Development of a business centred facilities maintenance strategy for a retail chain business

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\section*{Abstract}
The performance of facilities in buildings has profound influence on end-user satisfaction. This, in turn, affects the buildings’ income and hence the level of resources available for maintaining their facilities. This paper probes into the maintenance management and financial performance data of a company which operates from multiple locations, leading to the development of a model which links the individual SBU performance to the maintenance costs. In order to ensure uninterrupted business processes in the relevant, a method of prioritising response to restorative work request is outlined for the SBUs. The model for the foundation to developing the business centred facilities maintenance strategy consists of a criticality and priority assessment and ranking of both the outlets and the equipment, using a Maintenance Priority Matrix, and SWOT analysis. This leads to the development of a series of focus areas for the alignment of all SBUs to be stand alone profit centres. A logical framework Analysis is conducted in aid of the formulation of a business centred strategy. The model thus formed is useful in maintenance management for profitability for companies that operate from multiple locations. The research brings out the fact that the application of best practice maintenance management is possible in facilities maintenance, and that by viewing each SBU as a standalone entirety, it is possible to assess its profitability, align maintenance response to business performance as well as segment the SBUs for strategic decision making.

\textbf{Keywords}: business performance, business centred strategy, facilities maintenance, strategic decision making.

\section*{1 Introduction}
The success of any retail business depends largely on facilities management as it is an aspect of the business where huge costs can be diminished and hence profits optimised. Facility Management can be defined as the integration and alignment of the non-core services, including those relating to premises, required to operate and maintain a business to fully support the core objectives of the organisation [3] with the goal of promoting an efficient and collaborative environment to meet and fulfill the key objectives and mission of an organisation. There being various functions that contribute to the optimisation of cost, one such function where cost reduction can be achieved is maintenance management of the company’s assets. Tremendous efforts have been made to develop different types of maintenance strategies for enhancing the performance of equipment [5] but equipment continues to fail. Because maintenance decisions can directly affect a company, strategic management of the maintenance function is crucial. Rufaro Marketing Pvt. Ltd (RM) was born out of the unbundling of the City Council’s City Marketing Liquor undertaking, to form a standalone privately run company. As such, it was supposed to form its own business strategies and run as a profit centre which would then declare dividends to the City of Harare. Prior to that, City Marketing enjoyed a monopoly of Liquor undertaking in Harare and thus generated huge profits which contributed towards maintenance of social amenities in Harare, including the construction of Rufaro Stadium. In order to fulfil this mandate, the outlets are equipped with refrigeration, pipe fitting equipment as well as generators among other assets. These are maintained by the Technical Operations department of the organisation. The maintenance management is centralised with a Maintenance office receiving breakdown calls through a radio communication system.

However, with the advent of time, the monopoly was abolished by the introduction of a government bill banishing the monopoly in the liquor retailing. Thus licenses were given to other companies and individuals to trade in liquor. This brought stiff competition for City Marketing hence the decision to unbundle and run it as a private company. Against this background of stiff competition, profits began to fall and hence there was little funding that could go towards maintenance and other overheads.

Globalisation and generation evolution saw the taste of the traditional customer moving and the new players in the business were quick to adopt. The Rufaro Marketing business model which was born in the 1950s was slow to react to these changes and thus lost quite a lot in terms of customer base. Recently, a new board and executive team were
appointed to turnaround the performance of the business. Strategies are then required business wide, to steer the company out of the murky waters it is in today. Thus the need to re-look the way business is conducted and come up with solutions that will see the business performing at par with the rest of the liquor retailers. For there to be successful departmental synergies for organisational profitability, decision making, systems deployment need to be business centred.

2 OBJECTIVES
1. To redefine Overall Equipment Effectiveness to Overall Business Effectiveness for improvement of the overall equipment availability to 95% by the end of the third quarter, measuring every section of the technical aspect of the operations, of RM’s facilities and Utilities as perceived by the customer, through implementation of business centred maintenance strategies
2. To discuss development of a maintenance strategy and using this foundation, develop a plan which will reduce maintenance cost to less than 10% of the revenue generated per outlet
3. To provide a case study illustrating practical implementation of business centred maintenance management with a view to ensure a capacity utilisation of 100%.

3 METHODOLOGY
3.1 Data Collection
Information was gathered through observations, interviews with individuals in the company as well as analysing the available financial and maintenance history documents.

3.2 Analysis
The Boston Consulting Group analysis, portfolio diagram (BCG matrix), Strengths, Weaknesses, Opportunities, and Threats (SWOT) as well as a FMECA analysis were the primary methods of evaluation. BCG matrix is a chart that had been created by Bruce Henderson for the Boston Consulting Group in 1968 to help corporations with analyzing their business units or product lines. This helps the company allocate resources and is used as an analytical tool in brand marketing, product management, strategic management, and portfolio analysis [6]. SWOT analysis was widely used as a well-balanced approach for improving organizational performance and developing strategic plans while FMECA was useful for failure mode, effect and criticality analysis.

3.3 Model Development
Building upon the foundation provided by the data collection and analysis efforts, the final phase of the methodology was development of a model that provides practical guidance to bridge the gap between the current strategy and what it needs to become.

3.4 Business Centred Maintenance Strategy Formulation Methodology
BCM is a logical, systematic approach, which puts a practical, iterative, framework of guidelines around what can be quite a daunting task. The methodology is thus as follows:

3.5 Review Asset Register
An asset register was drawn up through reviewing the existing one. There was a drill down to the component level in order to have a correct record of what level of maintenance intervention was required at any given time that the component fails, as well as to assist the next stage of criticality ranking.

3.6 Carry out a FMECA Analysis
A simple model was used to look at the likelihood and consequence of failure and it must be done with input from different functions – marketing and sales, maintenance, security and finance. This ensured the best possible agreement on what was really critical to the business and helped in prioritising maintenance work.

3.7 Maintenance Requirements Assessment and Maintenance Plan
Maintenance history data was colleted and from these records, failure analysis is carried out and an appropriate maintenance intervention approach was identified per given asset. A dynamic maintenance schedule was then assembled from the programmes of work contained in the unit life plans.

3.8 Establish the Resource and Administration Structures
With the known workload and schedule, the resource and administration structures were established to meet them. This helped to determine the level of resources required, to carry out the workload, to achieve the objective, in line with the business plan.
3.9 Set Key performance Indicators
Key performance indicators (KPIs) were used to help reflect both efficiency and effectiveness, including maintenance effort per dollar of sales.

3.10 Put in place Systems to manage the maintenance process
Knowing what maintenance must do to achieve the business needs, knowing what specifically is to be done to each asset and knowing the resource levels required, the last phase was to put in place systems to ensure that all is happening as it should be.

3.11 Maintenance Strategy Compilation and Presentation
After all was done, a maintenance strategy was compiled showing how it fits into the business strategy. It showed how maintenance became a profit centre rather than a cost centre.

3.12 Reviews and future recommendations
As the business environment continues to evolve, it is necessary to continuously review the maintenance strategy in order to align it to the dynamic business needs.

4 RESULTS

4.1 Technical Operations Department
It is responsible for the maintenance and repair of the physical plant and all of its features, and these outlets are distributed into 3 regions. The equipment used in these regions are cold rooms, commercial freezers and 5.5KvA Generators.

4.2 The Boston Consulting Group Matrix for RM
Although this is a marketing tool, it was very useful in the analysis of resource allocation vs. outlet profitability.

4.3 Overall Business Effectiveness
Because of ad hoc activities, this means that there is poor utilization of maintenance staff and disproportionate investment in spare parts and maintenance materials leading to poor service delivery to the intended audience. All these contribute to high costs of service provision and loss of profits. Overall Equipment Effectiveness is an important performance measure metric for Equipment Effectiveness [4]. The cost of maintenance for the period July 2011 to Dec 2012 in comparison with the total revenue generated and profit margin is as follows:
4.4 Equipment Risk Matrix Calibration

<table>
<thead>
<tr>
<th>System</th>
<th>Sub-system</th>
<th>Severity</th>
<th>Occurrence</th>
</tr>
</thead>
<tbody>
<tr>
<td>Mechanical</td>
<td>Collar resistance</td>
<td>3</td>
<td>L</td>
</tr>
<tr>
<td></td>
<td>Pressure</td>
<td>3</td>
<td>L</td>
</tr>
<tr>
<td></td>
<td>Electrical</td>
<td>3</td>
<td>L</td>
</tr>
<tr>
<td></td>
<td>Plumbing and pipe</td>
<td>3</td>
<td>L</td>
</tr>
<tr>
<td></td>
<td>Heating</td>
<td>3</td>
<td>L</td>
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<tr>
<td></td>
<td>Cooling</td>
<td>3</td>
<td>L</td>
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<tr>
<td></td>
<td>Condenser</td>
<td>3</td>
<td>L</td>
</tr>
<tr>
<td></td>
<td>Refrigeration</td>
<td>3</td>
<td>L</td>
</tr>
<tr>
<td></td>
<td>Ice making machine</td>
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</tbody>
</table>

From the above analysis, it can be shown that the refrigeration systems is the most critical that would cause a significant loss of revenue at the facility; in addition to product availability. From interviews conducted, the patrons reiterated that they enjoyed the beverages better if they were ice cold; implying that the refrigeration systems had to be available and reliable all the time. General preventive maintenance, which does not return equipment to the as new condition, is appropriate for equipment subject to constant failure rate [2].

4.5 FMEA for Refrigeration System
4.6 Pareto Analysis of Refrigeration Failures

From the analysis above, the major contributor of systems inefficiencies and failure are the Shaft Seal, Compressors, Electric Motors and Dryers. The root cause analyses of these failures would be instrumental in developing and assigning the appropriate maintenance strategy. However there was no sufficient information on these failures to aid root cause analyses.

4.7 SWOT Analysis

4.8 Maintenance Strategy formulation

A strategy for a business centric maintenance plan was outlined. This should diminish, and consequently eradicate the ad hoc manner in which maintenance activities have been carried out. Prioritisation is key, to ensure efficient resource utilisation. The application of predictive maintenance strategies also diminish the cost of carrying out unnecessary maintenance and hence should be applied to the facility since it is more building centric than plant centric. However, for critical equipment like the refrigeration system, preventive maintenance is crucial; with corrective maintenance applicable to the electrical systems.

5 CONCLUSION

The thesis objectives were accomplished through case study and compilation of a strategy. As far as overall maintenance is concerned it is critical that there is a clear strategy [1] which is applicable to the obtaining maintenance dynamics. This strategy program plays a significant role in RM’s facilities and infrastructure maintenance operations. Even though RM is an extremely large public sector organisation, lessons learnt from the research can be applied by nearly any other local authority organisation as well as some such companies that operate from multiple locations interested in approaching repairs and maintenance from a business-centred point of view.

6 RECOMMENDATIONS

The major area of concern is the embracement of a Computerized Maintenance Management System, and it could be based on a case study for the development of a multi location business centred facilities maintenance management system. This would entail investigating the latest maintenance management technology/programs and exploring their potential role within and impacts upon a maintenance operation.
REFERENCES