2 | 6 | 12 | 2 | 0 |
| Row 3 | 6 | 17 | 2.833333 | 2.166667 |
| Row 4 | 6 | 14 | 2.333333 | 0.266667 |
| Row 5 | 6 | 24 | 4 | 0.4 |
| Row 6 | 6 | 22 | 3.666667 | 0.666667 |
| Row 7 | 6 | 25 | 4.166667 | 0.566667 |
| Row 8 | 6 | 26 | 4.333333 | 0.266667 |
| Row 9 | 6 | 24 | 4 | 2.4 |
| Row 10 | 6 | 24 | 4 | 0.4 |
| Row 11 | 6 | 36 | 6 | 0 |
| Row 12 | 6 | 25 | 4.166667 | 0.966667 |
| Row 13 | 6 | 22 | 3.666667 | 0.266667 |
| Row 14 | 6 | 19 | 3.166667 | 1.766667 |
| Row 15 | 6 | 29 | 4.833333 | 0.166667 |
| Row 16 | 6 | 25 | 4.166667 | 0.566667 |
| Row 17 | 6 | 32 | 5.333333 | 1.066667 |
| Row 18 | 6 | 35 | 5.833333 | 0.166667 |
| Row 19 | 6 | 17 | 2.833333 | 0.166667 |
| Row 20 | 6 | 22 | 3.666667 | 0.266667 |
| Row 21 | 6 | 36 | 6 | 0 |
| Row 22 | 6 | 25 | 4.166667 | 0.566667 |
| Row 23 | 6 | 22 | 3.666667 | 0.266667 |

ANOVA

| Source of Variation | SS | df | MS | F | P-value | F crit |
|---|---|---|---|---|---|---|
| Rows | 152.3333333 | 22 | 6.924242424 | 10.55109416 | 3.18222E-18 | 1.63988424 |
| Columns | 5.47826087 | 5 | 1.095652174 | 1.669544268 | 0.147917777 | 2.296868443 |
| Error | 72.1884058 | 110 | 0.656258235 | | | |
| | | | | | | |
| Total | 230 | 137 | | | | |

| | | | | |
|---|---|---|---|---|
| Column 1 | 23 | 97 | 4.217391 | 1.541502 |
| Column 2 | 23 | 89 | 3.869565 | 2.209486 |
| Column 3 | 23 | 98 | 4.26087 | 1.110672 |
| Column 4 | 23 | 94 | 4.086957 | 1.355731 |
| Column 5 | 23 | 86 | 3.73913 | 1.928854 |
| Column 6 | 23 | 88 | 3.826087 | 2.059289 |

# Financial Data - Cronbach's Alpha

| Cronbach's alpha | 0.9007764 |
|---|---|

Anova: Two-Factor Without Replication

| Question No 7 | 7.1 | 7.2 | 7.3 | 7.4 | 7.5 |
|---|---|---|---|---|---|
| | 5 | 5 | 8 | 8 | 3 |
| | 8 | 3 | 3 | 3 | 3 |
| | 2 | 5 | 7 | 10 | 2 |
| | 6 | 6 | 10 | 10 | 6 |
| | 8 | 6 | 6 | 6 | 8 |
| | 8 | 7 | 9 | 9 | 8 |
| | 9 | 8 | 9 | 9 | 9 |
| | 6 | 7 | 8 | 8 | 6 |
| | 10 | 8 | 10 | 9 | 9 |
| | 10 | 7 | 8 | 9 | 7 |
| | 4 | 1 | 7 | 7 | 2 |
| | 8 | 5 | 8 | 8 | 4 |
| | 9 | 9 | 9 | 9 | 6 |
| | 7 | 7 | 9 | 9 | 7 |
| | 5 | 5 | 10 | 10 | 8 |
| | 9 | 8 | 10 | 10 | 8 |
| | 0 | 0 | 0 | 0 | 0 |
| | 5 | 5 | 5 | 5 | 5 |
| | 7 | 5 | 7 | 7 | 7 |
| | 6 | 6 | 8 | 7 | 4 |
| | 4 | 1 | 7 | 7 | 2 |
| | 9 | 7 | 9 | 9 | 7 |
| | 6 | 6 | 9 | 9 | 7 |

| SUMMARY | Count | Sum | Average | Variance |
|---|---|---|---|---|
| Row 1 | 6 | 40 | 6.666667 | 4.666667 |
| Row 2 | 6 | 21 | 3.5 | 1.5 |
| Row 3 | 6 | 33 | 5.5 | 6.7 |
| Row 4 | 6 | 42 | 7 | 1.2 |
| Row 5 | 6 | 47 | 7.833333 | 0.566667 |
| Row 6 | 6 | 50 | 8.333333 | 0.666667 |
| Row 7 | 6 | 53 | 8.833333 | 0.966667 |
| Row 8 | 6 | 49 | 8.166667 | 0.966667 |
| Row 9 | 6 | 51 | 8.5 | 1.1 |
| Row 10 | 6 | 49 | 8.166667 | 0.966667 |
| Row 11 | 6 | 14 | 2.333333 | 4.266667 |
| Row 12 | 6 | 44 | 7.333333 | 1.466667 |
| Row 13 | 6 | 51 | 8.5 | 0.7 |
| Row 14 | 6 | 45 | 7.5 | 0.7 |
| Row 15 | 6 | 59 | 9.833333 | 0.166667 |
| Row 16 | 6 | 54 | 9 | 0.8 |
| Row 17 | 6 | 27 | 4.5 | 24.3 |
| Row 18 | 6 | 47 | 7.833333 | 4.166667 |
| Row 19 | 6 | 40 | 6.666667 | 0.666667 |
| Row 20 | 6 | 34 | 5.666667 | 1.866667 |
| Row 21 | 6 | 14 | 2.333333 | 4.266667 |
| Row 22 | 6 | 48 | 8 | 0.8 |
| Row 23 | 6 | 50 | 8.333333 | 0.666667 |

ANOVA

| Source of Variation | SS | df | MS | F | P-value | F crit |
|---|---|---|---|---|---|---|
| Rows | 571.2173913 | 22 | 25.96442688 | 10.07824486 | 1.50352E-17 | 1.63988424 |
| Columns | 37.27536232 | 5 | 7.455072464 | 2.893730183 | 0.017099668 | 2.296868443 |
| Error | 283.3913043 | 110 | 2.576284585 | | | |
| | | | | | | |
| Total | 891.884058 | 137 | | | | |

| | | | | |
|---|---|---|---|---|
| Column 1 | 23 | 176 | 7.652174 | 2.873518 |
| Column 2 | 23 | 159 | 6.913043 | 4.810277 |
| Column 3 | 23 | 170 | 7.391304 | 6.43083 |
| Column 4 | 23 | 167 | 7.26087 | 6.474308 |
| Column 5 | 23 | 146 | 6.347826 | 10.23715 |
| Column 6 | 23 | 144 | 6.26087 | 8.019763 |

# Financial Data - Cronbach's Alpha

| Cronbach's alpha | 0.798707938 |
|---|---|

**Anova: Two-Factor Without Replication**

| Question No 8 | 8.1 | 8.2 | 8.3 | 8.4 | 8.5 |
|---|---|---|---|---|---|
| | 2 | 2 | 3 | 4 | 3 |
| | 4 | 2 | 2 | 2 | 2 |
| | 1 | 2 | 4 | 6 | 1 |
| | 4 | 6 | 5 | 5 | 2 |
| | 4 | 3 | 3 | 3 | 4 |
| | 4 | 6 | 5 | 5 | 4 |
| | 5 | 4 | 5 | 5 | 5 |
| | 5 | 5 | 4 | 4 | 4 |
| | 5 | 3 | 5 | 3 | 2 |
| | 5 | 3 | 4 | 5 | 3 |
| | 6 | 6 | 4 | 4 | 4 |
| | 5 | 4 | 5 | 5 | 2 |
| | 4 | 4 | 4 | 4 | 3 |
| | 4 | 4 | 5 | 5 | 4 |
| | 2 | 2 | 5 | 5 | 3 |
| | 4 | 4 | 5 | 5 | 4 |
| | 6 | 6 | 6 | 6 | 6 |
| | 6 | 6 | 6 | 6 | 6 |
| | 3 | 2 | 4 | 4 | 4 |
| | 3 | 2 | 5 | 4 | 2 |
| | 6 | 6 | 4 | 4 | 4 |
| | 5 | 4 | 5 | 5 | 4 |
| | 4 | 4 | 4 | 4 | 4 |

| SUMMARY | Count | Sum | Average | Variance |
|---|---|---|---|---|
| Row 1 | 5 | 14 | 2.8 | 0.7 |
| Row 2 | 5 | 12 | 2.4 | 0.8 |
| Row 3 | 5 | 14 | 2.8 | 4.7 |
| Row 4 | 5 | 22 | 4.4 | 2.3 |
| Row 5 | 5 | 17 | 3.4 | 0.3 |
| Row 6 | 5 | 24 | 4.8 | 0.7 |
| Row 7 | 5 | 24 | 4.8 | 0.2 |
| Row 8 | 5 | 22 | 4.4 | 0.3 |
| Row 9 | 5 | 18 | 3.6 | 1.8 |
| Row 10 | 5 | 20 | 4 | 1 |
| Row 11 | 5 | 24 | 4.8 | 1.2 |
| Row 12 | 5 | 21 | 4.2 | 1.7 |
| Row 13 | 5 | 19 | 3.8 | 0.2 |
| Row 14 | 5 | 22 | 4.4 | 0.3 |
| Row 15 | 5 | 17 | 3.4 | 2.3 |
| Row 16 | 5 | 22 | 4.4 | 0.3 |
| Row 17 | 5 | 30 | 6 | 0 |
| Row 18 | 5 | 30 | 6 | 0 |
| Row 19 | 5 | 17 | 3.4 | 0.8 |
| Row 20 | 5 | 16 | 3.2 | 1.7 |
| Row 21 | 5 | 24 | 4.8 | 1.2 |
| Row 22 | 5 | 23 | 4.6 | 0.3 |
| Row 23 | 5 | 20 | 4 | 0 |

ANOVA

| Source of Variation | SS | df | MS | F | P-value | F crit |
|---|---|---|---|---|---|---|
| Rows | 93.54782609 | 22 | 4.252173913 | 4.967905795 | 2.94665E-08 | 1.66448866 |
| Columns | 15.87826087 | 4 | 3.969565217 | 4.637728007 | 0.001915439 | 2.475277409 |
| Error | 75.32173913 | 88 | 0.855928854 | | | |
| | | | | | | |
| Total | 184.7478261 | 114 | | | | |

| | | | | |
|---|---|---|---|---|
| Column 1 | 23 | 97 | 4.217391 | 1.814229 |
| Column 2 | 23 | 90 | 3.913043 | 2.355731 |
| Column 3 | 23 | 102 | 4.434783 | 0.893281 |
| Column 4 | 23 | 103 | 4.478261 | 0.988142 |
| Column 5 | 23 | 80 | 3.478261 | 1.624506 |

**Financial Data - Cronbach's Alpha**

| Column1 | Cronbach's Alfa | Limit |
|---|---|---|
| Question 1 | 0.866 | 0.6 |
| Question 2 | 0.729 | 0.6 |
| Question 3 | 0.923 | 0.6 |
| Question 4 | 0.838 | 0.6 |
| Question 5 | 0.901 | 0.6 |
| Question 6 | 0.905 | 0.6 |
| Question 7 | 0.901 | 0.6 |
| Question 8 | 0.799 | 0.6 |



Cronbach's alpha for Financial Questionnaire



Cronbach's alpha for Financial Questionnaire
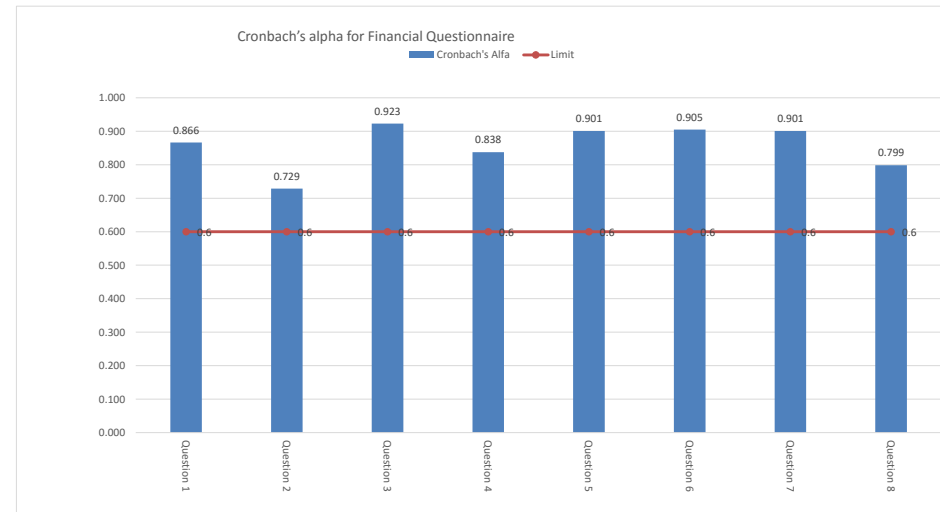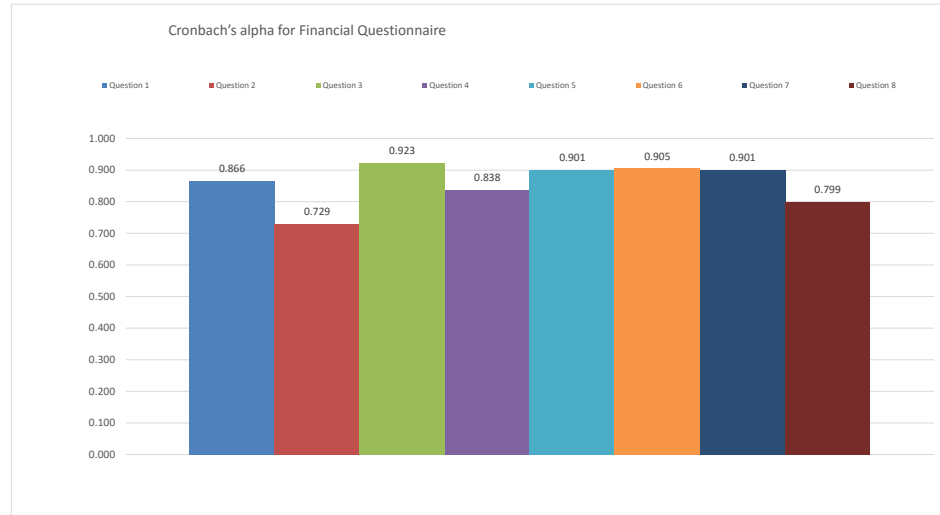
# APPENDIX V.
# SALES & MARKETING DATA – STATISTICS TABLES

# Sales Marketing Data - Statistics Tables

| Country | VPSM | VPI | OCSM | OSP | SMD | SSM | Respondents | Possible Respondents | Reponses % |
|---|---|---|---|---|---|---|---|---|---|
| Corp HQ | YES | NO | | | | | 1 | 2 | 50% |
| Plant ROG | | | NO | | N/A | NO | 0 | 2 | 0% |
| Plant ALB | | | NO | | N/A | NO | 0 | 2 | 0% |
| DPW | | | NO | | NO | NO | 0 | 3 | 0% |
| Spain | | | | | NO | NO | 0 | 2 | 0% |
| Poland | | | | | YES | YES | 2 | 2 | 100% |
| G Britain | | | | | YES | YES | 2 | 2 | 100% |
| Indonesia | | | | | NO | NO | 0 | 2 | 0% |
| Canada | | | | | NO | NO | 0 | 2 | 0% |
| Thailand | | | | | NO | NO | 0 | 2 | 0% |
| Australia | | | | | YES | YES | 2 | 2 | 100% |
| China | | | | | NO | YES | 1 | 2 | 50% |
| Mexico | | | | | YES | NO | 1 | 2 | 50% |
| Brazil | | | | | NO | NO | 0 | 2 | 0% |
| N Zealand | | | | | NO | NO | 0 | 2 | 0% |
| Argentina | | | | | NO | NO | 0 | 2 | 0% |
| Malaysia | | | | | N/A | NO | 0 | 1 | 0% |
| S Africa | | | | | N/A | YES | 1 | 1 | 100% |
| Russia | | | | | YES | N/A | 1 | 1 | 100% |
| | | | | | | | 11 | 36 | 31% |

| Key: | |
|---|---|
| VPF: | Vice-President Sales & Marketing |
| VPI: | Vice-President International |
| OCSM: | Other Corporate Sales Managers |
| OSP: | Other Sales Practitioners |
| SMD: | Subsidiary Managing Directors |
| SSM: | Subsidiary Sales & Marketing Managers |

# Sales Marketing Data - Statistics Tables

| Responses | Possible Responses | % Response | - Means OM Higher than MD's' |
|---|---|---|---|
| 11 | 36 | 0% | |

| | Question No1 P1 | Average Score | Ave MD's | Ave SM's | Difference | Possible Score | Confidence Norm | Median | Skew | STD Deviation | Kurtosis |
|---|---|---|---|---|---|---|---|---|---|---|---|
| 11 | 1.1 | 1.545 | 1.333 | 1.800 | -0.467 | 2 | 0.485 | 2.000 | -1.505 | 0.820 | 0.629 |
| 11 | 1.2 | 1.727 | 1.833 | 1.600 | 0.233 | 2 | 0.276 | 2.000 | -1.189 | 0.467 | -0.764 |
| 11 | 1.3 | 1.273 | 1.167 | 1.400 | -0.233 | 2 | 0.535 | 2.000 | -0.647 | 0.905 | -1.548 |
| 11 | 1.4 | 1.455 | 1.500 | 1.400 | 0.100 | 2 | 0.406 | 2.000 | -0.932 | 0.688 | 0.081 |
| 11 | 1.5 | 1.818 | 1.667 | 2.000 | -0.333 | 2 | 0.239 | 2.000 | -1.923 | 0.405 | 2.037 |
| 11 | 1.6 | 1.364 | 1.500 | 1.200 | 0.300 | 2 | 0.398 | 1.000 | -0.593 | 0.674 | -0.293 |
| 11 | 1.7 | 1.909 | 1.833 | 2.000 | -0.167 | 2 | 0.178 | 2.000 | -3.317 | 0.302 | 11.000 |
| 11 | 1.8 | 1.636 | 1.500 | 1.800 | -0.300 | 2 | 0.298 | 2.000 | -0.661 | 0.505 | -1.964 |
| | Average | 1.591 | 1.542 | 1.650 | -0.108 | 2.000 | 0.352 | 1.875 | -1.346 | 0.596 | 1.147 |

| | Question No1 P2 | Average Score | Ave MD's | Ave SM's | Difference | Possible Score | Confidence Norm | Median | Skew | STD Deviation | Kurtosis |
|---|---|---|---|---|---|---|---|---|---|---|---|
| 11 | 2.1 | 1.364 | 1.833 | 0.800 | 1.033 | 3 | 0.546 | 1.000 | 0.951 | 0.924 | 0.373 |
| 11 | 2.2 | 1.273 | 1.667 | 0.800 | 0.867 | 3 | 0.465 | 1.500 | -0.574 | 0.786 | -0.967 |
| 11 | 2.3 | 0.818 | 0.500 | 1.200 | -0.700 | 3 | 0.739 | 0.000 | 1.162 | 1.250 | -0.387 |
| 11 | 2.4 | 1.273 | 1.333 | 1.200 | 0.133 | 3 | 0.797 | 1.500 | 0.294 | 1.348 | -1.927 |
| 11 | 2.5 | 0.909 | 0.500 | 1.400 | -0.900 | 3 | 0.491 | 1.000 | 1.467 | 0.831 | 3.961 |
| 11 | 2.6 | 0.909 | 0.667 | 1.200 | -0.533 | 3 | 0.813 | 0.000 | 1.042 | 1.375 | -0.981 |
| 11 | 2.7 | 1.364 | 1.167 | 1.600 | -0.433 | 3 | 0.478 | 1.000 | 0.538 | 0.809 | 0.637 |
| 11 | 2.8 | 1.364 | 1.000 | 1.800 | -0.800 | 3 | 0.760 | 1.500 | 0.196 | 1.286 | -1.776 |
| | Average | 1.159 | 1.083 | 1.250 | -0.167 | 3.000 | 0.636 | 0.938 | 0.635 | 1.076 | -0.133 |
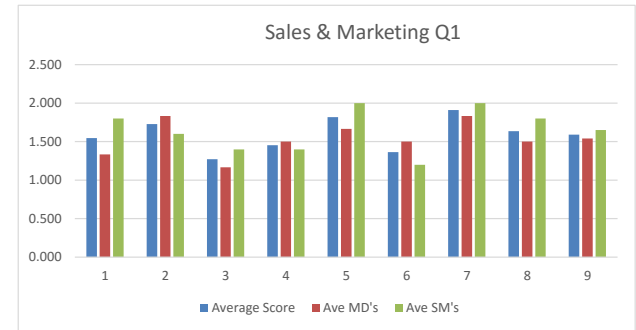


Sales & Marketing Q1
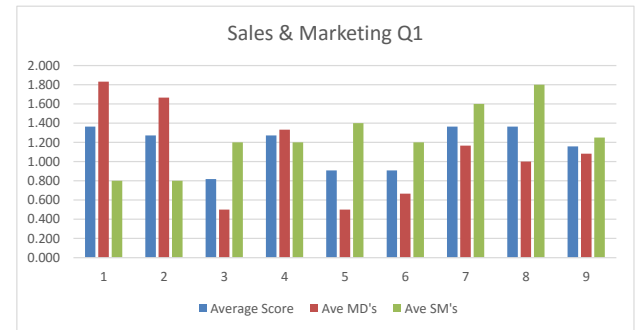


Sales & Marketing Q1

# Sales Marketing Data - Statistics Tables

| Question No 9 | Average Score | Ave MD's | Ave SM's | Difference | Possible Score | Confidence Norm | Median | Skew | STD Deviation | Kurtosis |
|---|---|---|---|---|---|---|---|---|---|---|
| 9.1 | 3.545 | 4.167 | 2.800 | 1.367 | 5 | 0.717 | 4.000 | -0.949 | 1.214 | 0.654 |
| 9.2 | 4.000 | 4.500 | 3.400 | 1.100 | 5 | 0.647 | 4.000 | -2.231 | 1.095 | 6.528 |
| 9.3 | 3.909 | 4.333 | 3.400 | 0.933 | 5 | 0.671 | 4.000 | -1.789 | 1.136 | 4.255 |
| 9.4 | 4.273 | 4.667 | 3.800 | 0.867 | 5 | 0.704 | 5.000 | -2.376 | 1.191 | 0.000 |
| 9.5 | 4.000 | 4.500 | 3.400 | 1.100 | 5 | 0.699 | 4.000 | -1.771 | 1.183 | 3.878 |
| 9.6 | 4.000 | 4.333 | 3.600 | 0.733 | 5 | 0.647 | 4.000 | -2.231 | 1.095 | 6.528 |
| 9.7 | 4.182 | 4.500 | 3.800 | 0.700 | 5 | 0.739 | 5.000 | -1.912 | 1.250 | 3.867 |
| 9.8 | 4.091 | 4.667 | 3.400 | 1.267 | 5 | 0.722 | 4.000 | -1.818 | 1.221 | 3.760 |
| 9.9 | 4.273 | 4.667 | 3.800 | 0.867 | 5 | 0.704 | 5.000 | -2.376 | 1.191 | 6.446 |
| 9.10 | 4.000 | 4.333 | 3.600 | 0.733 | 5 | 0.699 | 4.000 | -1.771 | 1.183 | 3.878 |
| 9.11 | 4.000 | 4.333 | 3.600 | 0.733 | 5 | 0.699 | 4.000 | -1.771 | 1.183 | 3.878 |
| 9.12 | 3.909 | 4.167 | 3.600 | 0.567 | 5 | 0.671 | 4.000 | -1.789 | 1.136 | 4.255 |
| 9.13 | 4.000 | 4.500 | 3.400 | 1.100 | 5 | 0.647 | 4.000 | -2.231 | 1.095 | 6.528 |
| Average | 4.014 | 4.436 | 3.508 | 0.928 | 5.000 | 0.690 | 4.231 | -1.924 | 1.167 | 4.189 |

| Question No 10 | Average Score | Ave MD's | Ave SM's | Difference | Possible Score | Confidence Norm | Median | Skew | STD Deviation | Kurtosis |
|---|---|---|---|---|---|---|---|---|---|---|
| 10.1 | 7.545 | 7.000 | 8.200 | -1.200 | 10 | 1.069 | 8.000 | -1.514 | 1.809 | 3.923 |
| 10.2 | 9.182 | 8.667 | 9.800 | -1.133 | 10 | 0.739 | 10.000 | -1.162 | 1.250 | -0.387 |
| 10.3 | 7.273 | 7.333 | 7.200 | 0.133 | 10 | 1.093 | 7.000 | -0.255 | 1.849 | -0.619 |
| 10.4 | 7.818 | 7.667 | 8.000 | -0.333 | 10 | 0.909 | 8.000 | -0.237 | 1.537 | -0.157 |
| 10.5 | 8.455 | 8.333 | 8.600 | -0.267 | 10 | 0.929 | 8.000 | -0.181 | 1.572 | -1.818 |
| 10.6 | 8.909 | 8.667 | 9.200 | -0.533 | 10 | 0.558 | 9.000 | 0.209 | 0.944 | -2.069 |
| 10.7 | 8.273 | 8.333 | 8.200 | 0.133 | 10 | 0.840 | 8.000 | -1.097 | 1.421 | 1.955 |
| Average | 8.208 | 8.000 | 8.457 | -0.457 | 10.000 | 0.877 | 8.286 | -0.605 | 1.483 | 0.118 |

| Question No 11 | Average Score | Ave MD's | Ave SM's | Difference | Possible Score | Confidence Norm | Median | Skew | STD Deviation | Kurtosis |
|---|---|---|---|---|---|---|---|---|---|---|
| 11.1 | 8.182 | 8.000 | 8.400 | -0.400 | 10 | 0.739 | 8.000 | -0.037 | 1.250 | -0.468 |
| 11.2 | 8.727 | 8.667 | 8.800 | -0.133 | 10 | 0.840 | 9.000 | -0.693 | 1.421 | -0.647 |
| 11.3 | 7.364 | 8.167 | 6.400 | 1.767 | 10 | 1.066 | 7.000 | -0.292 | 1.804 | -0.560 |
| 11.4 | 7.182 | 7.333 | 7.000 | 0.333 | 10 | 0.869 | 7.000 | -0.840 | 1.471 | 0.909 |
| Average | 7.864 | 8.042 | 7.650 | 0.392 | 10.000 | 0.878 | 7.750 | -0.466 | 1.487 | -0.192 |
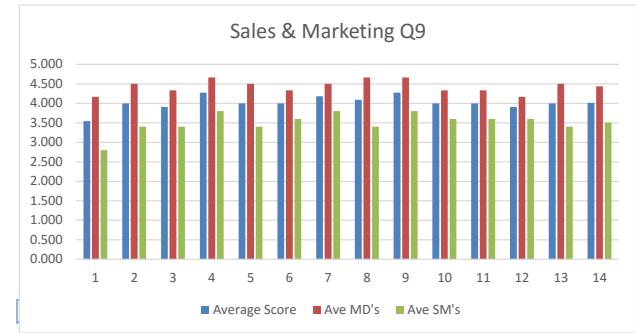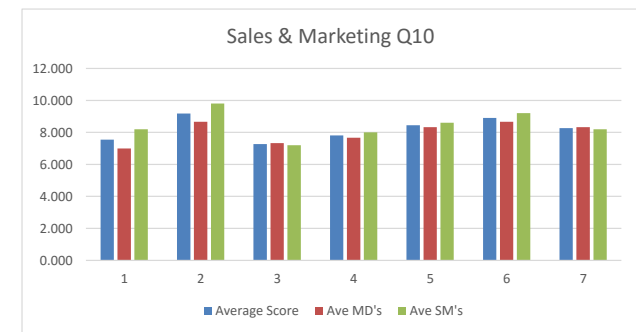


Sales & Marketing Q9



Sales & Marketing Q10
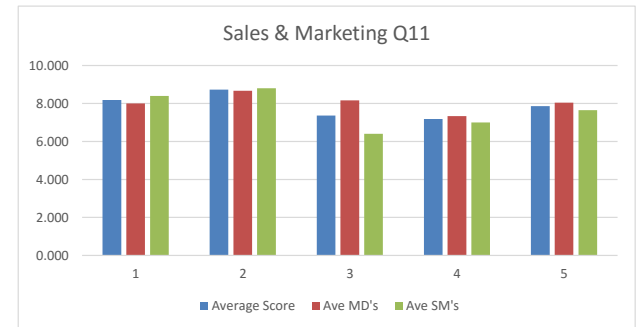


Sales & Marketing Q11

# Sales Marketing Data - Statistics Tables

| Question No 12 | Average Score | Ave MD's | Ave SM's | Difference | Possible Score | Confidence Norm | Median | Skew | STD Deviation | Kurtosis |
|---|---|---|---|---|---|---|---|---|---|---|
| 12.1 | 7.000 | 6.833 | 7.200 | -0.367 | 10 | 1.090 | 7.000 | -0.117 | 1.844 | -0.773 |
| 12.2 | 8.909 | 9.333 | 8.400 | 0.933 | 10 | 0.617 | 9.000 | -1.074 | 1.044 | 0.581 |
| 12.3 | 9.091 | 9.333 | 8.800 | 0.533 | 10 | 0.558 | 9.000 | -1.081 | 0.944 | 1.206 |
| 12.4 | 9.182 | 9.333 | 9.000 | 0.333 | 10 | 0.580 | 9.000 | -1.204 | 0.982 | 1.136 |
| Average | 8.205 | 8.368 | 8.008 | 0.360 | 10.000 | 0.765 | 8.125 | -0.797 | 1.295 | 0.478 |



| Question No 13 | Average Score | Ave MD's | Ave SM's | Difference | Possible Score | Confidence Norm | Median | Skew | STD Deviation | Kurtosis |
|---|---|---|---|---|---|---|---|---|---|---|
| 13.1 | 6.636 | 6.500 | 6.800 | -0.300 | 10 | 1.329 | 7.000 | -0.090 | 2.248 | -1.070 |
| 13.2 | 8.273 | 8.333 | 8.200 | 0.133 | 10 | 0.704 | 8.000 | 0.230 | 1.191 | -1.510 |
| 13.3 | 7.545 | 8.000 | 7.000 | 1.000 | 10 | 1.193 | 8.000 | -0.215 | 2.018 | -1.759 |
| 13.4 | 7.091 | 7.333 | 6.800 | 0.533 | 10 | 1.359 | 7.000 | -0.255 | 2.300 | -0.947 |
| 13.5 | 8.727 | 8.333 | 9.200 | -0.867 | 10 | 1.214 | 9.000 | -2.515 | 2.054 | 7.061 |
| 13.6 | 7.636 | 7.500 | 7.800 | -0.300 | 10 | 0.926 | 8.000 | -0.213 | 1.567 | -0.984 |
| 13.7 | 9.636 | 9.833 | 9.400 | 0.433 | 10 | 0.398 | 10.000 | -1.800 | 0.674 | 2.611 |
| 13.8 | 9.182 | 9.000 | 9.400 | -0.400 | 10 | 0.909 | 10.000 | -2.387 | 1.537 | 6.036 |
| 13.9 | 8.091 | 7.833 | 8.400 | -0.567 | 10 | 0.671 | 8.000 | -0.211 | 1.136 | -0.065 |
| 13.10 | 8.818 | 8.500 | 9.200 | -0.700 | 10 | 0.739 | 9.000 | -1.088 | 1.250 | 1.249 |
| 13.11 | 7.091 | 7.333 | 6.800 | 0.533 | 10 | 1.458 | 8.000 | -0.273 | 2.468 | -1.151 |
| 13.12 | 8.091 | 8.000 | 8.200 | -0.200 | 10 | 1.458 | 9.000 | -1.883 | 2.468 | 3.296 |
| 13.13 | 6.818 | 7.167 | 6.400 | 0.767 | 10 | 1.051 | 7.000 | -0.840 | 1.779 | 0.845 |
| 13.14 | 8.091 | 8.500 | 7.600 | 0.900 | 10 | 1.166 | 8.000 | -0.822 | 1.973 | 0.143 |
| 13.15 | 7.727 | 8.000 | 7.400 | 0.600 | 10 | 1.027 | 8.000 | -0.188 | 1.737 | -1.336 |
| 13.16 | 8.000 | 8.333 | 7.600 | 0.733 | 10 | 0.877 | 8.000 | -0.225 | 1.483 | -1.061 |
| 13.17 | 7.273 | 7.667 | 6.800 | 0.867 | 10 | 1.060 | 8.000 | -0.880 | 1.794 | -0.699 |
| 13.18 | 7.273 | 7.667 | 6.800 | 0.867 | 10 | 1.425 | 8.000 | -0.652 | 2.412 | -0.881 |
| Average | 7.889 | 7.991 | 7.767 | 0.224 | 10.000 | 1.054 | 8.222 | -0.795 | 1.783 | 0.543 |



| Question No 14 | Average Score | Ave MD's | Ave SM's | Difference | Possible Score | Confidence Norm | Median | Skew | STD Deviation | Kurtosis |
|---|---|---|---|---|---|---|---|---|---|---|
| 14.1 | 8.909 | 9.000 | 8.800 | 0.200 | 10 | 0.558 | 9.000 | -0.663 | 0.944 | 0.199 |
| 14.2 | 7.909 | 7.333 | 8.600 | -1.267 | 10 | 1.195 | 9.000 | -1.002 | 2.023 | -0.198 |
| 14.3 | 8.364 | 8.333 | 8.400 | -0.067 | 10 | 1.380 | 9.000 | -2.322 | 2.335 | 6.140 |
| Average | 8.394 | 8.222 | 8.600 | -0.378 | 10.000 | 1.044 | 9.000 | -1.329 | 1.767 | 2.047 |
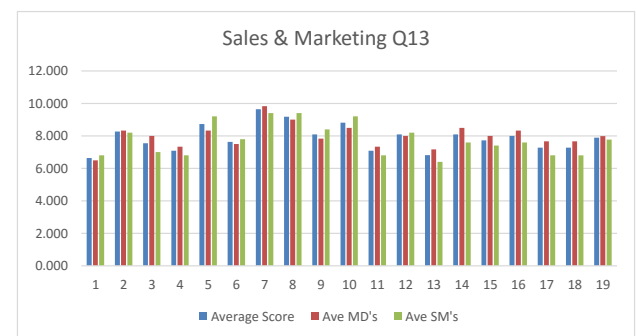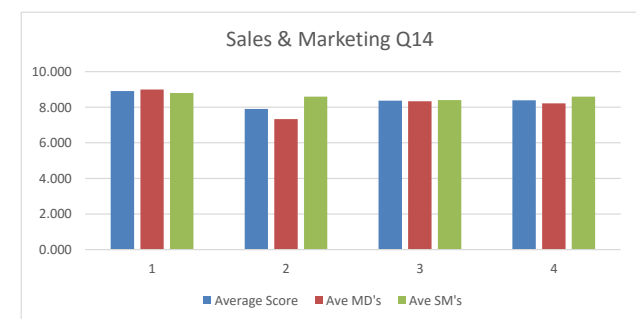
# APPENDIX VI.

# SALES & MARKETING DATA
# – FREQUENCY GRAPHS

# Sales Marketing - Frequency Graphs

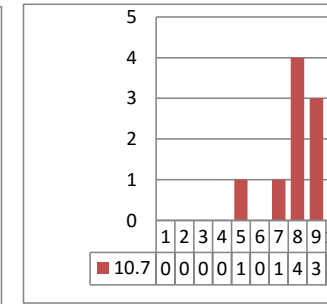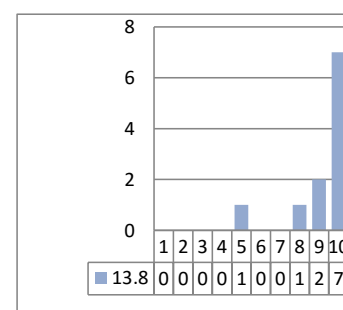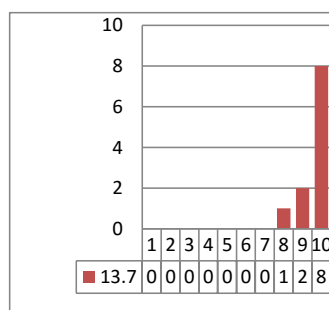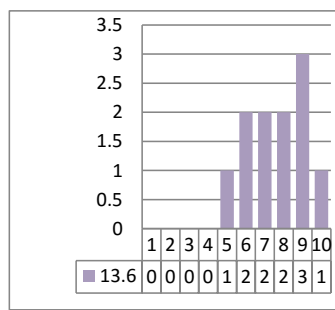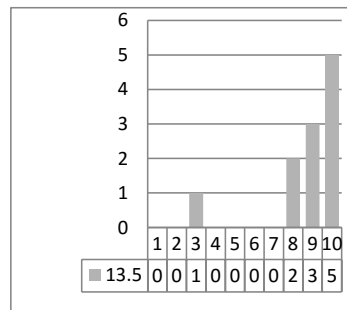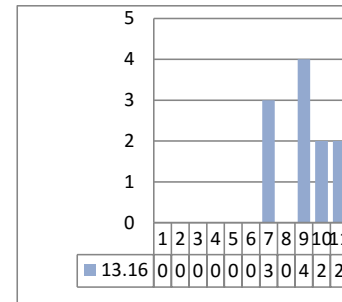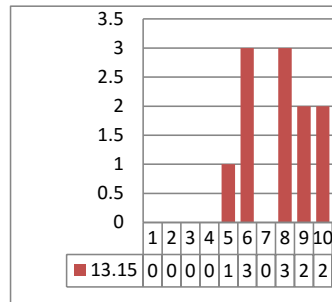| Q 1.1.1 | 1 | 2 |
|---|---|---|
| | 3 | 8 |

| Q1.1.2 | 1 | 2 |
|---|---|---|
| | 3 | 8 |

| Q 1.1.3 | 1 | 2 |
|---|---|---|
| | 3 | 8 |

| Q 1.1.4 | 1 | 2 |
|---|---|---|
| | 1 | 10 |

| Q 1.2.1 | 1 | 2 | 3 |
|---|---|---|---|
| | 8 | 1 | 2 |

| Q1.2.2 | 1 | 2 | 3 |
|---|---|---|---|
| | 6 | 5 | 0 |

| Q 1.2.3 | 1 | 2 | 3 |
|---|---|---|---|
| | 8 | 1 | 2 |

| Q 1.2.4 | 1 | 2 | 3 |
|---|---|---|---|
| | 6 | 2 | 3 |

| 9.1 | 1 | 2 | 3 | 4 | 5 |
|---|---|---|---|---|---|
| | 1 | 1 | 2 | 5 | 2 |

| 9.2 | 1 | 2 | 3 | 4 | 5 |
|---|---|---|---|---|---|
| | 1 | 0 | 0 | 7 | 3 |

| 9.3 | 1 | 2 | 3 | 4 | 5 |
|---|---|---|---|---|---|
| | 1 | 0 | 1 | 6 | 3 |

| 9.4 | 1 | 2 | 3 | 4 | 5 |
|---|---|---|---|---|---|
| | 1 | 0 | 0 | 4 | 6 |

| 10.1 | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 |
|---|---|---|---|---|---|---|---|---|---|---|
| | 0 | 0 | 1 | 0 | 0 | 0 | 4 | 3 | 2 | 1 |

| 10.2 | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 |
|---|---|---|---|---|---|---|---|---|---|---|
| | 0 | 0 | 0 | 0 | 0 | 0 | 2 | 1 | 1 | 7 |

| 10.3 | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 |
|---|---|---|---|---|---|---|---|---|---|---|
| | 0 | 0 | 0 | 1 | 1 | 1 | 4 | 0 | 3 | 1 |

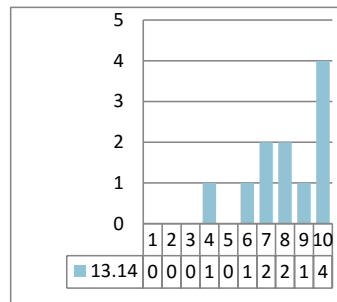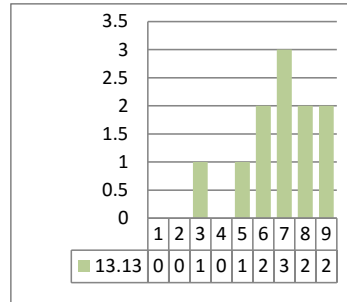| 10.4 | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 |
|---|---|---|---|---|---|---|---|---|---|---|
| | 0 | 0 | 0 | 0 | 1 | 1 | 2 | 4 | 1 | 2 |

# Sales Marketing - Frequency Graphs

| 11.1 | 0 | 0 | 0 | 0 | 0 | 1 | 2 | 4 | 2 | 2 |
|------|---|---|---|---|---|---|---|---|---|---|

| 11.2 | 0 | 0 | 0 | 0 | 1 | 1 | 3 | 1 | 5 |   |
|------|---|---|---|---|---|---|---|---|---|---|

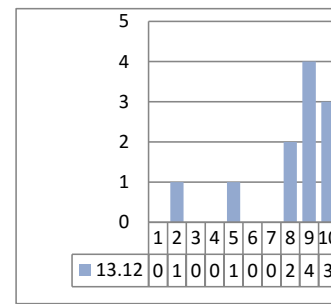| 11.3 | 0 | 0 | 0 | 1 | 0 | 3 | 2 | 1 | 3 | 1 |
|------|---|---|---|---|---|---|---|---|---|---|

| 11.4 | 0 | 0 | 0 | 1 | 0 | 2 | 3 | 3 | 2 | 0 |
|------|---|---|---|---|---|---|---|---|---|---|

| 12.1 | 0 | 0 | 0 | 1 | 2 | 1 | 2 | 3 | 1 | 1 |
|------|---|---|---|---|---|---|---|---|---|---|

| 12.2 | 0 | 0 | 0 | 0 | 0 | 0 | 2 | 0 | 6 | 3 |
|------|---|---|---|---|---|---|---|---|---|---|

| 12.3 | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 1 | 5 | 4 |
|------|---|---|---|---|---|---|---|---|---|---|

| 12.4 | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 1 | 4 | 5 |
|------|---|---|---|---|---|---|---|---|---|---|

| 13.2 | 0 | 0 | 1 | 1 | 2 | 1 | 2 | 1 | 1 | 1 |
|------|---|---|---|---|---|---|---|---|---|---|

| 13.2 | 0 | 0 | 0 | 0 | 0 | 0 | 4 | 2 | 3 | 1 |
|------|---|---|---|---|---|---|---|---|---|---|

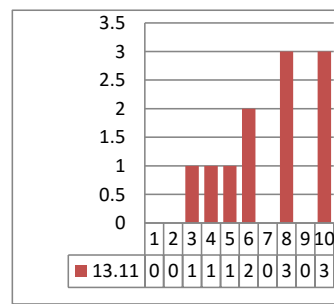| 13.3 | 0 | 0 | 0 | 0 | 3 | 1 | 1 | 1 | 3 | 2 |
|------|---|---|---|---|---|---|---|---|---|---|

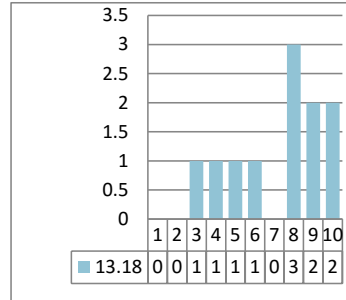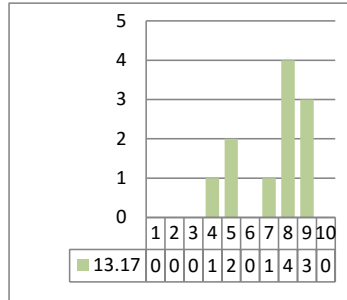| 13.4 | 0 | 0 | 1 | 0 | 2 | 2 | 1 | 1 | 2 | 2 |
|------|---|---|---|---|---|---|---|---|---|---|

# Sales Marketing - Frequency Graphs



| | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 |
|---|---|---|---|---|---|---|---|---|---|---|
| 14.1 | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 2 | 5 | 3 |

| | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 |
|---|---|---|---|---|---|---|---|---|---|---|
| 14.2 | 0 | 0 | 0 | 1 | 1 | 1 | 0 | 2 | 4 | 2 |

| | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 |
|---|---|---|---|---|---|---|---|---|---|---|
| 14.3 | 0 | 1 | 0 | 0 | 0 | 0 | 1 | 2 | 3 | 4 |

# Sales Marketing - Frequency Graphs

| Q 1.1.5 | 1 | 2 |
|---|---|---|
| | 0 | 11 |

| Q 1.1.6 | 1 | 2 |
|---|---|---|
| | 1 | 10 |

| Q 1.1.7 | 1 | 2 |
|---|---|---|
| | 0 | 11 |

| Q 1.1.8 | 1 | 2 |
|---|---|---|
| | 4 | 7 |

| Q 1.2.5 | 1 | 2 | 3 |
|---|---|---|---|
| | 10 | 0 | 1 |

| Q 1.2.6 | 1 | 2 | 3 |
|---|---|---|---|
| | 8 | 0 | 3 |

| Q 1.2.7 | 1 | 2 | 3 |
|---|---|---|---|
| | 7 | 3 | 1 |

| Q 1.2.8 | 1 | 2 | 3 |
|---|---|---|---|
| | 6 | 2 | 3 |

| 9.5 | 1 | 2 | 3 | 4 | 5 |
|---|---|---|---|---|---|
| | 1 | 0 | 1 | 5 | 4 |

| 9.6 | 1 | 2 | 3 | 4 | 5 |
|---|---|---|---|---|---|
| | 1 | 0 | 0 | 7 | 3 |

| 9.7 | 1 | 2 | 3 | 4 | 5 |
|---|---|---|---|---|---|
| | 1 | 0 | 1 | 3 | 6 |

| 9.8 | 1 | 2 | 3 | 4 | 5 |
|---|---|---|---|---|---|
| | 1 | 0 | 1 | 4 | 5 |

| 10.5 | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 |
|---|---|---|---|---|---|---|---|---|---|---|
| | 0 | 0 | 0 | 0 | 0 | 1 | 3 | 2 | 0 | 5 |

| 10.6 | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 |
|---|---|---|---|---|---|---|---|---|---|---|
| | 0 | 0 | 0 | 0 | 0 | 1 | 3 | 2 | 0 | 5 |

| 10.7 | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 |
|---|---|---|---|---|---|---|---|---|---|---|
| | 0 | 0 | 0 | 0 | 1 | 0 | 1 | 4 | 3 | 2 |

# Sales Marketing - Frequency Graphs



| | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 |
|---|---|---|---|---|---|---|---|---|---|---|
| 13.5 | 0 | 0 | 1 | 0 | 0 | 0 | 0 | 2 | 3 | 5 |

| | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 |
|---|---|---|---|---|---|---|---|---|---|---|
| 13.6 | 0 | 0 | 0 | 0 | 1 | 2 | 2 | 2 | 3 | 1 |

| | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 |
|---|---|---|---|---|---|---|---|---|---|---|
| 13.7 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 2 | 8 |

| | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 |
|---|---|---|---|---|---|---|---|---|---|---|
| 13.8 | 0 | 0 | 0 | 0 | 1 | 0 | 0 | 1 | 2 | 7 |

# Sales Marketing - Frequency Graphs



| 13.13 | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 |
|-------|---|---|---|---|---|---|---|---|---|
| | 0 | 0 | 1 | 0 | 1 | 2 | 3 | 2 | 2 |



| 13.14 | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 |
|-------|---|---|---|---|---|---|---|---|---|----|
| | 0 | 0 | 0 | 1 | 0 | 1 | 2 | 2 | 1 | 4 |



| 13.15 | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 |
|-------|---|---|---|---|---|---|---|---|---|----|
| | 0 | 0 | 0 | 0 | 1 | 3 | 0 | 3 | 2 | 2 |



| 13.16 | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 |
|-------|---|---|---|---|---|---|---|---|---|----|----|
| | 0 | 0 | 0 | 0 | 0 | 0 | 3 | 0 | 4 | 2 | 2 |

**Sales Marketing - Frequency Graphs**

| 9.9 | 1 | 2 | 3 | 4 | 5 |
|-----|---|---|---|---|---|
|     | 1 | 0 | 0 | 4 | 6 |

| 9.10 | 1 | 2 | 3 | 4 | 5 |
|------|---|---|---|---|---|
|      | 1 | 0 | 1 | 5 | 4 |

| 9.11 | 1 | 2 | 3 | 4 | 5 |
|------|---|---|---|---|---|
|      | 1 | 0 | 1 | 5 | 4 |

| 9.12 | 1 | 2 | 3 | 4 | 5 |
|------|---|---|---|---|---|
|      | 1 | 0 | 1 | 6 | 3 |

| 9.13 | 1 | 2 | 3 | 4 | 5 |
|------|---|---|---|---|---|
|      | 1 | 0 | 0 | 7 | 3 |

| | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 |
|---|---|---|---|---|---|---|---|---|---|---|
| 13.9 | 0 | 0 | 0 | 0 | 0 | 1 | 2 | 4 | 3 | 1 |

| | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 |
|---|---|---|---|---|---|---|---|---|---|---|
| 13.10 | 0 | 0 | 0 | 0 | 0 | 1 | 0 | 3 | 3 | 4 |

| | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 |
|---|---|---|---|---|---|---|---|---|---|---|
| 13.11 | 0 | 0 | 1 | 1 | 1 | 2 | 0 | 3 | 0 | 3 |

| | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 |
|---|---|---|---|---|---|---|---|---|---|---|
| 13.12 | 0 | 1 | 0 | 0 | 1 | 0 | 0 | 2 | 4 | 3 |

# Sales Marketing - Frequency Graphs



| 13.17 | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 |
|-------|---|---|---|---|---|---|---|---|---|----|
|       | 0 | 0 | 0 | 1 | 2 | 0 | 1 | 4 | 3 | 0  |



| 13.18 | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 |
|-------|---|---|---|---|---|---|---|---|---|----|
|       | 0 | 0 | 1 | 1 | 1 | 1 | 0 | 3 | 2 | 2  |

# APPENDIX VII.

# SALES & MARKETING – QUESTIONNAIRE

    **Sales Marketing Questionnaire**

| MARKETING & SALES METRICS |
|---|

Instructions: please choose your Current responsibilities and your location from the dropdown lists

| I am currently employed as | Your current responsibilities |
|---|---|
| At | Locate your workplace from list |
| My Main Area of Responsibility is | Main Focus Area |

| | | No | Yes | Monthly | Quarterly | Annually |
|---|---|---|---|---|---|---|
| **1** | Do you conduct any form of sales forecasting | | | | | |
| | Please proceed to question 2 | ● | ● | ○ | ○ | ○ |

| | | No | Yes | Monthly | Quarterly | Annually |
|---|---|---|---|---|---|---|
| **2** | Does the sales and marketing department have any input into the inventory management ? | | | | | |
| | Please proceed to question 3 | ● | ● | ○ | ○ | ○ |

| | | No | Yes | Monthly | Quarterly | Annually |
|---|---|---|---|---|---|---|
| **3** | Do you conduct customer surveys? | | | | | |
| | Please proceed to question 4 | ● | ● | ○ | ○ | ○ |

| | | No | Yes | Monthly | Quarterly | Annually |
|---|---|---|---|---|---|---|
| **4** | Do you measure customer relationships? | | | | | |
| | Please proceed to question 5 | ● | ● | ○ | ○ | ○ |

| | | No | Yes | Monthly | Quarterly | Annually |
|---|---|---|---|---|---|---|
| **5** | Do you measure Intercompany sales and relationships? | | | | | |
| | Please proceed to question 6 | ● | ● | ○ | ○ | ○ |

| | | No | Yes | Monthly | Quarterly | Annually |
|---|---|---|---|---|---|---|
| **6** | Do you measure external (bought out excluding Intercompany sales) partnerships and their relationships? | | | | | |
| | Please proceed to question 7 | ● | ● | ○ | ○ | ○ |

| | | No | Yes | Monthly | Quarterly | Annually |
|---|---|---|---|---|---|---|
| **7** | Does your subsidiary (Company) make use of market segmentation as an analysis tool? | | | | | |
| | Please proceed to question 8 | ● | ● | ○ | ○ | ○ |

| | | No | Yes | Monthly | Quarterly | Annually |
|---|---|---|---|---|---|---|
| **8** | Does your subsidiary (Company) have a customer retention strategy? | | | | | |
| | Please proceed to question 9 | ● | ● | ○ | ○ | ○ |

Instructions: please choose your Current responsibilities and your location from the dropdown lists

**Sales Marketing Questionnaire**

| Corporate and Subsidiary Strategy in the Sales & Marketing Environment | | Strongly Disagree | Disagree | Neutral | Agree | Strongly Agree |
|---|---|---|---|---|---|---|
| **Question No 9** | **In the Sales Department of**<br>**Locate your workplace from list we understand that** | | | | | |
| 9.1 | Our Sales and Marketing strategy is aligned to the PLP Corporate Strategy | O | O | O | O | O |
| 9.2 | Our Sales Strategy is Aligned to our overall Strategy | O | O | O | O | O |
| 9.3 | Our Mission & Vision are Clear to us | O | O | O | O | O |
| 9.4 | Our Values are made clear to us | O | O | O | O | O |
| 9.5 | Our Strategic Objectives are clear | O | O | O | O | O |
| 9.6 | Our individual Key Performance Areas are clear | O | O | O | O | O |
| 9.7 | We have a sales turnover budget which is aligned to our overall budget | O | O | O | O | O |
| 9.8 | Quality is considered an important strategic objective | O | O | O | O | O |
| 9.9 | Price is considered an important strategic objective | O | O | O | O | O |
| 9.10 | Process control development and innovation are considered important strategic objectives | O | O | O | O | O |
| 9.11 | Product development is considered an important strategic objective | O | O | O | O | O |
| 9.12 | Innovation is considered an important strategic objective | O | O | O | O | O |
| 9.13 | Management of people is considered an important strategic objective | O | O | O | O | O |

| | Please rate the following Sales Cycle And Performance Metrics individualy from 1 to 10 based on their importance to long term sustainability of.<br>Locate your workplace from list<br>e.g. 10 being most important and 1 being not important at all | Rating | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **Question No 10** | | | | | | | | | | | | |
| 10.1 | Quotation conversion rate | | O | O | O | O | O | O | O | O | O | O |
| 10.2 | Monthly order intake | | O | O | O | O | O | O | O | O | O | O |
| 10.3 | Finished goods inventory turns | | O | O | O | O | O | O | O | O | O | O |
| 10.4 | Sales cycle time | | O | O | O | O | O | O | O | O | O | O |
| 10.5 | Customer profitability report | | O | O | O | O | O | O | O | O | O | O |
| 10.6 | Sales revenue reports | | O | O | O | O | O | O | O | O | O | O |
| 10.7 | Customer Lifetime Value | | O | O | O | O | O | O | O | O | O | O |

| Question No 11 | Please rate the following Market Development Metrics individualy from 1 to 10 based on their importance to long term sustainability of. Locate your workplace from list e.g. 10 being most important and 1 being not important at all | Rating | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 11.1 | New Product Sales as a % of Total Sales Turnover (5 Years or Less) | 0 | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ |
| 11.2 | Major New Product Introductions | 0 | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ |
| 11.3 | Number of Patent Idea Disclosure/Applications | 0 | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ |
| 11.4 | Number of Acquisition/Alliance Leads | 0 | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ |

| Question No 12 | Please rate the following Customer Relationship Metrics individualy from 1 to 10 based on their importance to long term sustainability of. Locate your workplace from list e.g. 10 being most important and 1 being not important at all | Rating | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 12.1 | Number of Technical Papers, Presentations or Trade Articles | 0 | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ |
| 12.2 | Sales by Market Code (Actual vs. Plan & Last Year) | 0 | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ |
| 12.3 | Margin by Market Code (Actual vs. Plan & Last Year) | 0 | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ |
| 12.4 | Customer Complaint Frequency | 0 | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ |

| Question No 13 | Please rate the following Customer Service Metrics individualy from 1 to 10 based on their importance to long term sustainability of. Locate your workplace from list e.g. 10 being most important and 1 being not important at all | Rating | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 13.1 | Call Volume (calls per day) | 0 | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ |
| 13.2 | PLP Price Change Index (%) | 0 | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ |
| 13.3 | Return Material Authorization (% of occurrences) | 0 | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ |
| 13.4 | New Parts Added (% of turnover) | 0 | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ |
| 13.5 | Domestic Orders by Month (% of Orders/Shipments) | 0 | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ |
| 13.6 | Quotes by Month | 0 | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ |
| 13.7 | Monthly and YTD Financial Results by Industry (sales, GM, %) | 0 | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ |
| 13.8 | Month-End Bookings by Market (actual, budget, %) | 0 | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ |
| 13.9 | Volume/Price Analysis (volume change, price change, product mix change, total change) | 0 | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ |
| 13.10 | Top 15 Customers by Industry (sales, GM, %) | 0 | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ |
| 13.11 | Sales by Family Code and by Part (month, year) | 0 | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ |
| 13.12 | Sales & Marketing Department Period Expenses | 0 | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ |
| 13.13 | Advertising and Sales Promotion Details | 0 | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ |
| 13.14 | New Product Sales: sales, GM %, GM $, units | 0 | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ |
| 13.15 | Monthly and YTD New Product Results by Market | 0 | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ |
| 13.16 | YTD New Product Results by Market | 0 | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ |
| 13.17 | Customer Service Call Analysis | 0 | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ |
| 13.18 | Return Goods Analysis: gross value, number of occurrences | 0 | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ |

# Sales Marketing Questionnaire

| Question No 14 | Please rate the following Market Segment Metrics individualy from 1 to 10 based on their importance to long term sustainability of. Locate your workplace from list e.g. 10 being most important and 1 being not important at all | Rating | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 14.1 | Number of Projects awarded to  Locate your workplace from list | 0 | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ |
| 14.2 | Quotations converted to actual sales | 0 | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ |
| 14.3 | Total Orders received by Subsidiary and Country | 0 | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ |

| Question No 15 | In Your Opinion which 5 Sales & Marketing metrics are the most important to long term sustainability? Please list them below from most important with a brief motivation of your choice. |
|---|---|
| 1 | |
| 2 | |
| 3 | |
| 4 | |
| 5 | |

# APPENDIX VIII.

# SALES & MARKETING DATA – CRONBACH'S ALPHA

# Sales Marketing Cronbach's Alpha

| Cronbach's alpha | 0.364454443 |
|---|---|

**Anova: Two-Factor Without Replication**

| Question No 1 Part 1 | Q1 | Q2 | Q3 | Q4 | Q5 | Q6 | Q7 | Q8 |
|---|---|---|---|---|---|---|---|---|
| | 2 | 2 | 2 | 1 | 2 | 2 | 2 | 1 |
| | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 1 |
| | 2 | 2 | 0 | 1 | 1 | 1 | 1 | 2 |
| | 0 | 2 | 2 | 2 | 2 | 1 | 2 | 1 |
| | 2 | 2 | 0 | 2 | 2 | 2 | 2 | 2 |
| | 0 | 1 | 1 | 1 | 1 | 1 | 2 | 2 |
| | 2 | 1 | 2 | 1 | 2 | 2 | 2 | 2 |
| | 2 | 2 | 0 | 2 | 2 | 0 | 2 | 2 |
| | 2 | 2 | 1 | 2 | 2 | 1 | 2 | 1 |
| | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 |
| | 1 | 1 | 2 | 0 | 2 | 1 | 2 | 2 |

| SUMMARY | Count | Sum | Average | Variance |
|---|---|---|---|---|
| Row 1 | 8 | 14 | 1.75 | 0.214285714 |
| Row 2 | 8 | 15 | 1.875 | 0.125 |
| Row 3 | 8 | 10 | 1.25 | 0.5 |
| Row 4 | 8 | 12 | 1.5 | 0.571428571 |
| Row 5 | 8 | 14 | 1.75 | 0.5 |
| Row 6 | 8 | 9 | 1.125 | 0.410714286 |
| Row 7 | 8 | 14 | 1.75 | 0.214285714 |
| Row 8 | 8 | 12 | 1.5 | 0.857142857 |
| Row 9 | 8 | 13 | 1.625 | 0.267857143 |
| Row 10 | 8 | 16 | 2 | 0 |
| Row 11 | 8 | 11 | 1.375 | 0.553571429 |

**ANOVA**

| Source of Variation | SS | df | MS | F | P-value | F crit |
|---|---|---|---|---|---|---|
| Rows | 5.772727273 | 10 | 0.577272727 | 1.573451327 | 0.132807714 | 1.968874948 |
| Columns | 3.818181818 | 7 | 0.545454545 | 1.486725664 | 0.186238402 | 2.143478041 |
| Error | 25.68181818 | 70 | 0.366883117 | | | |
| | | | | | | |
| Total | 35.27272727 | 87 | | | | |

| | Count | Sum | Average | Variance |
|---|---|---|---|---|
| Column 1 | 11 | 17 | 1.545454545 | 0.672727273 |
| Column 2 | 11 | 19 | 1.727272727 | 0.218181818 |
| Column 3 | 11 | 14 | 1.272727273 | 0.818181818 |
| Column 4 | 11 | 16 | 1.454545455 | 0.472727273 |
| Column 5 | 11 | 20 | 1.818181818 | 0.163636364 |
| Column 6 | 11 | 15 | 1.363636364 | 0.454545455 |
| Column 7 | 11 | 21 | 1.909090909 | 0.090909091 |
| Column 8 | 11 | 18 | 1.636363636 | 0.254545455 |

# Sales Marketing Cronbach's Alpha

| Cronbach's alpha | 0.391235758 |
|---|---|

**Anova: Two-Factor Without Replication**

| Question No 1 part 2 | Q1 | Q2 | Q3 | Q4 | Q5 | Q6 | Q7 | Q8 |
|---|---|---|---|---|---|---|---|---|
| | 3 | 2 | 0 | 0 | 0 | 0 | 2 | 0 |
| | 1 | 2 | 3 | 3 | 1 | 3 | 2 | 0 |
| | 2 | 2 | 0 | 0 | 0 | 0 | 0 | 3 |
| | 3 | 2 | 0 | 2 | 1 | 0 | 1 | 0 |
| | 1 | 1 | 0 | 3 | 1 | 1 | 1 | 2 |
| | 1 | 1 | 0 | 0 | 0 | 0 | 1 | 1 |
| | 1 | 0 | 3 | 0 | 3 | 3 | 3 | 3 |
| | 1 | 1 | 0 | 3 | 1 | 0 | 1 | 3 |
| | 1 | 1 | 0 | 2 | 1 | 0 | 2 | 0 |
| | 1 | 2 | 1 | 1 | 1 | 3 | 1 | 2 |
| | 0 | 0 | 2 | 0 | 1 | 0 | 1 | 1 |

| SUMMARY | Count | Sum | Average | Variance |
|---|---|---|---|---|
| Row 1 | 8 | 7 | 0.875 | 1.553571429 |
| Row 2 | 8 | 15 | 1.875 | 1.267857143 |
| Row 3 | 8 | 7 | 0.875 | 1.553571429 |
| Row 4 | 8 | 9 | 1.125 | 1.267857143 |
| Row 5 | 8 | 10 | 1.25 | 0.785714286 |
| Row 6 | 8 | 4 | 0.5 | 0.285714286 |
| Row 7 | 8 | 16 | 2 | 2 |
| Row 8 | 8 | 10 | 1.25 | 1.357142857 |
| Row 9 | 8 | 7 | 0.875 | 0.696428571 |
| Row 10 | 8 | 12 | 1.5 | 0.571428571 |
| Row 11 | 8 | 5 | 0.625 | 0.553571429 |
| | | | | |
| Column 1 | 11 | 15 | 1.363636364 | 0.854545455 |
| Column 2 | 11 | 14 | 1.272727273 | 0.618181818 |
| Column 3 | 11 | 9 | 0.818181818 | 1.563636364 |
| Column 4 | 11 | 14 | 1.272727273 | 1.818181818 |
| Column 5 | 11 | 10 | 0.909090909 | 0.690909091 |
| Column 6 | 11 | 10 | 0.909090909 | 1.890909091 |
| Column 7 | 11 | 15 | 1.363636364 | 0.654545455 |
| Column 8 | 11 | 15 | 1.363636364 | 1.654545455 |

ANOVA

| Source of Variation | SS | df | MS | F | P-value | F crit |
|---|---|---|---|---|---|---|
| Rows | 18.52272727 | 10 | 1.852272727 | 1.642672041 | 0.11252204 | 1.968874948 |
| Columns | 4.318181818 | 7 | 0.616883117 | 0.547077455 | 0.795793728 | 2.143478041 |
| Error | 78.93181818 | 70 | 1.127597403 | | | |
| | | | | | | |
| Total | 101.7727273 | 87 | | | | |

# Sales Marketing Cronbach's Alpha

| Cronbach's alpha | 0.989264531 |
|---|---|

| Question No 9 | 9.1 | 9.2 | 9.3 | 9.4 | 9.5 | 9.6 | 9.7 | 9.8 | 9.9 | 9.10 | 9.11 | 9.12 | 9.13 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | 5 | 5 | 4 | 5 | 5 | 4 | 5 | 5 | 5 | 5 | 5 | 4 | 5 |
| | 4 | 5 | 5 | 5 | 5 | 5 | 5 | 5 | 5 | 5 | 5 | 5 | 5 |
| | 4 | 4 | 4 | 4 | 4 | 4 | 4 | 4 | 4 | 3 | 3 | 3 | 4 |
| | 3 | 4 | 4 | 5 | 4 | 4 | 5 | 5 | 5 | 4 | 4 | 4 | 4 |
| | 5 | 5 | 5 | 5 | 5 | 5 | 5 | 5 | 5 | 5 | 5 | 5 | 5 |
| | 4 | 4 | 4 | 4 | 4 | 4 | 3 | 4 | 4 | 4 | 4 | 4 | 4 |
| | 3 | 4 | 4 | 5 | 5 | 4 | 4 | 3 | 4 | 4 | 4 | 4 | 4 |
| | 2 | 4 | 3 | 4 | 3 | 4 | 5 | 4 | 4 | 4 | 4 | 4 | 4 |
| | 4 | 4 | 4 | 4 | 4 | 4 | 4 | 4 | 5 | 4 | 4 | 4 | 4 |
| | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 |
| | 4 | 4 | 5 | 5 | 4 | 5 | 5 | 5 | 5 | 5 | 5 | 5 | 4 |

ANOVA

| Source of Variation | SS | df | MS | F | P-value | F crit |
|---|---|---|---|---|---|---|
| Rows | 157.2027972 | 10 | 15.72027972 | 93.14917127 | 1.09326E-51 | 1.910461065 |
| Columns | 4.517482517 | 12 | 0.376456876 | 2.230662983 | 0.01415575 | 1.833695276 |
| Error | 20.25174825 | 120 | 0.168764569 | | | |
| | | | | | | |
| Total | 181.972028 | 142 | | | | |

**Anova: Two-Factor Without Replication**

| SUMMARY | Count | Sum | Average | Variance |
|---|---|---|---|---|
| Row 1 | 13 | 62 | 4.769230769 | 0.192307692 |
| Row 2 | 13 | 64 | 4.923076923 | 0.076923077 |
| Row 3 | 13 | 49 | 3.769230769 | 0.192307692 |
| Row 4 | 13 | 55 | 4.230769231 | 0.358974359 |
| Row 5 | 13 | 65 | 5 | 0 |
| Row 6 | 13 | 51 | 3.923076923 | 0.076923077 |
| Row 7 | 13 | 52 | 4 | 0.333333333 |
| Row 8 | 13 | 49 | 3.769230769 | 0.525641026 |
| Row 9 | 13 | 53 | 4.076923077 | 0.076923077 |
| Row 10 | 13 | 13 | 1 | 0 |
| Row 11 | 13 | 61 | 4.692307692 | 0.230769231 |
| | | | | |
| Column 1 | 11 | 39 | 3.545454545 | 1.472727273 |
| Column 2 | 11 | 44 | 4 | 1.2 |
| Column 3 | 11 | 43 | 3.909090909 | 1.290909091 |
| Column 4 | 11 | 47 | 4.272727273 | 1.418181818 |
| Column 5 | 11 | 44 | 4 | 1.4 |
| Column 6 | 11 | 44 | 4 | 1.2 |
| Column 7 | 11 | 46 | 4.181818182 | 1.563636364 |
| Column 8 | 11 | 45 | 4.090909091 | 1.490909091 |
| Column 9 | 11 | 47 | 4.272727273 | 1.418181818 |
| Column 10 | 11 | 44 | 4 | 1.4 |
| Column 11 | 11 | 44 | 4 | 1.4 |
| Column 12 | 11 | 43 | 3.909090909 | 1.290909091 |
| Column 13 | 11 | 44 | 4 | 1.2 |

# Sales Marketing Cronbach's Alpha

| Cronbach's alpha | 0.756164201 |
|---|---|

**Anova: Two-Factor Without Replication**

| Question No 10 | 10.1 | 10.2 | 10.3 | 10.4 | 10.5 | 10.6 | 10.7 |
|---|---|---|---|---|---|---|---|
| | 7 | 10 | 7 | 7 | 7 | 9 | 7 |
| | 3 | 7 | 7 | 8 | 8 | 8 | 9 |
| | 8 | 10 | 5 | 5 | 10 | 8 | 8 |
| | 8 | 8 | 9 | 8 | 7 | 8 | 8 |
| | 9 | 10 | 9 | 8 | 8 | 9 | 9 |
| | 7 | 7 | 7 | 10 | 10 | 10 | 9 |
| | 8 | 10 | 4 | 8 | 10 | 10 | 8 |
| | 7 | 9 | 6 | 6 | 6 | 8 | 8 |
| | 7 | 10 | 7 | 7 | 7 | 8 | 5 |
| | 9 | 10 | 9 | 9 | 10 | 10 | 10 |
| | 10 | 10 | 10 | 10 | 10 | 10 | 10 |

| SUMMARY | Count | Sum | Average | Variance |
|---|---|---|---|---|
| Row 1 | 7 | 54 | 7.714285714 | 1.571428571 |
| Row 2 | 7 | 50 | 7.142857143 | 3.80952381 |
| Row 3 | 7 | 54 | 7.714285714 | 4.238095238 |
| Row 4 | 7 | 56 | 8 | 0.333333333 |
| Row 5 | 7 | 62 | 8.857142857 | 0.476190476 |
| Row 6 | 7 | 60 | 8.571428571 | 2.285714286 |
| Row 7 | 7 | 58 | 8.285714286 | 4.571428571 |
| Row 8 | 7 | 50 | 7.142857143 | 1.476190476 |
| Row 9 | 7 | 51 | 7.285714286 | 2.238095238 |
| Row 10 | 7 | 67 | 9.571428571 | 0.285714286 |
| Row 11 | 7 | 70 | 10 | 0 |
| | | | | |
| Column 1 | 11 | 83 | 7.545454545 | 3.272727273 |
| Column 2 | 11 | 101 | 9.181818182 | 1.563636364 |
| Column 3 | 11 | 80 | 7.272727273 | 3.418181818 |
| Column 4 | 11 | 86 | 7.818181818 | 2.363636364 |
| Column 5 | 11 | 93 | 8.454545455 | 2.472727273 |
| Column 6 | 11 | 98 | 8.909090909 | 0.890909091 |
| Column 7 | 11 | 91 | 8.272727273 | 2.018181818 |

ANOVA

| Source of Variation | SS | df | MS | F | P-value | F crit |
|---|---|---|---|---|---|---|
| Rows | 64.96103896 | 10 | 6.496103896 | 4.101120525 | 0.00025072 | 1.992591997 |
| Columns | 32.67532468 | 6 | 5.445887446 | 3.438097841 | 0.00552319 | 2.25405301 |
| Error | 95.03896104 | 60 | 1.583982684 | | | |
| | | | | | | |
| Total | 192.6753247 | 76 | | | | |

# Sales Marketing Cronbach's Alpha

| Cronbach's alpha | 0.834843907 |
|---|---|

| Question No 11 | 11.1 | 11.2 | 11.3 | 11.4 |
|---|---|---|---|---|
| | 10 | 10 | 7 | 9 |
| | 8 | 10 | 9 | 7 |
| | 6 | 6 | 6 | 4 |
| | 7 | 8 | 9 | 8 |
| | 9 | 10 | 8 | 8 |
| | 8 | 8 | 10 | 8 |
| | 8 | 9 | 6 | 6 |
| | 7 | 7 | 4 | 7 |
| | 8 | 8 | 6 | 6 |
| | 10 | 10 | 9 | 9 |
| | 9 | 10 | 7 | 7 |

ANOVA

| Source of Variation | SS | df | MS | F | P-value | F crit |
|---|---|---|---|---|---|---|
| Rows | 60.18181818 | 10 | 6.018181818 | 6.054878049 | 5.59717E-05 | 2.164579917 |
| Columns | 17.18181818 | 3 | 5.727272727 | 5.762195122 | 0.003092349 | 2.922277191 |
| Error | 29.81818182 | 30 | 0.993939394 | | | |
| | | | | | | |
| Total | 107.1818182 | 43 | | | | |

**Anova: Two-Factor Without Replication**

| SUMMARY | Count | Sum | Average | Variance |
|---|---|---|---|---|
| Row 1 | 4 | 36 | 9 | 2 |
| Row 2 | 4 | 34 | 8.5 | 1.666666667 |
| Row 3 | 4 | 22 | 5.5 | 1 |
| Row 4 | 4 | 32 | 8 | 0.666666667 |
| Row 5 | 4 | 35 | 8.75 | 0.916666667 |
| Row 6 | 4 | 34 | 8.5 | 1 |
| Row 7 | 4 | 29 | 7.25 | 2.25 |
| Row 8 | 4 | 25 | 6.25 | 2.25 |
| Row 9 | 4 | 28 | 7 | 1.333333333 |
| Row 10 | 4 | 38 | 9.5 | 0.333333333 |
| Row 11 | 4 | 33 | 8.25 | 2.25 |
| | | | | |
| Column 1 | 11 | 90 | 8.181818182 | 1.563636364 |
| Column 2 | 11 | 96 | 8.727272727 | 2.018181818 |
| Column 3 | 11 | 81 | 7.363636364 | 3.254545455 |
| Column 4 | 11 | 79 | 7.181818182 | 2.163636364 |

# Sales Marketing Cronbach's Alpha

| Cronbach's alpha | 0.760262726 |
|---|---|

| Question No 12 | 12.1 | 12.2 | 12.3 | 12.4 |
|---|---|---|---|---|
| | 9 | 10 | 10 | 9 |
| | 7 | 9 | 9 | 10 |
| | 4 | 9 | 9 | 9 |
| | 6 | 9 | 9 | 9 |
| | 7 | 10 | 10 | 10 |
| | 8 | 9 | 9 | 9 |
| | 5 | 9 | 9 | 10 |
| | 8 | 7 | 8 | 7 |
| | 5 | 7 | 7 | 8 |
| | 10 | 10 | 10 | 10 |
| | 8 | 9 | 10 | 10 |

**ANOVA**

| Source of Variation | SS | df | MS | F | P-value | F crit |
|---|---|---|---|---|---|---|
| Rows | 36.90909091 | 10 | 3.690909091 | 4.17 | 0.001124062 | 2.164579917 |
| Columns | 35.45454545 | 3 | 11.81818182 | 13.4 | 1.03176E-05 | 2.922277191 |
| Error | 26.54545455 | 30 | 0.884848485 | | | |
| | | | | | | |
| Total | 98.90909091 | 43 | | | | |

**Anova: Two-Factor Without Replication**

| SUMMARY | Count | Sum | Average | Variance |
|---|---|---|---|---|
| Row 1 | 4 | 38 | 9.5 | 0.333333333 |
| Row 2 | 4 | 35 | 8.75 | 1.583333333 |
| Row 3 | 4 | 31 | 7.75 | 6.25 |
| Row 4 | 4 | 33 | 8.25 | 2.25 |
| Row 5 | 4 | 37 | 9.25 | 2.25 |
| Row 6 | 4 | 35 | 8.75 | 0.25 |
| Row 7 | 4 | 33 | 8.25 | 4.916666667 |
| Row 8 | 4 | 30 | 7.5 | 0.333333333 |
| Row 9 | 4 | 27 | 6.75 | 1.583333333 |
| Row 10 | 4 | 40 | 10 | 0 |
| Row 11 | 4 | 37 | 9.25 | 0.916666667 |
| | | | | |
| Column 1 | 11 | 77 | 7 | 3.4 |
| Column 2 | 11 | 98 | 8.909090909 | 1.090909091 |
| Column 3 | 11 | 100 | 9.090909091 | 0.890909091 |
| Column 4 | 11 | 101 | 9.181818182 | 0.963636364 |

# Sales Marketing Cronbach's Alpha

| Cronbach's alpha | 0.920942333 |
| --- | --- |

**Anova: Two-Factor Without Replication**

| Question No 13 | 13.1 | 13.2 | 13.3 | 13.4 | 13.5 | 13.6 | 13.7 | 13.8 | 13.9 | 13.10 | 13.11 | 13.12 | 13.13 | 13.14 | 13.15 | 13.16 | 13.17 | 13.18 |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| | 10 | 10 | 8 | 7 | 10 | 9 | 10 | 10 | 9 | 10 | 10 | 10 | 8 | 10 | 10 | 10 | 9 | 8 |
| | 7 | 7 | 10 | 10 | 3 | 7 | 10 | 5 | 9 | 8 | 10 | 2 | 7 | 10 | 9 | 9 | 8 | 8 |
| | 5 | 9 | 5 | 5 | 9 | 6 | 10 | 10 | 7 | 9 | 6 | 10 | 6 | 6 | 6 | 6 | 4 | 4 |
| | 7 | 8 | 9 | 8 | 9 | 9 | 9 | 10 | 8 | 6 | 4 | 9 | 8 | 7 | 8 | 8 | 8 | 9 |
| | 4 | 7 | 9 | 9 | 10 | 8 | 10 | 10 | 8 | 10 | 8 | 9 | 7 | 10 | 9 | 9 | 9 | 9 |
| | 6 | 9 | 7 | 5 | 9 | 6 | 10 | 9 | 6 | 8 | 6 | 8 | 7 | 8 | 6 | 8 | 8 | 8 |
| | 5 | 7 | 5 | 6 | 10 | 8 | 10 | 10 | 9 | 9 | 5 | 9 | 5 | 9 | 5 | 6 | 5 | 5 |
| | 3 | 7 | 5 | 3 | 8 | 5 | 9 | 9 | 7 | 9 | 3 | 5 | 3 | 4 | 6 | 6 | 5 | 3 |
| | 8 | 8 | 6 | 6 | 8 | 7 | 8 | 8 | 8 | 8 | 8 | 8 | 6 | 8 | 8 | 8 | 7 | 6 |
| | 9 | 9 | 9 | 10 | 10 | 9 | 10 | 10 | 10 | 10 | 10 | 9 | 9 | 10 | 10 | 10 | 8 | 10 |
| | 9 | 10 | 10 | 9 | 10 | 10 | 10 | 10 | 8 | 10 | 8 | 10 | 9 | 7 | 8 | 8 | 9 | 10 |

ANOVA

| Source of Variation | SS | df | MS | F | P-value | F crit |
| --- | --- | --- | --- | --- | --- | --- |
| Rows | 263.1111111 | 10 | 26.31111111 | 12.64899452 | 2.52771E-16 | 1.886763471 |
| Columns | 126.8282828 | 17 | 7.460487225 | 3.586608775 | 8.79156E-06 | 1.683169372 |
| Error | 353.6161616 | 170 | 2.080095068 | | | |
| | | | | | | |
| Total | 743.5555556 | 197 | | | | |

| SUMMARY | Count | Sum | Average | Variance |
| --- | --- | --- | --- | --- |
| Row 1 | 18 | 168 | 9.333333 | 0.941176 |
| Row 2 | 18 | 139 | 7.722222 | 5.624183 |
| Row 3 | 18 | 123 | 6.833333 | 4.382353 |
| Row 4 | 18 | 144 | 8 | 1.882353 |
| Row 5 | 18 | 155 | 8.611111 | 2.251634 |
| Row 6 | 18 | 134 | 7.444444 | 1.908497 |
| Row 7 | 18 | 128 | 7.111111 | 4.339869 |
| Row 8 | 18 | 100 | 5.555556 | 4.849673 |
| Row 9 | 18 | 134 | 7.444444 | 0.732026 |
| Row 10 | 18 | 172 | 9.555556 | 0.379085 |
| Row 11 | 18 | 165 | 9.166667 | 0.970588 |
| | | | | |
| Column 1 | 11 | 73 | 6.636364 | 5.054545 |
| Column 2 | 11 | 91 | 8.272727 | 1.418182 |
| Column 3 | 11 | 83 | 7.545455 | 4.072727 |
| Column 4 | 11 | 78 | 7.090909 | 5.290909 |
| Column 5 | 11 | 96 | 8.727273 | 4.218182 |
| Column 6 | 11 | 84 | 7.636364 | 2.454545 |
| Column 7 | 11 | 106 | 9.636364 | 0.454545 |
| Column 8 | 11 | 101 | 9.181818 | 2.363636 |
| Column 9 | 11 | 89 | 8.090909 | 1.290909 |
| Column 10 | 11 | 97 | 8.818182 | 1.563636 |
| Column 11 | 11 | 78 | 7.090909 | 6.090909 |
| Column 12 | 11 | 89 | 8.090909 | 6.090909 |
| Column 13 | 11 | 75 | 6.818182 | 3.163636 |
| Column 14 | 11 | 89 | 8.090909 | 3.890909 |
| Column 15 | 11 | 85 | 7.727273 | 3.018182 |
| Column 16 | 11 | 88 | 8 | 2.2 |
| Column 17 | 11 | 80 | 7.272727 | 3.218182 |
| Column 18 | 11 | 80 | 7.272727 | 5.818182 |

# Sales Marketing Cronbach's Alpha

| Cronbach's alpha | 0.045608108 |
|---|---|

| Question No 14 | 14.1 | 14.2 | 14.3 |
|---|---|---|---|
| | 10 | 9 | 10 |
| | 9 | 4 | 10 |
| | 9 | 6 | 9 |
| | 9 | 9 | 2 |
| | 8 | 8 | 9 |
| | 9 | 8 | 10 |
| | 8 | 9 | 8 |
| | 7 | 5 | 8 |
| | 10 | 10 | 7 |
| | 9 | 9 | 9 |
| | 10 | 10 | 10 |

ANOVA

| Source of Variation | SS | df | MS | F | P-value | F crit |
|---|---|---|---|---|---|---|
| Rows | 35.87878788 | 10 | 3.587878788 | 1.047787611 | 0.442194126 | 2.347877567 |
| Columns | 5.515151515 | 2 | 2.757575758 | 0.805309735 | 0.46092238 | 3.492828477 |
| Error | 68.48484848 | 20 | 3.424242424 | | | |
| | | | | | | |
| Total | 109.8787879 | 32 | | | | |

**Anova: Two-Factor Without Replication**

| SUMMARY | Count | Sum | Average | Variance |
|---|---|---|---|---|
| Row 1 | 3 | 29 | 9.666666667 | 0.333333333 |
| Row 2 | 3 | 23 | 7.666666667 | 10.33333333 |
| Row 3 | 3 | 24 | 8 | 3 |
| Row 4 | 3 | 20 | 6.666666667 | 16.33333333 |
| Row 5 | 3 | 25 | 8.333333333 | 0.333333333 |
| Row 6 | 3 | 27 | 9 | 1 |
| Row 7 | 3 | 25 | 8.333333333 | 0.333333333 |
| Row 8 | 3 | 20 | 6.666666667 | 2.333333333 |
| Row 9 | 3 | 27 | 9 | 3 |
| Row 10 | 3 | 27 | 9 | 0 |
| Row 11 | 3 | 30 | 10 | 0 |
| | | | | |
| Column 1 | 11 | 98 | 8.909090909 | 0.890909091 |
| Column 2 | 11 | 87 | 7.909090909 | 4.090909091 |
| Column 3 | 11 | 92 | 8.363636364 | 5.454545455 |

|            | Value | Limit |
|------------|-------|-------|
| *Q 1-8 S1* | 0.364 | 0.6 |
| *Q 1-8 S2* | 0.391 | 0.6 |
| *Question 9*  | 0.989 | 0.6 |
| *Question 10* | 0.756 | 0.6 |
| *Question 11* | 0.835 | 0.6 |
| *Question 12* | 0.760 | 0.6 |
| *Question 13* | 0.921 | 0.6 |
| *Question 14* | 0.046 | 0.6 |



Cronbach's Alpha Sales & Marketing Questionnaire



Cronbach's Alpha Sales & Marketing Questionnaire
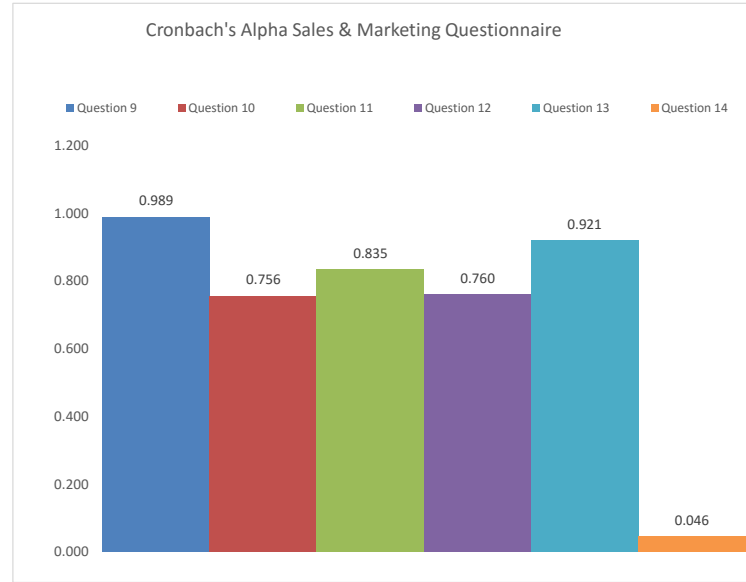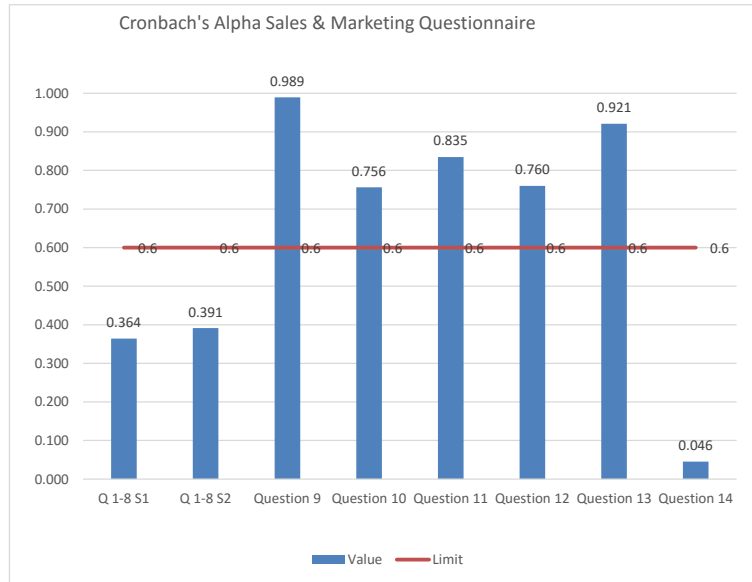
# APPENDIX IX.

# OPERATIONS DATA – STATISTICS TABLES

# Appendix IX.    Operations Data - Statistics Tables

| Country | VPOM | VPI | OCOM | OFP | SMD | SOM | Respondents | Possible Res | Repor |
|---|---|---|---|---|---|---|---|---|---|
| Corp HQ | YES | YES | | | | | 2 | 2 | 100% |
| Plant ROG | | | YES | | N/A | YES | 2 | 2 | 100% |
| Plant ALB | | | YES | | N/A | NO | 1 | 2 | 50% |
| DPW | | | YES | | NO | | 1 | 2 | 50% |
| Spain | | | | | NO | NO | 0 | 2 | 0% |
| Poland | | | | | NO | YES | 1 | 2 | 50% |
| G Britain | | | | | YES | YES | 2 | 2 | 100% |
| Indonesia | | | | | NO | YES | 1 | 2 | 50% |
| Canada | | | | | YES | NO | 1 | 2 | 50% |
| | | | | | | | 0 | #### | |
| Thailand | | | | | NO | NO | 0 | 2 | 0% |
| Australia | | | | | YES | YES | 2 | 2 | 100% |
| China | | | | | YES | NO | 1 | 2 | 50% |
| Mexico | | | | | YES | YES | 2 | 2 | 100% |
| Brazil | | | | | YES | YES | 2 | 2 | 100% |
| N Zealand | | | | | YES | YES | 2 | 2 | 100% |
| Argentina | | | | | NO | NO | 0 | 2 | 0% |
| Malaysia | | | | | N/A | NO | 0 | 1 | 0% |
| S Africa | | | | | | YES | 1 | 1 | 100% |
| | | | | | | | 21 | 34 | 62% |

| Key: | |
|---|---|
| VPF: | Vice-President Finance |
| VPI: | Vice-President International |
| OCOM: | Other Corporate Operations  Managers |
| OFP: | Other Operations Practitioners |
| SMD: | Subsidiary Managing Directors |
| SOM: | Subsidiary Operations Managers |

| Responses | Possible Responses | % Response | - Means OM Higher than MD's' |
|---|---|---|---|
| 21 | 34 | 0% | |

## Operations Data For Analysis

| Question No1 P1 | Average Score | Ave MD's | Ave OM's | Difference | Possible Score | STD Deviation | Confidence Norm | Median | Skew | Kurtosis |
|---|---|---|---|---|---|---|---|---|---|---|
| 1.1 | 1.810 | 1.600 | 2.000 | -0.400 | 2 | 0.602 | 0.257 | 2.000 | -2.975 | 7.562 |
| 1.2 | 1.789 | 1.875 | 1.727 | 0.148 | 2 | 0.419 | 0.188 | 2.000 | -1.545 | 0.419 |
| 1.3 | 1.810 | 1.600 | 2.000 | -0.400 | 2 | 0.602 | 0.257 | 2.000 | -2.975 | 7.562 |
| 1.4 | 1.526 | 1.500 | 1.545 | -0.045 | 2 | 0.513 | 0.231 | 2.000 | -0.115 | -2.235 |
| 1.5 | 1.684 | 1.500 | 1.818 | -0.318 | 2 | 0.582 | 0.262 | 2.000 | -1.766 | 2.540 |
| 1.6 | 1.895 | 1.750 | 2.000 | -0.250 | 2 | 0.315 | 0.142 | 2.000 | -2.798 | 6.509 |
| 1.7 | 1.368 | 1.250 | 1.455 | -0.205 | 2 | 0.496 | 0.223 | 1.000 | 0.593 | -1.856 |
| 1.8 | 1.053 | 1.125 | 1.000 | 0.125 | 2 | 0.621 | 0.279 | 1.000 | -0.026 | 0.024 |
| 1.9 | 1.789 | 1.875 | 1.727 | 0.148 | 2 | 0.419 | 0.188 | 2.000 | -1.545 | 0.419 |
| 1.10 | 1.316 | 1.250 | 1.364 | -0.114 | 2 | 0.582 | 0.262 | 1.000 | -0.120 | -0.443 |
| 1.11 | 1.895 | 1.875 | 1.909 | -0.034 | 2 | 0.315 | 0.142 | 2.000 | -2.798 | 6.509 |
| **Average** | **1.630** | **1.564** | **1.686** | **-0.122** | **2** | **0.497** | **0.221** | **1.727** | **-1.461** | **2.456** |
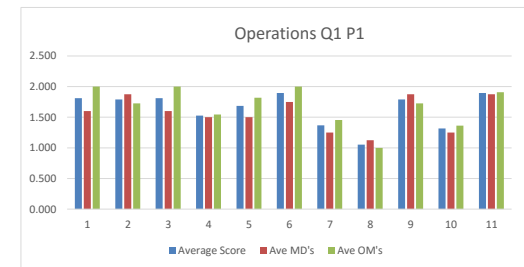
### Operations Q1 P1



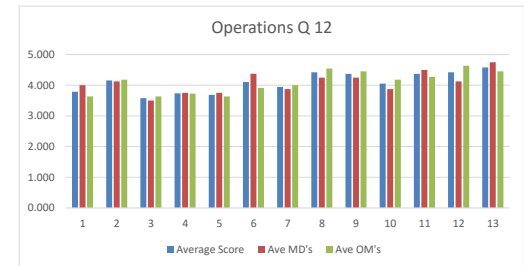| Question No1 P2 | Average Score | Ave MD's | Ave OM's | Difference | Possible Score | STD Deviation | Confidence Norm | Median | Skew | Kurtosis |
|---|---|---|---|---|---|---|---|---|---|---|
| 2.1 | 3.053 | 3.125 | 3.000 | 0.125 | 5 | 1.026 | 0.461 | 3.000 | -0.805 | -0.377 |
| 2.2 | 2.211 | 2.625 | 1.909 | 0.716 | 5 | 1.548 | 0.696 | 3.000 | -0.292 | -1.479 |
| 2.3 | 2.053 | 2.250 | 1.909 | 0.341 | 5 | 0.911 | 0.410 | 2.000 | 0.873 | 0.536 |
| 2.4 | 1.421 | 1.500 | 1.364 | 0.136 | 5 | 1.575 | 0.708 | 1.000 | 0.639 | -1.248 |
| 2.5 | 1.316 | 0.875 | 1.636 | -0.761 | 5 | 1.336 | 0.601 | 1.000 | 1.538 | 2.577 |
| 2.6 | 2.421 | 3.125 | 1.909 | 1.216 | 5 | 1.895 | 0.852 | 2.000 | 0.136 | -1.494 |
| 2.7 | 0.789 | 0.750 | 0.818 | -0.068 | 5 | 1.548 | 0.696 | 0.000 | 2.399 | 4.976 |
| 2.8 | 0.368 | 0.250 | 0.455 | -0.205 | 5 | 0.597 | 0.269 | 0.000 | 1.443 | 1.380 |
| 2.9 | 1.895 | 2.375 | 1.545 | 0.830 | 5 | 1.595 | 0.717 | 2.000 | 0.466 | -0.458 |
| 2.10 | 1.316 | 1.250 | 1.364 | -0.114 | 5 | 1.887 | 0.849 | 0.000 | 0.985 | -0.632 |
| 2.11 | 2.684 | 2.500 | 2.818 | -0.318 | 5 | 1.827 | 0.822 | 3.000 | 0.036 | -1.525 |
| **Average** | **1.775** | **1.875** | **1.702** | **0.173** | **5** | **1.431** | **0.644** | **1.545** | **0.675** | **0.205** |
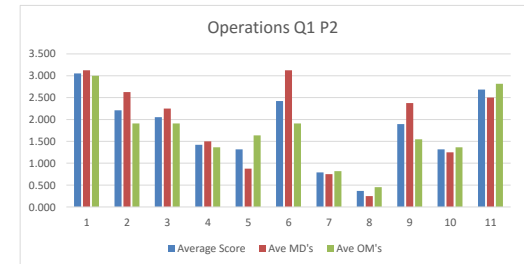
### Operations Q1 P2
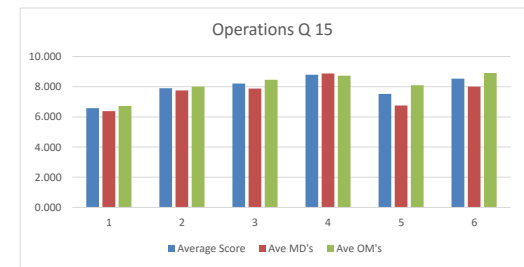
# Appendix IX.    Operations Data - Statistics Tables

| Question No1 P3 | Average Score | Ave MD's | Ave OM's | Difference | Possible Score | STD Deviation | Confidence Norm | Median | Skew | Kurtosis |
|---|---|---|---|---|---|---|---|---|---|---|
| 3.1 | 2.684 | 2.750 | 2.636 | 0.114 | 5 | 0.749 | 0.337 | 3.000 | -2.041 | 2.410 |
| 3.2 | 2.053 | 2.125 | 2.000 | 0.125 | 5 | 1.353 | 0.608 | 3.000 | -0.557 | -1.324 |
| 3.3 | 3.000 | 3.000 | 3.000 | 0.000 | 5 | 0.333 | 0.150 | 3.000 | 0.000 | 9.000 |
| 3.4 | 1.632 | 1.750 | 1.545 | 0.205 | 5 | 1.422 | 0.640 | 2.000 | -0.168 | -2.028 |
| 3.5 | 0.789 | 0.625 | 0.909 | -0.284 | 5 | 0.535 | 0.241 | 1.000 | -0.229 | 0.316 |
| 3.6 | 3.000 | 3.375 | 2.727 | 0.648 | 5 | 1.944 | 0.874 | 3.000 | -0.406 | -1.376 |
| 3.7 | 0.947 | 0.875 | 1.000 | -0.125 | 5 | 1.615 | 0.726 | 0.000 | 1.863 | 2.734 |
| 3.8 | 0.368 | 0.250 | 0.455 | -0.205 | 5 | 0.597 | 0.269 | 0.000 | 1.443 | 1.380 |
| 3.9 | 1.526 | 1.875 | 1.273 | 0.602 | 5 | 1.124 | 0.505 | 2.000 | 0.321 | -0.201 |
| 3.10 | 1.105 | 1.250 | 1.000 | 0.250 | 5 | 1.729 | 0.777 | 0.000 | 1.406 | 0.817 |
| 3.11 | 1.684 | 1.625 | 1.727 | -0.102 | 5 | 2.162 | 0.972 | 0.000 | 0.752 | -1.363 |
| **Average** | **1.708** | **1.773** | **1.661** | **0.112** | **5** | **1.233** | **0.554** | **1.545** | **0.217** | **0.942** |
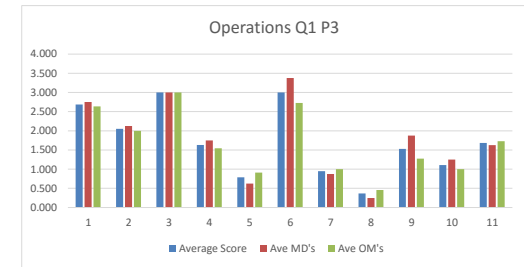


Operations Q1 P3

| Question No 12 | Average Score | Ave MD's | Ave OM's | Difference | Possible Score | STD Deviation | Confidence Norm | Median | Skew | Kurtosis |
|---|---|---|---|---|---|---|---|---|---|---|
| 12.1 | 3.789 | 4.000 | 3.636 | 0.364 | 5 | 0.787 | 0.354 | 4.000 | -1.116 | 1.598 |
| 12.2 | 4.158 | 4.125 | 4.182 | -0.057 | 5 | 0.602 | 0.271 | 4.000 | -0.047 | 0.038 |
| 12.3 | 3.579 | 3.500 | 3.636 | -0.136 | 5 | 0.838 | 0.377 | 4.000 | -0.277 | -0.178 |
| 12.4 | 3.737 | 3.750 | 3.727 | 0.023 | 5 | 0.872 | 0.392 | 4.000 | -0.548 | 0.061 |
| 12.5 | 3.684 | 3.750 | 3.636 | 0.114 | 5 | 0.478 | 0.215 | 4.000 | -0.862 | -1.419 |
| 12.6 | 4.105 | 4.375 | 3.909 | 0.466 | 5 | 0.809 | 0.364 | 4.000 | -0.204 | -1.412 |
| 12.7 | 3.947 | 3.875 | 4.000 | -0.125 | 5 | 0.780 | 0.351 | 4.000 | -0.690 | 0.982 |
| 12.8 | 4.421 | 4.250 | 4.545 | -0.295 | 5 | 0.838 | 0.377 | 5.000 | -1.624 | 2.709 |
| 12.9 | 4.368 | 4.250 | 4.455 | -0.205 | 5 | 0.496 | 0.223 | 4.000 | 0.593 | -1.856 |
| 12.10 | 4.053 | 3.875 | 4.182 | -0.307 | 5 | 0.911 | 0.410 | 4.000 | -0.604 | -0.388 |
| 12.11 | 4.368 | 4.500 | 4.273 | 0.227 | 5 | 0.684 | 0.308 | 4.000 | -0.632 | -0.527 |
| 12.12 | 4.421 | 4.125 | 4.636 | -0.511 | 5 | 1.121 | 0.504 | 5.000 | -1.762 | 3.924 |
| 12.13 | 4.579 | 4.750 | 4.455 | 0.295 | 5 | 0.607 | 0.273 | 5.000 | -1.168 | 0.582 |
| **Average** | **4.093** | **4.087** | **4.098** | **-0.011** | **5** | **0.756** | **0.340** | **4.231** | **-0.688** | **0.316** |



Operations Q 12

| Question No 13 | Average Score | Ave MD's | Ave OM's | Difference | Possible Score | STD Deviation | Confidence Norm | Median | Skew | Kurtosis |
|---|---|---|---|---|---|---|---|---|---|---|
| 13.1 | 8.474 | 8.875 | 8.182 | 0.693 | 10 | 1.611 | 0.725 | 9.000 | -0.793 | -0.484 |
| 13.2 | 8.632 | 9.000 | 8.364 | 0.636 | 10 | 1.461 | 0.657 | 9.000 | -1.186 | 0.814 |
| 13.3 | 8.789 | 8.875 | 8.727 | 0.148 | 10 | 1.032 | 0.464 | 9.000 | -0.211 | -1.125 |
| 13.4 | 8.474 | 8.125 | 8.727 | -0.602 | 10 | 1.349 | 0.606 | 9.000 | -0.545 | -0.833 |
| 13.5 | 8.789 | 8.875 | 8.727 | 0.148 | 10 | 1.316 | 0.592 | 9.000 | -1.531 | 2.654 |
| 13.6 | 8.263 | 7.750 | 8.636 | -0.886 | 10 | 1.593 | 0.716 | 9.000 | -0.575 | -0.883 |
| 13.7 | 8.632 | 8.125 | 9.000 | -0.875 | 10 | 1.342 | 0.603 | 9.000 | -1.238 | 1.527 |
| 13.8 | 7.474 | 7.125 | 7.727 | -0.602 | 10 | 1.954 | 0.879 | 8.000 | -2.003 | 6.345 |
| 13.9 | 7.211 | 6.875 | 7.455 | -0.580 | 10 | 1.960 | 0.881 | 8.000 | -1.714 | 5.063 |
| 13.10 | 7.737 | 7.375 | 8.000 | -0.625 | 10 | 2.104 | 0.946 | 8.000 | -1.852 | 5.058 |
| 13.11 | 6.947 | 6.375 | 7.364 | -0.989 | 10 | 1.929 | 0.867 | 7.000 | -1.579 | 3.987 |
| 13.12 | 6.632 | 6.125 | 7.000 | -0.875 | 10 | 1.770 | 0.796 | 7.000 | -1.652 | 5.045 |
| 13.13 | 6.789 | 5.875 | 7.455 | -1.580 | 10 | 2.070 | 0.931 | 7.000 | -1.113 | 2.186 |
| **Average** | **7.911** | **7.644** | **8.105** | **-0.461** | **10** | **1.653** | **0.743** | **8.308** | **-1.230** | **2.258** |
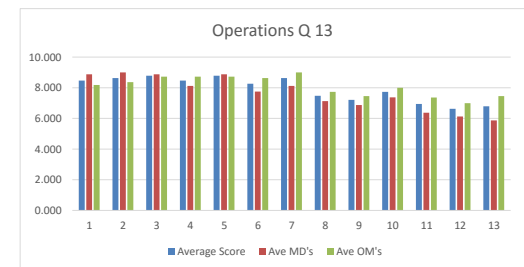


Operations Q 13

# Appendix IX.    Operations Data - Statistics Tables

| Question No 14 | Average Score | Ave MD's | Ave OM's | Difference | Possible Score | STD Deviation | Confidence Norm | Median | Skew | Kurtosis |
|---|---|---|---|---|---|---|---|---|---|---|
| 14.1 | 9.737 | 9.750 | 9.727 | 0.023 | 10 | 0.452 | 0.203 | 10.000 | -1.170 | -0.718 |
| 14.2 | 7.947 | 7.875 | 8.000 | -0.125 | 10 | 1.353 | 0.608 | 8.000 | 0.105 | -1.133 |
| 14.3 | 6.632 | 6.250 | 6.909 | -0.659 | 10 | 2.006 | 0.902 | 6.000 | -0.908 | 2.342 |
| 14.4 | 7.684 | 8.375 | 7.182 | 1.193 | 10 | 1.827 | 0.822 | 8.000 | -0.513 | -0.747 |
| 14.5 | 8.579 | 8.375 | 8.727 | -0.352 | 10 | 1.427 | 0.641 | 9.000 | -1.076 | 0.919 |
| 14.6 | 7.842 | 7.625 | 8.000 | -0.375 | 10 | 1.893 | 0.851 | 8.000 | -1.668 | 4.110 |
| 14.7 | 5.579 | 5.250 | 5.818 | -0.568 | 10 | 2.317 | 1.042 | 6.000 | -0.232 | -0.724 |
| 14.8 | 7.895 | 7.875 | 7.909 | -0.034 | 10 | 1.696 | 0.763 | 8.000 | -1.038 | 0.385 |
| Average | 7.737 | 7.672 | 7.784 | -0.112 | 10 | 1.621 | 0.729 | 7.875 | -0.813 | 0.554 |

| Question No 15 | Average Score | Ave MD's | Ave OM's | Difference | Possible Score | STD Deviation | Confidence Norm | Median | Skew | Kurtosis |
|---|---|---|---|---|---|---|---|---|---|---|
| 15.1 | 6.579 | 6.375 | 6.727 | -0.352 | 10 | 3.220 | 1.448 | 7.000 | -0.801 | -0.725 |
| 15.2 | 7.895 | 7.750 | 8.000 | -0.250 | 10 | 1.100 | 0.495 | 8.000 | -0.611 | 1.672 |
| 15.3 | 8.211 | 7.875 | 8.455 | -0.580 | 10 | 1.903 | 0.855 | 9.000 | -1.148 | 0.690 |
| 15.4 | 8.789 | 8.875 | 8.727 | 0.148 | 10 | 1.134 | 0.510 | 9.000 | -1.072 | 0.768 |
| 15.5 | 7.526 | 6.750 | 8.091 | -1.341 | 10 | 2.010 | 0.904 | 8.000 | -3.162 | 11.819 |
| 15.6 | 8.526 | 8.000 | 8.909 | -0.909 | 10 | 1.504 | 0.676 | 9.000 | -1.369 | 1.562 |
| Average | 7.921 | 7.604 | 8.152 | -0.547 | 10 | 1.812 | 0.815 | 8.333 | -1.360 | 2.631 |

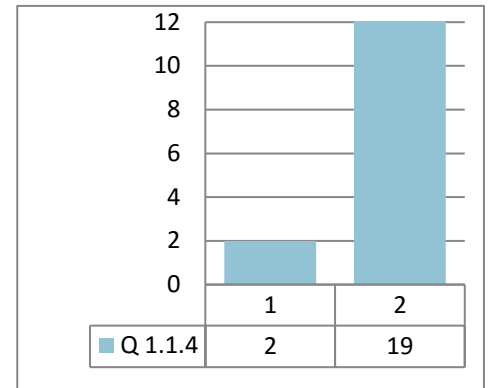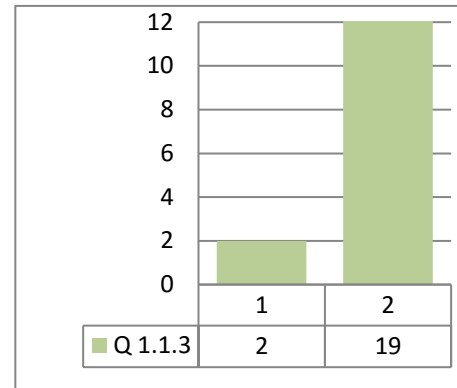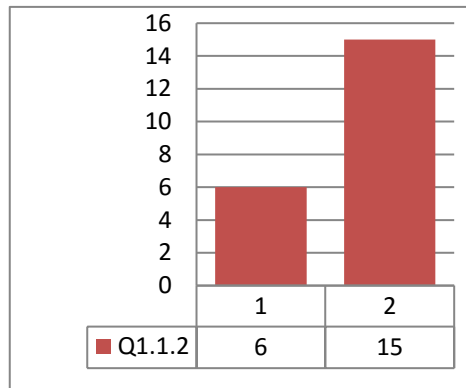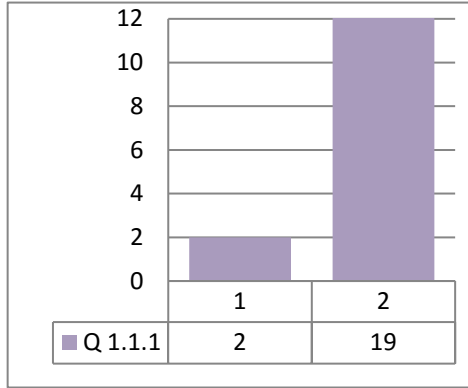| Question No 16 | Average Score | Ave MD's | Ave OM's | Difference | Possible Score | STD Deviation | Confidence Norm | Median | Skew | Kurtosis |
|---|---|---|---|---|---|---|---|---|---|---|
| 16.1 | 7.895 | 8.375 | 7.545 | 0.830 | 10 | 1.761 | 0.583 | 8.000 | -0.983 | 1.888 |
| 16.2 | 8.158 | 8.125 | 8.182 | -0.057 | 10 | 1.864 | 0.583 | 8.000 | -1.407 | 2.153 |
| 16.3 | 9.684 | 9.375 | 9.909 | -0.534 | 10 | 0.582 | 0.583 | 10.000 | -1.766 | 2.540 |
| 16.4 | 9.263 | 9.375 | 9.182 | 0.193 | 10 | 1.147 | 0.583 | 10.000 | -1.071 | -0.593 |
| 16.5 | 8.368 | 8.375 | 8.364 | 0.011 | 10 | 1.640 | 0.583 | 8.000 | -1.006 | 1.280 |
| 16.6 | 7.684 | 8.000 | 7.455 | 0.545 | 10 | 1.857 | 0.583 | 7.000 | -0.529 | 0.689 |
| 16.7 | 7.211 | 7.125 | 7.273 | -0.148 | 10 | 1.813 | 0.583 | 7.000 | -0.412 | 0.174 |
| 16.8 | 8.947 | 9.500 | 8.545 | 0.955 | 10 | 2.068 | 0.583 | 10.000 | -3.462 | 13.432 |
| 16.9 | 8.474 | 8.875 | 8.182 | 0.693 | 10 | 2.091 | 0.583 | 9.000 | -2.830 | 9.366 |
| 16.10 | 8.474 | 8.375 | 8.545 | -0.170 | 10 | 1.541 | 0.693 | 9.000 | -0.912 | -0.016 |
| Average | 8.416 | 8.550 | 8.318 | 0.232 | 10 | 1.636 | 0.594 | 8.600 | -1.438 | 3.091 |
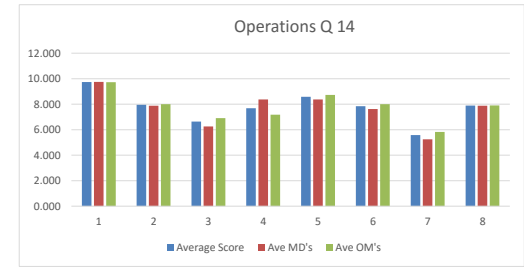


Operations Q 14



Operations Q 15
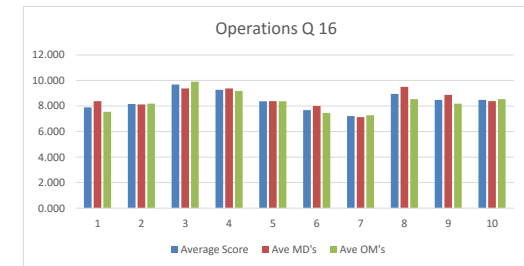


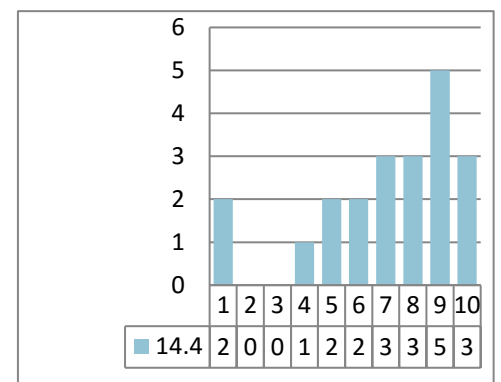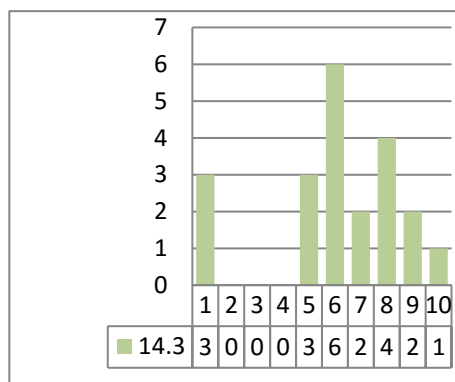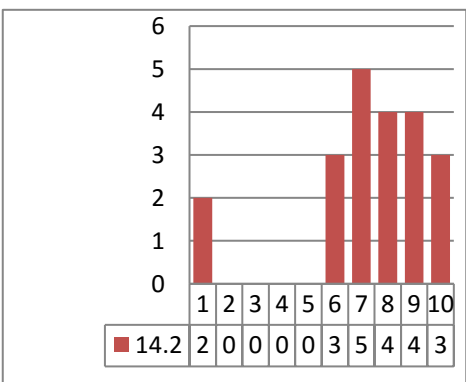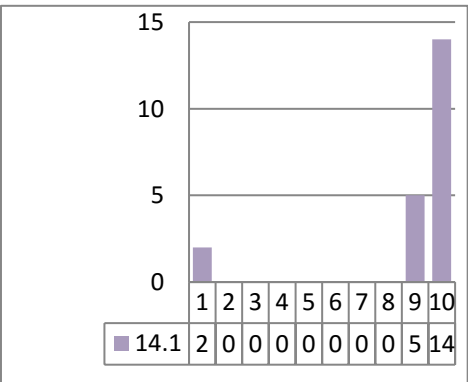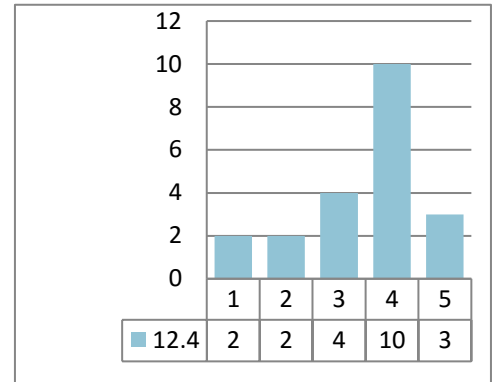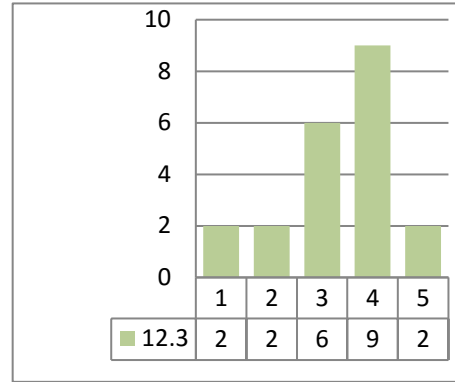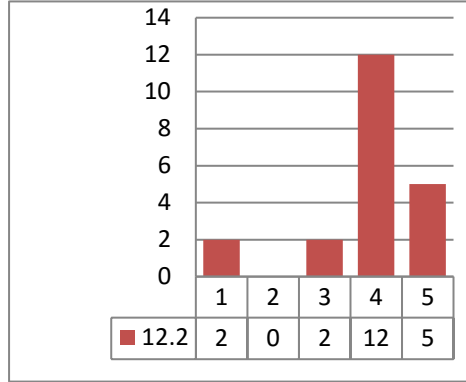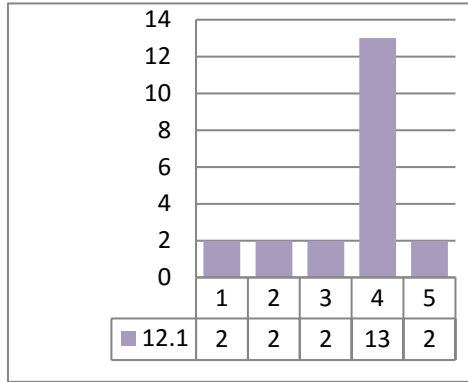Operations Q 16

# APPENDIX X. OPERATIONS DATA – FREQUENCY GRAPHS
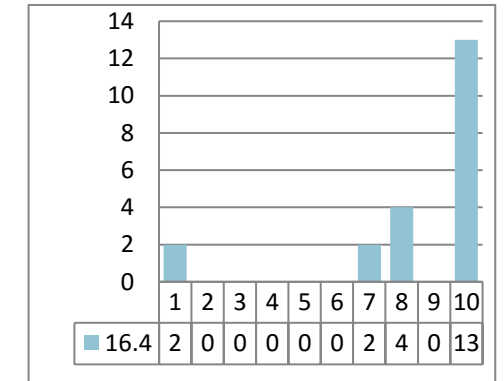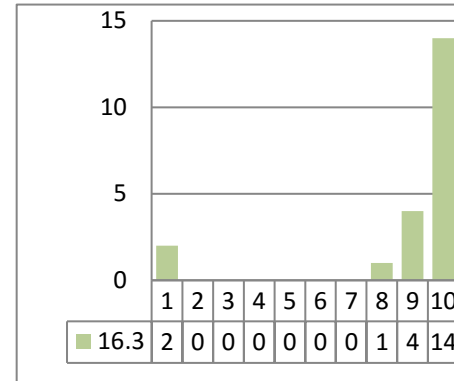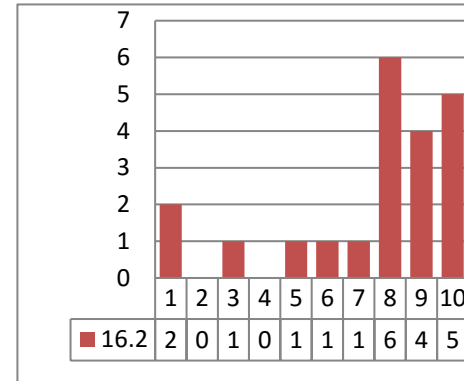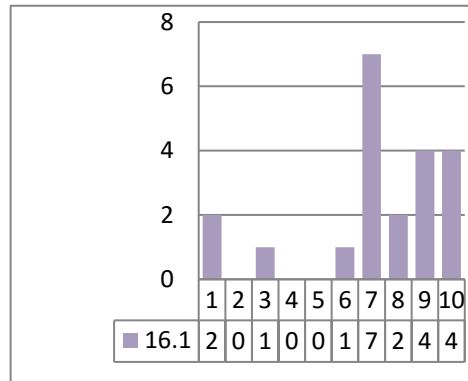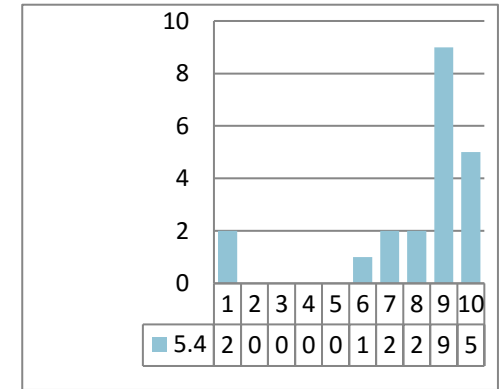
# Appendix X     Operations Data - Frequency Graphs

Question No1 P2



| Q 1.1.1 | 1 | 2 |
|---|---|---|
| | 2 | 19 |

| Q1.1.2 | 1 | 2 |
|---|---|---|
| | 6 | 15 |

| Q 1.1.3 | 1 | 2 |
|---|---|---|
| | 2 | 19 |

| Q 1.1.4 | 1 | 2 |
|---|---|---|
| | 2 | 19 |

| Q 1.2.1 | 1 | 2 | 3 | 4 | 5 |
|---|---|---|---|---|---|
| | 4 | 3 | 6 | 8 | 0 |

| Q1.2.2 | 1 | 2 | 3 | 4 | 5 |
|---|---|---|---|---|---|
| | 9 | 2 | 5 | 5 | 0 |

| Q 1.2.3 | 1 | 2 | 3 | 4 | 5 |
|---|---|---|---|---|---|
| | 7 | 10 | 2 | 2 | 0 |

| Q 1.2.4 | 1 | 2 | 3 | 4 | 5 |
|---|---|---|---|---|---|
| | 14 | 1 | 3 | 3 | 0 |

| Q 1.3.1 | 1 | 2 | 3 | 4 | 5 |
|---|---|---|---|---|---|
| | 5 | 0 | 16 | 0 | 0 |

| Q1.3.2 | 1 | 2 | 3 | 4 | 5 |
|---|---|---|---|---|---|
| | 9 | 1 | 10 | 1 | 0 |

| Q 1.3.3 | 1 | 2 | 3 | 4 | 5 |
|---|---|---|---|---|---|
| | 2 | 1 | 17 | 1 | 0 |

| Q 1.3.4 | 1 | 2 | 3 | 4 | 5 |
|---|---|---|---|---|---|
| | 11 | 1 | 9 | 0 | 0 |

# Operations Data - Frequency Graphs



| 12.1 | 1 | 2 | 3 | 4 | 5 |
|------|---|---|---|---|---|
|      | 2 | 2 | 2 | 13 | 2 |

| 12.2 | 1 | 2 | 3 | 4 | 5 |
|------|---|---|---|---|---|
|      | 2 | 0 | 2 | 12 | 5 |

| 12.3 | 1 | 2 | 3 | 4 | 5 |
|------|---|---|---|---|---|
|      | 2 | 2 | 6 | 9 | 2 |

| 12.4 | 1 | 2 | 3 | 4 | 5 |
|------|---|---|---|---|---|
|      | 2 | 2 | 4 | 10 | 3 |

| 13.1 | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 |
|------|---|---|---|---|---|---|---|---|---|----|
|      | 2 | 0 | 0 | 0 | 1 | 2 | 2 | 3 | 4 | 7 |

| 13.2 | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 |
|------|---|---|---|---|---|---|---|---|---|----|
|      | 2 | 0 | 0 | 0 | 1 | 1 | 2 | 2 | 7 | 6 |

| 13.3 | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 |
|------|---|---|---|---|---|---|---|---|---|----|
|      | 2 | 0 | 0 | 0 | 0 | 0 | 2 | 6 | 5 | 6 |

| 13.4 | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 |
|------|---|---|---|---|---|---|---|---|---|----|
|      | 2 | 0 | 0 | 0 | 0 | 2 | 3 | 3 | 6 | 5 |

| 14.1 | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 |
|------|---|---|---|---|---|---|---|---|---|----|
|      | 2 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 5 | 14 |

| 14.2 | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 |
|------|---|---|---|---|---|---|---|---|---|----|
|      | 2 | 0 | 0 | 0 | 0 | 3 | 5 | 4 | 4 | 3 |

| 14.3 | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 |
|------|---|---|---|---|---|---|---|---|---|----|
|      | 3 | 0 | 0 | 0 | 3 | 6 | 2 | 4 | 2 | 1 |

| 14.4 | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 |
|------|---|---|---|---|---|---|---|---|---|----|
|      | 2 | 0 | 0 | 1 | 2 | 2 | 3 | 3 | 5 | 3 |

| 5.2 | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 |
|-----|---|---|---|---|---|---|---|---|---|----|
|     | 5 | 1 | 0 | 0 | 2 | 1 | 3 | 1 | 5 | 3  |

| 5.2 | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 |
|-----|---|---|---|---|---|---|---|---|---|----|
|     | 2 | 0 | 0 | 0 | 1 | 0 | 5 | 8 | 4 | 1  |

| 5.3 | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 |
|-----|---|---|---|---|---|---|---|---|---|----|
|     | 2 | 0 | 0 | 2 | 0 | 1 | 2 | 4 | 4 | 6  |

| 5.4 | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 |
|-----|---|---|---|---|---|---|---|---|---|----|
|     | 2 | 0 | 0 | 0 | 0 | 1 | 2 | 2 | 9 | 5  |

| 16.1 | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 |
|------|---|---|---|---|---|---|---|---|---|----|
|      | 2 | 0 | 1 | 0 | 0 | 1 | 7 | 2 | 4 | 4  |

| 16.2 | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 |
|------|---|---|---|---|---|---|---|---|---|----|
|      | 2 | 0 | 1 | 0 | 1 | 1 | 1 | 6 | 4 | 5  |

| 16.3 | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 |
|------|---|---|---|---|---|---|---|---|---|----|
|      | 2 | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 4 | 14 |

| 16.4 | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 |
|------|---|---|---|---|---|---|---|---|---|----|
|      | 2 | 0 | 0 | 0 | 0 | 0 | 2 | 4 | 0 | 13 |

| Q 1.1.5 | 1 | 2 |
|---|---|---|
| | 3 | 18 |

| Q 1.1.6 | 1 | 2 |
|---|---|---|
| | 2 | 19 |

| Q 1.1.7 | 1 | 2 |
|---|---|---|
| | 2 | 19 |

| Q 1.1.8 | 1 | 2 |
|---|---|---|
| | 17 | 4 |

| Q 1.2.5 | 1 | 2 | 3 | 4 | 5 |
|---|---|---|---|---|---|
| | 15 | 4 | 0 | 1 | 1 |

| Q 1.2.6 | 1 | 2 | 3 | 4 | 5 |
|---|---|---|---|---|---|
| | 9 | 4 | 1 | 3 | 4 |

| Q 1.2.7 | 1 | 2 | 3 | 4 | 5 |
|---|---|---|---|---|---|
| | 19 | 0 | 0 | 0 | 2 |

| Q 1.2.8 | 1 | 2 | 3 | 4 | 5 |
|---|---|---|---|---|---|
| | 20 | 1 | 0 | 0 | 0 |

| Q 1.3.5 | 1 | 2 | 3 | 4 | 5 |
|---|---|---|---|---|---|
| | 20 | 1 | 0 | 0 | 0 |

| Q 1.3.6 | 1 | 2 | 3 | 4 | 5 |
|---|---|---|---|---|---|
| | 8 | 0 | 5 | 1 | 7 |

| Q 1.3.7 | 1 | 2 | 3 | 4 | 5 |
|---|---|---|---|---|---|
| | 16 | 3 | 0 | 0 | 2 |

| Q 1.3.8 | 1 | 2 | 3 | 4 | 5 |
|---|---|---|---|---|---|
| | 20 | 1 | 0 | 0 | 0 |

| 12.5 | 2 | 0 | 6 | 13 | 0 |
|------|---|---|---|----|---|

| 12.6 | 2 | 0 | 5 | 7 | 7 |
|------|---|---|---|---|---|

| 12.7 | 2 | 1 | 3 | 11 | 4 |
|------|---|---|---|----|---|

| 12.8 | 2 | 1 | 1 | 6 | 11 |
|------|---|---|---|---|----|

| 13.5 | 2 | 0 | 0 | 0 | 1 | 0 | 2 | 2 | 8 | 6 |
|------|---|---|---|---|---|---|---|---|---|---|

| 13.6 | 2 | 0 | 0 | 0 | 1 | 2 | 4 | 1 | 6 | 5 |
|------|---|---|---|---|---|---|---|---|---|---|

| 13.7 | 2 | 0 | 0 | 0 | 1 | 0 | 3 | 2 | 8 | 5 |
|------|---|---|---|---|---|---|---|---|---|---|

| 13.8 | 3 | 0 | 0 | 0 | 0 | 3 | 3 | 8 | 2 | 2 |
|------|---|---|---|---|---|---|---|---|---|---|

| 14.5 | 2 | 0 | 0 | 0 | 1 | 1 | 1 | 5 | 5 | 6 |
|------|---|---|---|---|---|---|---|---|---|---|

| 14.6 | 2 | 1 | 0 | 0 | 0 | 3 | 1 | 7 | 4 | 3 |
|------|---|---|---|---|---|---|---|---|---|---|

| 14.7 | 2 | 3 | 2 | 1 | 1 | 4 | 5 | 2 | 0 | 1 |
|------|---|---|---|---|---|---|---|---|---|---|

| 14.8 | 2 | 0 | 0 | 1 | 2 | 0 | 3 | 4 | 7 | 2 |
|------|---|---|---|---|---|---|---|---|---|---|

| 5.5 | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 |
|-----|---|---|---|---|---|---|---|---|---|----|
|     | 3 | 0 | 0 | 0 | 0 | 1 | 4 | 8 | 5 | 0  |

| 5.6 | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 |
|-----|---|---|---|---|---|---|---|---|---|----|
|     | 2 | 0 | 0 | 0 | 2 | 0 | 1 | 4 | 7 | 5  |

| 16.5 | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 |
|------|---|---|---|---|---|---|---|---|---|----|
|      | 2 | 0 | 0 | 1 | 0 | 1 | 2 | 7 | 1 | 7  |

| 16.6 | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 |
|------|---|---|---|---|---|---|---|---|---|----|
|      | 2 | 0 | 1 | 0 | 0 | 3 | 6 | 3 | 1 | 5  |

| 16.7 | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 |
|------|---|---|---|---|---|---|---|---|---|----|
|      | 2 | 0 | 1 | 0 | 2 | 3 | 5 | 3 | 3 | 2  |

| 16.8 | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 |
|------|---|---|---|---|---|---|---|---|---|----|
|      | 3 | 0 | 0 | 0 | 0 | 0 | 0 | 3 | 5 | 10 |

| Q 1.1.9 | 1 | 2 |
|---|---|---|
| | 6 | 15 |

| Q 1.1.10 | 1 | 2 |
|---|---|---|
| | 14 | 7 |

| Q 1.1.11 | 1 | 2 |
|---|---|---|
| | 4 | 17 |

| Q 1.2.9 | 1 | 2 | 3 | 4 | 5 |
|---|---|---|---|---|---|
| | 10 | 4 | 5 | 0 | 2 |

| Q 1.2.10 | 1 | 2 | 3 | 4 | 5 |
|---|---|---|---|---|---|
| | 14 | 1 | 3 | 1 | 2 |

| Q 1.2.11 | 1 | 2 | 3 | 4 | 5 |
|---|---|---|---|---|---|
| | 9 | 2 | 3 | 2 | 5 |

| Q 1.3.9 | 1 | 2 | 3 | 4 | 5 |
|---|---|---|---|---|---|
| | 11 | 7 | 2 | 1 | 0 |

| Q 1.3.10 | 1 | 2 | 3 | 4 | 5 |
|---|---|---|---|---|---|
| | 15 | 2 | 2 | 0 | 2 |

| Q 1.3.11 | 1 | 2 | 3 | 4 | 5 |
|---|---|---|---|---|---|
| | 14 | 1 | 0 | 2 | 4 |

| 12.9 | 1 | 2 | 3 | 4 | 5 |
|------|---|---|---|---|---|
|      | 2 | 0 | 0 | 12 | 7 |

| 12.10 | 1 | 2 | 3 | 4 | 5 |
|-------|---|---|---|---|---|
|       | 14 | 1 | 3 | 1 | 2 |

| 12.11 | 1 | 2 | 3 | 4 | 5 |
|-------|---|---|---|---|---|
|       | 2 | 0 | 2 | 8 | 9 |

| 12.12 | 1 | 2 | 3 | 4 | 5 |
|-------|---|---|---|---|---|
|       | 3 | 0 | 2 | 4 | 11 |

| 13.9 | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 |
|------|---|---|---|---|---|---|---|---|---|----|
|      | 3 | 0 | 0 | 0 | 1 | 3 | 3 | 9 | 0 | 2 |

| 13.10 | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 |
|-------|---|---|---|---|---|---|---|---|---|----|
|       | 3 | 0 | 0 | 0 | 0 | 3 | 3 | 4 | 5 | 3 |

| 13.11 | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 |
|-------|---|---|---|---|---|---|---|---|---|----|
|       | 3 | 0 | 0 | 0 | 1 | 6 | 2 | 5 | 4 | 0 |

| 13.12 | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 |
|-------|---|---|---|---|---|---|---|---|---|----|
|       | 3 | 0 | 0 | 0 | 1 | 7 | 4 | 4 | 2 | 0 |

| 16.9 | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 |
|---|---|---|---|---|---|---|---|---|---|---|
| | 3 | 0 | 0 | 0 | 0 | 1 | 1 | 2 | 9 | 5 |

| 16.10 | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 |
|---|---|---|---|---|---|---|---|---|---|---|
| | 2 | 0 | 0 | 0 | 1 | 2 | 1 | 4 | 5 | 6 |

**Appendix X        Operations Data - Frequency Graphs**
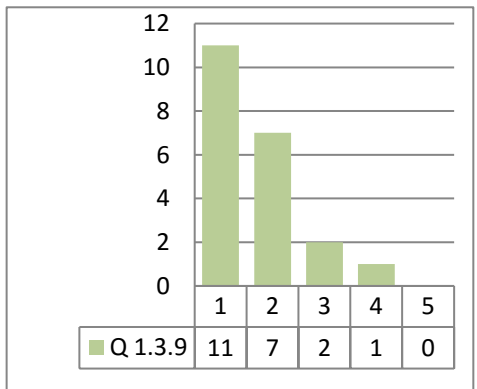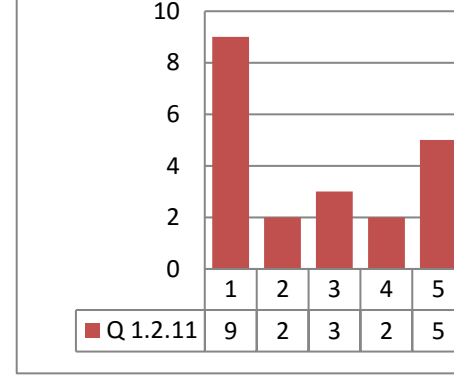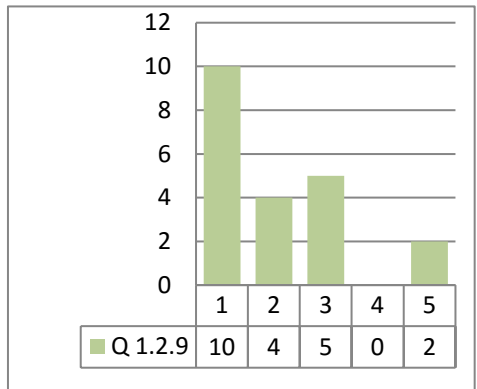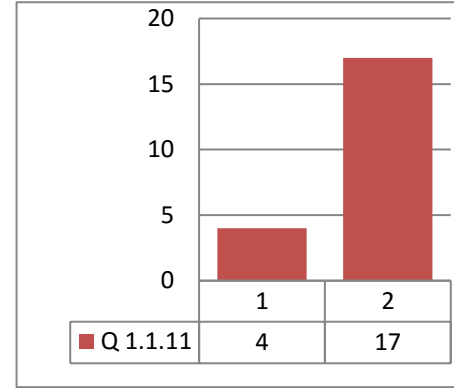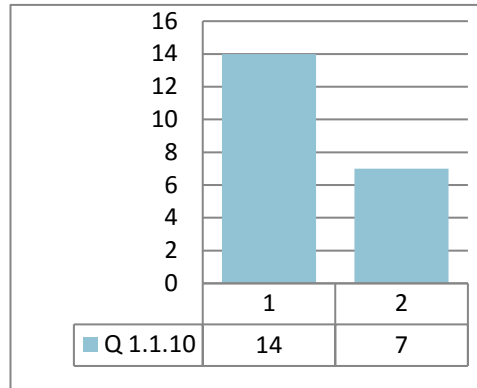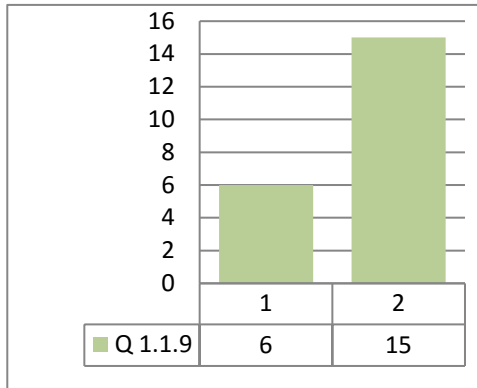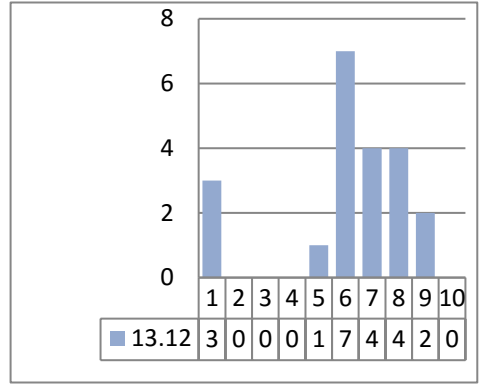
| 12.13 | 1 | 2 | 3 | 4 | 5 |
|---|---|---|---|---|---|
| | 2 | 0 | 1 | 6 | 12 |

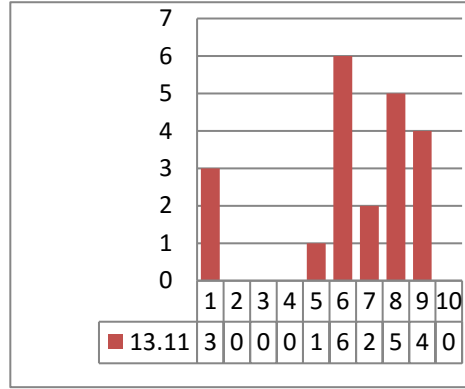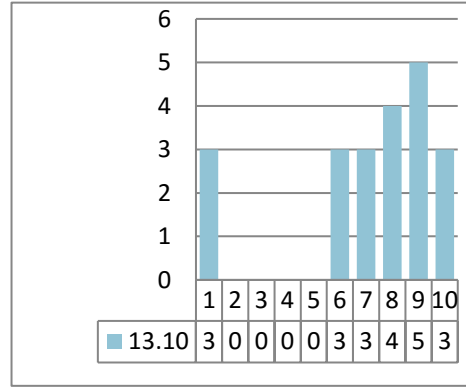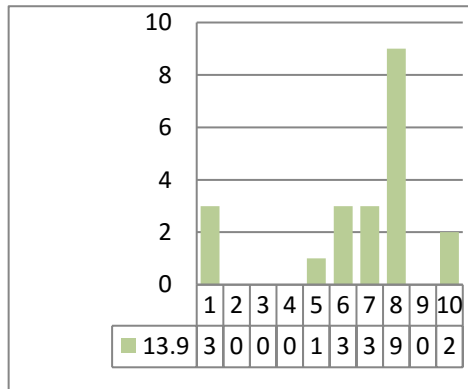| 13.13 | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 |
|---|---|---|---|---|---|---|---|---|---|---|
| | 3 | 0 | 0 | 1 | 1 | 6 | 1 | 6 | 2 | 1 |

**Appendix X        Operations Data - Frequency Graphs**

# APPENDIX XI.

# OPERATIONS – QUESTIONNAIRE

**Operations Questionnaire**

| OPERATIONS METRICS | |
|---|---|
| **Instructions: please choose your Current responsibilities and your location from the dropdown lists** | |
| **I am currently employed as a** | **Your current responsibilities** |
| **At** | **Locate your workplace from list** |
| **Please indicate main area of responsibility** | **Operations Management** |

**1** On time delivery to customers is a Commitment Metric which we use at Locate your workplace from list and is of paramount importance importance
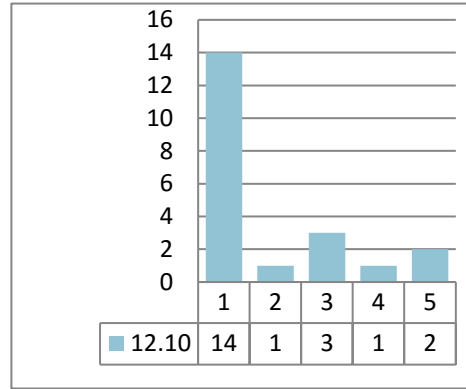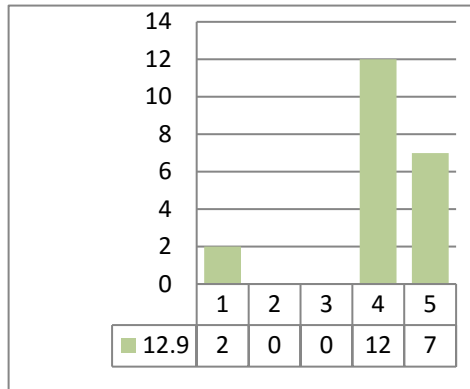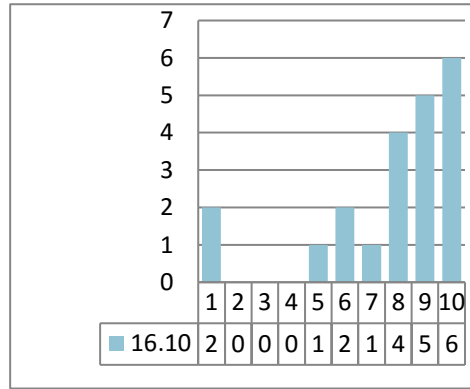
| | No | Yes |
|---|---|---|
| | O | O |

Please proceed to question 2

| <=70 | <=80 | <=90 | <=100 | 100+ |
|---|---|---|---|---|
| O | O | O | O | O |

Please proceed to question 2

| Daily | Weekly | Monthly | Quarterly | Annually |
|---|---|---|---|---|
| O | O | O | O | O |

**2** On time delivery in Full is a metric we use at Locate your workplace from list and find it to be a more important metric that simple On time delivery that was mentioned in Question 1

| | No | Yes |
|---|---|---|
| | O | O |

Please proceed to question 3

| <=70 | <=80 | <=90 | <=100 | 100+ |
|---|---|---|---|---|
| O | O | O | O | O |

Please proceed to question 3

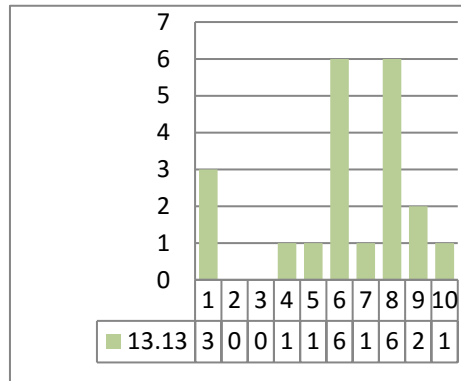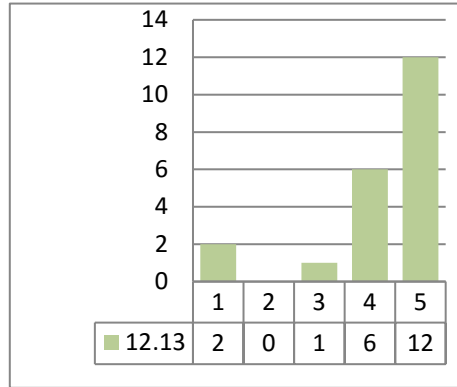| Daily | Weekly | Monthly | Quarterly | Annually |
|---|---|---|---|---|
| O | O | O | O | O |

**3** 6S audits are done regularly at Locate your workplace from list and contribute to the overall continuous improvement and Safety Foundation

| | No | Yes |
|---|---|---|
| | O | O |

Please proceed to question 4

| <=70 | <=80 | <=90 | <=100 | 100+ |
|---|---|---|---|---|
| O | O | O | O | O |

Please proceed to question 4

| Daily | Weekly | Monthly | Quarterly | Annually |
|---|---|---|---|---|
| O | O | O | O | O |

**4** At Locate your workplace from list we conduct a scheduled maintenance program and document machinery efficiency ratings using an internal plant audit system.(if yes, please provide sample documentation with this submission)

| | No | Yes |
|---|---|---|
| | O | O |

Please proceed to question 5

| <=70 | <=80 | <=90 | <=100 | 100+ |
|---|---|---|---|---|
| O | O | O | O | O |

Please proceed to question 5

| Daily | Weekly | Monthly | Quarterly | Annually |
|---|---|---|---|---|
| O | O | O | O | O |

| 5 | At Locate your workplace from list We measure average lead time and consider it a customer speed metric | | | | No | Yes |
|---|---|---|---|---|---|---|
| | | | | | ○ | ○ |
| | Please proceed to question 6 | <=5 weeks | <=6weeks | <=7 weeks | <=8 weeks | <=9weeks |
| | | ○ | ○ | ○ | ○ | ○ |
| | Please proceed to question 6 | <=5 weeks | <=6weeks | <=7 weeks | <=8 weeks | <=9weeks |
| | | ○ | ○ | ○ | ○ | ○ |

| 6 | At Locate your workplace from list  we consider Sales Per Employee an important people utilization metric | | | | No | Yes |
|---|---|---|---|---|---|---|
| | | | | | ○ | ○ |
| | Please proceed to question 7 | <=$ 80 000 | <=$ 100 000 | <=$ 150 000 | <=$ 200 000 | <=$ 250 000 |
| | | ○ | ○ | ○ | ○ | ○ |
| | Please proceed to question 7 | <=$ 80 000 | <=$ 100 000 | <= $ 150 000 | <=$ 200 000 | <=$ 250 000 |
| | | ○ | ○ | ○ | ○ | ○ |

| 7 | At Locate your workplace from list  we consider Profit Per Employee an important people utilization metric | | | | No | Yes |
|---|---|---|---|---|---|---|
| | | | | | ○ | ○ |
| | Please proceed to question 8 | <=$ 20 000 | <=$ 30 000 | <= $ 40 000 | <=$ 50 000 | <=$ 60 000 + |
| | | ○ | ○ | ○ | ○ | ○ |
| | Please proceed to question 8 | <=$ 20 000 | <=$ 30 000 | <= $ 40 000 | <=$ 50 000 | <=$ 60 000 + |
| | | ○ | ○ | ○ | ○ | ○ |

| 8 | At Locate your workplace from list Sales per Square Meter Facility Utilization Metric is an important measurement | | | | No | Yes |
|---|---|---|---|---|---|---|
| | | | | | ○ | ○ |
| | Please proceed to question 9 | <=$ 120 000 | <=$ 200 000 | <= $300 000 | <=$ 400 000 | $450 000 + |
| | | ○ | ○ | ○ | ○ | ○ |
| | Please proceed to question 9 | <=$ 120 000 | <=$ 200 000 | <= $300 000 | <=$ 400 000 | $450 000 + |
| | | ○ | ○ | ○ | ○ | ○ |

# Operations Questionnaire

| | | | | | | | No | Yes |
|---|---|---|---|---|---|---|---|---|
| **9** | At Locate your workplace from list Inventory Turns is a Leverage Metric we use and believe that it is an important indicatore of our ability to remain competitive both long and short term. | | | | | | ○ | ○ |
| | | | <= 80 Days | <= 100 Days | <= 120 Days | <= 150 Days | 150 Days + | |
| | Please proceed to question 10 | | ○ | ○ | ○ | ○ | ○ | |
| | | | <= 80 Days | <= 100 Days | <= 120 Days | <= 150 Days | 150 Days + | |
| | Please proceed to question 10 | | ○ | ○ | ○ | ○ | ○ | |

| | | | | | | | No | Yes |
|---|---|---|---|---|---|---|---|---|
| **10** | At Locate your workplace from list the shippable Backlog is analysed and used in the Average Lead Time metric | | | | | | ○ | ○ |
| | | | <= 2 Days | <= 5 Days | <= 10 Days | <= 15 Days | 20 Days + | |
| | Please proceed to question 11 | | ○ | ○ | ○ | ○ | ○ | |
| | | | <= 2 Days | <= 5 Days | <= 10 Days | <= 15 Days | 20 Days + | |
| | Please proceed to question 11 | | ○ | ○ | ○ | ○ | ○ | |

| | | | | | | | No | Yes |
|---|---|---|---|---|---|---|---|---|
| **11** | At Locate your workplace from list Training on lean manufacturing and Kaisen Events is important to us and we train all our staff for at least (hours) per annum | | | | | | ○ | ○ |
| | | | <= 8 Hours | <= 12 Hours | <= 18 Hours | <= 24 Hours | 25 Hours + | |
| | Please proceed to question 12 | | ○ | ○ | ○ | ○ | ○ | |
| | | | <= 8 Hours | <= 12 Hours | <= 18 Hours | <= 24 Hours | 25 Hours + | |
| | Please proceed to question 12 | | ○ | ○ | ○ | ○ | ○ | |

| Question No 12 | **In the Operations Department of Locate your workplace from list we understand that** | Strongly Disagree | Disagree | Neutral | Agree | Strongly Agree |
|---|---|---|---|---|---|---|
| 12.1 | Our Subsidiaries strategy is aligned to the PLP Corporate Strategy | O | O | O | O | O |
| 12.2 | Our Operations Strategy is Aligned to the Subsidiaries Strategy | O | O | O | O | O |
| 12.3 | Our Subsidiaries Mission & Vision is Clear | O | O | O | O | O |
| 12.4 | Our Subsidiaries Values are clear | O | O | O | O | O |
| 12.5 | Our subsidiaries Strategic Objectives are clear | O | O | O | O | O |
| 12.6 | Our individual Key Performance Areas Are clear | O | O | O | O | O |
| 12.7 | We have a budget which is aligned to the subsidiary budget | O | O | O | O | O |
| 12.8 | Quality is considered an important strategic objective | O | O | O | O | O |
| 12.9 | Price is considered an important strategic objective | O | O | O | O | O |
| 12.10 | Process control development and innovation is considered an important strategic objective | O | O | O | O | O |
| 12.11 | Product development is considered an important strategic objective | O | O | O | O | O |
| 12.12 | Innovation is considered an important strategic objective | O | O | O | O | O |
| 12.13 | Management of people is considered an important strategic objective | O | O | O | O | O |

**Corporate and Subsidiary Strategy in the Operations Environment** (title of the above table)

**Financial Metrics in the Operations Environment**

| Question No 13 | **In the Operations Department of Locate your workplace from list we understand that the following financial metrics are an important part of our contribution to the long term suatainability of the Organisation. please rate 1 to 10, 10 being most important and 1 being of no importance** | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 |
|---|---|---|---|---|---|---|---|---|---|---|---|
| 13.1 | The operations Strategy is Aligned to the subsidiaries strategy | O | O | O | O | O | O | O | O | O | O |
| 13.2 | Labour & Overhead Expenses | O | O | O | O | O | O | O | O | O | O |
| 13.3 | Gross Margin | O | O | O | O | O | O | O | O | O | O |
| 13.4 | Gross Profit | O | O | O | O | O | O | O | O | O | O |
| 13.5 | Operating profit | O | O | O | O | O | O | O | O | O | O |
| 13.6 | Pre-tax Profit | O | O | O | O | O | O | O | O | O | O |
| 13.7 | Net Profit | O | O | O | O | O | O | O | O | O | O |
| 13.8 | Working capital intensity | O | O | O | O | O | O | O | O | O | O |
| 13.9 | Working capital turnover | O | O | O | O | O | O | O | O | O | O |
| 13.10 | Return on Total Assets %. (ROTA) | O | O | O | O | O | O | O | O | O | O |
| 13.11 | Current Ratio | O | O | O | O | O | O | O | O | O | O |
| 13.12 | Quick Ratio | O | O | O | O | O | O | O | O | O | O |
| 13.13 | Cash Profitability of Total Assets | O | O | O | O | O | O | O | O | O | O |

## Super 8 Metrics

| Question No 14: Please rate the following Metrics individualy from 1 to 10 based on their contribution to the long term sustainability of. Locate your workplace from list e.g. 10 being most important and 1 being of not used at all | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 |
|---|---|---|---|---|---|---|---|---|---|---|
| 14.1 Average Monthly On Time Delivery | O | O | O | O | O | O | O | O | O | O |
| 14.2 Average Monthly 6S Organization Audit Score | O | O | O | O | O | O | O | O | O | O |
| 14.3 Annual Fixed Assets to Sales Ratio | O | O | O | O | O | O | O | O | O | O |
| 14.4 Average Inventory Turns Measure Monthly | O | O | O | O | O | O | O | O | O | O |
| 14.5 Average Customer Lead Time (Months) | O | O | O | O | O | O | O | O | O | O |
| 14.6 Average Monthly USD Sales Per Employee | O | O | O | O | O | O | O | O | O | O |
| 14.7 Average Monthly USD sales per Square Meter | O | O | O | O | O | O | O | O | O | O |
| 14.8 New Product Revenue (% Total Sales) | O | O | O | O | O | O | O | O | O | O |

## Lean Manufacturing & Continuous Improvement

| Question No 15: Please rate the following lean and continious improvement metrics / initiatives individually from 1 to 10 based on their contribution to the long term sustainability of Locate your workplace from list 10 being most important and 1 being of no importance at all | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 |
|---|---|---|---|---|---|---|---|---|---|---|
| 15.1 Theory of Constraints | O | O | O | O | O | O | O | O | O | O |
| 15.2 Value stream Mapping | O | O | O | O | O | O | O | O | O | O |
| 15.3 Variance Against standards | O | O | O | O | O | O | O | O | O | O |
| 15.4 Labour efficiency | O | O | O | O | O | O | O | O | O | O |
| 15.5 Planning meetings | O | O | O | O | O | O | O | O | O | O |
| 15.6 Planning reports | O | O | O | O | O | O | O | O | O | O |

| Quality measurement metrics | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **Question No 16** | **Please rate the following Quality Metrics individualy from 1 to 10 based on their contribution to the long term sustainability of Locate your workplace from list 10 being most important and 1 being of no importance at all** | **1** | **2** | **3** | **4** | **5** | **6** | **7** | **8** | **9** | **10** | |
| 16.1 | Overall Scrap rate in %: | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | |
| 16.2 | Overall Scrap rate in ($) | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | |
| 16.3 | On time delivery: | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | |
| 16.4 | Number of Non Conformances received from external customers | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | |
| 16.5 | Number of internal Non Conformances received | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | |
| 16.6 | Average time to close out NCR. | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | |
| 16.7 | Av. routine testing turnaround time | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | |
| 16.8 | On-going certification to ISO 9001 | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | |
| 16.9 | Completion of Internal Audits | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | |
| 16.10 | On time completion of quality projects | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | |

| Question No 17 | Within Locate your workplace from list there are other Operational Metrics which we believe are important to long term sustainability which are not mentioned in this Questionnaire and these are: |
|---|---|
| 17.1 | |
| 17.2 | |
| 17.3 | |
| 17.4 | |
| 17.5 | |

| Question No 18 | Please include other Operational metrics used that are not included in the above, please provide a calculation methodology and a rationale for their use |
|---|---|
| 18.1 | |
| 18.2 | |
| 18.3 | |
| 18.4 | |
| 18.5 | |

# End of Questionnaire, thank you!

# APPENDIX XII.
# OPERATIONS DATA –
# CRONBACH'S ALPHA

# Operations Data - Cronbach's Alpha

| Cronbach's alpha | 0.7719 |
|---|---|

**Anova: Two-Factor Without Replication**

| Question No 1 Part 1 | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | 2 | 2 | 2 | 2 | 2 | 2 | 1 | 1 | 2 | 2 | 2 |
| | 2 | 2 | 2 | 1 | 0 | 1 | 1 | 0 | 2 | 0 | 2 |
| | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 1 | 2 |
| | 2 | 2 | 2 | 1 | 2 | 2 | 1 | 1 | 2 | 1 | 2 |
| | 2 | 2 | 2 | 2 | 1 | 1 | 1 | 1 | 2 | 1 | 2 |
| | 2 | 2 | 2 | 1 | 2 | 2 | 1 | 1 | 2 | 2 | 2 |
| | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 |
| | 2 | 1 | 2 | 1 | 1 | 2 | 1 | 1 | 1 | 1 | 1 |
| | 2 | 1 | 2 | 2 | 1 | 2 | 1 | 0 | 1 | 1 | 2 |
| | 2 | 2 | 2 | 2 | 2 | 2 | 1 | 1 | 1 | 1 | 2 |
| | 2 | 2 | 2 | 1 | 2 | 2 | 1 | 1 | 2 | 1 | 2 |
| | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 1 | 2 | 1 | 2 |
| | 2 | 2 | 2 | 1 | 2 | 2 | 1 | 1 | 2 | 2 | 2 |
| | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 |
| | 2 | 2 | 2 | 1 | 2 | 2 | 2 | 1 | 2 | 1 | 2 |
| | 2 | 2 | 2 | 1 | 2 | 2 | 1 | 1 | 2 | 2 | 2 |
| | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 1 | 2 |
| | 2 | 1 | 2 | 1 | 1 | 2 | 1 | 1 | 1 | 1 | 1 |
| | 2 | 1 | 2 | 2 | 2 | 2 | 2 | 0 | 2 | 2 | 2 |

| SUMMARY | Count | Sum | Average | Variance |
|---|---|---|---|---|
| Row 1 | 11 | 20 | 1.818182 | 0.163636 |
| Row 2 | 11 | 13 | 1.181818 | 0.763636 |
| Row 3 | 11 | 21 | 1.909091 | 0.090909 |
| Row 4 | 11 | 18 | 1.636364 | 0.254545 |
| Row 5 | 11 | 17 | 1.545455 | 0.272727 |
| Row 6 | 11 | 19 | 1.727273 | 0.218182 |
| Row 7 | 11 | 22 | 2 | 0 |
| Row 8 | 11 | 14 | 1.272727 | 0.218182 |
| Row 9 | 11 | 15 | 1.363636 | 0.454545 |
| Row 10 | 11 | 18 | 1.636364 | 0.254545 |
| Row 11 | 11 | 18 | 1.636364 | 0.254545 |
| Row 12 | 11 | 20 | 1.818182 | 0.163636 |
| Row 13 | 11 | 19 | 1.727273 | 0.218182 |
| Row 14 | 11 | 22 | 2 | 0 |
| Row 15 | 11 | 19 | 1.727273 | 0.218182 |
| Row 16 | 11 | 19 | 1.727273 | 0.218182 |
| Row 17 | 11 | 21 | 1.909091 | 0.090909 |
| Row 18 | 11 | 14 | 1.272727 | 0.218182 |
| Row 19 | 11 | 19 | 1.727273 | 0.418182 |
| | | | | |
| Column 1 | 19 | 38 | 2 | 0 |
| Column 2 | 19 | 34 | 1.789474 | 0.175439 |
| Column 3 | 19 | 38 | 2 | 0 |
| Column 4 | 19 | 29 | 1.526316 | 0.263158 |
| Column 5 | 19 | 32 | 1.684211 | 0.339181 |
| Column 6 | 19 | 36 | 1.894737 | 0.099415 |
| Column 7 | 19 | 26 | 1.368421 | 0.245614 |
| Column 8 | 19 | 20 | 1.052632 | 0.385965 |
| Column 9 | 19 | 34 | 1.789474 | 0.175439 |
| Column 10 | 19 | 25 | 1.315789 | 0.339181 |
| Column 11 | 19 | 36 | 1.894737 | 0.099415 |

ANOVA

| Source of Variation | SS | df | MS | F | P-value | F crit |
|---|---|---|---|---|---|---|
| Rows | 11.64593301 | 18 | 0.646996279 | 4.384005764 | 8.98414E-08 | 1.661431688 |
| Columns | 18.34449761 | 10 | 1.834449761 | 12.43011527 | 2.71757E-16 | 1.883619098 |
| Error | 26.5645933 | 180 | 0.147581074 | | | |
| | | | | | | |
| Total | 56.55502392 | 208 | | | | |

# Operations Data - Cronbach's Alpha

| Cronbach's alpha | 0.5542 |
|---|---|

**Anova: Two-Factor Without Replication**

| Question No 1 part 2 | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | 4 | 4 | 2 | 3 | 1 | 5 | 0 | 0 | 3 | 2 | 4 |
| | 1 | 1 | 2 | 0 | 0 | 0 | 0 | 0 | 2 | 0 | 3 |
| | 4 | 4 | 2 | 1 | 2 | 5 | 5 | 1 | 3 | 0 | 1 |
| | 3 | 3 | 1 | 0 | 2 | 4 | 0 | 0 | 3 | 0 | 1 |
| | 4 | 3 | 4 | 4 | 1 | 0 | 0 | 0 | 0 | 0 | 3 |
| | 4 | 4 | 2 | 1 | 1 | 2 | 0 | 0 | 5 | 3 | 5 |
| | 2 | 2 | 4 | 3 | 0 | 4 | 1 | 1 | 3 | 5 | 3 |
| | 3 | 0 | 1 | 0 | 0 | 5 | 0 | 0 | 0 | 0 | 0 |
| | 4 | 0 | 2 | 4 | 0 | 5 | 0 | 0 | 0 | 0 | 2 |
| | 4 | 4 | 3 | 4 | 1 | 1 | 0 | 0 | 0 | 0 | 4 |
| | 3 | 3 | 2 | 0 | 1 | 1 | 0 | 0 | 1 | 0 | 1 |
| | 4 | 3 | 3 | 0 | 1 | 2 | 1 | 1 | 2 | 0 | 2 |
| | 3 | 1 | 2 | 0 | 4 | 4 | 0 | 0 | 1 | 3 | 1 |
| | 2 | 2 | 1 | 1 | 2 | 1 | 1 | 1 | 1 | 5 | 5 |
| | 3 | 3 | 2 | 0 | 1 | 0 | 5 | 0 | 3 | 0 | 5 |
| | 4 | 4 | 2 | 1 | 1 | 2 | 0 | 0 | 5 | 3 | 5 |
| | 1 | 1 | 2 | 3 | 5 | 3 | 1 | 2 | 2 | 0 | 1 |
| | 3 | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | 2 | 0 | 1 | 2 | 2 | 2 | 1 | 1 | 2 | 4 | 5 |

| SUMMARY | Count | Sum | Average | Variance |
|---|---|---|---|---|
| Row 1 | 11 | 28 | 2.545455 | 2.872727 |
| Row 2 | 11 | 9 | 0.818182 | 1.163636 |
| Row 3 | 11 | 28 | 2.545455 | 3.072727 |
| Row 4 | 11 | 17 | 1.545455 | 2.272727 |
| Row 5 | 11 | 19 | 1.727273 | 3.418182 |
| Row 6 | 11 | 27 | 2.454545 | 3.472727 |
| Row 7 | 11 | 28 | 2.545455 | 2.272727 |
| Row 8 | 11 | 9 | 0.818182 | 2.763636 |
| Row 9 | 11 | 17 | 1.545455 | 3.872727 |
| Row 10 | 11 | 21 | 1.909091 | 3.490909 |
| Row 11 | 11 | 12 | 1.090909 | 1.290909 |
| Row 12 | 11 | 19 | 1.727273 | 1.618182 |
| Row 13 | 11 | 19 | 1.727273 | 2.418182 |
| Row 14 | 11 | 22 | 2 | 2.4 |
| Row 15 | 11 | 22 | 2 | 3.8 |
| Row 16 | 11 | 27 | 2.454545 | 3.472727 |
| Row 17 | 11 | 21 | 1.909091 | 1.890909 |
| Row 18 | 11 | 4 | 0.363636 | 0.854545 |
| Row 19 | 11 | 22 | 2 | 2 |
| | | | | |
| Column 1 | 19 | 58 | 3.052632 | 1.052632 |
| Column 2 | 19 | 42 | 2.210526 | 2.397661 |
| Column 3 | 19 | 39 | 2.052632 | 0.830409 |
| Column 4 | 19 | 27 | 1.421053 | 2.479532 |
| Column 5 | 19 | 25 | 1.315789 | 1.783626 |
| Column 6 | 19 | 46 | 2.421053 | 3.590643 |
| Column 7 | 19 | 15 | 0.789474 | 2.397661 |
| Column 8 | 19 | 7 | 0.368421 | 0.356725 |
| Column 9 | 19 | 36 | 1.894737 | 2.54386 |
| Column 10 | 19 | 25 | 1.315789 | 3.561404 |
| Column 11 | 19 | 51 | 2.684211 | 3.339181 |

ANOVA

| Source of Variation | SS | df | MS | F | P-value | F crit |
|---|---|---|---|---|---|---|
| Rows | 80.2488 | 18 | 4.458267 | 2.243146 | 0.003866 | 1.661432 |
| Columns | 126.4306 | 10 | 12.64306 | 6.361268 | 2.39E-08 | 1.883619 |
| Error | 357.7512 | 180 | 1.987507 | | | |
| | | | | | | |
| Total | 564.4306 | 208 | | | | |

# Appendix XII Operations Data - Cronbach's Alpha

| Cronbach's alpha | 0.6799 |
|---|---|

**Anova: Two-Factor Without Replication**

| Question No 1 part 3 | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | 3 | 1 | 3 | 2 | 1 | 5 | 0 | 0 | 1 | 2 | 4 |
| | 1 | 1 | 3 | 0 | 0 | 0 | 0 | 0 | 2 | 0 | 0 |
| | 3 | 3 | 3 | 3 | 1 | 5 | 5 | 1 | 2 | 0 | 0 |
| | 3 | 3 | 4 | 0 | 1 | 5 | 0 | 0 | 1 | 0 | 0 |
| | 3 | 3 | 2 | 3 | 1 | 0 | 0 | 0 | 4 | 0 | 0 |
| | 3 | 3 | 3 | 3 | 1 | 3 | 0 | 0 | 3 | 3 | 5 |
| | 3 | 3 | 3 | 3 | 0 | 4 | 2 | 1 | 2 | 5 | 4 |
| | 3 | 0 | 3 | 0 | 0 | 5 | 0 | 0 | 0 | 0 | 0 |
| | 1 | 0 | 3 | 3 | 0 | 5 | 0 | 0 | 0 | 0 | 0 |
| | 3 | 4 | 3 | 1 | 1 | 1 | 0 | 0 | 0 | 0 | 0 |
| | 3 | 3 | 3 | 0 | 1 | 1 | 0 | 0 | 1 | 0 | 1 |
| | 1 | 1 | 3 | 1 | 1 | 3 | 1 | 1 | 2 | 0 | 0 |
| | 3 | 2 | 3 | 0 | 1 | 5 | 0 | 0 | 1 | 2 | 2 |
| | 3 | 3 | 3 | 3 | 1 | 1 | 1 | 1 | 1 | 5 | 5 |
| | 3 | 3 | 3 | 0 | 1 | 5 | 5 | 0 | 2 | 0 | 0 |
| | 3 | 3 | 3 | 3 | 1 | 3 | 0 | 0 | 3 | 3 | 5 |
| | 3 | 3 | 3 | 3 | 2 | 3 | 2 | 2 | 2 | 0 | 1 |
| | 3 | 0 | 3 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | 3 | 0 | 3 | 3 | 1 | 3 | 2 | 1 | 2 | 1 | 5 |

| SUMMARY | Count | Sum | Average | Variance |
|---|---|---|---|---|
| Row 1 | 11 | 22 | 2 | 2.6 |
| Row 2 | 11 | 7 | 0.636364 | 1.054545 |
| Row 3 | 11 | 26 | 2.363636 | 3.054545 |
| Row 4 | 11 | 17 | 1.545455 | 3.472727 |
| Row 5 | 11 | 16 | 1.454545 | 2.472727 |
| Row 6 | 11 | 27 | 2.454545 | 2.272727 |
| Row 7 | 11 | 30 | 2.727273 | 2.018182 |
| Row 8 | 11 | 11 | 1 | 3.2 |
| Row 9 | 11 | 12 | 1.090909 | 3.090909 |
| Row 10 | 11 | 13 | 1.181818 | 2.163636 |
| Row 11 | 11 | 13 | 1.181818 | 1.563636 |
| Row 12 | 11 | 14 | 1.272727 | 1.018182 |
| Row 13 | 11 | 19 | 1.727273 | 2.418182 |
| Row 14 | 11 | 27 | 2.454545 | 2.472727 |
| Row 15 | 11 | 22 | 2 | 3.8 |
| Row 16 | 11 | 27 | 2.454545 | 2.272727 |
| Row 17 | 11 | 24 | 2.181818 | 0.963636 |
| Row 18 | 11 | 6 | 0.545455 | 1.472727 |
| Row 19 | 11 | 24 | 2.181818 | 1.963636 |
| | | | | |
| Column 1 | 19 | 51 | 2.684211 | 0.561404 |
| Column 2 | 19 | 39 | 2.052632 | 1.830409 |
| Column 3 | 19 | 57 | 3 | 0.111111 |
| Column 4 | 19 | 31 | 1.631579 | 2.023392 |
| Column 5 | 19 | 15 | 0.789474 | 0.28655 |
| Column 6 | 19 | 57 | 3 | 3.777778 |
| Column 7 | 19 | 18 | 0.947368 | 2.608187 |
| Column 8 | 19 | 7 | 0.368421 | 0.356725 |
| Column 9 | 19 | 29 | 1.526316 | 1.263158 |
| Column 10 | 19 | 21 | 1.105263 | 2.988304 |
| Column 11 | 19 | 32 | 1.684211 | 4.672515 |

## ANOVA

| Source of Variation | SS | df | MS | F | P-value | F crit |
|---|---|---|---|---|---|---|
| Rows | 87.74162679 | 18 | 4.874534822 | 3.123701155 | 5.25399E-05 | 1.661431688 |
| Columns | 152.5645933 | 10 | 15.25645933 | 9.776649746 | 5.61604E-13 | 1.883619098 |
| Error | 280.8899522 | 180 | 1.560499734 | | | |
| | | | | | | |
| Total | 521.1961722 | 208 | | | | |

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| Cronbach's alpha | 0.7734 |
|---|---|

**Anova: Two-Factor Without Replication**

| Question No 12 | 12.1 | 12.2 | 12.3 | 12.4 | 12.5 | 12.6 | 12.7 | 12.8 | 12.9 | 12.10 | 12.11 | 12.12 | 12.13 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | 4 | 5 | 4 | 3 | 3 | 5 | 2 | 3 | 4 | 3 | 4 | 5 | 5 |
| | 5 | 5 | 4 | 4 | 4 | 5 | 5 | 5 | 5 | 4 | 4 | 1 | 5 |
| | 4 | 4 | 2 | 2 | 4 | 5 | 4 | 5 | 4 | 3 | 5 | 5 | 5 |
| | 3 | 4 | 4 | 4 | 3 | 5 | 5 | 4 | 5 | 4 | 5 | 5 | 5 |
| | 4 | 4 | 3 | 4 | 4 | 4 | 3 | 4 | 4 | 5 | 5 | 5 | 5 |
| | 4 | 4 | 3 | 5 | 4 | 4 | 4 | 5 | 4 | 5 | 5 | 5 | 5 |
| | 4 | 3 | 4 | 4 | 4 | 4 | 4 | 4 | 4 | 3 | 4 | 3 | 4 |
| | 4 | 4 | 4 | 4 | 4 | 3 | 4 | 4 | 4 | 4 | 4 | 4 | 4 |
| | 3 | 4 | 4 | 3 | 3 | 4 | 3 | 5 | 4 | 4 | 5 | 5 | 4 |
| | 2 | 4 | 2 | 2 | 3 | 3 | 3 | 2 | 4 | 3 | 3 | 4 | 3 |
| | 5 | 5 | 3 | 3 | 4 | 5 | 4 | 5 | 5 | 5 | 5 | 5 | 5 |
| | 4 | 4 | 5 | 4 | 4 | 5 | 4 | 4 | 5 | 4 | 4 | 4 | 4 |
| | 4 | 4 | 3 | 5 | 4 | 3 | 4 | 5 | 4 | 2 | 3 | 5 | 5 |
| | 4 | 4 | 5 | 4 | 4 | 5 | 4 | 5 | 5 | 5 | 5 | 6 | 5 |
| | 4 | 5 | 4 | 4 | 4 | 4 | 5 | 5 | 5 | 5 | 4 | 5 | 5 |
| | 4 | 4 | 3 | 5 | 4 | 4 | 4 | 5 | 4 | 5 | 5 | 5 | 5 |
| | 4 | 3 | 4 | 4 | 3 | 3 | 4 | 4 | 4 | 4 | 4 | 3 | 4 |
| | 4 | 5 | 3 | 3 | 3 | 3 | 4 | 5 | 5 | 4 | 4 | 4 | 4 |
| | 2 | 4 | 4 | 4 | 4 | 4 | 5 | 5 | 4 | 5 | 5 | 5 | 5 |

| SUMMARY | Count | Sum | Average | Variance |
|---|---|---|---|---|
| Row 1 | 13 | 50 | 3.846154 | 0.974359 |
| Row 2 | 13 | 56 | 4.307692 | 1.230769 |
| Row 3 | 13 | 52 | 4 | 1.166667 |
| Row 4 | 13 | 56 | 4.307692 | 0.564103 |
| Row 5 | 13 | 54 | 4.153846 | 0.474359 |
| Row 6 | 13 | 57 | 4.384615 | 0.423077 |
| Row 7 | 13 | 49 | 3.769231 | 0.192308 |
| Row 8 | 13 | 51 | 3.923077 | 0.076923 |
| Row 9 | 13 | 51 | 3.923077 | 0.576923 |
| Row 10 | 13 | 38 | 2.923077 | 0.576923 |
| Row 11 | 13 | 59 | 4.538462 | 0.602564 |
| Row 12 | 13 | 55 | 4.230769 | 0.192308 |
| Row 13 | 13 | 51 | 3.923077 | 0.910256 |
| Row 14 | 13 | 61 | 4.692308 | 0.397436 |
| Row 15 | 13 | 59 | 4.538462 | 0.269231 |
| Row 16 | 13 | 57 | 4.384615 | 0.423077 |
| Row 17 | 13 | 48 | 3.692308 | 0.230769 |
| Row 18 | 13 | 51 | 3.923077 | 0.576923 |
| Row 19 | 13 | 56 | 4.307692 | 0.730769 |
| | | | | |
| Column 1 | 19 | 72 | 3.789474 | 0.619883 |
| Column 2 | 19 | 79 | 4.157895 | 0.362573 |
| Column 3 | 19 | 68 | 3.578947 | 0.701754 |
| Column 4 | 19 | 71 | 3.736842 | 0.760234 |
| Column 5 | 19 | 70 | 3.684211 | 0.22807 |
| Column 6 | 19 | 78 | 4.105263 | 0.654971 |
| Column 7 | 19 | 75 | 3.947368 | 0.608187 |
| Column 8 | 19 | 84 | 4.421053 | 0.701754 |
| Column 9 | 19 | 83 | 4.368421 | 0.245614 |
| Column 10 | 19 | 77 | 4.052632 | 0.830409 |
| Column 11 | 19 | 83 | 4.368421 | 0.467836 |
| Column 12 | 19 | 84 | 4.421053 | 1.25731 |
| Column 13 | 19 | 87 | 4.578947 | 0.368421 |

ANOVA

| Source of Variation | SS | df | MS | F | P-value | F crit |
|---|---|---|---|---|---|---|
| Rows | 37.78137652 | 18 | 2.098965362 | 4.41264087 | 4.41391E-08 | 1.651797841 |
| Columns | 24.33198381 | 12 | 2.027665317 | 4.262747261 | 4.76011E-06 | 1.797205426 |
| Error | 102.7449393 | 216 | 0.475671015 | | | |
| | | | | | | |
| Total | 164.8582996 | 246 | | | | |

# Operations Data - Cronbach's Alpha

| Cronbach's alpha | 0.9124 |
|---|---|

**Anova: Two-Factor Without Replication**

| Question No 13 | 13.1 | 13.2 | 13.3 | 13.4 | 13.5 | 13.6 | 13.7 | 13.8 | 13.9 | 13.10 | 13.11 | 13.12 | 13.13 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | 7 | 9 | 8 | 6 | 7 | 7 | 7 | 1 | 1 | 1 | 1 | 1 | 1 |
| | 10 | 9 | 9 | 9 | 9 | 9 | 9 | 7 | 7 | 7 | 5 | 5 | 5 |
| | 9 | 8 | 8 | 8 | 9 | 6 | 9 | 8 | 8 | 8 | 9 | 7 | 8 |
| | 10 | 10 | 10 | 10 | 10 | 9 | 9 | 10 | 10 | 9 | 8 | 8 | 8 |
| | 10 | 10 | 10 | 6 | 10 | 5 | 5 | 8 | 8 | 9 | 6 | 6 | 6 |
| | 9 | 9 | 9 | 9 | 9 | 9 | 9 | 9 | 7 | 9 | 9 | 9 | 9 |
| | 6 | 7 | 7 | 7 | 7 | 7 | 7 | 6 | 6 | 6 | 6 | 6 | 6 |
| | 10 | 10 | 10 | 10 | 10 | 10 | 10 | 8 | 8 | 10 | 7 | 7 | 4 |
| | 6 | 10 | 9 | 9 | 9 | 7 | 9 | 7 | 5 | 6 | 6 | 6 | 6 |
| | 8 | 9 | 9 | 9 | 9 | 9 | 9 | 6 | 6 | 6 | 6 | 6 | 6 |
| | 8 | 8 | 8 | 8 | 8 | 8 | 8 | 8 | 8 | 8 | 8 | 8 | 8 |
| | 7 | 5 | 7 | 7 | 5 | 6 | 10 | 8 | 8 | 8 | 9 | 7 | 6 |
| | 10 | 9 | 10 | 9 | 9 | 10 | 8 | 6 | 6 | 9 | 8 | 6 | 8 |
| | 8 | 10 | 10 | 10 | 10 | 10 | 10 | 10 | 10 | 10 | 8 | 8 | 10 |
| | 10 | 9 | 8 | 10 | 10 | 10 | 9 | 8 | 8 | 8 | 8 | 8 | 8 |
| | 9 | 9 | 9 | 9 | 9 | 9 | 9 | 9 | 7 | 9 | 9 | 9 | 9 |
| | 5 | 6 | 8 | 8 | 9 | 9 | 10 | 7 | 8 | 7 | 6 | 6 | 7 |
| | 10 | 10 | 10 | 10 | 10 | 10 | 10 | 8 | 8 | 10 | 6 | 6 | 6 |
| | 9 | 7 | 8 | 7 | 8 | 7 | 7 | 8 | 8 | 7 | 7 | 7 | 8 |

| SUMMARY | Count | Sum | Average | Variance |
|---|---|---|---|---|
| Row 1 | 13 | 57 | 4.384615 | 11.08974 |
| Row 2 | 13 | 100 | 7.692308 | 3.230769 |
| Row 3 | 13 | 105 | 8.076923 | 0.74359 |
| Row 4 | 13 | 121 | 9.307692 | 0.730769 |
| Row 5 | 13 | 99 | 7.615385 | 4.089744 |
| Row 6 | 13 | 115 | 8.846154 | 0.307692 |
| Row 7 | 13 | 84 | 6.461538 | 0.269231 |
| Row 8 | 13 | 114 | 8.769231 | 3.525641 |
| Row 9 | 13 | 95 | 7.307692 | 2.730769 |
| Row 10 | 13 | 98 | 7.538462 | 2.269231 |
| Row 11 | 13 | 104 | 8 | 0 |
| Row 12 | 13 | 93 | 7.153846 | 2.141026 |
| Row 13 | 13 | 108 | 8.307692 | 2.230769 |
| Row 14 | 13 | 124 | 9.538462 | 0.769231 |
| Row 15 | 13 | 114 | 8.769231 | 0.858974 |
| Row 16 | 13 | 115 | 8.846154 | 0.307692 |
| Row 17 | 13 | 96 | 7.384615 | 2.089744 |
| Row 18 | 13 | 114 | 8.769231 | 3.025641 |
| Row 19 | 13 | 98 | 7.538462 | 0.435897 |
| | | | | |
| Column 1 | 19 | 161 | 8.473684 | 2.596491 |
| Column 2 | 19 | 164 | 8.631579 | 2.134503 |
| Column 3 | 19 | 167 | 8.789474 | 1.064327 |
| Column 4 | 19 | 161 | 8.473684 | 1.818713 |
| Column 5 | 19 | 167 | 8.789474 | 1.730994 |
| Column 6 | 19 | 157 | 8.263158 | 2.538012 |
| Column 7 | 19 | 164 | 8.631579 | 1.80117 |
| Column 8 | 19 | 142 | 7.473684 | 3.818713 |
| Column 9 | 19 | 137 | 7.210526 | 3.842105 |
| Column 10 | 19 | 147 | 7.736842 | 4.426901 |
| Column 11 | 19 | 132 | 6.947368 | 3.719298 |
| Column 12 | 19 | 126 | 6.631579 | 3.134503 |
| Column 13 | 19 | 129 | 6.789474 | 4.28655 |

**ANOVA**

| Source of Variation | SS | df | MS | F | P-value | F crit |
|---|---|---|---|---|---|---|
| Rows | 323.8866397 | 18 | 17.9937022 | 11.41335362 | 9.78503E-23 | 1.651797841 |
| Columns | 149.6194332 | 12 | 12.4682861 | 7.90859806 | 3.42572E-12 | 1.797205426 |
| Error | 340.534413 | 216 | 1.576548208 | | | |
| | | | | | | |
| Total | 814.0404858 | 246 | | | | |

# Operations Data - Cronbach's Alpha

| Cronbach's alpha | 0.6180 |
|---|---|

**Anova: Two-Factor Without Replication**

| Question No 14 | 14.1 | | 14.2 | 14.3 | 14.4 | 14.5 | 14.6 | 14.7 | 14.8 |
|---|---|---|---|---|---|---|---|---|---|
| | | 10 | 10 | 1 | 10 | 8 | 10 | 2 | 5 |
| | | 10 | 6 | 6 | 6 | 10 | 2 | 2 | 4 |
| | | 9 | 8 | 7 | 7 | 8 | 6 | 6 | 9 |
| | | 10 | 8 | 8 | 10 | 10 | 9 | 7 | 9 |
| | | 10 | 8 | 8 | 9 | 9 | 10 | 8 | 10 |
| | | 10 | 7 | 9 | 8 | 9 | 8 | 3 | 9 |
| | | 9 | 9 | 5 | 8 | 5 | 8 | 8 | 8 |
| | | 10 | 7 | 6 | 9 | 8 | 8 | 6 | 9 |
| | | 9 | 7 | 8 | 6 | 10 | 9 | 7 | 8 |
| | | 10 | 9 | 5 | 5 | 10 | 8 | 5 | 7 |
| | | 9 | 9 | 5 | 5 | 7 | 6 | 2 | 8 |
| | | 9 | 8 | 6 | 4 | 9 | 8 | 7 | 7 |
| | | 10 | 9 | 8 | 7 | 9 | 9 | 4 | 10 |
| | | 10 | 10 | 10 | 10 | 10 | 10 | 10 | 8 |
| | | 10 | 6 | 7 | 9 | 8 | 8 | 7 | 7 |
| | | 10 | 7 | 9 | 8 | 9 | 8 | 3 | 9 |
| | | 10 | 10 | 6 | 9 | 6 | 7 | 7 | 5 |
| | | 10 | 7 | 6 | 9 | 8 | 6 | 6 | 9 |
| | | 10 | 6 | 6 | 7 | 10 | 9 | 6 | 9 |

| SUMMARY | Count | Sum | Average | Variance |
|---|---|---|---|---|
| Row 1 | 8 | 56 | 7 | 14.57143 |
| Row 2 | 8 | 46 | 5.75 | 9.642857 |
| Row 3 | 8 | 60 | 7.5 | 1.428571 |
| Row 4 | 8 | 71 | 8.875 | 1.267857 |
| Row 5 | 8 | 72 | 9 | 0.857143 |
| Row 6 | 8 | 63 | 7.875 | 4.696429 |
| Row 7 | 8 | 60 | 7.5 | 2.571429 |
| Row 8 | 8 | 63 | 7.875 | 2.125 |
| Row 9 | 8 | 64 | 8 | 1.714286 |
| Row 10 | 8 | 59 | 7.375 | 4.839286 |
| Row 11 | 8 | 51 | 6.375 | 5.696429 |
| Row 12 | 8 | 58 | 7.25 | 2.785714 |
| Row 13 | 8 | 66 | 8.25 | 3.928571 |
| Row 14 | 8 | 78 | 9.75 | 0.5 |
| Row 15 | 8 | 62 | 7.75 | 1.642857 |
| Row 16 | 8 | 63 | 7.875 | 4.696429 |
| Row 17 | 8 | 60 | 7.5 | 3.714286 |
| Row 18 | 8 | 61 | 7.625 | 2.553571 |
| Row 19 | 8 | 63 | 7.875 | 3.267857 |

ANOVA

| Source of Variation | SS | df | MS | F | P-value | F crit |
|---|---|---|---|---|---|---|
| Rows | 113.9736842 | 18 | 6.331871345 | 2.617822295 | 0.000949132 | 1.686279821 |
| Columns | 202.7368421 | 7 | 28.96240602 | 11.9740955 | 1.21059E-11 | 2.083037256 |
| Error | 304.7631579 | 126 | 2.418755221 | | | |
| | | | | | | |
| Total | 621.4736842 | 151 | | | | |

| | | | | |
|---|---|---|---|---|
| Column 1 | 19 | 185 | 9.736842 | 0.204678 |
| Column 2 | 19 | 151 | 7.947368 | 1.830409 |
| Column 3 | 19 | 126 | 6.631579 | 4.023392 |
| Column 4 | 19 | 146 | 7.684211 | 3.339181 |
| Column 5 | 19 | 163 | 8.578947 | 2.035088 |
| Column 6 | 19 | 149 | 7.842105 | 3.584795 |
| Column 7 | 19 | 106 | 5.578947 | 5.368421 |
| Column 8 | 19 | 150 | 7.894737 | 2.877193 |

# Operations Data - Cronbach's Alpha

| Cronbach's alpha | 0.4661 | | | | |
|---|---|---|---|---|---|
| Less | 0.7755 | 0.3774 | 0.3875 | 0.3886 | 0.2869 | 0.2191 |
| Question No 15 | 15.1 | 15.2 | 15.3 | 15.4 | 15.5 | 15.6 |
| | 1 | 7 | 10 | 10 | 9 | 10 |
| | 9 | 7 | 7 | 6 | 0 | 5 |
| | 1 | 5 | 7 | 9 | 6 | 5 |
| | 9 | 9 | 9 | 9 | 7 | 8 |
| | 10 | 9 | 8 | 10 | 8 | 9 |
| | 5 | 9 | 10 | 9 | 8 | 9 |
| | 9 | 8 | 4 | 8 | 7 | 8 |
| | 7 | 8 | 8 | 10 | 9 | 10 |
| | 2 | 8 | 8 | 9 | 9 | 10 |
| | 1 | 10 | 9 | 9 | 8 | 9 |
| | 6 | 8 | 4 | 7 | 8 | 8 |
| | 10 | 8 | 8 | 9 | 8 | 9 |
| | 9 | 7 | 9 | 7 | 8 | 9 |
| | 10 | 8 | 10 | 8 | 9 | 10 |
| | 8 | 8 | 10 | 10 | 7 | 7 |
| | 5 | 9 | 10 | 9 | 8 | 9 |
| | 9 | 7 | 6 | 9 | 7 | 8 |
| | 7 | 8 | 10 | 10 | 9 | 10 |
| | 7 | 7 | 9 | 9 | 8 | 9 |

**Anova: Two-Factor Without Replication**

| SUMMARY | Count | Sum | Average | Variance |
|---|---|---|---|---|
| Row 1 | 6 | 47 | 7.833333 | 12.56667 |
| Row 2 | 6 | 34 | 5.666667 | 9.466667 |
| Row 3 | 6 | 33 | 5.5 | 7.1 |
| Row 4 | 6 | 51 | 8.5 | 0.7 |
| Row 5 | 6 | 54 | 9 | 0.8 |
| Row 6 | 6 | 50 | 8.333333 | 3.066667 |
| Row 7 | 6 | 44 | 7.333333 | 3.066667 |
| Row 8 | 6 | 52 | 8.666667 | 1.466667 |
| Row 9 | 6 | 46 | 7.666667 | 8.266667 |
| Row 10 | 6 | 46 | 7.666667 | 11.06667 |
| Row 11 | 6 | 41 | 6.833333 | 2.566667 |
| Row 12 | 6 | 52 | 8.666667 | 0.666667 |
| Row 13 | 6 | 49 | 8.166667 | 0.966667 |
| Row 14 | 6 | 55 | 9.166667 | 0.966667 |
| Row 15 | 6 | 50 | 8.333333 | 1.866667 |
| Row 16 | 6 | 50 | 8.333333 | 3.066667 |
| Row 17 | 6 | 46 | 7.666667 | 1.466667 |
| Row 18 | 6 | 54 | 9 | 1.6 |
| Row 19 | 6 | 49 | 8.166667 | 0.966667 |

**ANOVA** All

| Source of Variation | SS | df | MS | F | P-value | F crit |
|---|---|---|---|---|---|---|
| Rows | 111.7894737 | 18 | 6.210526316 | 1.873015873 | 0.028259616 | 1.719592446 |
| Columns | 60.07894737 | 5 | 12.01578947 | 3.623809524 | 0.004942169 | 2.315689238 |
| Error | 298.4210526 | 90 | 3.315789474 | | | |
| | | | | | | |
| Total | 470.2894737 | 113 | | | | |

| | Count | Sum | Average | Variance |
|---|---|---|---|---|
| Column 1 | 19 | 125 | 6.578947 | 10.36842 |
| Column 2 | 19 | 150 | 7.894737 | 1.210526 |
| Column 3 | 19 | 156 | 8.210526 | 3.619883 |
| Column 4 | 19 | 167 | 8.789474 | 1.28655 |
| Column 5 | 19 | 143 | 7.526316 | 4.040936 |
| Column 6 | 19 | 162 | 8.526316 | 2.263158 |

**ANOVA**

| Source of Variation | Less 15.1 MS | Less 15.2 MS | Less 15.3 MS | Less 15.4 MS | Less 15.5 MS | Less 15.6 MS |
|---|---|---|---|---|---|---|
| Rows | 6.54385965 | 6.18245614 | 5.556725146 | 6.240935673 | 4.866666667 | 4.977777778 |
| Columns | 4.752631579 | 15.01578947 | 14.54210526 | 10.72105263 | 14.13157895 | 12.93157895 |
| Error | 1.469298246 | 3.849122807 | 3.403216374 | 3.815497076 | 3.470467836 | 3.887134503 |
| Total | | | | | | |

# Operations Data - Cronbach's Alpha

| Cronbach's alpha | 0.8354 |
|---|---|

**Anova: Two-Factor Without Replication**

| Question No 16 | 16.1 | 16.2 | 16.3 | 16.4 | 16.5 | 16.6 | 16.7 | 16.8 | 16.9 | 16.10 |
|---|---|---|---|---|---|---|---|---|---|---|
| | 10 | 10 | 10 | 10 | 10 | 7 | 5 | 10 | 9 | 8 |
| | 7 | 7 | 10 | 10 | 6 | 6 | 6 | 10 | 7 | 7 |
| | 8 | 6 | 9 | 10 | 8 | 8 | 6 | 10 | 9 | 8 |
| | 9 | 9 | 10 | 10 | 10 | 10 | 8 | 10 | 10 | 9 |
| | 9 | 8 | 9 | 10 | 10 | 10 | 10 | 10 | 9 | 10 |
| | 9 | 9 | 10 | 10 | 8 | 10 | 9 | 9 | 10 | 10 |
| | 8 | 8 | 8 | 8 | 8 | 6 | 6 | 8 | 8 | 6 |
| | 7 | 8 | 9 | 7 | 7 | 7 | 7 | 9 | 9 | 9 |
| | 7 | 5 | 10 | 8 | 8 | 9 | 9 | 8 | 8 | 9 |
| | 10 | 8 | 10 | 10 | 10 | 8 | 8 | 10 | 10 | 10 |
| | 3 | 3 | 10 | 10 | 8 | 7 | 3 | 1 | 1 | 5 |
| | 7 | 10 | 10 | 10 | 10 | 3 | 7 | 10 | 10 | 10 |
| | 7 | 9 | 9 | 10 | 4 | 7 | 7 | 9 | 9 | 10 |
| | 10 | 10 | 10 | 10 | 10 | 10 | 10 | 10 | 9 | 8 |
| | 7 | 10 | 10 | 8 | 9 | 7 | 7 | 8 | 6 | 8 |
| | 9 | 9 | 10 | 10 | 8 | 10 | 9 | 9 | 10 | 10 |
| | 10 | 10 | 10 | 10 | 10 | 6 | 5 | 10 | 9 | 6 |
| | 7 | 8 | 10 | 7 | 7 | 7 | 7 | 9 | 9 | 9 |
| | 6 | 8 | 10 | 8 | 8 | 8 | 8 | 10 | 9 | 9 |

| SUMMARY | Count | Sum | Average | Variance |
|---|---|---|---|---|
| Row 1 | 10 | 89 | 8.9 | 2.988889 |
| Row 2 | 10 | 76 | 7.6 | 2.933333 |
| Row 3 | 10 | 82 | 8.2 | 1.955556 |
| Row 4 | 10 | 95 | 9.5 | 0.5 |
| Row 5 | 10 | 95 | 9.5 | 0.5 |
| Row 6 | 10 | 94 | 9.4 | 0.488889 |
| Row 7 | 10 | 74 | 7.4 | 0.933333 |
| Row 8 | 10 | 79 | 7.9 | 0.988889 |
| Row 9 | 10 | 81 | 8.1 | 1.877778 |
| Row 10 | 10 | 94 | 9.4 | 0.933333 |
| Row 11 | 10 | 51 | 5.1 | 11.87778 |
| Row 12 | 10 | 87 | 8.7 | 5.566667 |
| Row 13 | 10 | 81 | 8.1 | 3.433333 |
| Row 14 | 10 | 97 | 9.7 | 0.455556 |
| Row 15 | 10 | 80 | 8 | 1.777778 |
| Row 16 | 10 | 94 | 9.4 | 0.488889 |
| Row 17 | 10 | 86 | 8.6 | 4.266667 |
| Row 18 | 10 | 80 | 8 | 1.333333 |
| Row 19 | 10 | 84 | 8.4 | 1.377778 |
| | | | | |
| Column 1 | 19 | 150 | 7.894737 | 3.099415 |
| Column 2 | 19 | 155 | 8.157895 | 3.473684 |
| Column 3 | 19 | 184 | 9.684211 | 0.339181 |
| Column 4 | 19 | 176 | 9.263158 | 1.315789 |
| Column 5 | 19 | 159 | 8.368421 | 2.690058 |
| Column 6 | 19 | 146 | 7.684211 | 3.450292 |
| Column 7 | 19 | 137 | 7.210526 | 3.28655 |
| Column 8 | 19 | 170 | 8.947368 | 4.274854 |
| Column 9 | 19 | 161 | 8.473684 | 4.374269 |
| Column 10 | 19 | 161 | 8.473684 | 2.374269 |

ANOVA

| Source of Variation | SS | df | MS | F | P-value | F crit |
|---|---|---|---|---|---|---|
| Rows | 208.0526316 | 18 | 11.55847953 | 6.076345004 | 4.06991E-11 | 1.667863178 |
| Columns | 93.94210526 | 9 | 10.4380117 | 5.487309991 | 1.40435E-06 | 1.938083286 |
| Error | 308.1578947 | 162 | 1.902209227 | | | |
| | | | | | | |
| Total | 610.1526316 | 189 | | | | |

Cronbach's alpha for Operations Questionnaire

Cronbach's alpha for Operations Questionnaire
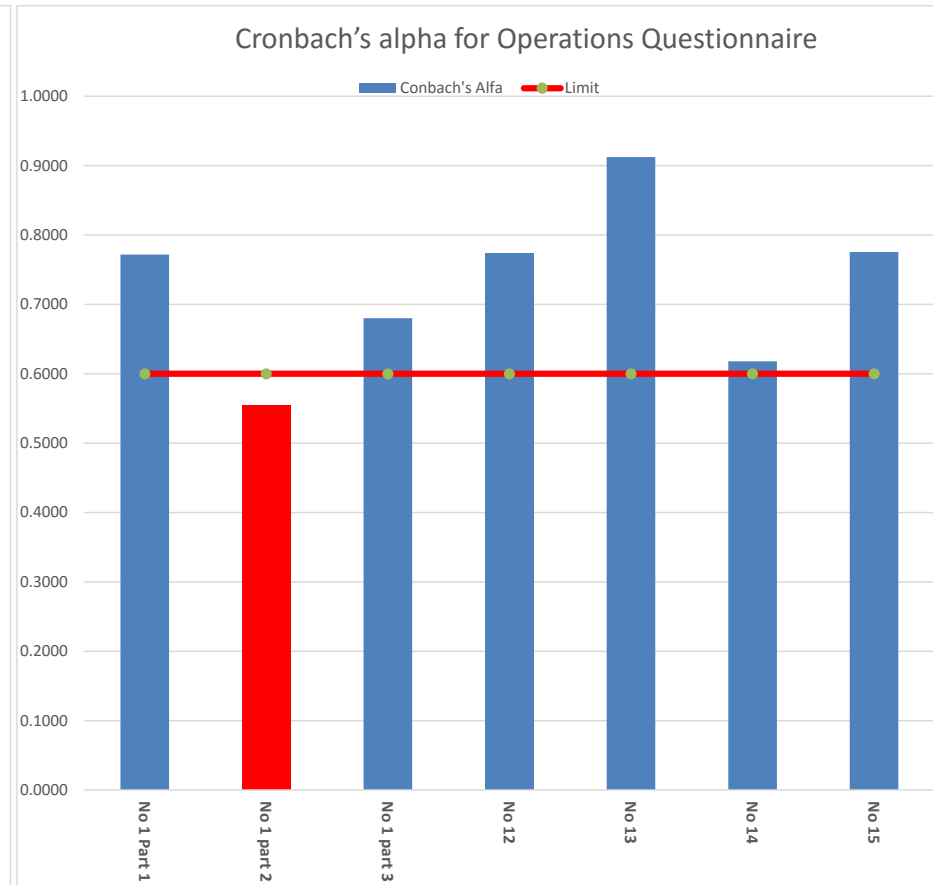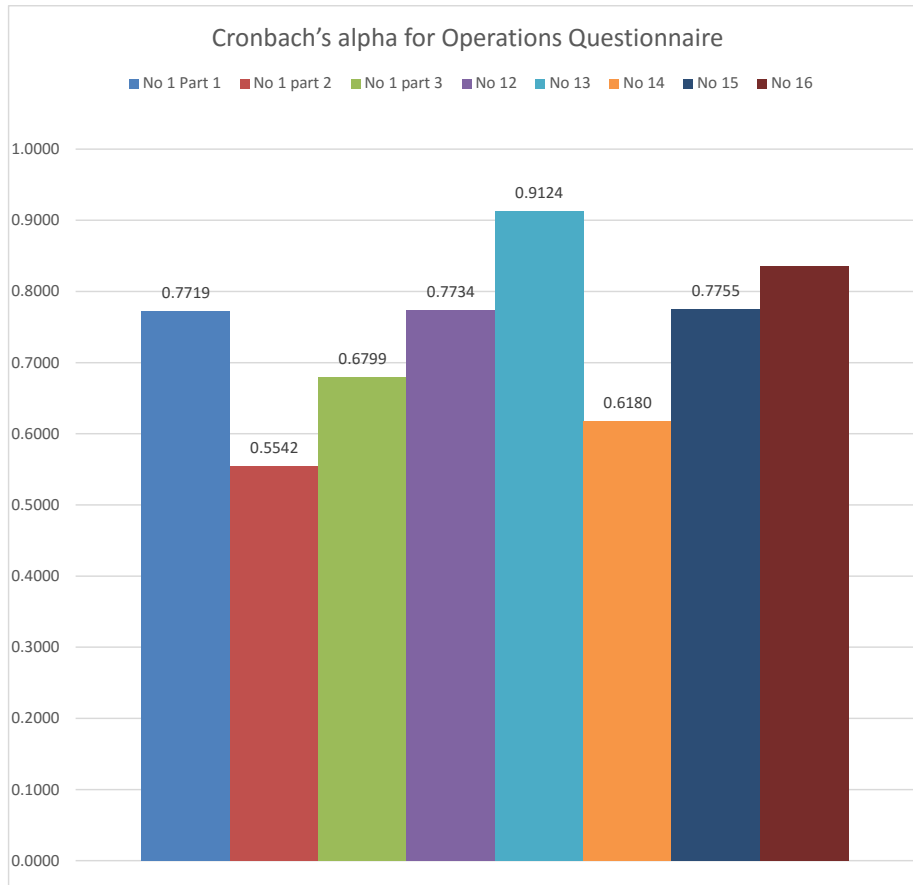
# APPENDIX XIII.

# HUMAN RESOURCES DATA  -
# STATISTICS TABLES

| Co VPHR | VPI | OCHRM | OPM | PHRM | SMD | SHRM | Respondents | Possible F | Reponse |
|---|---|---|---|---|---|---|---|---|---|
| Co NO | YES | YES | YES | | | | 3 | 4 | 75% |
| | | | | | | | | 0 | #DIV/0! |
| Plant ROG | | YES | YES | | | | 2 | 2 | 100% |
| Plant ALB | | NO | YES | | | | 1 | 2 | 50% |
| DPW | | | | | NO | YES | 1 | 2 | 50% |
| Spain | | | | | NO | NO | 0 | 2 | 0% |
| Poland | | | | | YES | YES | 2 | 2 | 100% |
| G Britain | | | | | YES | YES | 2 | 2 | 100% |
| Indonesia | | | | | YES | NO | 1 | 2 | 50% |
| Canada | | | | | YES | NO | 1 | 2 | 50% |
| Thailand | | | | | NO | YES | 1 | 2 | 50% |
| Australia | | | | | YES | NO | 1 | 2 | 50% |
| China | | | | | NO | NO | 0 | 2 | 0% |
| Mexico | | | | | YES | YES | 2 | 2 | 100% |
| Brazil | | | | | NO | YES | 1 | 2 | 50% |
| N Zealand | | | | | NO | NO | 0 | 2 | 0% |
| Argentina | | | | | YES | N/A | 1 | 1 | 100% |
| Malaysia | | | | | N/A | YES | 1 | 1 | 100% |
| S Africa | | | | | N/A | YES | 1 | 1 | 100% |
| | | | | | | | 21 | 35 | 60% |

| Key: | |
|---|---|
| VPF: | Vice-President Finance |
| VPI: | Vice-President International |
| OCHRM: | Other Corporate HR Managers |
| OPM: | Other Plant Managers |
| PHRM: | Plant HR Managers |
| SMD: | Subsidiary Managing Directors |
| SHRM: | Subsidiary HR Managers |

# Human Resources Data - Statistics Tables

| Responses | Possible Responses | % Response | |
|---|---|---|---|
| 21 | 35 | 60% | **- Means HRM Higher than MD's'** |

**Human Resources Data**

| Question No 1-3 | Average Score | Ave MD's | Ave HRM's | Difference | Possible Score | STD Deviation | Confidence Norm | Median | Skew | Std Dev | Kurtosis |
|---|---|---|---|---|---|---|---|---|---|---|---|
| 1 | 1.5714 | 1.5000 | 1.6364 | -0.136 | 2 | 0.5071 | 0.2169 | 2.0 | -0.3114 | 0.4949 | -2.1150 |
| 2 | 1.8095 | 1.7000 | 1.9091 | -0.209 | 2 | 0.4024 | 0.1721 | 2.0 | -1.7004 | 0.3927 | 0.9752 |
| 3 | 1.8571 | 1.9000 | 1.8182 | 0.082 | 2 | 0.3586 | 0.1534 | 2.0 | -2.2017 | 0.3499 | 3.1384 |
| **Average** | **1.7460** | **1.7000** | **1.7879** | **-0.0879** | **2.0000** | **0.4227** | **0.1808** | **2.0000** | **-1.4045** | **0.4125** | **0.6662** |

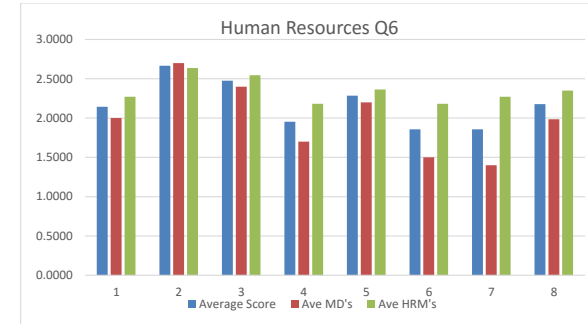| Question No 4 | Average Score | Ave MD's | Ave HRM's | Difference | Possible Score | STD Deviation | Confidence Norm | Median | Skew | Std Dev | Kurtosis |
|---|---|---|---|---|---|---|---|---|---|---|---|
| 1 | 3.8571 | 4.0000 | 3.7273 | 0.273 | 5 | 0.5732 | 0.2452 | 4.0 | -1.7965 | 0.5594 | 5.681 |
| 2 | 3.9048 | 4.0000 | 3.8182 | 0.182 | 5 | 0.7684 | 0.3287 | 4.0 | -0.5612 | 0.7499 | 0.676 |
| 3 | 3.9048 | 4.1000 | 3.7273 | 0.373 | 5 | 0.9437 | 0.4036 | 4.0 | -0.5849 | 0.9209 | -0.302 |
| 4 | 3.8095 | 4.1000 | 3.5455 | 0.555 | 5 | 0.9808 | 0.4195 | 4.0 | -0.6363 | 0.9571 | -0.333 |
| 5 | 4.0952 | 4.4000 | 3.8182 | 0.582 | 5 | 0.7684 | 0.3287 | 4.0 | -0.9003 | 0.7499 | 1.561 |
| 6 | 4.0000 | 4.0000 | 4.0000 | 0.000 | 5 | 0.6325 | 0.2705 | 4.0 | 0.0000 | 0.6172 | -0.132 |
| 7 | 4.1905 | 4.3000 | 4.0909 | 0.209 | 5 | 0.7496 | 0.3206 | 4.0 | -0.3368 | 0.7315 | -1.053 |
| 8 | 4.8095 | 4.9000 | 4.7273 | 0.173 | 5 | 0.4024 | 0.1721 | 5.0 | -1.7004 | 0.3927 | 0.975 |
| 9 | 4.2857 | 4.3000 | 4.2727 | 0.027 | 5 | 0.7838 | 0.3352 | 4.0 | -1.2650 | 0.7649 | 2.297 |
| 10 | 4.3333 | 4.3000 | 4.3636 | -0.064 | 5 | 0.5774 | 0.2469 | 4.0 | -0.1276 | 0.5634 | -0.537 |
| 11 | 4.4762 | 4.5000 | 4.4545 | 0.045 | 5 | 0.5118 | 0.2189 | 4.0 | 0.1028 | 0.4994 | -2.211 |
| 12 | 4.5238 | 4.8000 | 4.2727 | 0.527 | 5 | 0.6016 | 0.2573 | 5.0 | -0.8611 | 0.5871 | -0.100 |
| 13 | 4.5238 | 4.6000 | 4.4545 | 0.145 | 5 | 0.5118 | 0.2189 | 5.0 | -0.1028 | 0.4994 | -2.211 |
| 14 | 4.2381 | 4.4000 | 4.0909 | 0.309 | 5 | 0.6249 | 0.2673 | 4.0 | -0.1952 | 0.6098 | -0.365 |
| 15 | 4.1905 | 4.3000 | 4.0909 | 0.209 | 5 | 0.5118 | 0.2189 | 4.0 | 0.3553 | 0.4994 | 0.603 |
| 16 | 4.2857 | 4.3000 | 4.2727 | 0.027 | 5 | 0.4629 | 0.1980 | 4.0 | 1.0233 | 0.4518 | -1.064 |
| 17 | 4.1429 | 4.2000 | 4.0909 | 0.109 | 5 | 0.6547 | 0.2800 | 4.0 | -0.1447 | 0.6389 | -0.434 |
| **Average** | **4.2101** | **4.3235** | **4.1070** | **0.2166** | **5.0000** | **0.6506** | **0.2782** | **4.1765** | **-0.4548** | **0.6349** | **0.1796** |

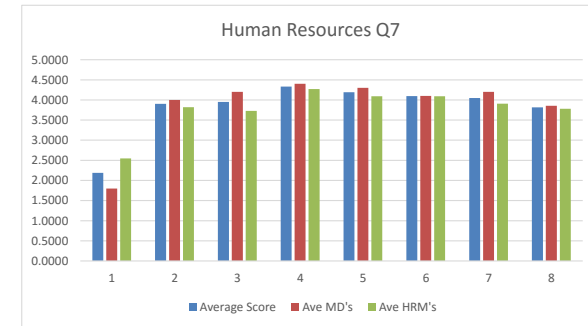| Question No 5 | Average Score | Ave MD's | Ave HRM's | Difference | Possible Score | STD Deviation | Confidence Norm | Median | Skew | Std Dev | Kurtosis |
|---|---|---|---|---|---|---|---|---|---|---|---|
| 1 | 4.6190 | 4.8000 | 4.4545 | 0.345 | 5 | 0.6690 | 0.2861 | 5.0 | -1.5884 | 0.6529 | 1.4285 |
| 2 | 4.4762 | 4.7000 | 4.2727 | 0.427 | 5 | 0.6016 | 0.2573 | 5.0 | -0.6619 | 0.5871 | -0.3942 |
| 3 | 3.9048 | 3.9000 | 3.9091 | -0.009 | 5 | 0.7684 | 0.3287 | 4.0 | 0.1696 | 0.7499 | -1.2062 |
| 4 | 4.2381 | 4.4000 | 4.0909 | 0.309 | 5 | 0.8309 | 0.3554 | 4.0 | -1.0737 | 0.8109 | 1.1455 |
| 5 | 2.6190 | 2.6000 | 2.6364 | -0.036 | 5 | 0.8047 | 0.3442 | 3.0 | 0.2082 | 0.7854 | -0.4052 |
| 6 | 4.2381 | 4.3000 | 4.1818 | 0.118 | 5 | 0.4364 | 0.1867 | 4.0 | 1.3265 | 0.4259 | -0.2763 |
| 7 | 3.2381 | 3.1000 | 3.3636 | -0.264 | 5 | 0.8309 | 0.3554 | 3.0 | 0.6600 | 0.8109 | 0.4169 |
| 8 | 3.1905 | 3.1000 | 3.2727 | -0.173 | 5 | 0.9808 | 0.4195 | 3.0 | 0.2848 | 0.9571 | -0.8749 |
| 9 | 4.0476 | 3.5000 | 3.7273 | -0.227 | 5 | 0.5896 | 0.2522 | 4.0 | -0.6626 | 0.8438 | 0.3505 |
| 10 | 4.1905 | 3.7000 | 3.1818 | 0.518 | 5 | 0.5118 | 0.2189 | 4.0 | -1.3825 | 1.1369 | 0.6029 |
| 11 | 3.6190 | 4.2000 | 3.8182 | 0.382 | 5 | 0.8646 | 0.3698 | 4.0 | 0.0000 | 0.6172 | -0.0372 |
| 12 | 3.4286 | 3.7000 | 3.1818 | 0.518 | 5 | 1.1650 | 0.4983 | 4.0 | -1.3825 | 1.1369 | 2.5121 |
| 13 | 4.0000 | 4.2000 | 3.8182 | 0.382 | 5 | 0.6325 | 0.2705 | 4.0 | 0.0000 | 0.6172 | -0.1316 |
| **Average** | **3.8315** | **3.8615** | **3.6853** | **0.1762** | **5.0000** | **0.7451** | **0.3187** | **3.9231** | **-0.3156** | **0.7794** | **0.2408** |



Human Resources Q4
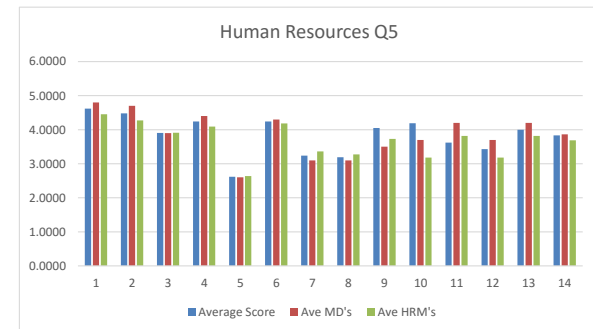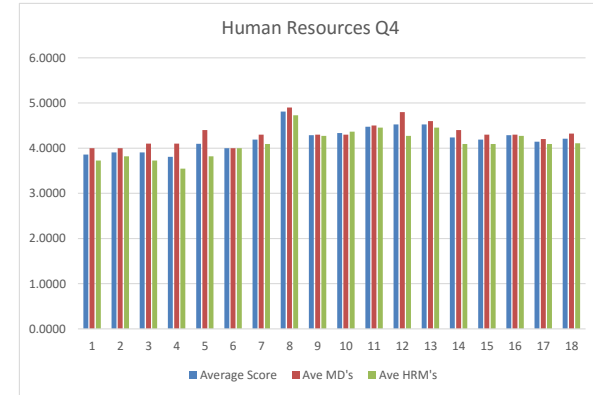


Human Resources Q5
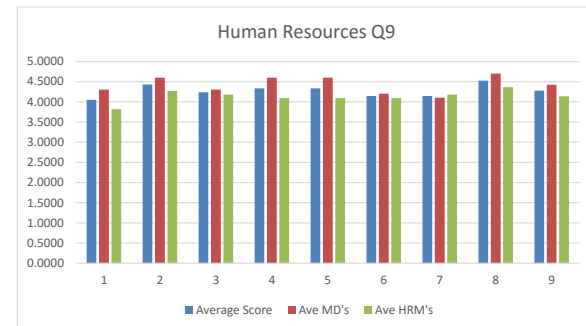
# Human Resources Data - Statistics Tables

| Question No 6 | Average Score | Ave MD's | Ave HRM's | Difference | Possible Score | STD Deviation | Confidence Norm | Median | Skew | Std Dev | Kurtosis |
|---|---|---|---|---|---|---|---|---|---|---|---|
| 1 | 2.1429 | 2.0000 | 2.2727 | -0.273 | 5 | 1.0142 | 0.4338 | 2.0 | 0.9601 | 0.9897 | 0.0739 |
| 2 | 2.6667 | 2.7000 | 2.6364 | 0.064 | 5 | 0.8563 | 0.3663 | 3.0 | 0.2151 | 0.8357 | -0.7177 |
| 3 | 2.4762 | 2.4000 | 2.5455 | -0.145 | 5 | 0.9808 | 0.4195 | 2.0 | 0.6004 | 0.9571 | -0.7915 |
| 4 | 1.9524 | 1.7000 | 2.1818 | -0.482 | 5 | 0.9735 | 0.4163 | 2.0 | 1.1808 | 0.9500 | 0.8912 |
| 5 | 2.2857 | 2.2000 | 2.3636 | -0.164 | 5 | 0.9562 | 0.4090 | 2.0 | 0.4954 | 0.9331 | -0.4425 |
| 6 | 1.8571 | 1.5000 | 2.1818 | -0.682 | 5 | 1.1084 | 0.4741 | 2.0 | 1.5256 | 1.0817 | 2.1951 |
| 7 | 1.8571 | 1.4000 | 2.2727 | -0.873 | 5 | 1.1526 | 0.4930 | 2.0 | 1.6041 | 1.1249 | 2.0451 |
| Average | 2.1769 | 1.9857 | 2.3506 | -0.3649 | 5.0000 | 1.0060 | 0.4303 | 2.1429 | 0.9402 | 0.9818 | 0.4648 |



Human Resources Q6

| Question No 7 | Average Score | Ave MD's | Ave HRM's | Difference | Possible Score | STD Deviation | Confidence Norm | Median | Skew | Std Dev | Kurtosis |
|---|---|---|---|---|---|---|---|---|---|---|---|
| 1 | 2.1905 | 1.8000 | 2.5455 | -0.745 | 5 | 1.0779 | 0.4610 | 2.0 | -0.4158 | 1.0519 | 0.1983 |
| 2 | 3.9048 | 4.0000 | 3.8182 | 0.182 | 5 | 0.5390 | 0.2305 | 4.0 | -0.1137 | 0.5260 | 0.9416 |
| 3 | 3.9524 | 4.2000 | 3.7273 | 0.473 | 5 | 0.4976 | 0.2128 | 4.0 | -0.1302 | 0.4856 | 1.8639 |
| 4 | 4.3333 | 4.4000 | 4.2727 | 0.127 | 5 | 0.5774 | 0.2469 | 4.0 | -0.1276 | 0.5634 | -0.5368 |
| 5 | 4.1905 | 4.3000 | 4.0909 | 0.209 | 5 | 0.6016 | 0.2573 | 4.0 | -0.0714 | 0.5871 | -0.0995 |
| 6 | 4.0952 | 4.1000 | 4.0909 | 0.009 | 5 | 0.4364 | 0.1867 | 4.0 | 0.5939 | 0.4259 | 2.9151 |
| 7 | 4.0476 | 4.2000 | 3.9091 | 0.291 | 5 | 0.5896 | 0.2522 | 4.0 | 0.0012 | 0.5754 | 0.3505 |
| Average | 3.8163 | 3.8571 | 3.7792 | 0.0779 | 5.0000 | 0.6171 | 0.2639 | 3.7143 | -0.0376 | 0.6022 | 0.8047 |



Human Resources Q7

# Human Resources Data - Statistics Tables

| Question No 8 | Average Score | Ave MD's | Ave HRM's | Difference | Possible Score | STD Deviation | Confidence Norm | Median | Skew | Std Dev | Kurtosis |
|---|---|---|---|---|---|---|---|---|---|---|---|
| 1 | 4.1905 | 4.3000 | 4.0909 | 0.209 | 5 | 0.6016 | 0.2573 | 4.0 | -0.0714 | 0.5871 | -0.0995 |
| 2 | 4.7143 | 4.8000 | 4.6364 | 0.164 | 5 | 0.4629 | 0.1980 | 5.0 | -1.0233 | 0.4518 | -1.0643 |
| 3 | 4.5714 | 4.7000 | 4.4545 | 0.245 | 5 | 0.5071 | 0.2169 | 5.0 | -0.3114 | 0.4949 | -2.1150 |
| 4 | 4.2857 | 4.3000 | 4.2727 | 0.027 | 5 | 0.6437 | 0.2753 | 4.0 | -0.3299 | 0.6281 | -0.5096 |
| 5 | 4.1429 | 4.0000 | 4.2727 | -0.273 | 5 | 0.5732 | 0.2452 | 4.0 | 0.0359 | 0.5594 | 0.3180 |
| 6 | 4.0476 | 4.0000 | 4.0909 | -0.091 | 5 | 0.8646 | 0.3698 | 4.0 | -0.6103 | 0.8438 | -0.1063 |
| Average | 4.3254 | 4.3500 | 4.3030 | 0.0470 | 5.0000 | 0.6088 | 0.2604 | 4.3333 | -0.3850 | 0.5942 | -0.5961 |
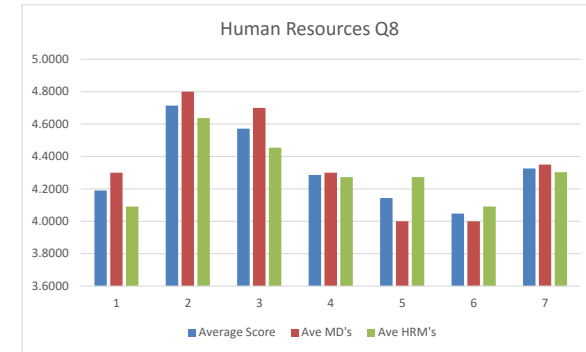


Human Resources Q8

| Question No 9 | Average Score | Ave MD's | Ave HRM's | Difference | Possible Score | STD Deviation | Confidence Norm | Median | Skew | Std Dev | Kurtosis |
|---|---|---|---|---|---|---|---|---|---|---|---|
| 1 | 4.0476 | 4.3000 | 3.8182 | 0.482 | 5 | 0.7400 | 0.3165 | 4.0 | -0.8955 | 0.7222 | 1.9197 |
| 2 | 4.4286 | 4.6000 | 4.2727 | 0.327 | 5 | 0.5976 | 0.2556 | 4.0 | -0.4756 | 0.5832 | -0.5600 |
| 3 | 4.2381 | 4.3000 | 4.1818 | 0.118 | 5 | 0.5390 | 0.2305 | 4.0 | 0.2001 | 0.5260 | 0.0267 |
| 4 | 4.3333 | 4.6000 | 4.0909 | 0.509 | 5 | 0.5774 | 0.2469 | 4.0 | -0.1276 | 0.5634 | -0.5368 |
| 5 | 4.3333 | 4.6000 | 4.0909 | 0.509 | 5 | 0.7303 | 0.3123 | 4.0 | -1.4819 | 0.7127 | 3.9844 |
| 6 | 4.1429 | 4.2000 | 4.0909 | 0.109 | 5 | 0.4781 | 0.2045 | 4.0 | 0.4954 | 0.4666 | 1.4967 |
| 7 | 4.1429 | 4.1000 | 4.1818 | -0.082 | 5 | 0.4781 | 0.2045 | 4.0 | 0.4954 | 0.4666 | 1.4967 |
| 8 | 4.5238 | 4.7000 | 4.3636 | 0.336 | 5 | 0.5118 | 0.2189 | 5.0 | -0.1028 | 0.4994 | -2.2105 |
| Average | 4.2738 | 4.4250 | 4.1364 | 0.2886 | 5.0000 | 0.5815 | 0.2487 | 4.1250 | -0.2366 | 0.5675 | 0.7021 |



Human Resources Q9

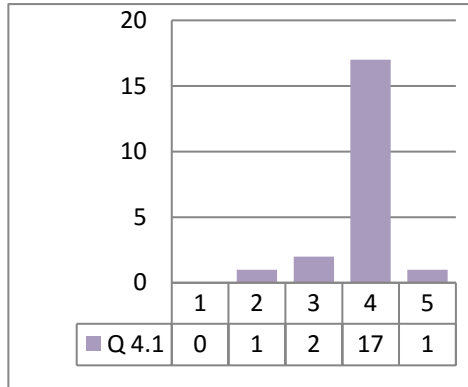| Question No 10 | Average Score | Ave MD's | Ave HRM's | Difference | Possible Score | STD Deviation | Confidence Norm | Median | Skew | Std Dev | Kurtosis |
|---|---|---|---|---|---|---|---|---|---|---|---|
| 1 | 4.1905 | 4.3000 | 4.0909 | 0.209 | 5 | 0.6016 | 0.2573 | 4.0 | -0.0714 | 0.5871 | -0.0995 |
| 2 | 3.5714 | 3.4000 | 3.7273 | -0.327 | 5 | 1.0282 | 0.4397 | 4.0 | -2.0420 | 1.0034 | 6.8952 |
| 3 | 4.1905 | 4.2000 | 4.1818 | 0.018 | 5 | 0.6016 | 0.2573 | 4.0 | -0.0714 | 0.5871 | -0.0995 |
| 4 | 3.8571 | 4.0000 | 3.7273 | 0.273 | 5 | 0.6547 | 0.2800 | 4.0 | 0.1447 | 0.6389 | -0.4339 |
| Average | 3.9524 | 3.9750 | 3.9318 | 0.0432 | 5.0000 | 0.7215 | 0.3086 | 4.0000 | -0.5100 | 0.7041 | 1.5656 |
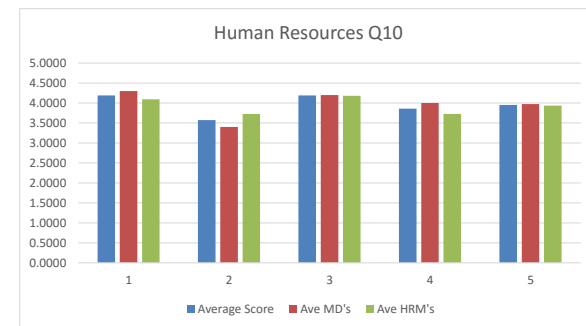


Human Resources Q10

# APPENDIX XIV.

# HUMAN RESOURCES DATA  -
# FREQUENCY GRAPHS

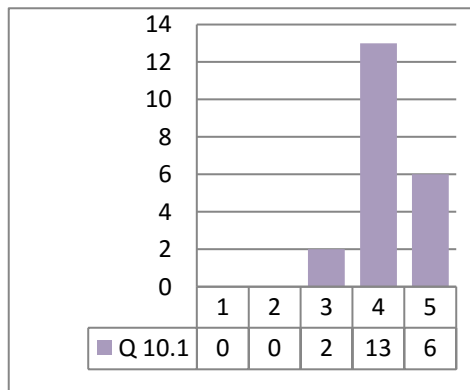# Appendix XIV.    Human Resources Data - Frequency Graphs
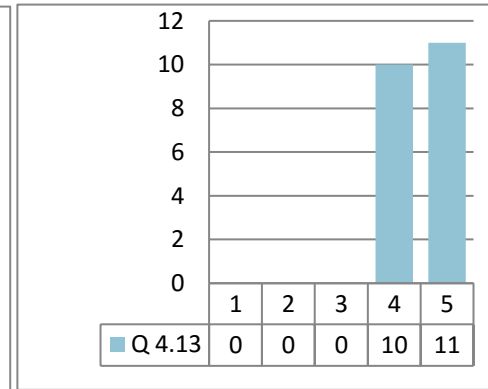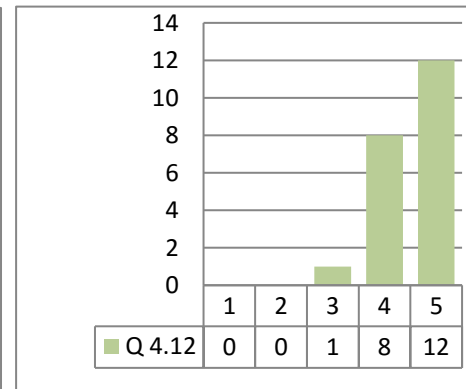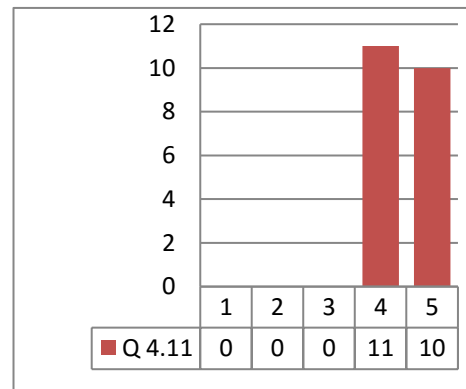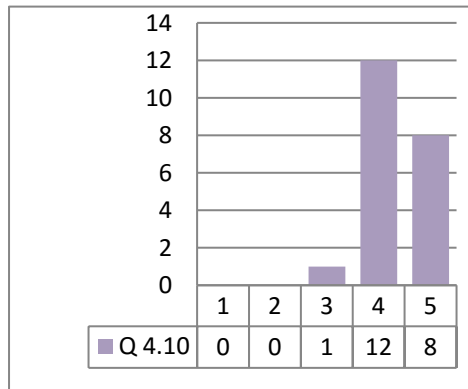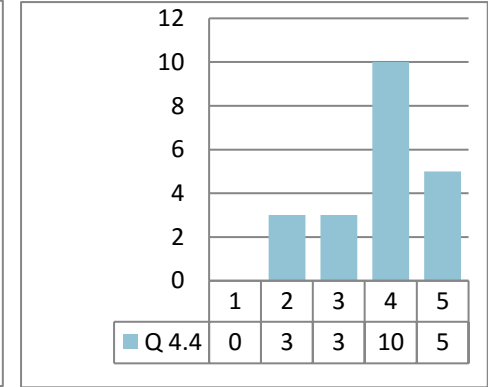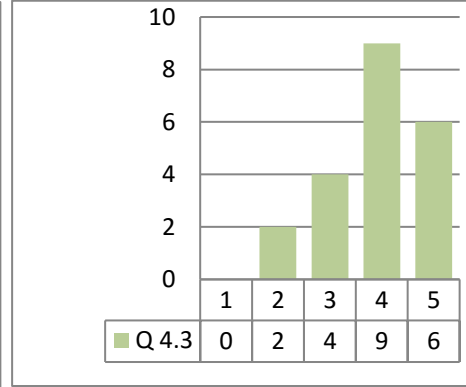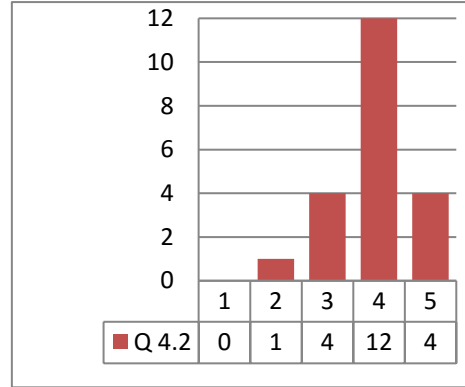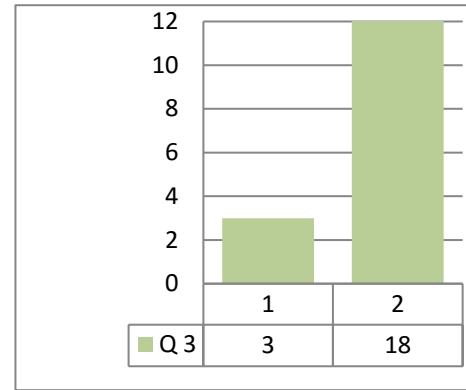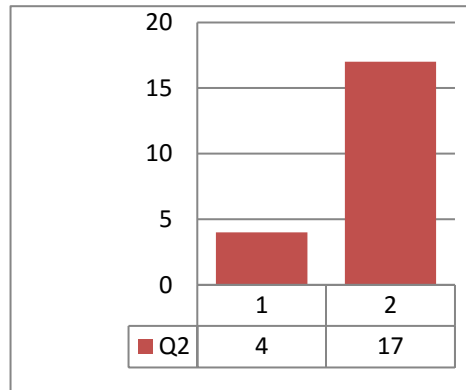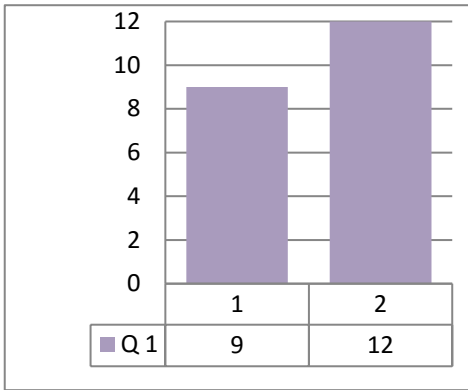
| | 1 | 2 |
|---|---|---|
| Q 1 | 9 | 12 |

| | 1 | 2 |
|---|---|---|
| Q2 | 4 | 17 |

| | 1 | 2 |
|---|---|---|
| Q 3 | 3 | 18 |

| | 1 | 2 | 3 | 4 | 5 |
|---|---|---|---|---|---|
| Q 4.1 | 0 | 1 | 2 | 17 | 1 |

| | 1 | 2 | 3 | 4 | 5 |
|---|---|---|---|---|---|
| Q 4.2 | 0 | 1 | 4 | 12 | 4 |

| | 1 | 2 | 3 | 4 | 5 |
|---|---|---|---|---|---|
| Q 4.3 | 0 | 2 | 4 | 9 | 6 |

| | 1 | 2 | 3 | 4 | 5 |
|---|---|---|---|---|---|
| Q 4.4 | 0 | 3 | 3 | 10 | 5 |

| | 1 | 2 | 3 | 4 | 5 |
|---|---|---|---|---|---|
| Q 4.10 | 0 | 0 | 1 | 12 | 8 |

| | 1 | 2 | 3 | 4 | 5 |
|---|---|---|---|---|---|
| Q 4.11 | 0 | 0 | 0 | 11 | 10 |

| | 1 | 2 | 3 | 4 | 5 |
|---|---|---|---|---|---|
| Q 4.12 | 0 | 0 | 1 | 8 | 12 |

| | 1 | 2 | 3 | 4 | 5 |
|---|---|---|---|---|---|
| Q 4.13 | 0 | 0 | 0 | 10 | 11 |

| Q 5.1 | 1 | 2 | 3 | 4 | 5 |
|---|---|---|---|---|---|
| | 0 | 0 | 2 | 4 | 15 |

| Q 5.2 | 1 | 2 | 3 | 4 | 5 |
|---|---|---|---|---|---|
| | 0 | 0 | 1 | 9 | 11 |

| Q 5.3 | 1 | 2 | 3 | 4 | 5 |
|---|---|---|---|---|---|
| | 0 | 0 | 7 | 9 | 5 |

| Q 5.4 | 1 | 2 | 3 | 4 | 5 |
|---|---|---|---|---|---|
| | 0 | 1 | 2 | 9 | 9 |

| Q 6.1 | 1 | 2 | 3 | 4 | 5 |
|---|---|---|---|---|---|
| | 5 | 12 | 0 | 4 | 0 |

| Q 6.2 | 1 | 2 | 3 | 4 | 5 |
|---|---|---|---|---|---|
| | 1 | 9 | 7 | 4 | 0 |

| Q 6.3 | 1 | 2 | 3 | 4 | 5 |
|---|---|---|---|---|---|
| | 2 | 12 | 2 | 5 | 0 |

| Q 6.4 | 1 | 2 | 3 | 4 | 5 |
|---|---|---|---|---|---|
| | 7 | 11 | 0 | 3 | 0 |

| Q 7.1 | 1 | 2 | 3 | 4 | 5 |
|---|---|---|---|---|---|
| | 4 | 9 | 6 | 2 | 0 |

| Q 7.2 | 1 | 2 | 3 | 4 | 5 |
|---|---|---|---|---|---|
| | 0 | 0 | 4 | 15 | 2 |

| Q 7.3 | 1 | 2 | 3 | 4 | 5 |
|---|---|---|---|---|---|
| | 0 | 0 | 3 | 16 | 2 |

| Q 7.4 | 1 | 2 | 3 | 4 | 5 |
|---|---|---|---|---|---|
| | 0 | 0 | 1 | 12 | 8 |

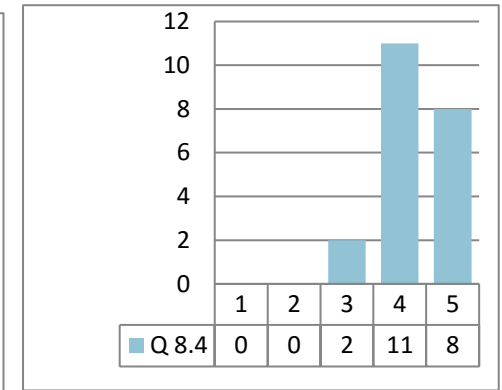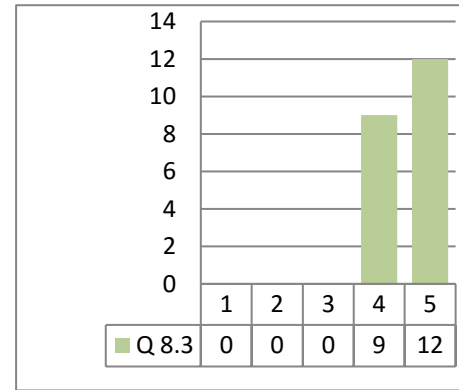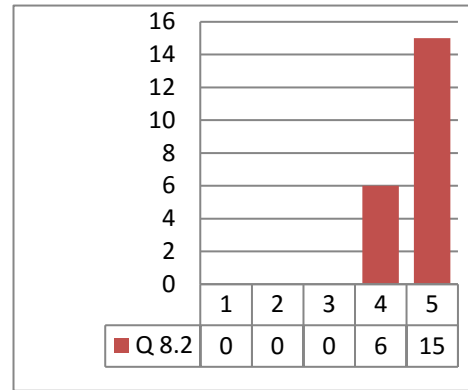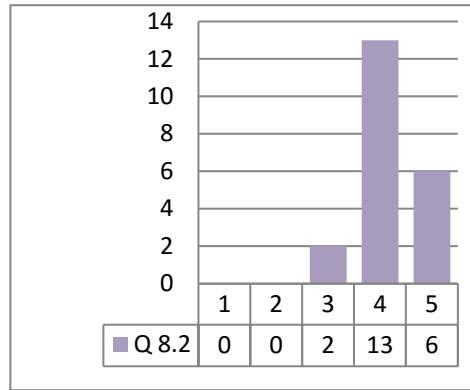# Appendix XIV.    Human Resources Data - Frequency Graphs

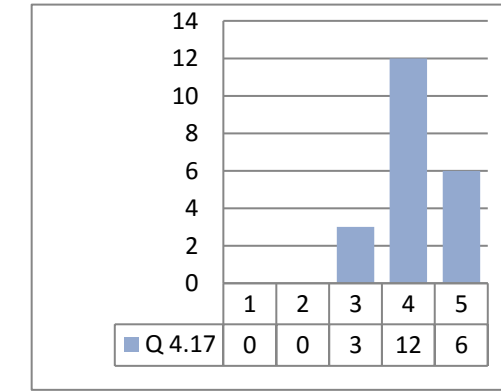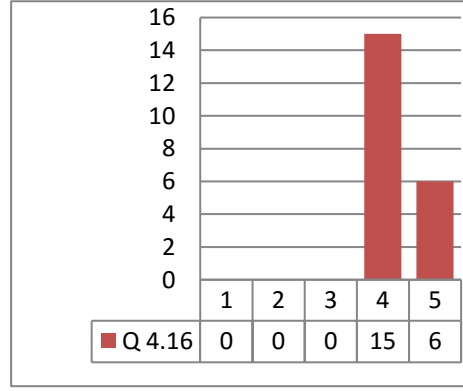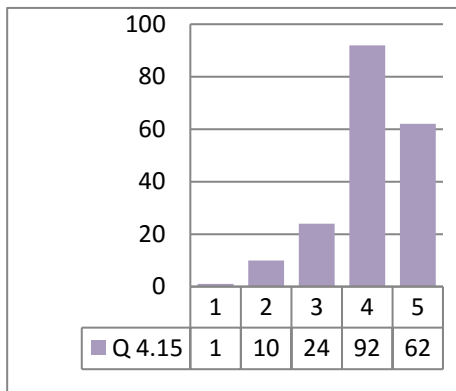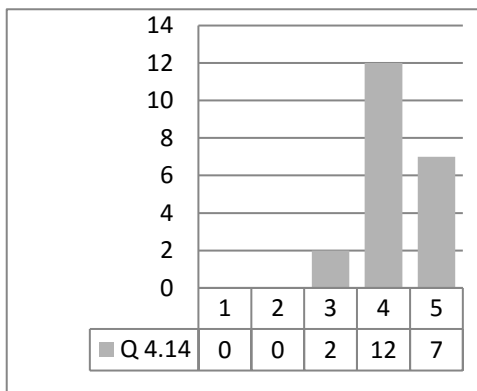| Q 8.2 | 1 | 2 | 3 | 4 | 5 |
|---|---|---|---|---|---|
| | 0 | 0 | 2 | 13 | 6 |

| Q 8.2 | 1 | 2 | 3 | 4 | 5 |
|---|---|---|---|---|---|
| | 0 | 0 | 0 | 6 | 15 |

| Q 8.3 | 1 | 2 | 3 | 4 | 5 |
|---|---|---|---|---|---|
| | 0 | 0 | 0 | 9 | 12 |

| Q 8.4 | 1 | 2 | 3 | 4 | 5 |
|---|---|---|---|---|---|
| | 0 | 0 | 2 | 11 | 8 |

| Q 9.1 | 1 | 2 | 3 | 4 | 5 |
|---|---|---|---|---|---|
| | 0 | 0 | 1 | 14 | 6 |

| Q 9.2 | 1 | 2 | 3 | 4 | 5 |
|---|---|---|---|---|---|
| | 0 | 0 | 1 | 12 | 8 |

| Q 9.3 | 1 | 2 | 3 | 4 | 5 |
|---|---|---|---|---|---|
| | 0 | 1 | 0 | 11 | 9 |

| Q 9.4 | 1 | 2 | 3 | 4 | 5 |
|---|---|---|---|---|---|
| | 0 | 0 | 1 | 16 | 4 |

| Q 10.1 | 1 | 2 | 3 | 4 | 5 |
|---|---|---|---|---|---|
| | 0 | 0 | 2 | 13 | 6 |

| Q 10.2 | 1 | 2 | 3 | 4 | 5 |
|---|---|---|---|---|---|
| | 1 | 0 | 7 | 11 | 2 |

| Q 10.3 | 1 | 2 | 3 | 4 | 5 |
|---|---|---|---|---|---|
| | 0 | 0 | 2 | 13 | 6 |

| Q 10.4 | 1 | 2 | 3 | 4 | 5 |
|---|---|---|---|---|---|
| | 0 | 0 | 6 | 12 | 3 |

| Q 4.5 | 1 | 2 | 3 | 4 | 5 |
|---|---|---|---|---|---|
| | 0 | 1 | 2 | 12 | 6 |

| Q 4.6 | 1 | 2 | 3 | 4 | 5 |
|---|---|---|---|---|---|
| | 0 | 0 | 4 | 13 | 4 |

| Q 4.7 | 1 | 2 | 3 | 4 | 5 |
|---|---|---|---|---|---|
| | 0 | 0 | 4 | 9 | 8 |

| Q 4.8 | 1 | 2 | 3 | 4 | 5 |
|---|---|---|---|---|---|
| | 0 | 0 | 0 | 4 | 17 |

| Q 4.14 | 1 | 2 | 3 | 4 | 5 |
|---|---|---|---|---|---|
| | 0 | 0 | 2 | 12 | 7 |

| Q 4.15 | 1 | 2 | 3 | 4 | 5 |
|---|---|---|---|---|---|
| | 1 | 10 | 24 | 92 | 62 |

| Q 4.16 | 1 | 2 | 3 | 4 | 5 |
|---|---|---|---|---|---|
| | 0 | 0 | 0 | 15 | 6 |

| Q 4.17 | 1 | 2 | 3 | 4 | 5 |
|---|---|---|---|---|---|
| | 0 | 0 | 3 | 12 | 6 |

| Q 5.5 | 1 | 2 | 3 | 4 | 5 |
|---|---|---|---|---|---|
| | 1 | 9 | 8 | 3 | 0 |

| Q 5.6 | 1 | 2 | 3 | 4 | 5 |
|---|---|---|---|---|---|
| | 0 | 0 | 0 | 16 | 5 |

| Q 5.7 | 1 | 2 | 3 | 4 | 5 |
|---|---|---|---|---|---|
| | 0 | 3 | 12 | 4 | 2 |

| Q 5.8 | 1 | 2 | 3 | 4 | 5 |
|---|---|---|---|---|---|
| | 0 | 6 | 7 | 6 | 2 |

| Q 6.5 | 1 | 2 | 3 | 4 | 5 |
|---|---|---|---|---|---|
| | 4 | 10 | 4 | 3 | 0 |

| Q 6.6 | 1 | 2 | 3 | 4 | 5 |
|---|---|---|---|---|---|
| | 10 | 7 | 2 | 1 | 1 |

| Q 6.7 | 1 | 2 | 3 | 4 | 5 |
|---|---|---|---|---|---|
| | 10 | 8 | 0 | 2 | 1 |

| Q 7.5 | 1 | 2 | 3 | 4 | 5 |
|---|---|---|---|---|---|
| | 0 | 0 | 2 | 13 | 6 |

| Q 7.6 | 1 | 2 | 3 | 4 | 5 |
|---|---|---|---|---|---|
| | 0 | 0 | 1 | 17 | 3 |

| Q 7.7 | 1 | 2 | 3 | 4 | 5 |
|---|---|---|---|---|---|
| | 0 | 0 | 3 | 14 | 4 |

| | 1 | 2 | 3 | 4 | 5 |
|---|---|---|---|---|---|
| Q8.5 | 0 | 0 | 2 | 14 | 5 |

| | 1 | 2 | 3 | 4 | 5 |
|---|---|---|---|---|---|
| Q8.6 | 0 | 1 | 4 | 9 | 7 |

| | 1 | 2 | 3 | 4 | 5 |
|---|---|---|---|---|---|
| Q 9.5 | 0 | 0 | 1 | 16 | 4 |

| | 1 | 2 | 3 | 4 | 5 |
|---|---|---|---|---|---|
| Q 9.5 | 0 | 0 | 0 | 10 | 11 |

| | 1 | 2 | 3 | 4 | 5 |
|---|---|---|---|---|---|
| Q 9.7 | 0 | 0 | 1 | 16 | 4 |

| | 1 | 2 | 3 | 4 | 5 |
|---|---|---|---|---|---|
| Q 9.8 | 0 | 0 | 0 | 10 | 11 |

| | 1 | 2 | 3 | 4 | 5 |
|---|---|---|---|---|---|
| Q 4.9 | 0 | 1 | 1 | 10 | 9 |

| | 1 | 2 | 3 | 4 | 5 |
|---|---|---|---|---|---|
| Q 5.9 | 0 | 0 | 3 | 14 | 4 |

| | 1 |
|---|---|
| Q 5.10 | 1 |

| | 1 | 2 | 3 | 4 | 5 |
|---|---|---|---|---|---|
| Q 5.11 | 0 | 3 | 4 | 12 | 2 |

| | 1 | 2 | 3 | 4 | 5 |
|---|---|---|---|---|---|
| Q 5.12 | 1 | 3 | 4 | 11 | 2 |

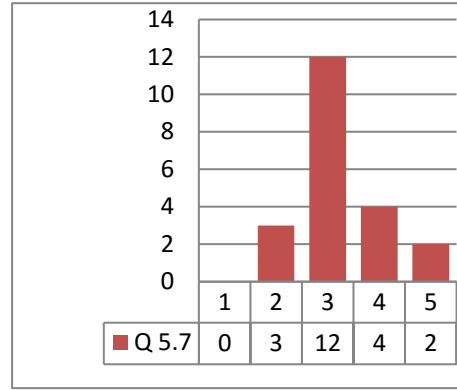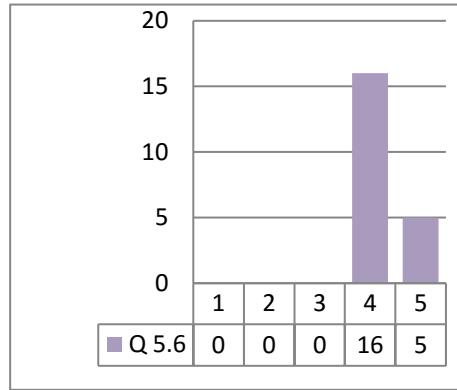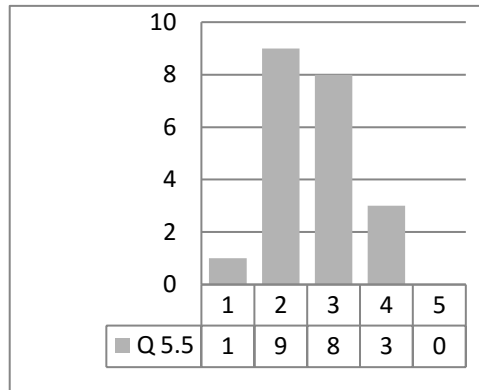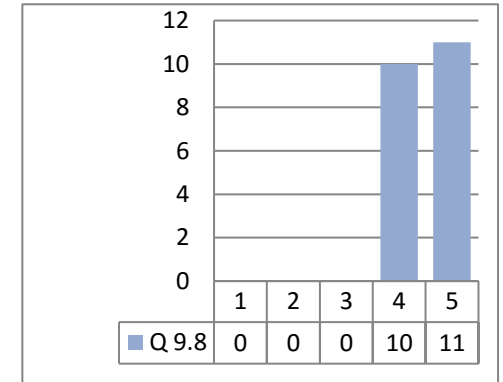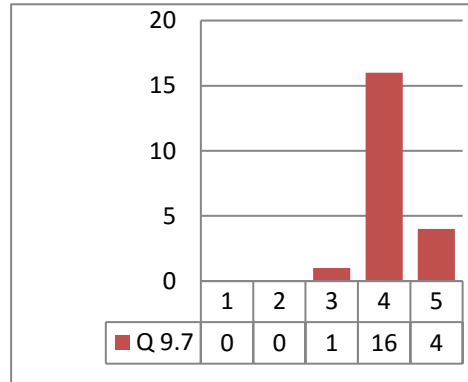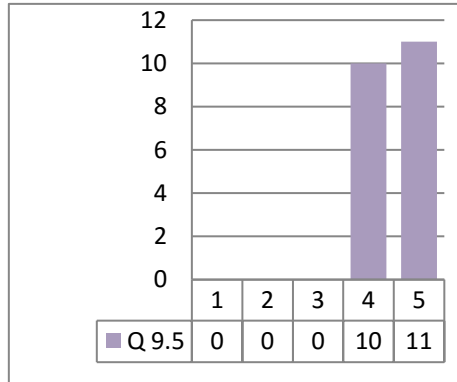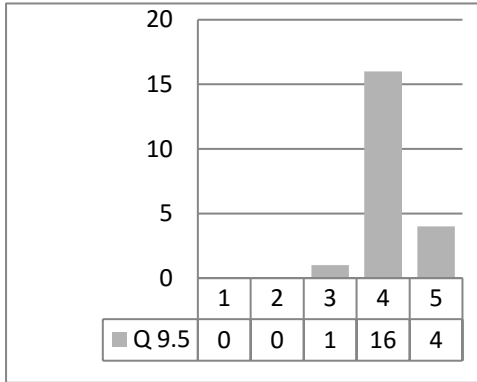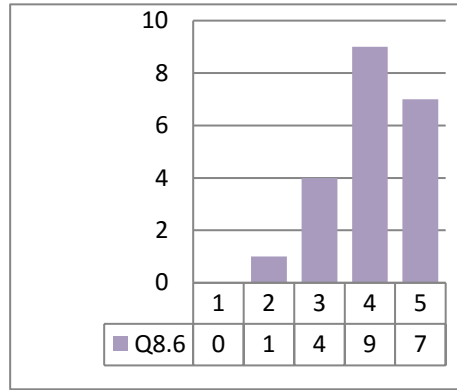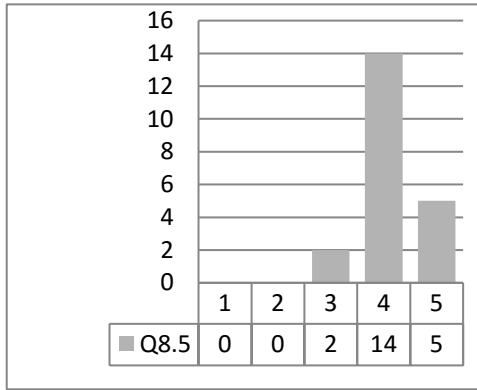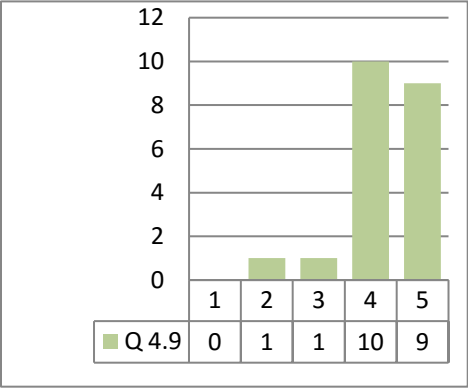| | 1 | 2 | 3 | 4 | 5 |
|---|---|---|---|---|---|
| Q 5.13 | 0 | 0 | 4 | 13 | 4 |
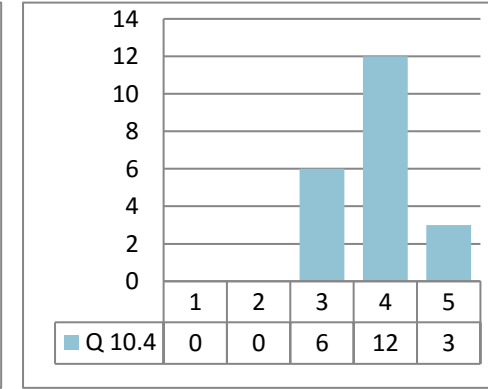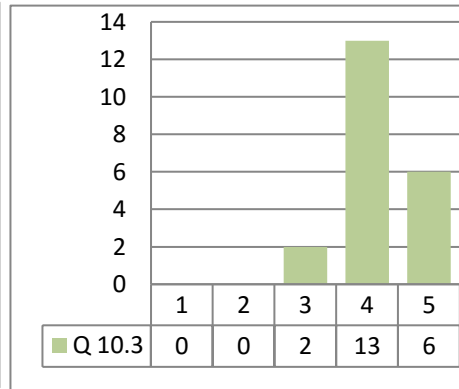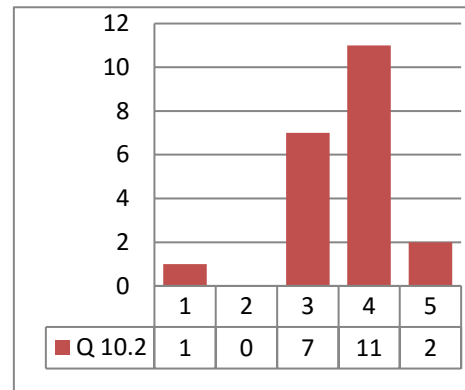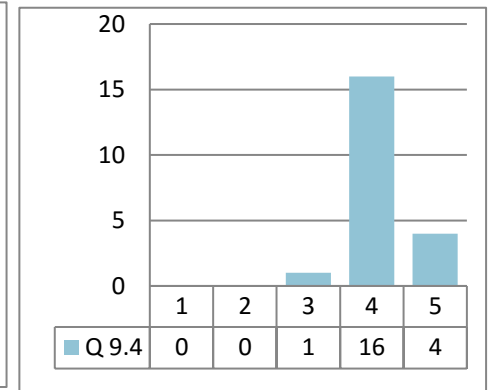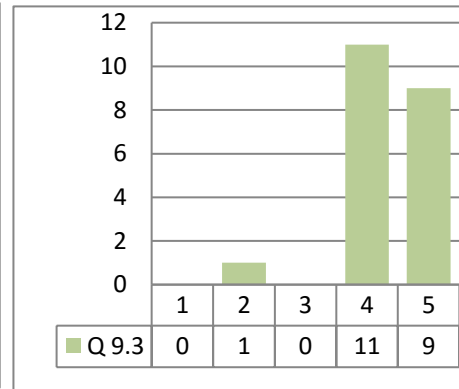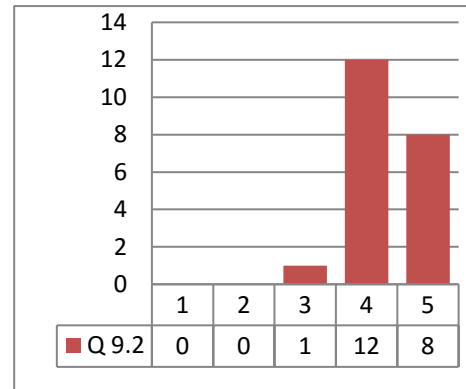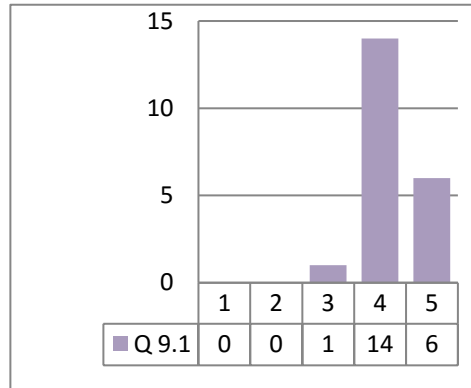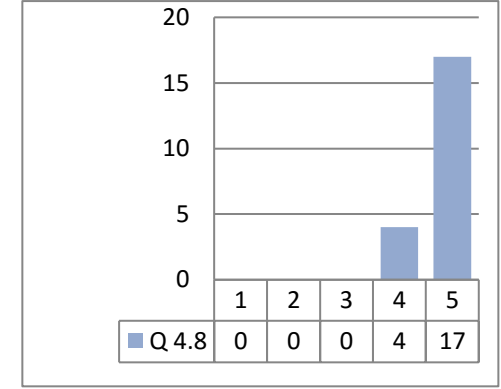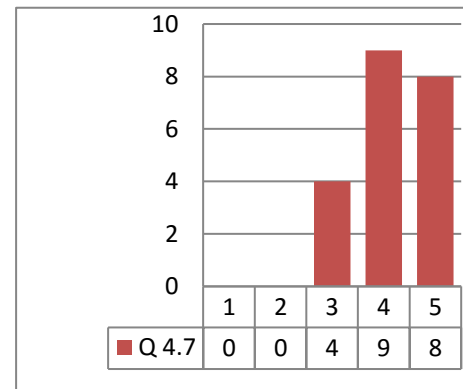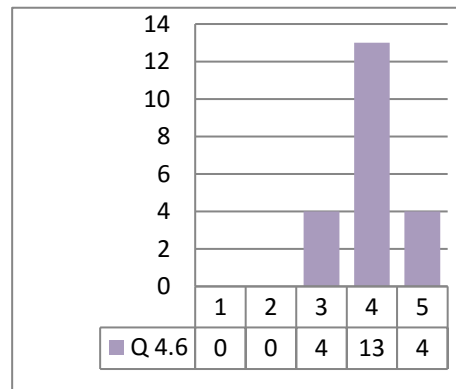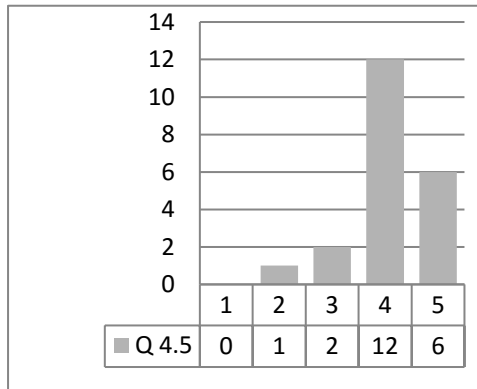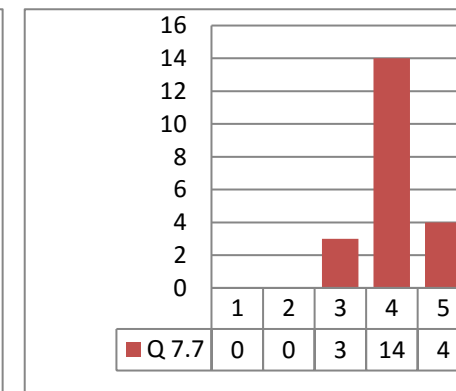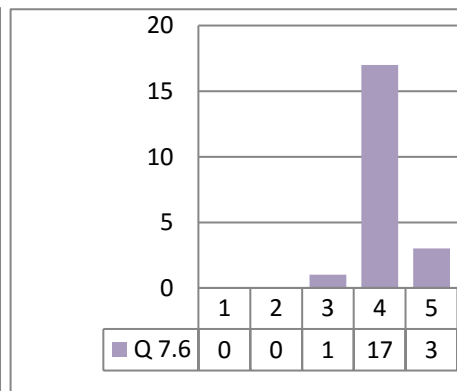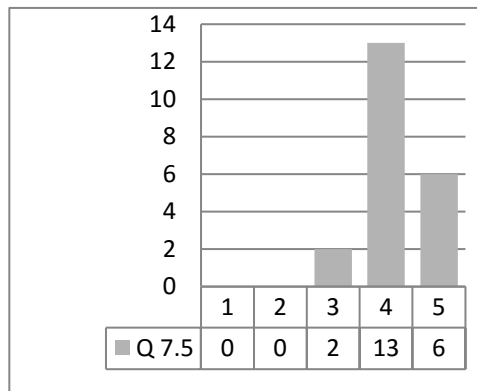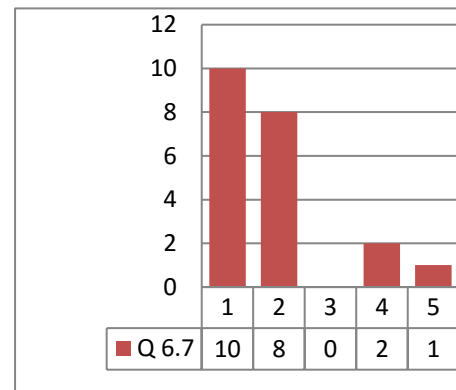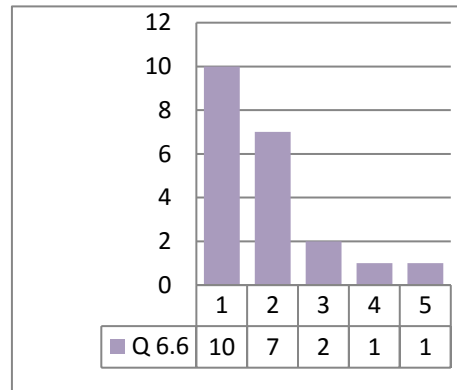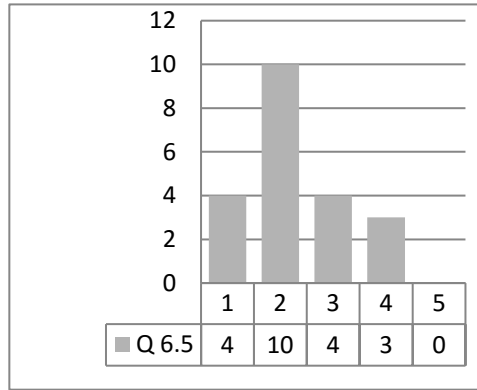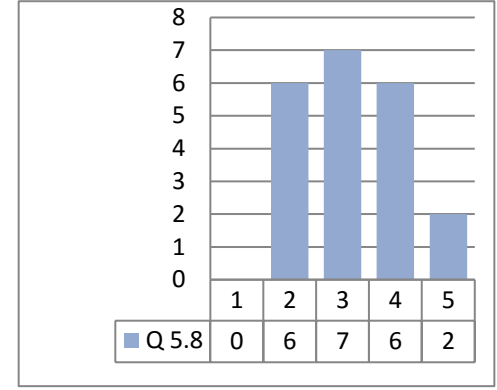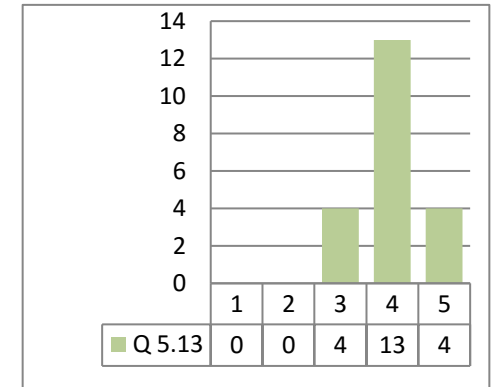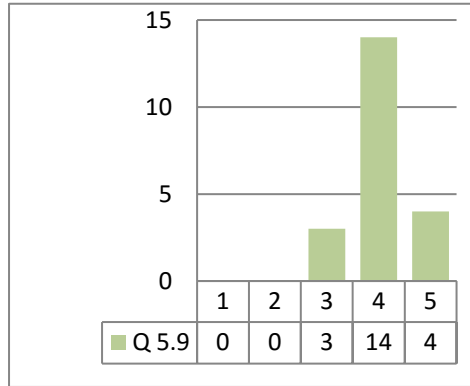
# Appendix XIV. Human Resources Data - Frequency Graphs
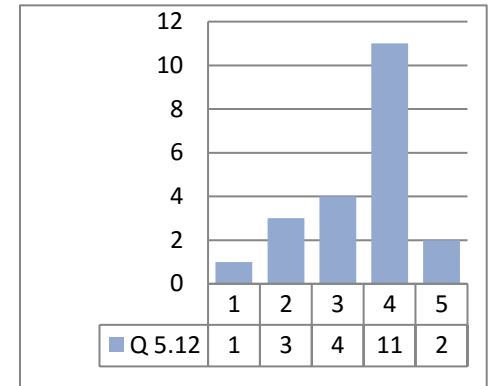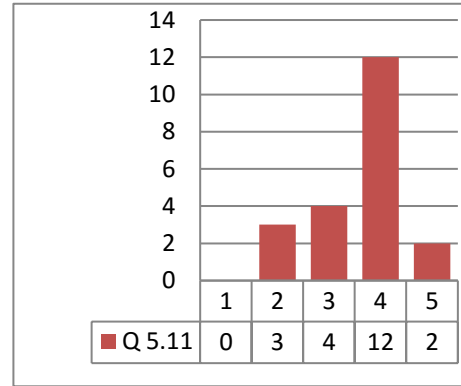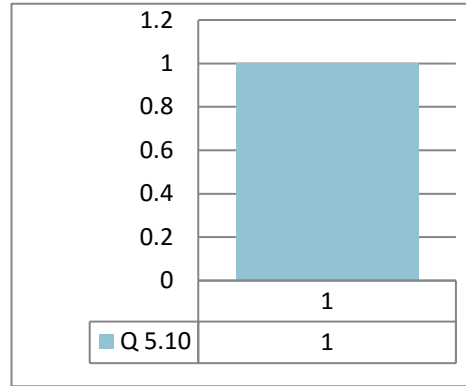
# APPENDIX XV.

# HUMAN RESOURCES – QUESTIONNAIRE

| **HUMAN RESOURCES METRICS** | |
|---|---|
| **Instructions: please choose your Current responsibilities and your location from the dropdown li** | |
| **I am currently employed as a** | **Your current responsibilities** |
| **At** | **Locate your workplace from list** |
| **Please indicate main area of responsibility** | **Your Main Focus Area** |

| | | No | Yes |
|---|---|---|---|
| **1** | At Locate your workplace from list we have a Human Resources strategy in place and have a reporting system to support this initiative | ○ | ◉ |
| | Please provide a short description of your HR strategy in the place provided below and/or attach a copy to this response sheet | | |
| | | | |
| **2** | We have a performance management system in place at Locate your workplace from list and find it to be an important Human Resource Management tool to measure worker performance | ○ | ◉ |
| | Please provide a short description of your Human Resource Strategy in the space provided below and/or attach a copy to this response sheet | | |
| | | | |
| **3** | At Locate your workplace from list We have a full time Human resources manager who is part of the management team and contributes to the organisations vison and strategy | ○ | ◉ |

| **Corporate and Subsidiary Strategy in the Human Resources Environment** | | | | | | |
|---|---|---|---|---|---|---|
| **Question 4** | **In the Human Resource Department of Locate your workplace from list we understand that** | Strongly Disagree | Disagree | Neutral | Agree | Strongly Agree |
| **4.1** | Our Subsidiaries strategy is aligned to the PLP Corporate Strategy | ○ | ○ | ○ | ○ | ○ |
| **4.2** | Our Human Resources Strategy is Aligned to the Subsidiaries Strategy | ○ | ○ | ○ | ○ | ○ |
| **4.3** | Our Subsidiaries Mission & Vision is Clear | ○ | ○ | ○ | ○ | ○ |
| **4.4** | Our Subsidiaries Values are clear | ○ | ○ | ○ | ○ | ○ |
| **4.5** | Our subsidiaries Strategic Objectives are clear | ○ | ○ | ○ | ○ | ○ |
| **4.6** | Our individual Key Performance Areas are clear | ○ | ○ | ○ | ○ | ○ |
| **4.7** | We have a budget which is aligned to the subsidiary budget | ○ | ○ | ○ | ○ | ○ |
| **4.8** | Quality is considered an important strategic objective | ○ | ○ | ○ | ○ | ○ |
| **4.9** | Price is considered an important strategic objective | ○ | ○ | ○ | ○ | ○ |
| **4.10** | Process control development and innovation is considered an important strategic objective | ○ | ○ | ○ | ○ | ○ |
| **4.11** | Product development is considered an important strategic objective | ○ | ○ | ○ | ○ | ○ |
| **4.12** | Innovation is considered an important strategic objective | ○ | ○ | ○ | ○ | ○ |
| **4.13** | Management of people is considered an important strategic objective | ○ | ○ | ○ | ○ | ○ |
| **4.14** | We have a safety culture whith strong management commitment and communication | ○ | ○ | ○ | ○ | ○ |
| **4.15** | the Corporate safety initiatives are communicated to all semployees at our facility | ○ | ○ | ○ | ○ | ○ |
| **4.16** | Safety rules are upheld and a safety culture has been implanted into theo rganisation | ○ | ○ | ○ | ○ | ○ |
| **4.17** | Our safety program contributes towards Long term sustainability | ○ | ○ | ○ | ○ | ○ |

| Question 5 | **In Human Resource Management at Locate your workplace from list we understand that long term sustainability is supported by the following statements.** | Strongly Disagree | Disagree | Neutral | Agree | Strongly Agree |
|---|---|---|---|---|---|
| 5.1 | Human Resource Management is a strategic contributor to the enterprise | O | O | O | O | O |
| 5.2 | Management acknowledge that human capital management is critical to the fundamental success of the business | O | O | O | O | O |
| 5.3 | Measurement is key to the delivery of human capital management | O | O | O | O | O |
| 5.4 | In our Organization management are concerned about peoples well being. | O | O | O | O | O |
| 5.5 | In our Organization shareholders and investors are only concerned about people reports and measures. | O | O | O | O | O |
| 5.6 | Human resources' services could have an effect on organizational outcomes. | O | O | O | O | O |
| 5.7 | We have a clear succession planning program in our organization | O | O | O | O | O |
| 5.8 | Our succession plan is updated annually | O | O | O | O | O |
| 5.9 | Within our organization we have professional objectives and organizational goals | O | O | O | O | O |
| 5.10 | Employee training and development is part of our culture | O | O | O | O | O |
| 5.11 | Leadership and team capability are regularly discussed | O | O | O | O | O |
| 5.12 | We have a capability measurement system (Skills Matrix). | O | O | O | O | O |
| 5.13 | We believe that good human resource management increases revenue per employee | O | O | O | O | O |

| Question 6 | **In Human Resources at Locate your workplace from list we do not believe the following metrics are an important part of our contribution towards the long term sustainability of the Organisation.** | Strongly Disagree | Disagree | Neutral | Agree | Strongly Agree |
|---|---|---|---|---|---|
| 6.1 | Headcount changes | O | O | O | O | O |
| 6.2 | Hiring Statistics | O | O | O | O | O |
| 6.3 | Termination statistics | O | O | O | O | O |
| 6.4 | Absenteeism | O | O | O | O | O |
| 6.5 | Total compensation | O | O | O | O | O |
| 6.6 | Employee motivation | O | O | O | O | O |
| 6.7 | Employee training and Skills development | O | O | O | O | O |

| Question 7 | **The leadership at Locate your workplace from list believe our local senior management team.** | Strongly Disagree | Disagree | Neutral | Agree | Strongly Agree |
|---|---|---|---|---|---|
| 7.1 | Cannot see leadership, but can see people behaving in ways that we call leadership | O | O | O | O | O |
| 7.2 | Through observation, it could be said that our management provide a vision | O | O | O | O | O |
| 7.3 | Make it a point to be visible in the workspace | O | O | O | O | O |
| 7.4 | Encourage new ideas, | O | O | O | O | O |
| 7.5 | Listen to employees | O | O | O | O | O |
| 7.6 | Recognize performance | O | O | O | O | O |
| 7.7 | Are good leaders. | O | O | O | O | O |

| Question 8 | **At Locate your workplace from list we believe our committed employees are those who:** | Strongly Disagree | Disagree | Neutral | Agree | Strongly Agree |
|---|---|---|---|---|---|
| 8.1 | Have a low absence rate | ○ | ○ | ○ | ○ | ○ |
| 8.2 | Work effectively with co-workers | ○ | ○ | ○ | ○ | ○ |
| 8.3 | Contribute ideas for better ways to work | ○ | ○ | ○ | ○ | ○ |
| 8.4 | Produce more than the average worker, | ○ | ○ | ○ | ○ | ○ |
| 8.5 | Speak well of the organization | ○ | ○ | ○ | ○ | ○ |
| 8.6 | Do not quit | ○ | ○ | ○ | ○ | ○ |

| Question 9 | **At Locate your workplace from list we consider our company to be:** | Strongly Disagree | Disagree | Neutral | Agree | Strongly Agree |
|---|---|---|---|---|---|
| 9.1 | An Employer of Choice | ○ | ○ | ○ | ○ | ○ |
| 9.2 | We believe in the Company/Organization Image | ○ | ○ | ○ | ○ | ○ |
| 9.3 | We experience job satisfaction | ○ | ○ | ○ | ○ | ○ |
| 9.4 | We feel engagement with the organization | ○ | ○ | ○ | ○ | ○ |
| 9.5 | Leadership is visible and important to us | ○ | ○ | ○ | ○ | ○ |
| 9.6 | There is employee commitment | ○ | ○ | ○ | ○ | ○ |
| 9.7 | We can align with the organizations Culture | ○ | ○ | ○ | ○ | ○ |
| 9.8 | The organizations Reputation is an important and valuable asset | ○ | ○ | ○ | ○ | ○ |

| Question 10 | **In Human Resources at Locate your workplace from list we believe that.** | Strongly Disagree | Disagree | Neutral | Agree | Strongly Agree |
|---|---|---|---|---|---|
| 10.1 | Structure and strategy are interlinked | ○ | ○ | ○ | ○ | ○ |
| 10.2 | The relationship between a diversification strategy and multidivisional structure, focuses on administrative efficiency and remains applicable to today's markets and technological economies and, as such, could be exploited | ○ | ○ | ○ | ○ | ○ |
| 10.3 | The interactions of strategy and structure have an impact on overall performance or firm adaptability. | ○ | ○ | ○ | ○ | ○ |
| 10.4 | It is the strategic orientation, rather than the structural configuration of firms, which are relevant to overall performance and adaptability | ○ | ○ | ○ | ○ | ○ |

# APPENDIX XVI.
# HUMAN RESOURCES DATA – CRONBACH'S ALPHA

| Cronbach's alpha | 0.85456529 |
|---|---|

| Question No 4 | 4.1 | 4.2 | 4.3 | 4.4 | 4.5 | 4.6 | 4.7 | 4.8 | 4.9 | 4.10 | 4.11 | 4.12 | 4.13 | 4.14 | 4.15 | 4.16 | 4.17 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | 4 | 3 | 3 | 4 | 4 | 3 | 5 | 5 | 5 | 4 | 5 | 5 | 5 | 4 | 4 | 4 | 4 |
| | 4 | 4 | 4 | 4 | 4 | 4 | 4 | 5 | 4 | 4 | 4 | 5 | 4 | 4 | 4 | 4 | 4 |
| | 5 | 5 | 5 | 5 | 5 | 5 | 5 | 5 | 5 | 5 | 5 | 5 | 5 | 5 | 5 | 5 | 5 |
| | 4 | 4 | 4 | 4 | 4 | 4 | 4 | 5 | 5 | 5 | 5 | 5 | 4 | 4 | 4 | 4 | 4 |
| | 4 | 5 | 5 | 5 | 5 | 4 | 3 | 4 | 5 | 4 | 4 | 5 | 5 | 5 | 5 | 5 | 5 |
| | 3 | 4 | 5 | 4 | 5 | 4 | 5 | 5 | 5 | 5 | 5 | 5 | 4 | 5 | 4 | 4 | 4 |
| | 4 | 4 | 2 | 2 | 4 | 4 | 4 | 4 | 5 | 2 | 4 | 5 | 5 | 5 | 5 | 5 | 5 |
| | 4 | 3 | 4 | 4 | 4 | 5 | 5 | 5 | 4 | 4 | 5 | 5 | 4 | 4 | 4 | 4 | 4 |
| | 4 | 4 | 5 | 5 | 5 | 4 | 5 | 5 | 4 | 4 | 4 | 4 | 4 | 4 | 4 | 4 | 3 |
| | 4 | 4 | 4 | 4 | 4 | 3 | 3 | 5 | 3 | 4 | 4 | 4 | 4 | 4 | 4 | 4 | 4 |
| | 4 | 4 | 4 | 4 | 4 | 3 | 3 | 5 | 4 | 4 | 4 | 5 | 5 | 5 | 5 | 5 | 5 |
| | 4 | 3 | 3 | 3 | 4 | 5 | 4 | 5 | 5 | 5 | 5 | 5 | 5 | 5 | 5 | 5 | 5 |
| | 4 | 4 | 3 | 3 | 3 | 4 | 4 | 4 | 4 | 4 | 4 | 4 | 4 | 4 | 4 | 4 | 4 |
| | 3 | 4 | 3 | 3 | 3 | 4 | 5 | 5 | 4 | 5 | 5 | 5 | 4 | 4 | 4 | 4 | 3 |
| | 4 | 4 | 4 | 4 | 4 | 4 | 4 | 5 | 5 | 5 | 5 | 4 | 4 | 4 | 4 | 4 | 4 |
| | 4 | 3 | 4 | 4 | 4 | 4 | 4 | 4 | 4 | 4 | 4 | 4 | 4 | 4 | 4 | 4 | 4 |
| | 4 | 5 | 4 | 2 | 4 | 4 | 5 | 5 | 5 | 5 | 5 | 3 | 4 | 4 | 3 | 4 | 4 |
| | 4 | 4 | 5 | 5 | 5 | 4 | 5 | 4 | 4 | 4 | 4 | 4 | 4 | 4 | 4 | 4 | 3 |
| | 4 | 5 | 5 | 5 | 4 | 4 | 4 | 5 | 4 | 3 | 4 | 4 | 3 | 4 | 4 | 4 | 4 |
| | 2 | 2 | 2 | 2 | 2 | 3 | 4 | 4 | 4 | 4 | 4 | 4 | 3 | 4 | 4 | 4 | 4 |
| | 2 | 2 | 2 | 2 | 2 | 3 | 4 | 4 | 4 | 4 | 4 | 4 | 3 | 4 | 4 | 4 | 4 |

ANOVA

| Source of Variation | SS | df | MS | F | P-value | F crit |
|---|---|---|---|---|---|---|
| Rows | 50.06722689 | 20 | 2.503361345 | 6.87593768 | 8.25461E-16 | 1.603478359 |
| Columns | 29.2605042 | 16 | 1.828781513 | 5.023081362 | 2.6907E-09 | 1.675190511 |
| Error | 116.5042017 | 320 | 0.36407563 | | | |
| | | | | | | |
| Total | 195.8319328 | 356 | | | | |

Anova: Two-Factor Without Replication

| SUMMARY | Count | Sum | Average | Variance |
|---|---|---|---|---|
| Row 1 | 17 | 71 | 4.17647059 | 0.52941176 |
| Row 2 | 17 | 70 | 4.11764706 | 0.11029412 |
| Row 3 | 17 | 85 | 5 | 0 |
| Row 4 | 17 | 74 | 4.35294118 | 0.24264706 |
| Row 5 | 17 | 78 | 4.58823529 | 0.38235294 |
| Row 6 | 17 | 76 | 4.47058824 | 0.38970588 |
| Row 7 | 17 | 70 | 4.11764706 | 1.23529412 |
| Row 8 | 17 | 73 | 4.29411765 | 0.34558824 |
| Row 9 | 17 | 72 | 4.23529412 | 0.31617647 |
| Row 10 | 17 | 66 | 3.88235294 | 0.23529412 |
| Row 11 | 17 | 72 | 4.23529412 | 0.44117647 |
| Row 12 | 17 | 76 | 4.47058824 | 0.63970588 |
| Row 13 | 17 | 65 | 3.82352941 | 0.15441176 |
| Row 14 | 17 | 69 | 4.05882353 | 0.68382353 |
| Row 15 | 17 | 74 | 4.35294118 | 0.24264706 |
| Row 16 | 17 | 67 | 3.94117647 | 0.05882353 |
| Row 17 | 17 | 70 | 4.11764706 | 0.73529412 |
| Row 18 | 17 | 72 | 4.23529412 | 0.31617647 |
| Row 19 | 17 | 70 | 4.11764706 | 0.36029412 |
| Row 20 | 17 | 56 | 3.29411765 | 0.84558824 |
| Row 21 | 17 | 56 | 3.29411765 | 0.84558824 |
| | | | | |
| Column 1 | 21 | 79 | 3.76190476 | 0.49047619 |
| Column 2 | 21 | 80 | 3.80952381 | 0.76190476 |
| Column 3 | 21 | 80 | 3.80952381 | 1.06190476 |
| Column 4 | 21 | 78 | 3.71428571 | 1.11428571 |
| Column 5 | 21 | 83 | 3.95238095 | 0.74761905 |
| Column 6 | 21 | 82 | 3.9047619 | 0.39047619 |
| Column 7 | 21 | 89 | 4.23809524 | 0.49047619 |
| Column 8 | 21 | 100 | 4.76190476 | 0.19047619 |
| Column 9 | 21 | 90 | 4.28571429 | 0.61428571 |
| Column 10 | 21 | 90 | 4.28571429 | 0.31428571 |
| Column 11 | 21 | 93 | 4.42857143 | 0.25714286 |
| Column 12 | 21 | 94 | 4.47619048 | 0.36190476 |
| Column 13 | 21 | 94 | 4.47619048 | 0.26190476 |
| Column 14 | 21 | 87 | 4.14285714 | 0.42857143 |
| Column 15 | 21 | 88 | 4.19047619 | 0.26190476 |
| Column 16 | 21 | 89 | 4.23809524 | 0.19047619 |
| Column 17 | 21 | 86 | 4.0952381 | 0.39047619 |

| Cronbach's alpha | 0.526041667 |
|---|---|

| Question No 7 | 7.1 | 7.2 | 7.3 | 7.4 | 7.5 | 7.6 | 7.7 |
|---|---|---|---|---|---|---|---|
| | 3 | 4 | 4 | 5 | 4 | 4 | 4 |
| | 2 | 4 | 4 | 4 | 4 | 4 | 5 |
| | 2 | 5 | 5 | 5 | 5 | 3 | 4 |
| | 1 | 4 | 4 | 4 | 4 | 4 | 4 |
| | 0 | 4 | 4 | 4 | 4 | 4 | 4 |
| | 3 | 3 | 4 | 4 | 4 | 4 | 4 |
| | 2 | 4 | 5 | 5 | 5 | 5 | 5 |
| | 0 | 4 | 4 | 5 | 4 | 4 | 3 |
| | 2 | 4 | 4 | 4 | 4 | 4 | 4 |
| | 3 | 4 | 4 | 4 | 5 | 5 | 5 |
| | 4 | 4 | 4 | 5 | 5 | 4 | 4 |
| | 2 | 5 | 4 | 5 | 5 | 5 | 5 |
| | 3 | 4 | 3 | 3 | 4 | 4 | 3 |
| | 2 | 4 | 4 | 5 | 4 | 4 | 4 |
| | 1 | 4 | 4 | 4 | 4 | 4 | 4 |
| | 3 | 3 | 3 | 4 | 3 | 4 | 4 |
| | 4 | 3 | 3 | 4 | 4 | 4 | 3 |
| | 2 | 4 | 4 | 4 | 4 | 4 | 4 |
| | 2 | 4 | 4 | 4 | 4 | 4 | 4 |
| | 3 | 4 | 4 | 4 | 3 | 4 | 4 |
| | 3 | 4 | 4 | 4 | 3 | 4 | 4 |

ANOVA

| Source of Variation | SS | df | MS | F | P-value | F crit |
|---|---|---|---|---|---|---|
| Rows | 15.23809524 | 20 | 0.761904762 | 2.10989011 | 0.007131894 | 1.658680143 |
| Columns | 62.0952381 | 6 | 10.34920635 | 28.65934066 | 4.55672E-21 | 2.175006253 |
| Error | 43.33333333 | 120 | 0.361111111 | | | |
| | | | | | | |
| Total | 120.6666667 | 146 | | | | |

Anova: Two-Factor Without Replication

| SUMMARY | Count | Sum | Average | Variance |
|---|---|---|---|---|
| Row 1 | 7 | 28 | 4 | 0.33333333 |
| Row 2 | 7 | 27 | 3.85714286 | 0.80952381 |
| Row 3 | 7 | 29 | 4.14285714 | 1.47619048 |
| Row 4 | 7 | 25 | 3.57142857 | 1.28571429 |
| Row 5 | 7 | 24 | 3.42857143 | 2.28571429 |
| Row 6 | 7 | 26 | 3.71428571 | 0.23809524 |
| Row 7 | 7 | 31 | 4.42857143 | 1.28571429 |
| Row 8 | 7 | 24 | 3.42857143 | 2.61904762 |
| Row 9 | 7 | 26 | 3.71428571 | 0.57142857 |
| Row 10 | 7 | 30 | 4.28571429 | 0.57142857 |
| Row 11 | 7 | 30 | 4.28571429 | 0.23809524 |
| Row 12 | 7 | 31 | 4.42857143 | 1.28571429 |
| Row 13 | 7 | 24 | 3.42857143 | 0.28571429 |
| Row 14 | 7 | 27 | 3.85714286 | 0.80952381 |
| Row 15 | 7 | 25 | 3.57142857 | 1.28571429 |
| Row 16 | 7 | 24 | 3.42857143 | 0.28571429 |
| Row 17 | 7 | 25 | 3.57142857 | 0.28571429 |
| Row 18 | 7 | 26 | 3.71428571 | 0.57142857 |
| Row 19 | 7 | 26 | 3.71428571 | 0.57142857 |
| Row 20 | 7 | 26 | 3.71428571 | 0.23809524 |
| Row 21 | 7 | 26 | 3.71428571 | 0.23809524 |
| | | | | |
| Column 1 | 21 | 47 | 2.23809524 | 1.19047619 |
| Column 2 | 21 | 83 | 3.95238095 | 0.24761905 |
| Column 3 | 21 | 83 | 3.95238095 | 0.24761905 |
| Column 4 | 21 | 90 | 4.28571429 | 0.31428571 |
| Column 5 | 21 | 86 | 4.0952381 | 0.39047619 |
| Column 6 | 21 | 86 | 4.0952381 | 0.19047619 |
| Column 7 | 21 | 85 | 4.04761905 | 0.34761905 |

| Cronbach's alpha | 0.793225971 |
|---|---|

| Question No 5 | 5.1 | 5.2 | 5.3 | 5.4 | 5.5 | 5.6 | 5.7 | 5.8 | 5.9 | 5.10 | 5.11 | 5.12 | 5.13 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | 5 | 5 | 3 | 5 | 2 | 4 | 3 | 2 | 3 | 4 | 4 | 3 | 5 |
| | 5 | 5 | 4 | 5 | 3 | 4 | 4 | 4 | 4 | 4 | 4 | 3 | 4 |
| | 5 | 5 | 4 | 5 | 2 | 5 | 4 | 4 | 4 | 5 | 5 | 5 | 5 |
| | 5 | 5 | 3 | 3 | 2 | 4 | 3 | 4 | 4 | 4 | 3 | 4 | 4 |
| | 5 | 5 | 3 | 5 | 3 | 5 | 4 | 4 | 5 | 5 | 4 | 4 | 4 |
| | 5 | 4 | 5 | 5 | 3 | 4 | 3 | 3 | 4 | 4 | 4 | 5 | 5 |
| | 4 | 5 | 4 | 4 | 1 | 4 | 2 | 2 | 5 | 4 | 2 | 4 | 4 |
| | 4 | 4 | 4 | 4 | 4 | 5 | 3 | 3 | 4 | 4 | 2 | 3 | 3 |
| | 5 | 4 | 4 | 4 | 4 | 4 | 3 | 3 | 4 | 4 | 3 | 4 | 4 |
| | 5 | 5 | 5 | 4 | 2 | 4 | 2 | 2 | 3 | 4 | 4 | 2 | 4 |
| | 5 | 4 | 4 | 5 | 2 | 5 | 4 | 4 | 4 | 4 | 4 | 4 | 4 |
| | 5 | 5 | 5 | 5 | 2 | 5 | 5 | 5 | 5 | 5 | 5 | 2 | 4 |
| | 4 | 4 | 3 | 4 | 3 | 4 | 3 | 3 | 4 | 4 | 4 | 4 | 3 |
| | 5 | 5 | 4 | 5 | 2 | 4 | 5 | 5 | 4 | 5 | 4 | 0 | 4 |
| | 5 | 5 | 3 | 3 | 2 | 4 | 3 | 4 | 4 | 4 | 3 | 4 | 4 |
| | 3 | 4 | 3 | 4 | 3 | 4 | 3 | 3 | 4 | 4 | 4 | 4 | 3 |
| | 4 | 4 | 4 | 4 | 3 | 4 | 3 | 2 | 4 | 4 | 4 | 5 | 5 |
| | 5 | 4 | 4 | 4 | 4 | 4 | 3 | 3 | 4 | 4 | 3 | 4 | 4 |
| | 5 | 4 | 5 | 4 | 2 | 4 | 2 | 2 | 4 | 4 | 4 | 2 | 4 |
| | 3 | 3 | 3 | 2 | 3 | 4 | 3 | 2 | 3 | 3 | 2 | 3 | 3 |
| | 3 | 3 | 3 | 2 | 3 | 4 | 3 | 2 | 3 | 3 | 2 | 3 | 3 |

ANOVA

| Source of Variation | SS | df | MS | F | P-value | F crit |
|---|---|---|---|---|---|---|
| Rows | 47.76556777 | 20 | 2.388278388 | 4.836197305 | 7.49109E-10 | 1.614488472 |
| Columns | 76.71062271 | 12 | 6.392551893 | 12.94473977 | 2.28694E-20 | 1.792673617 |
| Error | 118.5201465 | 240 | 0.493833944 | | | |
| | | | | | | |
| Total | 242.996337 | 272 | | | | |

Anova: Two-Factor Without Replication

| SUMMARY | Count | Sum | Average | Variance |
|---|---|---|---|---|
| Row 1 | 13 | 48 | 3.692307692 | 1.230769231 |
| Row 2 | 13 | 53 | 4.076923077 | 0.41025641 |
| Row 3 | 13 | 58 | 4.461538462 | 0.769230769 |
| Row 4 | 13 | 48 | 3.692307692 | 0.730769231 |
| Row 5 | 13 | 56 | 4.307692308 | 0.564102564 |
| Row 6 | 13 | 54 | 4.153846154 | 0.641025641 |
| Row 7 | 13 | 45 | 3.461538462 | 1.602564103 |
| Row 8 | 13 | 47 | 3.615384615 | 0.58974359 |
| Row 9 | 13 | 50 | 3.846153846 | 0.307692308 |
| Row 10 | 13 | 46 | 3.538461538 | 1.435897436 |
| Row 11 | 13 | 53 | 4.076923077 | 0.576923077 |
| Row 12 | 13 | 58 | 4.461538462 | 1.269230769 |
| Row 13 | 13 | 47 | 3.615384615 | 0.256410256 |
| Row 14 | 13 | 52 | 4 | 2.166666667 |
| Row 15 | 13 | 48 | 3.692307692 | 0.730769231 |
| Row 16 | 13 | 46 | 3.538461538 | 0.269230769 |
| Row 17 | 13 | 49 | 3.769230769 | 0.525641026 |
| Row 18 | 13 | 50 | 3.846153846 | 0.307692308 |
| Row 19 | 13 | 46 | 3.538461538 | 1.269230769 |
| Row 20 | 13 | 37 | 2.846153846 | 0.307692308 |
| Row 21 | 13 | 37 | 2.846153846 | 0.307692308 |
| | | | | |
| Column 1 | 21 | 95 | 4.523809524 | 0.561904762 |
| Column 2 | 21 | 92 | 4.380952381 | 0.447619048 |
| Column 3 | 21 | 80 | 3.80952381 | 0.561904762 |
| Column 4 | 21 | 86 | 4.095238095 | 0.89047619 |
| Column 5 | 21 | 55 | 2.619047619 | 0.647619048 |
| Column 6 | 21 | 89 | 4.238095238 | 0.19047619 |
| Column 7 | 21 | 68 | 3.238095238 | 0.69047619 |
| Column 8 | 21 | 66 | 3.142857143 | 1.028571429 |
| Column 9 | 21 | 83 | 3.952380952 | 0.347619048 |
| Column 10 | 21 | 86 | 4.095238095 | 0.29047619 |
| Column 11 | 21 | 74 | 3.523809524 | 0.861904762 |
| Column 12 | 21 | 71 | 3.380952381 | 1.347619048 |
| Column 13 | 21 | 83 | 3.952380952 | 0.447619048 |

| Cronbach's alpha | 0.652610837 |
|---|---|

| Question No 8 | 8.1 | 8.2 | 8.3 | 8.4 | 8.5 | 8.6 |
|---|---|---|---|---|---|---|
| | 5 | 5 | 4 | 4 | 5 | 4 |
| | 4 | 5 | 4 | 4 | 4 | 5 |
| | 4 | 5 | 5 | 3 | 4 | 2 |
| | 5 | 5 | 5 | 5 | 5 | 5 |
| | 5 | 5 | 5 | 4 | 4 | 3 |
| | 4 | 4 | 4 | 4 | 4 | 4 |
| | 4 | 4 | 5 | 5 | 4 | 5 |
| | 4 | 5 | 5 | 5 | 3 | 5 |
| | 4 | 5 | 5 | 4 | 4 | 4 |
| | 4 | 5 | 5 | 5 | 3 | 3 |
| | 4 | 5 | 5 | 4 | 4 | 4 |
| | 5 | 5 | 4 | 5 | 5 | 5 |
| | 4 | 4 | 4 | 3 | 4 | 4 |
| | 3 | 5 | 5 | 5 | 4 | 4 |
| | 5 | 5 | 5 | 5 | 5 | 5 |
| | 4 | 4 | 4 | 4 | 4 | 4 |
| | 3 | 4 | 4 | 4 | 4 | 3 |
| | 4 | 5 | 5 | 4 | 4 | 4 |
| | 4 | 5 | 4 | 4 | 4 | 3 |
| | 4 | 4 | 4 | 4 | 4 | 4 |
| | 4 | 4 | 4 | 4 | 4 | 4 |

ANOVA

| Source of Variation | SS | df | MS | F | P-value | F crit |
|---|---|---|---|---|---|---|
| Rows | 16.11111111 | 20 | 0.805555556 | 2.878615995 | 0.000275089 | 1.67643425 |
| Columns | 7.182539683 | 5 | 1.436507937 | 5.133295519 | 0.000311795 | 2.305318242 |
| Error | 27.98412698 | 100 | 0.27984127 | | | |
| | | | | | | |
| Total | 51.27777778 | 125 | | | | |

Anova: Two-Factor Without Replication

| SUMMARY | Count | Sum | Average | Variance |
|---|---|---|---|---|
| Row 1 | 6 | 27 | 4.5 | 0.3 |
| Row 2 | 6 | 26 | 4.333333333 | 0.266666667 |
| Row 3 | 6 | 23 | 3.833333333 | 1.366666667 |
| Row 4 | 6 | 30 | 5 | 0 |
| Row 5 | 6 | 26 | 4.333333333 | 0.666666667 |
| Row 6 | 6 | 24 | 4 | 0 |
| Row 7 | 6 | 27 | 4.5 | 0.3 |
| Row 8 | 6 | 27 | 4.5 | 0.7 |
| Row 9 | 6 | 26 | 4.333333333 | 0.266666667 |
| Row 10 | 6 | 25 | 4.166666667 | 0.966666667 |
| Row 11 | 6 | 26 | 4.333333333 | 0.266666667 |
| Row 12 | 6 | 29 | 4.833333333 | 0.166666667 |
| Row 13 | 6 | 23 | 3.833333333 | 0.166666667 |
| Row 14 | 6 | 26 | 4.333333333 | 0.666666667 |
| Row 15 | 6 | 30 | 5 | 0 |
| Row 16 | 6 | 24 | 4 | 0 |
| Row 17 | 6 | 22 | 3.666666667 | 0.266666667 |
| Row 18 | 6 | 26 | 4.333333333 | 0.266666667 |
| Row 19 | 6 | 24 | 4 | 0.4 |
| Row 20 | 6 | 24 | 4 | 0 |
| Row 21 | 6 | 24 | 4 | 0 |
| | | | | |
| Column 1 | 21 | 87 | 4.142857143 | 0.328571429 |
| Column 2 | 21 | 98 | 4.666666667 | 0.233333333 |
| Column 3 | 21 | 95 | 4.523809524 | 0.261904762 |
| Column 4 | 21 | 89 | 4.238095238 | 0.39047619 |
| Column 5 | 21 | 86 | 4.095238095 | 0.29047619 |
| Column 6 | 21 | 84 | 4 | 0.7 |

| Cronbach's alpha | 0.927915063 |
|---|---|

| Question No 6 | 6.1 | 6.2 | 6.3 | 6.4 | 6.5 | 6.6 | 6.7 |
|---|---|---|---|---|---|---|---|
| | 4 | 2 | 2 | 2 | 3 | 2 | 2 |
| | 2 | 3 | 2 | 2 | 2 | 1 | 1 |
| | 2 | 2 | 2 | 1 | 3 | 1 | 1 |
| | 1 | 4 | 4 | 1 | 1 | 1 | 1 |
| | 2 | 3 | 3 | 2 | 3 | 3 | 2 |
| | 2 | 3 | 3 | 1 | 3 | 1 | 1 |
| | 2 | 3 | 2 | 2 | 2 | 1 | 1 |
| | 1 | 3 | 2 | 2 | 1 | 1 | 2 |
| | 2 | 2 | 2 | 2 | 2 | 2 | 1 |
| | 2 | 2 | 2 | 2 | 2 | 2 | 2 |
| | 4 | 3 | 4 | 4 | 4 | 4 | 4 |
| | 1 | 1 | 1 | 1 | 1 | 1 | 1 |
| | 2 | 2 | 2 | 2 | 2 | 2 | 2 |
| | 4 | 4 | 4 | 4 | 4 | 5 | 5 |
| | 1 | 4 | 4 | 1 | 1 | 1 | 1 |
| | 2 | 2 | 2 | 2 | 2 | 2 | 2 |
| | 2 | 3 | 1 | 1 | 2 | 1 | 2 |
| | 2 | 2 | 2 | 2 | 2 | 2 | 1 |
| | 2 | 2 | 2 | 2 | 2 | 2 | 2 |
| | 4 | 4 | 4 | 4 | 4 | 3 | 4 |
| | 4 | 4 | 4 | 4 | 4 | 3 | 4 |

ANOVA

| Source of Variation | SS | df | MS | F | P-value | F crit |
|---|---|---|---|---|---|---|
| Rows | 109.5646259 | 20 | 5.478231293 | 13.87252369 | 1.48175E-22 | 1.658680143 |
| Columns | 11.46938776 | 6 | 1.911564626 | 4.840654608 | 0.000184843 | 2.175006253 |
| Error | 47.3877551 | 120 | 0.394897959 | | | |
| | | | | | | |
| Total | 168.4217687 | 146 | | | | |

Anova: Two-Factor Without Replication

| SUMMARY | Count | Sum | Average | Variance |
|---|---|---|---|---|
| Row 1 | 7 | 17 | 2.428571429 | 0.619047619 |
| Row 2 | 7 | 13 | 1.857142857 | 0.476190476 |
| Row 3 | 7 | 12 | 1.714285714 | 0.571428571 |
| Row 4 | 7 | 13 | 1.857142857 | 2.142857143 |
| Row 5 | 7 | 18 | 2.571428571 | 0.285714286 |
| Row 6 | 7 | 14 | 2 | 1 |
| Row 7 | 7 | 13 | 1.857142857 | 0.476190476 |
| Row 8 | 7 | 12 | 1.714285714 | 0.571428571 |
| Row 9 | 7 | 13 | 1.857142857 | 0.142857143 |
| Row 10 | 7 | 14 | 2 | 0 |
| Row 11 | 7 | 27 | 3.857142857 | 0.142857143 |
| Row 12 | 7 | 7 | 1 | 0 |
| Row 13 | 7 | 14 | 2 | 0 |
| Row 14 | 7 | 30 | 4.285714286 | 0.238095238 |
| Row 15 | 7 | 13 | 1.857142857 | 2.142857143 |
| Row 16 | 7 | 14 | 2 | 0 |
| Row 17 | 7 | 12 | 1.714285714 | 0.571428571 |
| Row 18 | 7 | 13 | 1.857142857 | 0.142857143 |
| Row 19 | 7 | 14 | 2 | 0 |
| Row 20 | 7 | 27 | 3.857142857 | 0.142857143 |
| Row 21 | 7 | 27 | 3.857142857 | 0.142857143 |
| | | | | |
| Column 1 | 21 | 48 | 2.285714286 | 1.114285714 |
| Column 2 | 21 | 58 | 2.761904762 | 0.79047619 |
| Column 3 | 21 | 54 | 2.571428571 | 1.057142857 |
| Column 4 | 21 | 44 | 2.095238095 | 1.09047619 |
| Column 5 | 21 | 50 | 2.380952381 | 1.047619048 |
| Column 6 | 21 | 41 | 1.952380952 | 1.247619048 |
| Column 7 | 21 | 42 | 2 | 1.5 |

| Cronbach's alpha | 0.876426604 |
|---|---|

| Question No 9 | 9.1 | 9.2 | 9.3 | 9.4 | 9.5 | 9.6 | 9.7 | 9.8 |
|---|---|---|---|---|---|---|---|---|
| | 5 | 5 | 4 | 4 | 5 | 4 | 4 | 5 |
| | 5 | 5 | 5 | 5 | 5 | 5 | 5 | 5 |
| | 4 | 5 | 4 | 4 | 4 | 4 | 4 | 4 |
| | 4 | 5 | 4 | 5 | 4 | 5 | 4 | 4 |
| | 4 | 4 | 3 | 4 | 4 | 4 | 3 | 4 |
| | 4 | 4 | 4 | 5 | 4 | 4 | 4 | 5 |
| | 4 | 5 | 4 | 5 | 5 | 4 | 4 | 5 |
| | 4 | 4 | 5 | 5 | 5 | 4 | 4 | 5 |
| | 4 | 5 | 4 | 5 | 4 | 4 | 4 | 4 |
| | 5 | 5 | 5 | 5 | 5 | 5 | 5 | 5 |
| | 5 | 4 | 4 | 4 | 4 | 4 | 4 | 4 |
| | 5 | 5 | 5 | 5 | 5 | 5 | 5 | 5 |
| | 4 | 4 | 4 | 4 | 4 | 4 | 4 | 4 |
| | 4 | 4 | 4 | 4 | 4 | 5 | 5 | 5 |
| | 4 | 4 | 5 | 4 | 5 | 4 | 4 | 5 |
| | 3 | 4 | 4 | 4 | 4 | 4 | 4 | 4 |
| | 2 | 3 | 4 | 4 | 4 | 4 | 4 | 4 |
| | 4 | 5 | 4 | 5 | 4 | 4 | 4 | 4 |
| | 4 | 5 | 4 | 4 | 5 | 4 | 4 | 4 |
| | 3 | 4 | 4 | 3 | 2 | 3 | 4 | 4 |
| | 3 | 4 | 4 | 3 | 2 | 3 | 4 | 4 |

ANOVA

| Source of Variation | SS | df | MS | F | P-value | F crit |
|---|---|---|---|---|---|---|
| Rows | 34.57142857 | 20 | 1.728571429 | 8.092356688 | 3.72267E-15 | 1.646027152 |
| Columns | 3.470238095 | 7 | 0.495748299 | 2.320859873 | 0.028606106 | 2.075588793 |
| Error | 29.9047619 | 140 | 0.213605442 | | | |
| | | | | | | |
| Total | 67.94642857 | 167 | | | | |

Anova: Two-Factor Without Replication

| SUMMARY | Count | Sum | Average | Variance |
|---|---|---|---|---|
| Row 1 | 8 | 36 | 4.5 | 0.285714286 |
| Row 2 | 8 | 40 | 5 | 0 |
| Row 3 | 8 | 33 | 4.125 | 0.125 |
| Row 4 | 8 | 35 | 4.375 | 0.267857143 |
| Row 5 | 8 | 30 | 3.75 | 0.214285714 |
| Row 6 | 8 | 34 | 4.25 | 0.214285714 |
| Row 7 | 8 | 36 | 4.5 | 0.285714286 |
| Row 8 | 8 | 36 | 4.5 | 0.285714286 |
| Row 9 | 8 | 34 | 4.25 | 0.214285714 |
| Row 10 | 8 | 40 | 5 | 0 |
| Row 11 | 8 | 33 | 4.125 | 0.125 |
| Row 12 | 8 | 40 | 5 | 0 |
| Row 13 | 8 | 32 | 4 | 0 |
| Row 14 | 8 | 35 | 4.375 | 0.267857143 |
| Row 15 | 8 | 35 | 4.375 | 0.267857143 |
| Row 16 | 8 | 31 | 3.875 | 0.125 |
| Row 17 | 8 | 29 | 3.625 | 0.553571429 |
| Row 18 | 8 | 34 | 4.25 | 0.214285714 |
| Row 19 | 8 | 34 | 4.25 | 0.214285714 |
| Row 20 | 8 | 27 | 3.375 | 0.553571429 |
| Row 21 | 8 | 27 | 3.375 | 0.553571429 |
| | | | | |
| Column 1 | 21 | 84 | 4 | 0.6 |
| Column 2 | 21 | 92 | 4.380952381 | 0.347619048 |
| Column 3 | 21 | 89 | 4.238095238 | 0.29047619 |
| Column 4 | 21 | 90 | 4.285714286 | 0.414285714 |
| Column 5 | 21 | 89 | 4.238095238 | 0.79047619 |
| Column 6 | 21 | 86 | 4.095238095 | 0.29047619 |
| Column 7 | 21 | 87 | 4.142857143 | 0.228571429 |
| Column 8 | 21 | 94 | 4.476190476 | 0.261904762 |

Cronbach's alpha for Human Resources Questionnaire



Cronbach's alpha for Human Resources Questionnaire
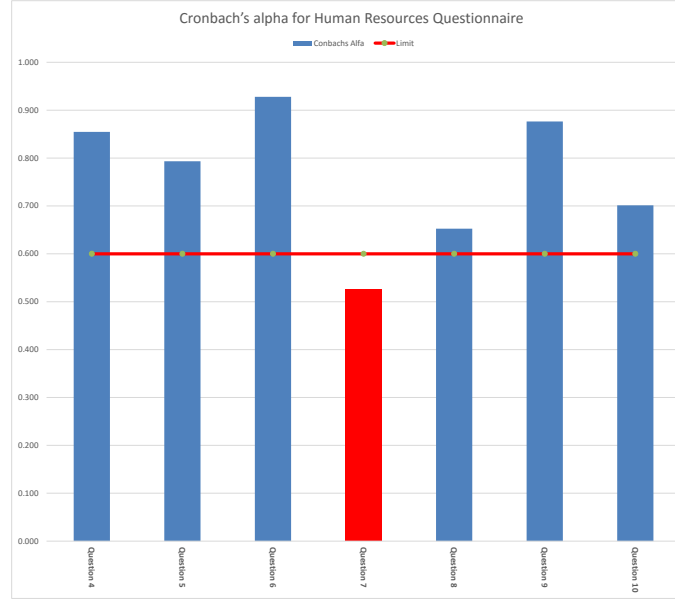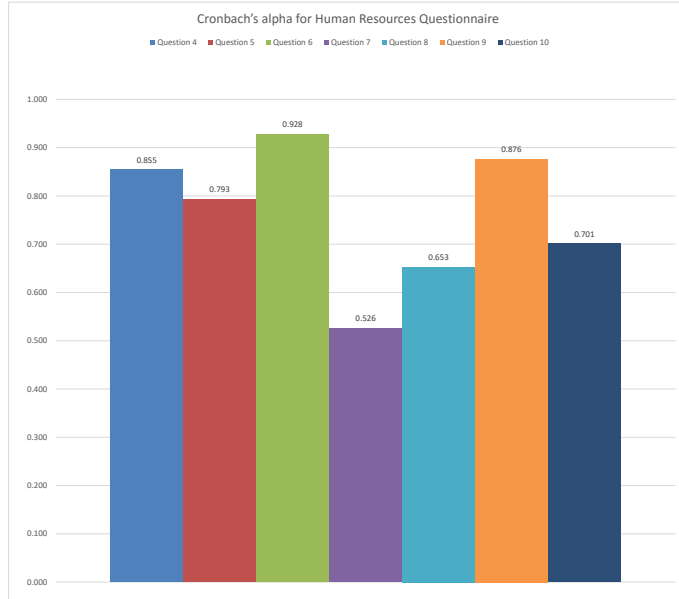
| Cronbach's alpha | 0.701273262 |
|---|---|

| Question No 10 | 10.1 | 10.2 | 10.3 | 10.4 |
|---|---|---|---|---|
| | 4 | 4 | 4 | 4 |
| | 4 | 3 | 4 | 4 |
| | 4 | 4 | 4 | 3 |
| | 4 | 4 | 4 | 4 |
| | 4 | 3 | 3 | 3 |
| | 4 | 3 | 4 | 4 |
| | 5 | 4 | 5 | 4 |
| | 5 | 0 | 5 | 5 |
| | 4 | 4 | 4 | 4 |
| | 5 | 5 | 5 | 5 |
| | 4 | 4 | 4 | 4 |
| | 5 | 4 | 5 | 4 |
| | 3 | 3 | 4 | 3 |
| | 5 | 5 | 5 | 5 |
| | 4 | 4 | 4 | 4 |
| | 4 | 3 | 4 | 3 |
| | 4 | 3 | 4 | 3 |
| | 4 | 4 | 4 | 4 |
| | 4 | 4 | 4 | 4 |
| | 3 | 3 | 3 | 3 |
| | 3 | 3 | 3 | 3 |

ANOVA

| Source of Variation | SS | df | MS | F | P-value | F crit |
|---|---|---|---|---|---|---|
| Rows | 24.30952381 | 20 | 1.21547619 | 3.347540984 | 0.00015 | 1.74798 |
| Columns | 4.714285714 | 3 | 1.571428571 | 4.327868852 | 0.00792 | 2.75808 |
| Error | 21.78571429 | 60 | 0.363095238 | | | |
| | | | | | | |
| Total | 50.80952381 | 83 | | | | |

Anova: Two-Factor Without Replication

| SUMMARY | Count | Sum | Average | Variance |
|---|---|---|---|---|
| Row 1 | 4 | 16 | 4 | 0 |
| Row 2 | 4 | 15 | 3.75 | 0.25 |
| Row 3 | 4 | 15 | 3.75 | 0.25 |
| Row 4 | 4 | 16 | 4 | 0 |
| Row 5 | 4 | 13 | 3.25 | 0.25 |
| Row 6 | 4 | 15 | 3.75 | 0.25 |
| Row 7 | 4 | 18 | 4.5 | 0.33333 |
| Row 8 | 4 | 15 | 3.75 | 6.25 |
| Row 9 | 4 | 16 | 4 | 0 |
| Row 10 | 4 | 20 | 5 | 0 |
| Row 11 | 4 | 16 | 4 | 0 |
| Row 12 | 4 | 18 | 4.5 | 0.33333 |
| Row 13 | 4 | 13 | 3.25 | 0.25 |
| Row 14 | 4 | 20 | 5 | 0 |
| Row 15 | 4 | 16 | 4 | 0 |
| Row 16 | 4 | 14 | 3.5 | 0.33333 |
| Row 17 | 4 | 14 | 3.5 | 0.33333 |
| Row 18 | 4 | 16 | 4 | 0 |
| Row 19 | 4 | 16 | 4 | 0 |
| Row 20 | 4 | 12 | 3 | 0 |
| Row 21 | 4 | 12 | 3 | 0 |
| | | | | |
| Column 1 | 21 | 86 | 4.09524 | 0.39048 |
| Column 2 | 21 | 74 | 3.52381 | 1.0619 |
| Column 3 | 21 | 86 | 4.09524 | 0.39048 |
| Column 4 | 21 | 80 | 3.80952 | 0.4619 |