CHAPTER – 4

ANALYSIS OF THE PRELIMINARY DATA

In this chapter ‘data analysis and results interpretation’ of manufacturing competencies on strategic success of automobile manufacturing industry has been presented. This chapter describes the analysis performed to attain the desired objectives of the study. Statistical Package for the Social Sciences (SPSS) 21.0 (now called PASW (Predictive Analytics Software)) is the statistical tool used for applying different statistical techniques. Various statistical techniques applied are: Multiple Regression, ANOVA, Two tailed t-test, Croanbach alpha, Correlation. The internal consistency, that is, how closely a set of variables are related in a group, of the questionnaire is measured by employing Croanbach alpha.

4.1 CROANBACH ALPHA RELIABILITY ANALYSIS

Higher the coefficient, more is reliability of the generated questionnaire. Nunnaly (1978) has specified 0.7 as an acceptable reliability coefficient but sometimes, lower coefficients are also used. Reliability index is evaluated for different sections of the questionnaire which are: manufacturing competencies, strategic success, output, and for the overall questionnaire. Moreover, the Croanbach alpha indices are evaluated for all parameters of manufacturing competencies, strategic success, output and overall questionnaire.

Table 4.1 (a) shows that the indices for manufacturing competency factors are above the 0.760, which reflects the internal consistency of the data response available. The
indices for the various parameters of the manufacturing competencies, i.e., process planning (0.886), product design and development (0.879), quality control (0.828), product concept (0.826), production planning and control (0.778) and raw material and equipment (0.769) were on higher side and suggesting that items have relatively high internal consistency. The indices evaluated for the manufacturing competencies section is 0.968.

Table 4.1: Croanbach Alpha Reliability Index of the Questionnaire

(a) Manufacturing Competency Attributes

<table>
<thead>
<tr>
<th>Product Concept</th>
<th>0.826</th>
</tr>
</thead>
<tbody>
<tr>
<td>Product Design &amp; Dev</td>
<td>0.879</td>
</tr>
<tr>
<td>Process Planning</td>
<td>0.886</td>
</tr>
<tr>
<td>Raw Material &amp; Equipment</td>
<td>0.769</td>
</tr>
<tr>
<td>Production Planning</td>
<td>0.778</td>
</tr>
<tr>
<td>Quality Control</td>
<td>0.828</td>
</tr>
<tr>
<td>Manufacturing Competency Section</td>
<td>0.968</td>
</tr>
</tbody>
</table>

(b) Strategic Success Attributes

<table>
<thead>
<tr>
<th>Strategy Agility</th>
<th>0.818</th>
</tr>
</thead>
<tbody>
<tr>
<td>Management</td>
<td>0.901</td>
</tr>
<tr>
<td>Team Work</td>
<td>0.890</td>
</tr>
<tr>
<td>Administration</td>
<td>0.738</td>
</tr>
<tr>
<td>Interpersonal</td>
<td>0.885</td>
</tr>
<tr>
<td>Strategic Success Section</td>
<td>0.967</td>
</tr>
</tbody>
</table>

(c) Output Factors and Overall Questionnaire

<table>
<thead>
<tr>
<th>Output Factors</th>
<th>0.906</th>
</tr>
</thead>
<tbody>
<tr>
<td>Overall Questionnaire</td>
<td>0.985</td>
</tr>
</tbody>
</table>
Table 4.1 (b) shows the indices for strategic success factors. The inference drawn is that all the indices for strategic success parameters are above 0.730, which reflects the internal consistency of the data response available. The indices for the various parameters of the strategic success i.e. strategy agility (0.818), management (0.901), teamwork (0.890), administration (0.738) and interpersonal (0.885) is on higher side and suggesting that items have relatively high internal consistency. The indices evaluated for the section strategic success is 0.967.

Based on analysis, inference is drawn that all indices are above 0.900, which reflects the internal consistency of the data response available, for the output section is 0.906 and for the overall questionnaire used in the research study is 0.985. This suggests that items have relatively high internal consistency.

4.2 RESPONSE ANALYSIS

The surveyed respondents were assessed on various statements based on the parameters of the manufacturing competencies. The data was collected from the respondents on four-point scale regarding the implementation of various issues, i.e., not at all (A), to some extent (B), reasonably well (C) and to a great extent (D).

4.2.1 MANUFACTURING COMPETENCY

Different factors in Manufacturing Competency are:

1. Product Concept
2. Product Design and Development
3. Process Planning
4. Raw Material and Equipment

5. Production Planning and Control

6. Quality Control

4.2.1.1 Product Concept

Table 4.2: Response Analysis of Product Concept

<table>
<thead>
<tr>
<th>S. No</th>
<th>ISSUES</th>
<th>Companies Response Score</th>
<th>Total Responses (N)</th>
<th>Total Points (TPS)</th>
<th>Percent Points (TPS x 100)</th>
<th>Central Tendency TPS/N</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.</td>
<td>Do you have a well planned &amp; structured Concept Generation process in your organization?</td>
<td>6 40 44 44 28</td>
<td>118</td>
<td>330</td>
<td>70.0</td>
<td>2.79</td>
</tr>
<tr>
<td>2.</td>
<td>Whether your company policies promote innovation?</td>
<td>16 54 40 8</td>
<td>118</td>
<td>276</td>
<td>58.4</td>
<td>2.34</td>
</tr>
<tr>
<td>3.</td>
<td>Do you feel that marketing department is adequately motivated to get an idea about the new product?</td>
<td>20 37 57 4</td>
<td>118</td>
<td>281</td>
<td>59.5</td>
<td>2.38</td>
</tr>
<tr>
<td>4.</td>
<td>Whether your organization encourages the deployment of inter-departmental teams to identify and create new ideas?</td>
<td>30 55 31 2</td>
<td>118</td>
<td>241</td>
<td>51.0</td>
<td>2.04</td>
</tr>
<tr>
<td>5.</td>
<td>Is your organization flexible enough for making changes during operations and maintenance to satisfy customer needs?</td>
<td>23 74 12 9</td>
<td>118</td>
<td>243</td>
<td>51.5</td>
<td>2.06</td>
</tr>
<tr>
<td>6.</td>
<td>Whether your organization uses centralized planning structure for idea generation?</td>
<td>32 55 25 6</td>
<td>118</td>
<td>241</td>
<td>51.0</td>
<td>2.04</td>
</tr>
</tbody>
</table>

(Total Points Scored = TPS = A x 1 + B x 2 + C x 3 + D x 4) = 549

Table 4.2 shows the data regarding the product concept issues. The analysis of significant attributes of major product concept (idea generation) issues reveal that significantly large number of organisations have evolved well planned and structured
concept generation process (percent point scored, PPS=70), promote innovation and marketing (PPS=58.4), encouragement for inter-departmental teams (PPS=51.0), centralized planning (PPS=51.0), creativity (PPS=58.0) as other factors have low PPS, some improvements can be suggested. Figure 4.1 depicts the issue wise performance.

![Figure 4.1: Performance chart for Product Concept](image)

The response analysis results showed that maximum weightage was given to the product concept attribute ‘well planned concept generation process’, it was followed by ‘company policies towards innovation’ and ‘marketing department motivation for new concepts’. Almost similar preferences were for ‘centralized planning structure’, ‘developments of inter departmental relationships’ and ‘flexibility of organisation towards changes for satisfying customers’. The analysis assessed that 23.7% of surveyed respondents reported about implementing ‘well planned structured concept
‘generation process’ while 33.9% and 37.3% reported it either to some extent or reasonably well respectively.

The product concept ideas innovation and marketing department motivation for new concepts, were also reported on the similar scale in the organisation. It was analyzed that 33.9% and 45.8% reported that ‘company policies promoted innovation’ either to some extent or reasonably well respectively. 48.3% and 31.4% reported ‘marketing department motivated enough to bring up new concepts’ either to some extent or reasonably well respectively.

When further analyzed, it was evident that all other product concepts i.e. ‘centralized planning development’, ‘flexibility of organisation towards changes’ and ‘developing inter departmental relations for new ideas’ up to some extent in the organisations as 46.6%, 62.7% and 46.6% reported on these product concepts. There were also 27.1%, 19.5% and 25.4% of the respondents reported that these product concepts i.e. ‘centralized planning development’, ‘flexibility of organisation towards changes’ and ‘developing inter departmental relations for new ideas’ were not implemented in their organisation.

4.2.1.2 Product Design and Development

Table 4.3 represents the performance regarding the Product Design and Development issues. The analysis of issues related to manufacturing organisation reveals that significantly large number of organisations have an effective design technology (PPS=67.8), computer technology for analysis (PPS=54.0), Product Life Cycle
(PPS=5.2), Aesthetics and Ergonomics of products (PPS=57.8), Simulation and Modeling (PPS=53.8).

Table 4.3: Response Analysis of Product Design and Development

<table>
<thead>
<tr>
<th>S. No</th>
<th>ISSUES</th>
<th>Companies Response Score</th>
<th>Total Responses (N)</th>
<th>Total Points (TPS)</th>
<th>Percent Points (PPS)</th>
<th>Central Tendency TPS/N</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.</td>
<td>Whether your organization has an effective Design Technology Program (CAD)?</td>
<td>25 20 37 30</td>
<td>118</td>
<td>320</td>
<td>67.8</td>
<td>2.71</td>
</tr>
<tr>
<td>2.</td>
<td>Whether your organization uses computerized technology for Analysis purposes?</td>
<td>12 78 55 3</td>
<td>118</td>
<td>335</td>
<td>54.0</td>
<td>2.16</td>
</tr>
<tr>
<td>3.</td>
<td>Whether the design program includes procedures like Product Life Cycle?</td>
<td>23 75 16 4</td>
<td>118</td>
<td>237</td>
<td>50.2</td>
<td>2.00</td>
</tr>
<tr>
<td>4.</td>
<td>Whether the design program includes Aesthetics and Ergonomics of the product?</td>
<td>25 38 48 7</td>
<td>118</td>
<td>273</td>
<td>57.8</td>
<td>2.31</td>
</tr>
<tr>
<td>5.</td>
<td>Does your organization use simulation and modeling for analyzing designs?</td>
<td>24 59 28 7</td>
<td>118</td>
<td>234</td>
<td>53.8</td>
<td>2.15</td>
</tr>
<tr>
<td>6.</td>
<td>Does your organization track Design &amp; Development program costs?</td>
<td>8 48 51 13</td>
<td>118</td>
<td>305</td>
<td>64.5</td>
<td>2.58</td>
</tr>
<tr>
<td>7.</td>
<td>What percentage of the designing is done with the aid of computer?</td>
<td>45 23 31 19</td>
<td>118</td>
<td>260</td>
<td>55.1</td>
<td>2.20</td>
</tr>
</tbody>
</table>

(Total Points Scored 'TPS' = A x 1 + B x 2 + C x 3 + D x 4)

The results showed that maximum weightage was given to ‘implementation of design technology program’ in the organisation, followed by ‘modeling and simulating for product analysis’ and ‘tracking design and development costs’. Almost similar
weightage was given to ‘use of product life cycles’ and ‘ergonomics and aesthetics in product design’, while least weightage was given to ‘using computer for analyses’. Figure 4.2 represents the performance of various organisations.

![Performance chart for Product Design and Development](chart.png)

**Fig. 4.2: Performance chart for Product Design and Development**

The analysis assessed that 30.5% respondents reported that ‘effective design technology program’ implemented to a great extent in the organisation whereas 21.2% and 31.4% reported it either not at all or reasonably well respectively. The product design and development ideas like ‘use of product life cycles’ and ‘usage of computerized technology for analysis’, were also reported on the similar scale in the organisation. It was analyzed that 63.6% and 66.1% respondents reported their implementation to some extent while 19.5% and 10.2% reported no implementation whereas 13.6% and 21.2% reported it as reasonably well. The similar trend was evident in the process of ‘usage of modeling and simulation for analysing designs’, as 50% respondents reported it to some extent while 23.7% of the respondents reported it
to be reasonably well while 20.3% reported not at all in their organisations. 43.2% and 40.7% of the surveyed respondents reported ‘tracking design and development costs’ and ‘inclusion of ergonomics and aesthetics in product designing’ in their organisation was at reasonable level while 39% and 32.2% respectively reported to some extent.

On the issue regarding ‘higher usage of computer in designing’, it was evident that 16.3% were using for more than 75% of processes, 26.3% reported computer usage up to 50-75%, 19.5% reported it to be in range of 25–50% while 38.1% of the organisations use it less than 25%.

4.2.1.3 Process Planning

Table 4.4 portrays the data regarding the Process Planning issues. Analysis of process planning issues shows that most organisations have generally scored quite low rating. The data shows that many manufacturing organisations have an effective process planning program (PPS=67.16), tracking process planning costs (PPS=70.7), material and machine selection (PPS=56.1), Group Technology (PPS=5.8), finishing and assembly of the product (PPS=63.7).

The idea of ‘implementation of design technology program’ was given maximum preference which was followed by the idea ‘taking and simulating account of assembling and finishing of products’ and ‘tracking process planning costs’. Almost similar extent of weightage was given to ‘preferences to departments integration’ and
‘usage of mechanism for machine and material selection’ while least preference was for ‘software based planning and regular updating of software’.

Table 4.4: Response Analysis of Process Planning

<table>
<thead>
<tr>
<th>S. No.</th>
<th>FACTORS</th>
<th>No. of Companies Scoring Points</th>
<th>Total No. of Response (N)</th>
<th>Total Points Scored (TPS)</th>
<th>Percent Points Scored (PPS)</th>
<th>Central Tendency TP&amp;N</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.</td>
<td>Whether your organization has an effective Process Planning program?</td>
<td>12</td>
<td>32</td>
<td>317</td>
<td>67.2</td>
<td>2.69</td>
</tr>
<tr>
<td>2.</td>
<td>Does your organization apply Group Technology?</td>
<td>29</td>
<td>5</td>
<td>240</td>
<td>50.8</td>
<td>2.03</td>
</tr>
<tr>
<td>3.</td>
<td>Does your organization possess a mechanism for material and machine selection?</td>
<td>5</td>
<td>5</td>
<td>265</td>
<td>56.1</td>
<td>2.25</td>
</tr>
<tr>
<td>4.</td>
<td>Whether the planning software is updated &amp; reviewed periodically in accordance with technological changes?</td>
<td>28</td>
<td>3</td>
<td>245</td>
<td>51.9</td>
<td>2.68</td>
</tr>
<tr>
<td>5.</td>
<td>Does your organization incur Process Planning costs?</td>
<td>11</td>
<td>10</td>
<td>384</td>
<td>70.7</td>
<td>2.83</td>
</tr>
<tr>
<td>6.</td>
<td>Does your organization prefer integration of different departments?</td>
<td>24</td>
<td>0</td>
<td>255</td>
<td>54.0</td>
<td>2.16</td>
</tr>
<tr>
<td>7.</td>
<td>Does your organization particularly take into account finishing and assembly of the product?</td>
<td>4</td>
<td>12</td>
<td>301</td>
<td>63.7</td>
<td>2.55</td>
</tr>
<tr>
<td>8.</td>
<td>What percentage of the process planning is done with the aid of technology?</td>
<td>42</td>
<td>9</td>
<td>254</td>
<td>49.6</td>
<td>1.98</td>
</tr>
</tbody>
</table>

Evidently, regarding ‘higher usage of computerized process planning’, 7.6% organisation were using it for more than 75%, 18.6% the organisation reported use of computer up to 50-75%, 38.1% reported it to be in range of 25 – 50% and 35.6% of
the organisations using it less than 25%. The analysis showed 27.1% of respondents reported that ‘effective process planning program’ to a great extent in the organisation whereas 24.7% and 38.1% reported it either to reasonably well or to some extent respectively. 20.3% reported ‘usage of mechanism for machine and material selection’, reasonably well while 71.2% reported to some extent. Figure 4.3 represents the performance of various organisations.

![Process Planning Chart](image)

**Fig. 4.3: Performance chart for Process Planning**

On issues based on process planning i.e. ‘preferences to departments integration’, ‘use of group technology’ and ‘planning software regularly updated and reviewed with technological advancement’, 20.3%, 24.7% and 23.7% of the organisations reported that there was no implementation at all whereas 43.2%, 50% and 47.5% reported their implementation to some extent. On the issues of ‘process planning costs’, and ‘considering assembling and finishing of products’, 50% and 39% of the organisations reported reasonably well implementation while 32.2% and 48.3% reported to some extent.
4.2.1.4 Raw Material and Equipment

Table 4.5 illustrates the performance regarding the Raw Material and Equipment issues.

Table 4.5: Response Analysis of Raw Material and Equipment

<table>
<thead>
<tr>
<th>S. No</th>
<th>ISSUES</th>
<th>Response Score</th>
<th>Total Responses</th>
<th>Total Points (TPS)</th>
<th>Percent Points (PPS)</th>
<th>Central Tendency</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Does your organization use ERP software for record keeping?</td>
<td>15 31 35 34</td>
<td>118</td>
<td>821</td>
<td>68.0</td>
<td>2.72</td>
</tr>
<tr>
<td>2</td>
<td>Whether your organization has its own transportation?</td>
<td>40 28 32 0</td>
<td>118</td>
<td>237</td>
<td>50.2</td>
<td>2.01</td>
</tr>
<tr>
<td>3</td>
<td>Whether your organization has enough warehouses for inventory storage?</td>
<td>25 45 32 16</td>
<td>118</td>
<td>275</td>
<td>58.2</td>
<td>2.33</td>
</tr>
<tr>
<td>4</td>
<td>Whether the three departments (marketing, design, and production) are synergistically involved in equipment selection decisions?</td>
<td>19 56 40 3</td>
<td>118</td>
<td>263</td>
<td>55.7</td>
<td>2.23</td>
</tr>
<tr>
<td>5</td>
<td>Does your organization have sufficient automated equipment with appropriate process capabilities to meet market demands?</td>
<td>14 58 44 2</td>
<td>118</td>
<td>270</td>
<td>57.2</td>
<td>2.29</td>
</tr>
</tbody>
</table>

The analysis of various issues related to manufacturing organisation indicated that many manufacturing organisations use ERP software for record keeping (PPS=68.0), whereas some other factors like having own transportation (PPS=5.2), inventory storage (PPS=58.2), different departments involvement for machine selection (PPS=55.7) need immediate attention, since these factors have been found to be under-performing. Figure 4.4 illustrates the issue wise performance.
The results show that ‘use of ERP software for record keeping’ was given the maximum weightage, followed by ‘existences of warehouse facility for inventory, synergistically involvement of designing, production and marketing department in equipment selection’ and ‘availability of automated equipment having process capabilities equivalent to market demands’. The least weightage was given to ‘existence of transportation facility’.

The ‘use of ERP software for record keeping’ was reported by 28.8% to a great extent while 29.7% and 26.3% reported it either to reasonable well or to some extent respectively. On the issue regarding ‘existence of transportation facility’ 41.5% were not having it at all while 23.7% and 27.1% reported it either to some extent or at reasonable well respectively. 21.2% of the organisations reported that they had no ‘warehouse for inventory storages’, while 27.1% and 38.1% reported it either at reasonable level or to some extent respectively. 37.3% and 33.9% reported that ‘availability of automated equipment having process capabilities’ and ‘synergistically
involvement of designing, production and marketing department in equipment selection’ was at reasonable level while 49.2% and 47.5% organisation reported to some extent.

4.2.1.5 Production Planning and Control

Table 4.6 reports the performance regarding the Production Planning and Control issues.

Table 4.6: Response Analysis of Production Planning and Control

<table>
<thead>
<tr>
<th>S. No</th>
<th>ISSUES</th>
<th>Companies Response Score</th>
<th>Total Responses (N)</th>
<th>Total Points (TPS)</th>
<th>Percent Points (PPS)</th>
<th>Central Tendency</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>A</td>
<td>B</td>
<td>C</td>
<td>D</td>
<td></td>
</tr>
<tr>
<td>1.</td>
<td>Whether your organization has Computerized Manufacturing Systems (CAM)?</td>
<td>10</td>
<td>49</td>
<td>41</td>
<td>10</td>
<td>118</td>
</tr>
<tr>
<td>2.</td>
<td>How much do you want to get precise and accurate dimensions?</td>
<td>7</td>
<td>35</td>
<td>68</td>
<td>7</td>
<td>118</td>
</tr>
<tr>
<td>3.</td>
<td>Does your organization prefer GREEN MANUFACTURING?</td>
<td>32</td>
<td>55</td>
<td>20</td>
<td>11</td>
<td>118</td>
</tr>
<tr>
<td>4.</td>
<td>Does your organization track Production Planning &amp; Control program costs?</td>
<td>13</td>
<td>51</td>
<td>42</td>
<td>11</td>
<td>118</td>
</tr>
<tr>
<td>5.</td>
<td>What percentage of the work is done with the help of robots?</td>
<td>91</td>
<td>25</td>
<td>0</td>
<td>2</td>
<td>118</td>
</tr>
<tr>
<td>6.</td>
<td>What is the percentage of maintenance hours in relation to total working hours?</td>
<td>90</td>
<td>27</td>
<td>1</td>
<td>0</td>
<td>118</td>
</tr>
<tr>
<td>7.</td>
<td>To what Extent Hydraulic and Pneumatic systems are employed in your organization?</td>
<td>40</td>
<td>51</td>
<td>14</td>
<td>13</td>
<td>118</td>
</tr>
</tbody>
</table>

The analysis of data obtained from the survey has indicated that many manufacturing organisations have generally reported low performance regarding production,
planning and control factors. The results reveal that many manufacturing organisations exert on precision and accuracy (PPS=65.9), green manufacturing (PPS=52.1), hydraulic and pneumatic system (PPS=5.0), Computer Aided Manufacturing (PPS-59.1). Figure 4.5 shows the chart for issue wise performance.

![Fig. 4.5: Performance chart for Production Planning and Control](image)

The results show that ‘precise and accurate results’ was given the highest weightage, followed by the ideas ‘computerized manufacturing systems’ and ‘tracking production planning and control programs cost’. The minimum weightage was on the issue of ‘green manufacturing’.

The analysis for the issues ‘manufacturing hours in relation to working hours’ and ‘help of robots’, reveal that 76.3% and 77.1% reported these for lesser than 25% of the times in the organisation while 22.9% and 21.2% reported these for 25 - 50% of the times. Similarly, 43.2% organisation reported the use of ‘hydraulic and pneumatic systems’ for 25 – 50% while 33.9% reported for lesser than 25%. 41.5% organisations use ‘computerized manufacturing systems’ to some extent while 34.8%
and 15.3% at either reasonable level or not at all respectively. 44.1% and 46.6% of the organisations followed ‘tracking production planning and control program costs’ and ‘green manufacturing’ to some extent while 11% and 27.1% not at all. 30.5% of organisation ‘exert to get precise and accurate results’ to some extent while 57.6% to reasonable level.

4.2.1.6 Quality Control

Table 4.7 outlines the performance regarding the Quality Control issues.

<table>
<thead>
<tr>
<th>S. No</th>
<th>ISSUES</th>
<th>Companies Response Score</th>
<th>Total Responses</th>
<th>Total Points (TPS)</th>
<th>Percent Points (TPS*100)/N</th>
<th>Central Tendency</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.</td>
<td>Whether your organization, test products under actual conditions?</td>
<td>8</td>
<td>118</td>
<td>356</td>
<td>75.4</td>
<td>3.02</td>
</tr>
<tr>
<td>2.</td>
<td>Does your organization carry out Life Cycle Analysis of the Product?</td>
<td>28</td>
<td>118</td>
<td>249</td>
<td>52.7</td>
<td>2.11</td>
</tr>
<tr>
<td>3.</td>
<td>Does your organization use technology to analyze quality?</td>
<td>30</td>
<td>118</td>
<td>260</td>
<td>57.0</td>
<td>3.22</td>
</tr>
<tr>
<td>4.</td>
<td>Does your organization issue computerized Quality Control instructions?</td>
<td>41</td>
<td>118</td>
<td>219</td>
<td>46.4</td>
<td>1.86</td>
</tr>
<tr>
<td>5.</td>
<td>Up to what Extent, the product needs to be re-processed after inspection?</td>
<td>36</td>
<td>118</td>
<td>156</td>
<td>33.0</td>
<td>1.32</td>
</tr>
<tr>
<td>6.</td>
<td>To what Extent your organization, invest on Quality Control &amp; Inspection fraction as compared to total production cost?</td>
<td>51</td>
<td>118</td>
<td>212</td>
<td>44.9</td>
<td>1.80</td>
</tr>
</tbody>
</table>

(Total Points Scored ‘TPS’ = A*1 + B*2 + C*3 + D*4)  

The analysis of significant attributes of Quality reveals that most manufacturing organisations have shown acceptable performance rating. The data has indicated that that many manufacturing organisations test products under actual conditions
(PPS=75.4), technology for quality analysis (PPS=57.0), life cycle analysis (PPS=52.7). Figure 4.6 outlines the issue wise performance.

![Quality Control Performance Chart](chart.png)

**Fig. 4.6: Performance chart for Quality Control**

The response analysis results show ‘testing product materials under actual conditions’ was given the maximum preference, followed by ‘technology to analyse quality’ and ‘life cycle analysis of products’. The least weightage was given to the issue of ‘computerized quality control instructions’. The analysis shows that ‘reprocessing of products after inspection’, 72.9% reported it less than 25% while 23.7% reported for 25 - 50%.

On contrary, ‘investment on quality control and inspection in comparison to total production cost’, 43.2% reported it less than 25% while 35.6% reported 25 – 50%. It was further analysed that regarding the quality control parameters like ‘use of technology for the assessment of the products’, ‘computerized quality control instructions’ and ‘life cycle analysis of the products’, 25.4%, 34.8% and 23.7% were not following them at all whereas on same issues 51.7%, 31.4% and 44.10% using
them to some level. It was inference that 54.2% organisations were ‘testing products under actual conditions’ to reasonable level while 27.1% at great extent.

4.2.2 STRATEGIC SUCCESS

Various parameters of strategic success are:

1. Strategy Agility
2. Management
3. Team Work
4. Administration
5. Interpersonal

4.2.2.1 Strategy Agility

Table 4.8 depicts the performance on Strategy Agility issues.

<table>
<thead>
<tr>
<th>S. No.</th>
<th>ISSUES</th>
<th>Companies Response Score</th>
<th>Total Responses (N)</th>
<th>Total Points (TPS)</th>
<th>Percent Points (PPS)</th>
<th>TPS x 100 / TN</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>A</td>
<td>B</td>
<td>C</td>
<td>D</td>
<td></td>
</tr>
<tr>
<td>1</td>
<td>Quality conformance</td>
<td>10</td>
<td>33</td>
<td>60</td>
<td>15</td>
<td>118</td>
</tr>
<tr>
<td>2</td>
<td>Improving Customer Base</td>
<td>9</td>
<td>47</td>
<td>57</td>
<td>5</td>
<td>118</td>
</tr>
<tr>
<td>3</td>
<td>Developing and enhancing Market Share</td>
<td>11</td>
<td>45</td>
<td>42</td>
<td>20</td>
<td>118</td>
</tr>
<tr>
<td>4</td>
<td>Achieving higher profit</td>
<td>7</td>
<td>33</td>
<td>48</td>
<td>30</td>
<td>118</td>
</tr>
<tr>
<td>5</td>
<td>Competitive Pricing of the products</td>
<td>15</td>
<td>48</td>
<td>29</td>
<td>20</td>
<td>118</td>
</tr>
</tbody>
</table>

(Total Points Scored ‘TPS’ = A x 1 + B x 2 + C x 3 + D x 4) = 66.93 

The results reveal that many manufacturing organisations have exhibited strong endeavor to realize various strategic success issues, quality conformance (PPS=66.9), customer base (PPS=62.3), competitive pricing (PPS=65.0), market share (PPS=71.4),
profit (PPS=64.0). The data reveals that many organisations press for various strategic issues like customer base, quality performance, competitive pricing, market share, profit. Figure 4.7 depicts the issue wise performance. The results showed that the under strategy agility ‘achieving higher profit’ was given maximum weightage, by ‘quality performance’ and ‘market share’. At last almost similar preference was given to ‘competitive pricing of the products’, while least to ‘improving customer base’.

![Strategy Agility Graph](image)

**Fig. 4.7: Performance chart for Strategy Agility**

‘Quality performance’ and ‘customer base’, 50.8% and 48.3% respectively, followed them reasonably well whereas 28% and 39.8% reported them to some extent. On similar pattern 40.7% of the organisations followed ‘achieving higher profits’, at reasonable level while 28.4% it to some level and 25.4% organisation at great level. On the issue of ‘market share’, 35.6% and 38.1% implemented it at either reasonable level or to some extent while 16.9% organisations to a great extent. ‘Competitive products price’ was worked on to some extent in 40.7%, while 22% and 24.7% were working on this to either great extent or at reasonable level.
4.2.2.2 Management

Table 4.9 portrays the performance regarding the issues on Management.

Table 4.9: Response Analysis of Management

<table>
<thead>
<tr>
<th>S. No</th>
<th>ISSUES</th>
<th>Companies Response Score</th>
<th>Total Responses</th>
<th>Total Points</th>
<th>Percent Points</th>
<th>Central Tendency</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>A</td>
<td>B</td>
<td>C</td>
<td>D</td>
<td>(N)</td>
</tr>
<tr>
<td>1</td>
<td>Enhanced production capabilities and improved control</td>
<td>3</td>
<td>39</td>
<td>49</td>
<td>27</td>
<td>118</td>
</tr>
<tr>
<td>2</td>
<td>Better Production Planning and Control Functions</td>
<td>2</td>
<td>35</td>
<td>54</td>
<td>27</td>
<td>118</td>
</tr>
<tr>
<td>3</td>
<td>Information Flow within departments through intranet</td>
<td>37</td>
<td>24</td>
<td>46</td>
<td>13</td>
<td>118</td>
</tr>
<tr>
<td>4</td>
<td>Information analysis in different departments</td>
<td>32</td>
<td>34</td>
<td>51</td>
<td>1</td>
<td>118</td>
</tr>
<tr>
<td>5</td>
<td>Risk Management</td>
<td>33</td>
<td>49</td>
<td>33</td>
<td>3</td>
<td>118</td>
</tr>
<tr>
<td>6</td>
<td>Crisis Management</td>
<td>25</td>
<td>49</td>
<td>44</td>
<td>0</td>
<td>118</td>
</tr>
<tr>
<td>7</td>
<td>Co-ordination between departments</td>
<td>8</td>
<td>30</td>
<td>32</td>
<td>24</td>
<td>118</td>
</tr>
</tbody>
</table>

(Total Points Scored \( TPS = A \times 1 + B \times 2 + C \times 3 + D \times 4 \)) = 61.41

The significant attributes of management depict that many manufacturing organisations have better production planning and control functions (PPS=72.4), co-ordination between departments (PPS=7.0) and enhanced production capabilities (PPS=71.2) but some improvement can be suggested for other factors like efficient information flow (PPS=56.6), information analysis in departments (PPS=54.4), crises management (PPS=54.0) and Risk management (PPS=51.3), since these factors have been under-preforming.
The results show that ‘production planning and control functions’ was given maximum preference, followed by ‘co-ordination between departments’ and ‘production capabilities and improved control’. The ‘information flow within the departments through intranet’ was also given similar preferences whereas equal importance was for ‘information analysis in various departments’ and ‘crisis management’. The least preference was to ‘risk management’. Figure 4.8 depicts the issue wise performance.

![Performance Chart for Management](image)

**Fig. 4.8: Performance chart for Management**

The analysis shows the issues ‘production capabilities and improved control’, ‘production planning and control functions’, ‘co – ordination between departments’, and ‘information analysis in various departments’, 41 – 46% organisations were realizing them at reasonable level whereas 29 – 33% organisations were realizing them to some extent respectively. Also, it was seen that 20 – 22% organisations were realizing these issues to a great extent.
It was further analysed that 41.5% of the organisations were working on the concept of ‘crisis management’ and ‘risk management’ to some extent while 28% and 21.2% were not implementing them respectively and 28% and 37.3% were implementing them at reasonable level. 39% of the organisations reported that ‘information flow in the departments through intranet’ to reasonable level while 20.3% to some extent and 31.4% of the organisations were not using this concept at all.

4.2.2.3 Team Work

Table 4.10 represents the performance regarding the Team Work issues.

<table>
<thead>
<tr>
<th>S. No</th>
<th>ISSUES</th>
<th>Company Response Score</th>
<th>Total Responses</th>
<th>Percent Points</th>
<th>Central Tendency TPS/N</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Coordinated efforts for Development / fostering of new generation technology</td>
<td>8 45 65 0</td>
<td>118</td>
<td>62.1</td>
<td>2.48</td>
</tr>
<tr>
<td>2</td>
<td>Transforming a traditional hierarchical organization into a boundary-less organization</td>
<td>27 68 22 1</td>
<td>118</td>
<td>49.3</td>
<td>1.97</td>
</tr>
<tr>
<td>3</td>
<td>Promotion of developed product</td>
<td>14 20 50 25</td>
<td>118</td>
<td>60.2</td>
<td>2.79</td>
</tr>
<tr>
<td>4</td>
<td>Culture of Kaizen &amp; Continuous Improvement</td>
<td>37 37 26 18</td>
<td>118</td>
<td>55.3</td>
<td>2.21</td>
</tr>
<tr>
<td>5</td>
<td>Overall Equipment Effectiveness (OEE) improvement</td>
<td>30 41 28 19</td>
<td>118</td>
<td>57.6</td>
<td>2.31</td>
</tr>
<tr>
<td>6</td>
<td>Effectively managing process capability</td>
<td>13 57 45 3</td>
<td>118</td>
<td>58.0</td>
<td>2.32</td>
</tr>
<tr>
<td>7</td>
<td>Enhanced Autonomous Maintenance capabilities</td>
<td>20 48 26 14</td>
<td>118</td>
<td>55.1</td>
<td>2.20</td>
</tr>
<tr>
<td>8</td>
<td>Communication and Co-operation among team members</td>
<td>8 99 49 26</td>
<td>118</td>
<td>68.8</td>
<td>2.75</td>
</tr>
</tbody>
</table>

(Total Points Scored 'TPS' = A x 1 + B x 2 + C x 3 + D x 4) 59.3 2.37

The results reveal that many manufacturing organisations emphasize on improving communication and coordination amongst team members (PPS=68.8), coordinated
efforts for next generation technology (PPS=62.1) and better promotion of products (PPS=68.2) whereas some other factors need immediate attention, since these factors have been found to be under-preforming. The results show that ‘co–operation and communication between team members’ and ‘promoting developed products’ were given highest weightage, followed by ‘co–ordinate efforts for next generation technology’ and ‘effective management of process capabilities’. Figure 4.9 represents the issue wise performance.

![Performance chart for Team Work](image)

**Fig. 4.9: Performance chart for Team Work**

The scope of ‘overall equipment effectiveness improvement’ was also given preference, while equal importance was for ‘Kaizen and continuous improvement’ and ‘enhanced autonomous manufacturing capabilities’. The least preference was given to ‘transforming hierarchical organisation into boundary-less organisation’. It was further concluded that 23% - 25% were following concepts like ‘transforming hierarchical organisation into boundary-less organisation’, ‘overall equipment effectiveness’ and ‘autonomous manufacturing capabilities’ while the same issues were followed to some extent by 57.6%, 34.8% and 40.7% respectively. The ‘Kaizen
and Continuous Improvement’ was either not followed or to some extent by 31.4% while 22% following it at reasonable level. The factors ‘communication and co-operation between team members’ and ‘effective managing process capability’ were followed at reasonable level in 31.4% of organisations whereas 33.3% and 48.3% following them to some extent. 54.2% of the organisations reported that ‘co-ordinate effort for development of new technology’ was followed at reasonable level while 38.1% followed them to some extent. Similarly, 42.4% of the organisations reported that ‘promotion of developed product concept’ was followed at reasonable level while 21.2% and 24.7% organisations followed them to a great extent and to some extent respectively.

4.2.2.4 Administration

Table 4.11 illustrates the performance regarding the Administration issues.

<table>
<thead>
<tr>
<th>S. No</th>
<th>ISSUES</th>
<th>Total Responses</th>
<th>Total Points</th>
<th>Percent Points</th>
<th>Central Tendency</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Efficient office administration &amp; management</td>
<td>118</td>
<td>338</td>
<td>71.6</td>
<td>2.86</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>(TPS)</td>
<td></td>
</tr>
<tr>
<td>2</td>
<td>Policy Formation</td>
<td>118</td>
<td>319</td>
<td>67.6</td>
<td>2.70</td>
</tr>
<tr>
<td>3</td>
<td>Commitment of Top level management</td>
<td>118</td>
<td>298</td>
<td>63.1</td>
<td>2.53</td>
</tr>
<tr>
<td>4</td>
<td>Support and Encouragement from Top level management</td>
<td>118</td>
<td>266</td>
<td>50.3</td>
<td>2.25</td>
</tr>
</tbody>
</table>

(Total Points Scored ‘TPS’ = A × 1 + B × 2 + C × 3 + D × 4)
The analysis of significant attributes of administration has indicated that many manufacturing organisations have efficient administration and management (PPS=71.6), support and encouragement from top management (PPS=56.3), policy formation (PPS=67.6) and top level management commitment (PPS=63.1) and. Figure 4.10 illustrates the issue wise performance.

![Performance Chart for Administration](image)

**Fig. 4.10: Performance chart for Administration**

The results show that ‘office management and administration’ was given highest weightage, followed by ‘policy formation’. The ‘commitment of top level management’ was also given some weightage while the less preference was given to ‘support and encouragement from the top level management’. The analysis of the administrative reforms such as ‘office administration and management’ is followed to a reasonable level in 57.6% organisations while 21.2% reported it to some extent. 51.7% reported ‘commitment from top management’ to some extent whereas 26.3% it to reasonable level. It was further assessed that in 35.8% organisations ‘policy formation’ and ‘support and encouragement from top management’ to a reasonable level while 35.6% and 45.8% were implementing it to some extent.
### 4.2.2.5 Interpersonal

Table 4.12 outlines the performance regarding the interpersonal.

**Table 4.12: Response Analysis of Interpersonal**

<table>
<thead>
<tr>
<th>S. No</th>
<th>ISSUES</th>
<th>A</th>
<th>B</th>
<th>C</th>
<th>D</th>
<th>(N)</th>
<th>TPS</th>
<th>(PPS)</th>
<th>TPS/N</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Self-Confidence of employees</td>
<td>0</td>
<td>30</td>
<td>74</td>
<td>14</td>
<td>118</td>
<td>338</td>
<td>71.6</td>
<td>2.85</td>
</tr>
<tr>
<td>2</td>
<td>Stress management</td>
<td>38</td>
<td>43</td>
<td>25</td>
<td>12</td>
<td>118</td>
<td>247</td>
<td>52.3</td>
<td>2.09</td>
</tr>
<tr>
<td>3</td>
<td>Waste Utilization</td>
<td>39</td>
<td>60</td>
<td>7</td>
<td>12</td>
<td>118</td>
<td>228</td>
<td>48.3</td>
<td>1.93</td>
</tr>
<tr>
<td>4</td>
<td>Multi skilling of workers</td>
<td>28</td>
<td>39</td>
<td>50</td>
<td>1</td>
<td>118</td>
<td>260</td>
<td>55.0</td>
<td>2.20</td>
</tr>
<tr>
<td>5</td>
<td>Safety and Health awareness among workers</td>
<td>17</td>
<td>55</td>
<td>34</td>
<td>12</td>
<td>118</td>
<td>277</td>
<td>58.7</td>
<td>2.34</td>
</tr>
<tr>
<td>6</td>
<td>Broader Job Perspectives &amp; Employee empowerment</td>
<td>23</td>
<td>46</td>
<td>43</td>
<td>6</td>
<td>118</td>
<td>268</td>
<td>56.8</td>
<td>2.27</td>
</tr>
<tr>
<td>7</td>
<td>Self-managed project teams &amp; Problem solving groups</td>
<td>30</td>
<td>31</td>
<td>48</td>
<td>9</td>
<td>118</td>
<td>272</td>
<td>57.6</td>
<td>2.31</td>
</tr>
</tbody>
</table>

(Total Points Scored ‘TPS’ = A x 1 + B x 2 + C x 3 + D x 4)

<table>
<thead>
<tr>
<th></th>
<th>TPS/N</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>57.19</td>
</tr>
</tbody>
</table>

The analysis of significant attributes of interpersonal issues has revealed that many manufacturing organisations have worked aggressively for building self-confidence of employees (PPS=71.6), safety and health awareness (PPS=58.7), self-managed teams (PPS=57.6), employee empowerment (PPS=56.8), multi-skilling of workers (PPS=55.0) and stress management (PPS=52.3). The results reveal that ‘self-confidence of employee’ was given highest weightage, followed by ‘safety and health awareness amid workers’ and ‘self-managed and problem solving project teams’. The scope of the ‘multi skilling of workers’, ‘job prospective and employee empowerment’
and ‘stress management’ were given somewhat equal preferences. Least preference was to ‘waste utilizations’. Figure 4.11 outlines the issue wise performance.

![Performance Chart for Interpersonal](image)

**Fig. 4.11: Performance chart for Interpersonal**

After analysing, it was assessed that 62.7% of the organisations were working over the ‘self-confidence of the employees’ at reasonable level while similar concept was to some extent in 25.4%. Approximately 33% of the organisations were found to be not at all following the issues of interpersonal like ‘stress management’ and ‘waste utilization’ whereas 10.2% were following to great extent on both issues. 36.4% of the organisation reported to follow ‘stress management’ to some extent, whereas 21.2% organisations followed it to reasonable level. Similarly, 50.8% organisations were working on ‘waste utilization’ to some extent.

It was assessed that about 25% of the organisations were not implementing the concept of ‘multi skilling of workers’ and ‘self-managed project teams and problem solving groups’ whereas about 42% of the organisations were implementing both these concepts at reasonable levels. It was also concluded that 33.1% organisations
were to some extent pushing for ‘multi skilling of workers’ while 26.3% of the organisations were pushing for the ‘self-managed project teams and problem solving groups’. On the issue of ‘safety and health awareness among workers’, 46.6% of the organisations were following it to some extent whereas 28.8% organisations were doing it on reasonable level. On similar notes, regarding ‘broader job prospective and employee empowerment’ 39.9% of the organisations were implementing it to some extent whereas 36.4% organisations were doing it on reasonable level.

4.2.3 OUTPUT

Table 4.13 characterizes the performance of manufacturing organisations regarding the Output factors.

<table>
<thead>
<tr>
<th>S. No</th>
<th>ISSUES</th>
<th>Companies Response Score</th>
<th>Total Responses</th>
<th>Total Points</th>
<th>Percent Points</th>
<th>Central Tendency</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>A</td>
<td>B</td>
<td>C</td>
<td>D</td>
<td>(N)</td>
</tr>
<tr>
<td>1</td>
<td>Production Capacity</td>
<td>0</td>
<td>30</td>
<td>49</td>
<td>39</td>
<td>118</td>
</tr>
<tr>
<td>2</td>
<td>Production Time</td>
<td>5</td>
<td>32</td>
<td>46</td>
<td>35</td>
<td>118</td>
</tr>
<tr>
<td>3</td>
<td>Lead Time</td>
<td>18</td>
<td>52</td>
<td>42</td>
<td>6</td>
<td>118</td>
</tr>
<tr>
<td>4</td>
<td>Quality</td>
<td>3</td>
<td>14</td>
<td>61</td>
<td>40</td>
<td>118</td>
</tr>
<tr>
<td>5</td>
<td>Reliability</td>
<td>6</td>
<td>29</td>
<td>42</td>
<td>41</td>
<td>118</td>
</tr>
<tr>
<td>6</td>
<td>Productivity</td>
<td>9</td>
<td>43</td>
<td>35</td>
<td>31</td>
<td>118</td>
</tr>
<tr>
<td>7</td>
<td>Growth &amp; Expansion</td>
<td>23</td>
<td>38</td>
<td>51</td>
<td>6</td>
<td>118</td>
</tr>
<tr>
<td>8</td>
<td>Competitiveness</td>
<td>16</td>
<td>26</td>
<td>71</td>
<td>5</td>
<td>118</td>
</tr>
<tr>
<td>9</td>
<td>Sales (Annually)</td>
<td>5</td>
<td>61</td>
<td>27</td>
<td>25</td>
<td>118</td>
</tr>
<tr>
<td>10</td>
<td>Profit (Annually)</td>
<td>14</td>
<td>57</td>
<td>20</td>
<td>27</td>
<td>118</td>
</tr>
<tr>
<td>11</td>
<td>Market Share</td>
<td>7</td>
<td>62</td>
<td>45</td>
<td>4</td>
<td>118</td>
</tr>
<tr>
<td>12</td>
<td>Customer Base</td>
<td>6</td>
<td>55</td>
<td>42</td>
<td>15</td>
<td>118</td>
</tr>
</tbody>
</table>

(Total Points Scored ‘TPS’ = A × 1 + B × 2 + C × 3 + D × 4)
The analysis of significant attributes of organisations has revealed that many manufacturing organisations have revealed acceptable performance regarding major attributes. The organisations work on quality (PPS=79.2), production capacity (PPS=77.0), Reliability (PPS=75), Production Time (PPS=73.5), and some organisation work on Productivity (PPS=68.6), Competitiveness (PPS=63.7), Sales (Annually) (PPS=65.2), Customer Base (PPS=64.0) and Profit (Annually) (PPS=62.7).

However, there is an emergent need to affect improvements in Lead Time (PPS=57.6), Growth and Expansion (PPS=58.4) and Market Share (PPS=59.7), since these factors have been under-performing. Figure 4.12 depicts the issue wise performance. The analysis shows the parameters like ‘production time’, ‘production capacity’, ‘quality’ and ‘reliability’, were in excellent conditions in about 30 – 34%
of the organisations while 26.3% organisations had ‘productivity’ in excellent conditions. 21 – 23% of the organisations had process like ‘sales’ and ‘profit’ in excellent conditions.

On the other hand, regarding other processes the conditions were not too much encouraging. ‘Production capacity’ was in good condition among 41.5% of the organisations while 25.4% organisations reported it as satisfactory. ‘Production time’ was in good condition among 39% of the organisations while 27.1% organisation reported it as satisfactory. ‘Lead time’ was in good condition among 35.6% of the organisations while 44.1% organisation reported it as satisfactory.

‘Quality’ was in good condition among 51.7% of the organisations while 11.9% organisation reported it as satisfactory. ‘Reliability’ was in good condition among 35.6% of the organisations while 24.6% organisation reported it as satisfactory. ‘Productivity’ was in good condition among 29.7% of the organisations while 36.4% organisation reported it as satisfactory. ‘Growth and expansion’ was in good condition among 43.2% of the organisations while 32.2% organisation reported it as satisfactory.

‘Competitiveness’ was in good condition among 60.2% of the organisations while 22% organisation reported it as satisfactory. ‘Sales (annually)’ were in good condition among 22.9% of the organisations while 51.7% organisation reported it as satisfactory. ‘Profit (annually)’ was in good condition among 16.9% of the organisations while 48.3% organisation reported it as satisfactory. ‘Market share’ was
in good condition among 38.1% of the organisations while 52.5% organisation reported it as satisfactory. ‘Customer base’ was in good condition among 35.6% of the organisations while 46.6% organisation reported it as satisfactory.

4.2.4 COMPARATIVE ANALYSIS OF ALL FACTORS

Based on the above analysis of Percent Point Score (PPS) and Central Tendency, the following table 4.14 depicts the comparative result of all factors.

**Table 4.14: Comparative Result of all factors**

<table>
<thead>
<tr>
<th>Factors</th>
<th>Percent Points Score (PPS)</th>
<th>Central Tendency</th>
<th>Rank</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Manufacturing Competency Factors</strong></td>
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<tr>
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<td>Raw Material and Equipment</td>
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<td>2.32</td>
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<td>Product Design and Development</td>
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<td>Product Concept</td>
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<td>Production Planning and Control</td>
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<td><strong>Strategic Success Factors</strong></td>
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<tr>
<td>Strategy Agility</td>
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<td>2.64</td>
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<td>Administration</td>
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<td>2.59</td>
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<td>Management</td>
<td>61.41</td>
<td>2.46</td>
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<tr>
<td>Interpersonal</td>
<td>57.19</td>
<td>2.29</td>
<td>5</td>
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<tr>
<td><strong>Output Factors</strong></td>
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<tr>
<td>Quality</td>
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<tr>
<td>Production Capacity</td>
<td>770</td>
<td>37</td>
<td>2</td>
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<tr>
<td>Reliability</td>
<td>750</td>
<td>30</td>
<td>3</td>
</tr>
<tr>
<td>Production Time</td>
<td>73.50</td>
<td>2.94</td>
<td>4</td>
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<tr>
<td>Productivity</td>
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<td>2.74</td>
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</tr>
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<td>Sales (Annually)</td>
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<td>Customer Base</td>
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<tr>
<td>Competitiveness</td>
<td>63.70</td>
<td>2.55</td>
<td>8</td>
</tr>
<tr>
<td>Profit (Annually)</td>
<td>62.70</td>
<td>2.51</td>
<td>9</td>
</tr>
<tr>
<td>Market Share</td>
<td>59.70</td>
<td>2.39</td>
<td>10</td>
</tr>
<tr>
<td>Growth and Expansion</td>
<td>58.40</td>
<td>2.34</td>
<td>11</td>
</tr>
<tr>
<td>Lead Time</td>
<td>57.60</td>
<td>2.31</td>
<td>12</td>
</tr>
</tbody>
</table>
4.3 CORRELATION ANALYSIS

The purpose of correlation analysis is to identify the relationship within various parameters. Moreover, perception was measured by correlation by evaluating statements as all were measured on the same scale. The correlation process used is Karl Pearson Correlation with significance level 0.05. Table 4.15 shows the same.

Table 4.15: Karl Pearson Correlation Matrix

<table>
<thead>
<tr>
<th></th>
<th>O1</th>
<th>O2</th>
<th>O3</th>
<th>O4</th>
<th>O5</th>
<th>O6</th>
<th>O7</th>
<th>O8</th>
<th>O9</th>
<th>O10</th>
<th>O11</th>
<th>O12</th>
</tr>
</thead>
<tbody>
<tr>
<td>I1</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
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<tr>
<td>I2</td>
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<tr>
<td>I3</td>
<td></td>
<td></td>
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<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
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<tr>
<td>I4</td>
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<td></td>
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<tr>
<td>I5</td>
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<td>I6</td>
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<td></td>
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<td></td>
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<tr>
<td>I7</td>
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<tr>
<td>I9</td>
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<td></td>
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<tr>
<td>I10</td>
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<tr>
<td>I11</td>
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<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

The purpose of correlation matrix was to establish the relationship and its direction between the parameters of the manufacturing competencies, strategic success over the output process followed in the organisations. The hypothesis was also framed for the relationship between the parameters at 0.05 levels of significance.

\(H_{01}:\) There was no relationship between the product concept and output process

The analysis of the correlation matrix showed that the above null hypothesis assumed was not acceptable as the correlations obtained between the product concept and all process of output was significant and they were being affected in the organisation in a positive manner. It was inference that the correlation of the product concept with the parameters \(\text{reliability} (r = 0.727), \text{competitiveness} (r = 0.684), \text{quality} (r = 0.675), \text{production time} (r = 0.613), \text{production capacity} (r = 0.606), \text{growth and expansion} (r = 0.527)\) and \(\text{productivity} (r = 0.500)\) were significant positive.

\(H_{02}:\) There was no relationship between the product design and development and output process

The analysis of the correlation matrix showed that the above null hypothesis assumed was not acceptable as the correlations obtained between the product design and development and all process of output was significant and they were being affected in the organisation in a positive manner. It was inference that the correlation of the
product design and development with the parameters i.e. reliability ($r = 0.758$), competitiveness ($r = 0.696$), quality ($r = 0.692$), production time ($r = 0.635$), production capacity ($r = 0.606$), growth and expansion ($r = 0.556$), productivity ($r = 0.554$), lead time ($r = 0.527$) and profit ($r = 0.505$) were significant positive.

$H_{a3}$: There was no relationship between the process planning and output process

The analysis of the correlation matrix showed that the above null hypothesis assumed was not acceptable as the correlations obtained between the process planning and all process of output was significant and they were being affected in the organisation in a positive manner. It was inference that the correlation of the process planning with the parameters i.e. reliability ($r = 0.746$), competitiveness ($r = 0.675$), quality ($r = 0.595$) and production capacity ($r = 0.550$) were significant positive.

$H_{a4}$: There was no relationship between the raw material and equipment and output process

The analysis of the correlation matrix showed that the above null hypothesis assumed was not acceptable as the correlations obtained between the raw material and equipment and all process of output was significant and they were being affected in the organisation in a positive manner. It was inference that the correlation of the raw material and equipment with parameters i.e. reliability ($r = 0.770$), competitiveness ($r = 0.704$), quality ($r = 0.690$), production capacity ($r = 0.672$), production time ($r = 0.631$), productivity ($r = 0.553$), growth and expansion ($r = 0.552$), market share ($r = 0.526$) and profit ($r = 0.511$) were significant positive.
H05: There was no relationship between the production planning and output process

The analysis of the correlation matrix showed that the above null hypothesis assumed was not acceptable as the correlations obtained between the production planning and all process of output was significant and they were being affected in the organisation in a positive manner. It was inference that the correlation of the production planning with the parameters i.e. reliability \( (r = 0.688) \), competitiveness \( (r = 0.638) \), production capacity \( (r = 0.614) \), quality \( (r = 0.590) \), growth and expansion \( (r = 0.553) \), production time \( (r = 0.549) \) and market share \( (r = 0.508) \) were significant positive.

H06: There was no relationship between the quality control and output process

The analysis of the correlation matrix showed that the above null hypothesis assumed was not acceptable as the correlations obtained between the quality control and all process of output was significant and they were being affected in the organisation in a positive manner. It was inference that the correlation of the quality control with the parameters i.e. production capacity \( (r = 0.653) \), reliability \( (r = 0.652) \), production time \( (r = 0.628) \), quality \( (r = 0.586) \), productivity \( (r = 0.564) \), growth and expansion \( (r = 0.531) \) and competitiveness \( (r = 0.525) \) were significant positive.

H07: There was no relationship between the strategy agility and output process

The analysis of the correlation matrix showed that the above null hypothesis assumed was not acceptable as the correlations obtained between the strategy agility and all process of output was significant and they were being affected in the organisation in a positive manner. It was inference that the correlation of the strategy agility with the
parameters i.e. quality (r = 0.709), production capacity (r = 0.679), production time (r = 0.677), reliability (r = 0.643), productivity (r = 0.612), growth and expansion (r = 0.590), competitiveness (r = 0.569), profit (r = 0.554), sales (r = 0.547) and lead time (r = 0.506) were significant positive.

H_{08}: There was no relationship between the management and output process

The analysis of the correlation matrix showed that the above null hypothesis assumed was not acceptable as the correlations obtained between the management and all process of output was significant and they were being affected in the organisation in a positive manner. It was inference that the correlation of the management with the parameters i.e. reliability (r = 0.700), profit (r = 0.655), production time (r = 0.640), competitiveness (r = 0.639), growth and expansion (r = 0.606), lead time (r = 0.597), productivity (r = 0.581), quality (r = 0.547), sales (r = 0.529), market share (r = 0.521), production capacity (r = 0.516), and customer base (r = 0.515) were significant positive.

H_{09}: There was no relationship between the team work and output process

The analysis of the correlation matrix showed that the above null hypothesis assumed was not acceptable as the correlations obtained between the team work and all process of output was significant and they were being affected in the organisation in a positive manner. It was inference that the correlation of the team work with the parameters i.e. reliability (r = 0.806), competitiveness (r = 0.708), production time (r = 0.652), quality (r = 0.647), production capacity (r = 0.607), productivity (r = 0.596), profit (r =
growth and expansion (r = 0.555), sales (r = 0.522) and market share (r = 0.508) were significant positive.

**H10:** There was no relationship between the administration and output process

The analysis of the correlation matrix showed that the above null hypothesis assumed was not acceptable as the correlations obtained between the administration and all process of output was significant and they were being affected in the organisation in a positive manner. It was inference that the correlation of the administration with the parameters i.e. reliability (r = 0.685), competitiveness (r = 0.631), quality (r = 0.624), productivity (r = 0.575), production time (r = 0.566), production capacity (r = 0.527) and profit (r = 0.507) were significant positive.

**H11:** There was no relationship between the interpersonal and output process

The analysis of the correlation matrix showed that the above null hypothesis assumed was not acceptable as the correlations obtained between the interpersonal and all process of output was significant and they were being affected in the organisation in a positive manner. It was inference that the correlation of the interpersonal with the parameters i.e. reliability (r = 0.738), competitiveness (r = 0.610), production time (r = 0.554), quality (r = 0.553) and production capacity (r = 0.528) were significant positive.

**4.4 REGRESSION ANALYSIS**

Multiple linear regression analysis has been used for developing regression weights. *Table t-value for 10 degree of freedom at 5% level is 1.812 and the t-values higher than this in following Table will give the significant parameters.*
4.4.1 PRODUCTION CAPACITY

The regression outputs for the dependent variable Production Capacity are shown in the following Table 4.16.

**Table 4.16: Multiple Linear Regression analysis of the Production Capacity**

(a) **Model Summary**

<table>
<thead>
<tr>
<th>Model</th>
<th>R</th>
<th>R Square</th>
<th>Adjusted R Square</th>
<th>Std. Error of the Estimate</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>0.763</td>
<td>0.592</td>
<td>0.538</td>
<td>0.518</td>
</tr>
</tbody>
</table>

Predictors: (Constant), Interpersonal, Product Concept, Strategy Agility, Process Planning, Management, Quality Control, Administration, Production Planning, Raw Material & Equipment, Product Design & Dev, Team Work.

(b) **ANOVA**

<table>
<thead>
<tr>
<th>Model</th>
<th>Sum of Squares</th>
<th>DF</th>
<th>Mean Square</th>
<th>F</th>
</tr>
</thead>
<tbody>
<tr>
<td>Regression</td>
<td>39.237</td>
<td>11</td>
<td>3.567</td>
<td>13.274</td>
</tr>
<tr>
<td>Residual</td>
<td>28.216</td>
<td>105</td>
<td>269</td>
<td></td>
</tr>
<tr>
<td>Total</td>
<td>67.453</td>
<td>116</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Predictors: (Constant), Interpersonal, Product Concept, Strategy Agility, Process Planning, Management, Quality Control, Administration, Production Planning, Raw Material & Equipment, Product Design & Dev, Team Work.

Dependent Variable: Production Capacity.

(c) **Un Standardized Coefficients**

<table>
<thead>
<tr>
<th></th>
<th>B</th>
<th>Std. Error</th>
<th>Beta</th>
<th>T</th>
</tr>
</thead>
<tbody>
<tr>
<td>(Constant)</td>
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<td>.270</td>
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<td>4.495</td>
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<tr>
<td>Product Concept</td>
<td>.021</td>
<td>.037</td>
<td>.096</td>
<td>1.550</td>
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<tr>
<td>Product Design &amp; Dev</td>
<td>-.010</td>
<td>.037</td>
<td>-.061</td>
<td>.270</td>
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<tr>
<td>Process Planning</td>
<td>-.005</td>
<td>.027</td>
<td>-.033</td>
<td>.970</td>
</tr>
<tr>
<td>Raw Material &amp; Equipment</td>
<td>.122</td>
<td>.053</td>
<td>.520</td>
<td>2.279</td>
</tr>
<tr>
<td>Production Planning</td>
<td>-.043</td>
<td>.044</td>
<td>-.198</td>
<td>1.982</td>
</tr>
<tr>
<td>Quality Control</td>
<td>.111</td>
<td>.037</td>
<td>.521</td>
<td>3.009</td>
</tr>
<tr>
<td>Strategy Agility</td>
<td>.095</td>
<td>.031</td>
<td>.405</td>
<td>3.081</td>
</tr>
<tr>
<td>Management</td>
<td>-.041</td>
<td>.025</td>
<td>-.252</td>
<td>1.629</td>
</tr>
<tr>
<td>Team Work</td>
<td>-.005</td>
<td>.036</td>
<td>-.033</td>
<td>.133</td>
</tr>
<tr>
<td>Administration</td>
<td>-.097</td>
<td>.051</td>
<td>-.307</td>
<td>.911</td>
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<tr>
<td>Interpersonal</td>
<td>.014</td>
<td>.028</td>
<td>.087</td>
<td>.521</td>
</tr>
</tbody>
</table>

The regression model developed was significant as ANOVA analysis showed F – test = 13.27, p < 0.05. The predictors identified from the analysis was Product Concept, Raw Material and Equipment, Production Planning and Control and Quality Control.
parameters of manufacturing competencies and Strategy Agility and Management parameters of the strategic success.

4.4.2 PRODUCTION TIME

Following are the regression outputs for the dependent variable Production Time shown in Table 4.17.

Table 4.17: Multiple Linear Regression analysis of the Production Time

(a) Model Summary

<table>
<thead>
<tr>
<th>Model</th>
<th>R</th>
<th>R Square</th>
<th>Adjusted R Square</th>
<th>Std. Error of the Estimate</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>.784</td>
<td>.614</td>
<td>.573</td>
<td>.561</td>
</tr>
</tbody>
</table>

Predictors: (Constant), Interpersonal, Product Concept, Strategy Agility, Process Planning, Management, Quality Control, Administration, Production Planning, Raw Material & Equipment, Product Design & Dev, Team Work

(b) ANOVA

<table>
<thead>
<tr>
<th></th>
<th>Sum of Squares</th>
<th>Df</th>
<th>Mean Square</th>
<th>F</th>
</tr>
</thead>
<tbody>
<tr>
<td>Regression</td>
<td>52.457</td>
<td>11</td>
<td>4.769</td>
<td>15.176</td>
</tr>
<tr>
<td>Residual</td>
<td>32.996</td>
<td>105</td>
<td>314</td>
<td></td>
</tr>
<tr>
<td>Total</td>
<td>85.433</td>
<td>116</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Predictors: (Constant), Interpersonal, Product Concept, Strategy Agility, Process Planning, Management, Quality Control, Administration, Production Planning, Raw Material & Equipment, Product Design & Dev, Team Work

Dependent Variable: Production Time

(c) Un Standardized Coefficients

<table>
<thead>
<tr>
<th>B</th>
<th>Std. Error</th>
<th>Beta</th>
<th>t</th>
</tr>
</thead>
<tbody>
<tr>
<td>(Constant)</td>
<td>.901</td>
<td>.292</td>
<td>3.698</td>
</tr>
<tr>
<td>Product Concept</td>
<td>.049</td>
<td>.041</td>
<td>.204</td>
</tr>
<tr>
<td>Process Planning</td>
<td>-.075</td>
<td>.040</td>
<td>.409</td>
</tr>
<tr>
<td>Raw Material &amp; Equipment</td>
<td>-.013</td>
<td>.058</td>
<td>-.049</td>
</tr>
<tr>
<td>Production Planning</td>
<td>-.086</td>
<td>.047</td>
<td>-.352</td>
</tr>
<tr>
<td>Quality Control</td>
<td>.130</td>
<td>.040</td>
<td>.541</td>
</tr>
<tr>
<td>Strategy Agility</td>
<td>.072</td>
<td>.033</td>
<td>.272</td>
</tr>
<tr>
<td>Management</td>
<td>.031</td>
<td>.028</td>
<td>1.68</td>
</tr>
<tr>
<td>Team Work</td>
<td>.032</td>
<td>.039</td>
<td>3.17</td>
</tr>
<tr>
<td>Administration</td>
<td>-.033</td>
<td>.053</td>
<td>-.091</td>
</tr>
<tr>
<td>Interpersonal</td>
<td>-.026</td>
<td>.030</td>
<td>-.141</td>
</tr>
</tbody>
</table>

The regression model developed was significant as ANOVA analysis showed F – test = 15.17, p < 0.05. The predictors identified from the analysis was Product Concept,
Product Design and Development, Process Planning, Production Planning and Control and Quality Control parameters of manufacturing competencies and strategy agility, management and team work parameters of the strategic success.

4.4.3 LEAD TIME

Table 4.18 shows the Regression outputs for the dependent variable Lead Time.

Table 4.18: Multiple Linear Regression analysis of the Lead Time

<table>
<thead>
<tr>
<th>Model Summary</th>
<th>Model</th>
<th>R</th>
<th>R Square</th>
<th>Adjusted R Square</th>
<th>Std. Error of the Estimate</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>1</td>
<td>.676</td>
<td>.457</td>
<td>.400</td>
<td>.614</td>
</tr>
</tbody>
</table>

Predictors: (Constant), Interpersonal, Product Concept, Strategy Agility, Process Planning, Management, Quality Control, Administration, Production Planning, Raw Material & Equipment, Product Design & Dev, Team Work

<table>
<thead>
<tr>
<th>ANOVA</th>
<th>Model</th>
<th>Sum of Squares</th>
<th>df</th>
<th>Mean Square</th>
<th>F</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Regression</td>
<td>33.328</td>
<td>11</td>
<td>3.030</td>
<td>8.035</td>
</tr>
<tr>
<td></td>
<td>Residual</td>
<td>39.593</td>
<td>105</td>
<td>.377</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Total</td>
<td>72.923</td>
<td>116</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Predictors: (Constant), Interpersonal, Product Concept, Strategy Agility, Process Planning, Management, Quality Control, Administration, Production Planning, Raw Material & Equipment, Product Design & Dev, Team Work

Dependent Variable: Lead Time

<table>
<thead>
<tr>
<th>(Constant)</th>
<th>Un Standardized Coefficients</th>
<th>Standardized Coefficients</th>
<th>T</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>B</td>
<td>Std. Error</td>
<td>Beta</td>
</tr>
<tr>
<td>.714</td>
<td>.320</td>
<td>.677</td>
<td>8.035</td>
</tr>
</tbody>
</table>

| Product Concept | -0.017 | .044 | -2.389 |
| Product Design & Dev | .112 | .043 | .662 |
| Process Planning | -0.080 | .032 | -0.478 |
| Raw Material & Equipment | -0.074 | .063 | -1.172 |
| Production Planning | -0.045 | .052 | -2.000 |
| Quality Control | .031 | .044 | .139 |
| Strategy Agility | .028 | .037 | .114 |
| Management | .108 | .030 | .632 |
| Team Work | -0.026 | .043 | -1.693 |
| Administration | .043 | .060 | .129 |
| Interpersonal | -0.093 | .033 | -0.919 |

122
The regression model developed was significant as ANOVA analysis showed $F$-test $= 83, p < 0.05$. The predictors identified from the analysis was Product Concept, Product Design and Development, Raw Material and Equipment, Process Planning and Control and Quality Control parameters of manufacturing competencies and Management parameter of the strategic success.

### 4.4.4 QUALITY

Following are the regression outputs for the dependent variable Quality. Table 4.19 shows the Regression Analysis of Quality.

**Table 4.19: Multiple Linear Regression analysis of the Quality**

<p>| (a) Model Summary |
|-------------------|---|---|---|---|</p>
<table>
<thead>
<tr>
<th>Model</th>
<th>R</th>
<th>R Square</th>
<th>Adjusted R Square</th>
<th>Std. Error of the Estimate</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>.782</td>
<td>.611</td>
<td>.570</td>
<td>.482</td>
</tr>
</tbody>
</table>

Predictors: (Constant), Interpersonal, Product Concept, Strategy Agility, Process Planning, Management, Quality Control, Administration, Production Planning, Raw Material & Equipment, Product Design & Dev, Team Work

<table>
<thead>
<tr>
<th>(b) ANOVA</th>
</tr>
</thead>
<tbody>
<tr>
<td>Model</td>
</tr>
<tr>
<td>Regression</td>
</tr>
<tr>
<td>Residual</td>
</tr>
<tr>
<td>Total</td>
</tr>
</tbody>
</table>

Predictors: (Constant), Interpersonal, Product Concept, Strategy Agility, Process Planning, Management, Quality Control, Administration, Production Planning, Raw Material & Equipment, Product Design & Dev, Team Work

Dependent Variable: Quality

<table>
<thead>
<tr>
<th>(c) Un Standardized Coefficients</th>
<th>Standardized Coefficients</th>
<th>T</th>
</tr>
</thead>
<tbody>
<tr>
<td>B</td>
<td>Std. Error</td>
<td>Beta</td>
</tr>
<tr>
<td>(Constant)</td>
<td>1.031</td>
<td>.251</td>
</tr>
<tr>
<td>Product Concept</td>
<td>.033</td>
<td>.015</td>
</tr>
<tr>
<td>Product Design &amp; Dev</td>
<td>.049</td>
<td>.034</td>
</tr>
<tr>
<td>Process Planning</td>
<td>-.018</td>
<td>.025</td>
</tr>
<tr>
<td>Raw Material &amp; Equipment</td>
<td>.027</td>
<td>.050</td>
</tr>
<tr>
<td>Production Planning</td>
<td>-.0056</td>
<td>.041</td>
</tr>
<tr>
<td>Quality Control</td>
<td>-.0111</td>
<td>.034</td>
</tr>
<tr>
<td>Strategy Agility</td>
<td>.123</td>
<td>.029</td>
</tr>
<tr>
<td>Management</td>
<td>-.081</td>
<td>.024</td>
</tr>
<tr>
<td>Team Work</td>
<td>.039</td>
<td>.033</td>
</tr>
<tr>
<td>Administration</td>
<td>.057</td>
<td>.047</td>
</tr>
<tr>
<td>Interpersonal</td>
<td>.015</td>
<td>.026</td>
</tr>
</tbody>
</table>
The regression model developed was significant as ANOVA analysis showed \( F \) – test = 14.9, \( p < 0.05 \). The predictors identified from the analysis was Product Concept, Production Planning and Control and Quality Control parameters of Manufacturing Competency and Management and Administration parameter of the strategic success.

4.4.5 RELIABILITY

Following are the regression outputs for the dependent variable Reliability as shown in table 4.20.

<table>
<thead>
<tr>
<th>Model Summary</th>
<th>Model</th>
<th>R</th>
<th>R Square</th>
<th>Adjusted R Square</th>
<th>Std. Error of the Estimate</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>.867</td>
<td>.751</td>
<td>.725</td>
<td>.472</td>
<td></td>
</tr>
</tbody>
</table>

Predictors: (Constant), Interpersonal, Product Concept, Strategy Agility, Process Planning, Management, Quality Control, Administration, Production Planning, Raw Material & Equipment, Product Design & Dev, Team Work

<table>
<thead>
<tr>
<th>ANOVA</th>
<th>Model</th>
<th>Sum of Squares</th>
<th>df</th>
<th>Mean Square</th>
<th>F</th>
</tr>
</thead>
<tbody>
<tr>
<td>Regression</td>
<td>70,624</td>
<td>11</td>
<td>6,420</td>
<td>28.839</td>
<td></td>
</tr>
<tr>
<td>Residual</td>
<td>23,376</td>
<td>105</td>
<td>223</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Total</td>
<td>94,000</td>
<td>116</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Predictors: (Constant), Interpersonal, Product Concept, Strategy Agility, Process Planning, Management, Quality Control, Administration, Production Planning, Raw Material & Equipment, Product Design & Dev, Team Work

Dependent Variable: Reliability

<table>
<thead>
<tr>
<th>Un Standardized Coefficients</th>
<th>Standardized Coefficients</th>
<th>( t )</th>
</tr>
</thead>
<tbody>
<tr>
<td>(Constant)</td>
<td>.238</td>
<td>.246</td>
</tr>
<tr>
<td>Product Concept</td>
<td>.074</td>
<td>.034</td>
</tr>
<tr>
<td>Product Design &amp; Dev</td>
<td>-.050</td>
<td>.033</td>
</tr>
<tr>
<td>Process Planning</td>
<td>.081</td>
<td>.024</td>
</tr>
<tr>
<td>Raw Material &amp; Equipment</td>
<td>.060</td>
<td>.049</td>
</tr>
<tr>
<td>Production Planning</td>
<td>-.101</td>
<td>.040</td>
</tr>
<tr>
<td>Quality Control</td>
<td>-.031</td>
<td>.034</td>
</tr>
<tr>
<td>Strategy Agility</td>
<td>.003</td>
<td>.028</td>
</tr>
<tr>
<td>Management</td>
<td>-.032</td>
<td>.023</td>
</tr>
<tr>
<td>Team Work</td>
<td>.096</td>
<td>.033</td>
</tr>
<tr>
<td>Administration</td>
<td>.091</td>
<td>.046</td>
</tr>
<tr>
<td>Interpersonal</td>
<td>1.13</td>
<td>.025</td>
</tr>
</tbody>
</table>
The regression model developed was significant as ANOVA analysis showed \( F - \) test = 28.80, \( p < 0.05 \). The predictors identified from the analysis was Product Concept, Product Design and Development, Raw Material and Equipment, Production Planning and Control and Quality Control parameters of manufacturing competencies and Management and Interpersonal parameter of the strategic success.

4.4.6 PRODUCTIVITY

Table 4.21 shows the regression outputs for the dependent variable 

**Table 4.21: Multiple Linear Regression analysis of the Productivity**

<table>
<thead>
<tr>
<th>Model Summary</th>
<th>Model</th>
<th>R</th>
<th>R Square</th>
<th>Adjusted R Square</th>
<th>Std. Error of the Estimate</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>1</td>
<td>.695</td>
<td>.483</td>
<td>.429</td>
<td>.708</td>
</tr>
<tr>
<td>Predictors:</td>
<td>(Constant), Interpersonal, Product Concept, Strategy Agility, Process Planning, Management, Quality Control, Administration, Production Planning, Raw Material &amp; Equipment, Product Design &amp; Dev, Team Work</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>ANOVA</th>
<th>Model</th>
<th>Sum of Squares</th>
<th>Df</th>
<th>Mean Square</th>
<th>F</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Regression</td>
<td>49.149</td>
<td>11</td>
<td>4.468</td>
<td>8.908</td>
</tr>
<tr>
<td></td>
<td>Residual</td>
<td>52.663</td>
<td>105</td>
<td>502</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Total</td>
<td>101.812</td>
<td>116</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Predictors:</td>
<td>(Constant), Interpersonal, Product Concept, Strategy Agility, Process Planning, Management, Quality Control, Administration, Production Planning, Raw Material &amp; Equipment, Product Design &amp; Dev, Team Work</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**Dependent Variable: Productivity**

<table>
<thead>
<tr>
<th>Un Standardized Coefficients</th>
<th>Standardized Coefficients</th>
<th>t</th>
</tr>
</thead>
<tbody>
<tr>
<td>(Constant)</td>
<td>.555</td>
<td>.369</td>
</tr>
<tr>
<td>Product Concept</td>
<td>-.016</td>
<td>.051</td>
</tr>
<tr>
<td>Product Design &amp; Dev</td>
<td>.048</td>
<td>.030</td>
</tr>
<tr>
<td>Process Planning</td>
<td>-.043</td>
<td>.037</td>
</tr>
<tr>
<td>Raw Material &amp; Equipment</td>
<td>.042</td>
<td>.073</td>
</tr>
<tr>
<td>Production Planning</td>
<td>-.114</td>
<td>.060</td>
</tr>
<tr>
<td>Quality Control</td>
<td>.115</td>
<td>.030</td>
</tr>
<tr>
<td>Strategy Agility</td>
<td>.089</td>
<td>.042</td>
</tr>
<tr>
<td>Management</td>
<td>.015</td>
<td>.035</td>
</tr>
<tr>
<td>Team Work</td>
<td>.102</td>
<td>.049</td>
</tr>
<tr>
<td>Administration</td>
<td>.117</td>
<td>.070</td>
</tr>
<tr>
<td>Interpersonal</td>
<td>-.093</td>
<td>.038</td>
</tr>
</tbody>
</table>

125
The regression model developed was significant as ANOVA analysis showed F – test = 8.90, p < 05. The predictors identified from the analysis was Product Concept, Process Planning, Production Planning and Control and Quality Control parameters of manufacturing competencies and Management, Administration and Interpersonal parameter of the strategic success.

**4.4.7 GROWTH AND EXPANSION**

The following table 4.22 shows the regression outputs for the dependent variable *Growth and Expansion*.

<table>
<thead>
<tr>
<th>Model Summary</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Model</td>
<td>R</td>
</tr>
<tr>
<td>1</td>
<td>.673</td>
</tr>
</tbody>
</table>

Predictors: (Constant), Interpersonal, Product Concept, Strategy Agility, Process Planning, Management, Quality Control, Administration, Production Planning, Raw Material & Equipment, Product Design & Dev, Team Work

<table>
<thead>
<tr>
<th>ANOVA</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Model</td>
<td>Sum of Squares</td>
</tr>
<tr>
<td>Regression</td>
<td>38.011</td>
</tr>
<tr>
<td>Residual</td>
<td>45.989</td>
</tr>
<tr>
<td>Total</td>
<td>54.000</td>
</tr>
</tbody>
</table>

Predictors: (Constant), Interpersonal, Product Concept, Strategy Agility, Process Planning, Management, Quality Control, Administration, Production Planning, Raw Material & Equipment, Product Design & Dev, Team Work

Dependent Variable: Growth & Expansion

<table>
<thead>
<tr>
<th>Unstandardized Coefficients</th>
<th>Standardized Coefficients</th>
<th>t</th>
</tr>
</thead>
<tbody>
<tr>
<td>(Constant)</td>
<td>.273</td>
<td>.344</td>
</tr>
<tr>
<td>Product Concept</td>
<td>.039</td>
<td>.048</td>
</tr>
<tr>
<td>Raw Material &amp; Equipment</td>
<td>-.051</td>
<td>.068</td>
</tr>
<tr>
<td>Management</td>
<td>.055</td>
<td>.047</td>
</tr>
<tr>
<td>Strategy Agility</td>
<td>.039</td>
<td>.039</td>
</tr>
<tr>
<td>Team Work</td>
<td>-.022</td>
<td>.046</td>
</tr>
<tr>
<td>Administration</td>
<td>-.069</td>
<td>.065</td>
</tr>
<tr>
<td>Interpersonal</td>
<td>-.042</td>
<td>.035</td>
</tr>
</tbody>
</table>
The regression model developed was significant as ANOVA analysis showed \( F - \text{test} = 7.89, p < 0.05 \). The predictors identified from the analysis was Product Concept, Product Design and Development, Production Planning and Control and Quality Control parameters of Manufacturing Competency and Management and administration parameters of the strategic success.

4.4.8 COMPETITIVENESS

Following are the regression outputs for the dependent variable Competitiveness shown in table 4.23.

Table 4.23: Multiple Linear Regression analysis of the Competitiveness

<table>
<thead>
<tr>
<th>Model</th>
<th>R</th>
<th>R Square</th>
<th>Adjusted R Square</th>
<th>Std. Error of the Estimate</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>.772</td>
<td>.596</td>
<td>.553</td>
<td>.523</td>
</tr>
</tbody>
</table>

Predictors: (Constant), Interpersonal, Product Concept, Strategy Agility, Process Planning, Management, Quality Control, Administration, Production Planning, Raw Material & Equipment, Product Design & Dev, Team Work

<table>
<thead>
<tr>
<th>ANOVA</th>
</tr>
</thead>
<tbody>
<tr>
<td>Model</td>
</tr>
<tr>
<td>Regression</td>
</tr>
<tr>
<td>Residual</td>
</tr>
<tr>
<td>Total</td>
</tr>
</tbody>
</table>

Predictors: (Constant), Interpersonal, Product Concept, Strategy Agility, Process Planning, Management, Quality Control, Administration, Production Planning, Raw Material & Equipment, Product Design & Dev, Team Work

<table>
<thead>
<tr>
<th>Dependent Variable: Competitiveness</th>
</tr>
</thead>
<tbody>
<tr>
<td>Un Standardized Coefficients</td>
</tr>
<tr>
<td>(Constant)</td>
</tr>
<tr>
<td>Product Concept</td>
</tr>
<tr>
<td>Product Design &amp; Dev</td>
</tr>
<tr>
<td>Process Planning</td>
</tr>
<tr>
<td>Raw Material &amp; Equipment</td>
</tr>
<tr>
<td>Production Planning</td>
</tr>
<tr>
<td>Quality Control</td>
</tr>
<tr>
<td>Strategy Agility</td>
</tr>
<tr>
<td>Management</td>
</tr>
<tr>
<td>Team Work</td>
</tr>
<tr>
<td>Administration</td>
</tr>
<tr>
<td>Interpersonal</td>
</tr>
</tbody>
</table>
The regression model developed was significant as ANOVA analysis showed $F$ – test $= 145$, $p < 0.05$. The predictors identified from the analysis were Product Concept, Product Design and Development, Production Planning and Control and Quality Control parameters of Manufacturing Competency and Management and Administration parameters of the strategic success.

### 4.4.9 SALES

The regression outputs for the dependent variable *Sales* are depicted in Table 4.24

#### Table 4.24: Multiple Linear Regression analysis of the Sales

<table>
<thead>
<tr>
<th>Model Summary</th>
<th>Model</th>
<th>R</th>
<th>R Square</th>
<th>Adjusted R Square</th>
<th>Std Error of Estimate</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>1</td>
<td>.615</td>
<td>.378</td>
<td>.312</td>
<td>.721</td>
</tr>
<tr>
<td>Predictors: (Constant), Interpersonal, Product Concept, Strategy Agility, Process Planning, Management, Quality Control, Administration, Production Planning, Raw Material &amp; Equipment, Product Design &amp; Dev, Team Work</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

#### ANOVA

<table>
<thead>
<tr>
<th>Model</th>
<th>Sum of Squares</th>
<th>Df</th>
<th>Mean Square</th>
<th>F</th>
</tr>
</thead>
<tbody>
<tr>
<td>Regression</td>
<td>33.115</td>
<td>11</td>
<td>3.019</td>
<td>5.792</td>
</tr>
<tr>
<td>Residual</td>
<td>54.773</td>
<td>105</td>
<td>.520</td>
<td></td>
</tr>
<tr>
<td>Total</td>
<td>87.692</td>
<td>116</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Predictors: (Constant), Interpersonal, Product Concept, Strategy Agility, Process Planning, Management, Quality Control, Administration, Production Planning, Raw Material & Equipment, Product Design & Dev, Team Work

**Dependent Variable: Sales**

<table>
<thead>
<tr>
<th>Un Standardized Coefficients</th>
<th>Standardized Coefficients</th>
<th>t</th>
</tr>
</thead>
<tbody>
<tr>
<td>B</td>
<td>Std. Error</td>
<td>Beta</td>
</tr>
<tr>
<td>(Constant)</td>
<td>.577</td>
<td>.375</td>
</tr>
<tr>
<td>Product Concept</td>
<td>-.068</td>
<td>.052</td>
</tr>
<tr>
<td>Product Design &amp; Dev</td>
<td>.007</td>
<td>.051</td>
</tr>
<tr>
<td>Process Planning</td>
<td>.011</td>
<td>.037</td>
</tr>
<tr>
<td>Raw Material &amp; Equipment</td>
<td>-.016</td>
<td>.074</td>
</tr>
<tr>
<td>Production Planning</td>
<td>-.013</td>
<td>.061</td>
</tr>
<tr>
<td>Quality Control</td>
<td>-.084</td>
<td>.051</td>
</tr>
<tr>
<td>Strategy Agility</td>
<td>.128</td>
<td>.043</td>
</tr>
<tr>
<td>Management</td>
<td>.015</td>
<td>.035</td>
</tr>
<tr>
<td>Team Work</td>
<td>.085</td>
<td>.050</td>
</tr>
<tr>
<td>Administration</td>
<td>.113</td>
<td>.071</td>
</tr>
<tr>
<td>Interpersonal</td>
<td>-.042</td>
<td>.039</td>
</tr>
</tbody>
</table>
The regression model developed was significant as ANOVA analysis showed $F$ – test $= 5.79$, $p < 0.05$. The predictors identified from the analysis was Product Concept, Production Planning and Control and Quality Control parameters of Manufacturing Competency and Management and Interpersonal parameters of the strategic success.

### 4.4.10 PROFIT

The following regression analysis for the dependent variable *Profit* is given in table 4.25.

**Table 4.25: Multiple Linear Regression analysis of the Profit**

(a) 

<table>
<thead>
<tr>
<th>Model Summary</th>
<th>Model</th>
<th>$R$</th>
<th>$R$ Square</th>
<th>Adjusted $R$ Square</th>
<th>Std. Error of the Estimate</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>0.719</td>
<td>0.517</td>
<td>0.466</td>
<td>0.715</td>
<td></td>
</tr>
</tbody>
</table>

Predictors: (Constant), Interpersonal, Product Concept, Strategy Agility, Process Planning, Management, Quality Control, Administration, Production Planning, Raw Material & Equipment, Product Design & Dev, Team Work

(b) 

<table>
<thead>
<tr>
<th>ANOVA</th>
<th>Model</th>
<th>Sum of Squares</th>
<th>df</th>
<th>Mean Square</th>
<th>$F$</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Regression</td>
<td>57.515</td>
<td>11</td>
<td>5.229</td>
<td>10.221</td>
</tr>
<tr>
<td></td>
<td>Residual</td>
<td>55.716</td>
<td>105</td>
<td>.512</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Total</td>
<td>113.231</td>
<td>116</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Predictors: (Constant), Interpersonal, Product Concept, Strategy Agility, Process Planning, Management, Quality Control, Administration, Production Planning, Raw Material & Equipment, Product Design & Dev, Team Work

Dependent Variable: Profit

(c) 

<table>
<thead>
<tr>
<th>Un Standardized Coefficients</th>
<th>Standardized Coefficients</th>
<th>$T$</th>
</tr>
</thead>
<tbody>
<tr>
<td>(Constant)</td>
<td>-1.95</td>
<td>0.372</td>
</tr>
<tr>
<td>Product Concept</td>
<td>-0.645</td>
<td>0.152</td>
</tr>
<tr>
<td>Product Design &amp; Dev</td>
<td>-0.611</td>
<td>0.051</td>
</tr>
<tr>
<td>Process Planning</td>
<td>-0.006</td>
<td>0.037</td>
</tr>
<tr>
<td>Raw Material &amp; Equipment</td>
<td>-0.016</td>
<td>0.074</td>
</tr>
<tr>
<td>Production Planning</td>
<td>-0.069</td>
<td>0.060</td>
</tr>
<tr>
<td>Quality Control</td>
<td>-1.105</td>
<td>0.111</td>
</tr>
<tr>
<td>Strategy Agility</td>
<td>0.095</td>
<td>0.043</td>
</tr>
<tr>
<td>Management</td>
<td>0.104</td>
<td>0.035</td>
</tr>
<tr>
<td>Team Work</td>
<td>0.120</td>
<td>0.050</td>
</tr>
<tr>
<td>Administration</td>
<td>0.101</td>
<td>0.070</td>
</tr>
<tr>
<td>Interpersonal</td>
<td>-0.042</td>
<td>0.038</td>
</tr>
</tbody>
</table>
The regression model developed was significant as ANOVA analysis showed $F$–test $= 10.22$, $p < 0.05$. The predictors identified from the analysis was Product Concept, Raw Material and Equipment, Production Planning and Control and Quality Control parameters of the manufacturing competencies and Management, Administration and Interpersonal parameters of the strategic success.

### 4.4.11 MARKET SHARE

Table 4.26 shows the Regression Analysis of Market Share. The regression model developed was significant as ANOVA analysis showed $F$–test $= 10.32$, $p < 0.05$.

#### Table 4.26: Multiple Linear Regression analysis of the Market Share

<table>
<thead>
<tr>
<th>Model Summary</th>
<th>Model</th>
<th>R</th>
<th>R Square</th>
<th>Adjusted R Square</th>
<th>Std. Error of the Estimate</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>.721</td>
<td>.520</td>
<td>.469</td>
<td>.477</td>
<td></td>
</tr>
</tbody>
</table>

Predictors: (Constant), Interpersonal, Product Concept, Strategy Agility, Process Planning, Management, Quality Control, Administration, Production Planning, Raw Material & Equipment, Product Design & Dev, Team Work

<table>
<thead>
<tr>
<th>ANOVA</th>
<th>Model</th>
<th>Sum of Squares</th>
<th>DF</th>
<th>Mean Square</th>
<th>F</th>
</tr>
</thead>
<tbody>
<tr>
<td>Regression</td>
<td>22.826</td>
<td>11</td>
<td>2.348</td>
<td>10.329</td>
<td></td>
</tr>
<tr>
<td>Residual</td>
<td>23.866</td>
<td>105</td>
<td>.227</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Total</td>
<td>46.692</td>
<td>116</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Predictors: (Constant), Interpersonal, Product Concept, Strategy Agility, Process Planning, Management, Quality Control, Administration, Production Planning, Raw Material & Equipment, Product Design & Dev, Team Work

Dependent Variable: Market Share

<table>
<thead>
<tr>
<th>Un Standardized Coefficients</th>
<th>Standardized Coefficients</th>
<th>T</th>
</tr>
</thead>
<tbody>
<tr>
<td>(Constant)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Product Concept</td>
<td>-.001</td>
<td>.248</td>
</tr>
<tr>
<td>Product Design &amp; Dev</td>
<td>.026</td>
<td>.034</td>
</tr>
<tr>
<td>Process Planning</td>
<td>-.099</td>
<td>.025</td>
</tr>
<tr>
<td>Raw Material &amp; Equipment</td>
<td>.107</td>
<td>.049</td>
</tr>
<tr>
<td>Production Planning</td>
<td>.181</td>
<td>.040</td>
</tr>
<tr>
<td>Quality Control</td>
<td>-.160</td>
<td>.034</td>
</tr>
<tr>
<td>Strategy Agility</td>
<td>.028</td>
<td>.028</td>
</tr>
<tr>
<td>Management</td>
<td>.046</td>
<td>.023</td>
</tr>
<tr>
<td>Team Work</td>
<td>-.036</td>
<td>.023</td>
</tr>
<tr>
<td>Administration</td>
<td>-.060</td>
<td>.047</td>
</tr>
<tr>
<td>Interpersonal</td>
<td>.070</td>
<td>.026</td>
</tr>
</tbody>
</table>

130
The predictors identified from the analysis was Product Concept, Process Planning, Production Planning and Control and Quality Control parameters of the manufacturing competencies and Management and Team Work parameters of the strategic success. The following were the regression outputs for the dependent variable Market Share.

4.4.12 CUSTOMER BASE

Table 4.27 shows the regression outputs for the dependent variable Customer Base.

Table 4.27: Multiple Linear Regression analysis of the Customer Base

<table>
<thead>
<tr>
<th>Model Summary</th>
<th>Model</th>
<th>R</th>
<th>R Square</th>
<th>Adjusted R Square</th>
<th>Std. Error of the Estimate</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>1</td>
<td>.601</td>
<td>.361</td>
<td>294</td>
<td>.537</td>
</tr>
<tr>
<td>a. Predictors: (Constant), Interpersonal, Product Concept, Strategy Agility, Process Planning, Management, Quality Control, Administration, Production Planning, Raw Material &amp; Equipment, Product Design &amp; Dev, Team Work</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>ANOVA</th>
<th>Model</th>
<th>Sum of Squares</th>
<th>DF</th>
<th>Mean Square</th>
<th>F</th>
</tr>
</thead>
<tbody>
<tr>
<td>Regression</td>
<td>25.566</td>
<td>11</td>
<td></td>
<td>2.324</td>
<td>5.384</td>
</tr>
<tr>
<td>Residual</td>
<td>45.323</td>
<td>105</td>
<td></td>
<td>.432</td>
<td></td>
</tr>
<tr>
<td>Total</td>
<td>70.889</td>
<td>116</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Predictors: (Constant), Interpersonal, Product Concept, Strategy Agility, Process Planning, Management, Quality Control, Administration, Production Planning, Raw Material &amp; Equipment, Product Design &amp; Dev, Team Work</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Dependent Variable: Customer Base</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Un Standardized Coefficients</th>
<th>Standardized Coefficients</th>
<th>T</th>
</tr>
</thead>
<tbody>
<tr>
<td>Un Standardized Coefficients</td>
<td>Standardized Coefficients</td>
<td>T</td>
</tr>
<tr>
<td>(Constant)</td>
<td>.660</td>
<td>.342</td>
</tr>
<tr>
<td>Product Concept</td>
<td>.000</td>
<td>.047</td>
</tr>
<tr>
<td>Product Design &amp; Dev</td>
<td>.030</td>
<td>.047</td>
</tr>
<tr>
<td>Process Planning</td>
<td>-.081</td>
<td>.034</td>
</tr>
<tr>
<td>Raw Material &amp; Equipment</td>
<td>-.050</td>
<td>.068</td>
</tr>
<tr>
<td>Production Planning</td>
<td>.114</td>
<td>.056</td>
</tr>
<tr>
<td>Quality Control</td>
<td>-.047</td>
<td>.047</td>
</tr>
<tr>
<td>Strategy Agility</td>
<td>.049</td>
<td>.039</td>
</tr>
<tr>
<td>Management</td>
<td>.077</td>
<td>.032</td>
</tr>
<tr>
<td>Team Work</td>
<td>-.066</td>
<td>.046</td>
</tr>
<tr>
<td>Administration</td>
<td>.062</td>
<td>.085</td>
</tr>
<tr>
<td>Interpersonal</td>
<td>.045</td>
<td>.035</td>
</tr>
</tbody>
</table>

The regression model developed was significant as ANOVA analysis showed F – test = 5.38, p < 05. The predictors identified from the analysis were Product Concept,
Production Planning and control and Quality Control parameters of the manufacturing competencies and Management parameter of the strategic success.

4.5 CONCLUDING REMARKS

Based on the above analysis, it is examined that the various competency factors have effect on strategy formation and overall performance of the organisation. Along with manufacturing competency, management and administration related issues such as commitment and support from top management and better administrative control are essential for bringing together all departments, forming teams in order to strategize new ideas for achieving more profit by having higher sales thus improving company profile and performance. In nutshell, the common input parameters having an impact on all the output factors are Product Concept, Production Planning and Control and Quality Control and Management.