



A STUDY ON PURCHASE INFLUENCING FACTORS OF ELECTRICAL PANELS

Mr J.Aldrin, Marketing Manager,AJC ,Trichy., India

Abstract: This study gives the features about purchase influencing factors. The primary objective of this study is to stretch their future plan, increase the annual turnover and customer relation improvement. The secondary objective is to find the equipment which is preferred by most customers .To know how the customers are facing the problems while using them. The preference of industrial products and to know the overall delivery schedules which provide best result. Inferences have been drawn from the required data collected through the usage of questionnaire. Interpretation of the data along with statistical tools has been made to give recommendations to the company to promote the sales.

Index Terms - Purchase, Electrical panels, Industrial products.

INTRODUCTION

The real world is very different form the one that a company looks from a distance and experiencing this was quite different experience in itself. The project “A STUDY ON PURCHASE INFLUENCING FACTORS OF ELECTRICAL PANELS” has been a very realistic adventure. The term marketing has been gaining immense importance in today’s competitive market scenario. Marketing is the life blood of every organization as to be carefully looked at before implementation. Fruitful marketing of every product has to be preceded by a very focus and in depth marketing research, which should be of search nature that it can accommodate even the minute detail with respect to the product in focus. Marketing belong to human behavior has its deal with buying decision; advertising is a socio, psychological art. The advertisement writer like a teacher has to study psychology behind human behavior in respect of satisfaction of his wants.

Review of literature

NIK SALEHAH NIK ABDUL AZIZI (2013) identified the factors that are assumed to be influencing Malaysian consumers’ intention to purchase for solar panel. These factors are perceived government policy, perceived costs and maintenance, product knowledge and experience, solar panel aesthetics, social influence, environmental concern, product benefits and demographic factors (represented by education level and income). The survey managed to collect a total of 211 usable responses for further analysis. Multiple regression analysis carried out on the data revealed that from eight independent variables, only perceived cost and maintenance, product knowledge and experience, social influence and product benefits have direct impact on consumer’s solar panel purchase intention. Perceived government policy, solar panel aesthetics, environmental concern and demographic factors (education and income level) were found to have insignificant relationships with purchase intention. In addition, environmental attitude was found to be mediator between the relationship of independent variables (product knowledge and experience, product benefits) and purchase intention.

Dr. Yakup Durmaz(2014) explored the Influence of Cultural Factors on Consumer Buying Behaviour and an Application in Turkey. A survey was conducted on 1400 people from the different parts of Turkey. The purpose of this question is to learn if culture, beliefs and traditions are the most important criteria of the survey participants in buying goods and services. The result revealed that, for 524 people (38.1 %) faith, culture and tradition are certainly the most important criteria in buying goods and services whereas for 298 people (21.7 %) is the most important. According to criteria for 263 people (19.1.9%) reported not; 202 persons (14.7%) had mentioned certainly not. According to these results that can be said those for the majority of survey respondents (approximately 60%), belief, culture and tradition are the most important factor.

Objectives of the study**Primary objective**

The main objective is to study about the purchase influencing factors of Electrical Panels.

Secondary objective

1. To increase the turnover of the company.
2. To submit the final specification, invite the customers for inspection with internal test report.
3. To ensure proper packing to avoid damage during transit.
4. To furnish operation and maintenance manual and satisfy the customer with the performance of panels within guarantee period.

Research methodology

Descriptive research design

Data collection

The investigator collected the data by observation and interview schedule using questionnaire.

Sample Size: It was confined to the sample of 25 customers.

Analysis and interpretation

Table 1 Distribution of customers based on purchase influencing factors of electrical panels

N=25

| S.No | Purchase influencing factors of electrical panels | Frequency | Percentage |
|------|--|-----------|------------|
| 1. | Electrical items regularly purchased | | |
| | a) Junction boxes | 6 | 24 |
| | b) Push button boxes | 6 | 24 |
| | c) Control panels | 8 | 32 |
| | d) Power distribution panels | 5 | 20 |
| 2. | Submission of complete offer for Panels | | |
| | a) Within given time | 6 | 24 |
| | b) Beyond tender date | 8 | 32 |
| | c) Ask for clarification | 8 | 32 |
| | d) Request for extension | 3 | 12 |
| 3. | Response to call for discussion on Tender documents | | |
| | a) Very fast | 8 | 32 |
| | b) Reminder to be sent | 5 | 20 |
| | c) Customer go to vendor | 6 | 24 |
| | d) Reply at their convenience | 6 | 24 |
| 4. | Receipt of order acknowledgement | | |
| | a) Within 2 days | 6 | 24 |
| | b) Within a week | 7 | 28 |
| | c) Within 2 weeks | 8 | 32 |
| | d) Non-receipt | 4 | 16 |
| 5. | The type of control panel | | |
| | a) Cubicle type | 4 | 16 |
| | b) Compartment type | 7 | 28 |
| | c) Modular type | 7 | 28 |
| | d) Sheet steel type | 7 | 28 |
| 6. | Submission of final specification and drawings for approval | | |
| | a) Within a week | 7 | 28 |
| | b) Within 2 weeks | 5 | 20 |
| | c) As per P.O clause | 9 | 36 |
| | d) Reminder by vendor | 4 | 16 |
| 7. | Submission of quality plan for approval | | |
| | a) Along with diagrams | 6 | 24 |
| | b) After approval of diagrams | 11 | 44 |
| | c) Along with inspection call letter | 5 | 20 |
| | d) Reminder by vendor | 3 | 12 |
| 8. | No. of submission of quality plan for final approval | | |
| | a) One time | 8 | 32 |
| | b) Two times | 6 | 24 |
| | c) More than two times | 11 | 44 |
| | d) Irregular submission | 0 | 0 |
| 9. | Compliance of quality plan for inspection and testing | | |
| | a) Vendor QP | 6 | 24 |
| | b) Customer QP | 11 | 44 |
| | c) Consultant QP | 6 | 24 |

| | | | |
|-----|--|----|----|
| | d) Combination of a&b/b&c/a,b&c | 2 | 8 |
| 10. | Intimation to customer on readiness for inspection at vendor works | | |
| | a) With documents | 7 | 28 |
| | b) With specification | 7 | 28 |
| | c) With vendor test report | 8 | 32 |
| | d) No procedures | 3 | 12 |
| 11. | Status of panel at the time of offering for inspection | | |
| | a) Complete in all aspects | 6 | 24 |
| | b) With minor deviations | 10 | 40 |
| | c) With major deviations | 9 | 36 |
| | d) Trouble shooting | 0 | 0 |
| 12. | Inspection of panel at vendor works | | |
| | a) Inspection by vendor only | 6 | 24 |
| | b) By customer | 8 | 32 |
| | c) By consultant | 6 | 24 |
| | d) By customers & consultants | 5 | 20 |
| 13. | Vendor acceptance of additional requirement at the time of inspection | | |
| | a) Vendor will not accept | 5 | 20 |
| | b) With reluctance & delivery extension | 9 | 36 |
| | c) At extra cost | 7 | 28 |
| | d) At free of cost | 4 | 16 |
| 14. | Delivery schedule of panels | | |
| | a) Dispatch immediately | 6 | 24 |
| | b) As per vendor schedule | 5 | 20 |
| | c) As per P.O schedule | 10 | 40 |
| | d) Delay in packing & forwarding | 4 | 16 |
| 15. | Compliance of customers delivery schedule | | |
| | a) Delivery within customer schedule | 2 | 8 |
| | b) Delivery with penalty | 8 | 32 |
| | c) Delayed delivery | 11 | 44 |
| | d) Non-compliance | 4 | 16 |
| 16. | Supply of operation and maintenance manuals of panels | | |
| | a) Complete set along with panel | 5 | 20 |
| | b) Along with dispatch documents | 7 | 28 |
| | c) Incomplete set | 9 | 36 |
| | d) Non-submission | 4 | 16 |
| 17. | Usefulness of operation and maintenance manual | | |
| | a) Useful for operating technicals | 6 | 24 |
| | b) Useful for supervisors only | 2 | 8 |
| | c) Useful for commissioning staff only | 8 | 32 |
| | d) Useful for all concerned departments | 9 | 36 |
| 18. | Guarantee period for free replacement | | |
| | a) 12 month from date of installation | 8 | 32 |
| | b) 18 month from date of commissioning | 5 | 20 |
| | c) 24 month from date of supply | 5 | 20 |
| | d) No guarantee | 7 | 28 |

Inference

The above table infers that 24% of the customers regularly purchase junction boxes, 24% of the customers purchase push button boxes, 32% of the customers purchase control panels and 20% of the customers purchase power distribution panels.

It is inferred that 24% of the customers receive the complete offer for panels within given time, 32% of the customers receive beyond tender date, 32% of the customers to furnish for clarification and 12% of the customers allow for extension.

The above table shows that 32% of the customers' response to call for discussion on tender documents is very fast, 20% of the customers send reminders to be sent, 24% of the customers go to vendor and 24% of the customers receive reply slowly.

The above table illustrates that 16% of the customers prefer cubicle type control panels, 28% of the customers prefer compartment type, 28% of the customers prefer modular type and 28% of the customers prefer sheet steel type control panels.

The above table depicts that 28% of the customers get final specification and drawings for approval within a week, 20% of the customers get within 2 weeks, 36% of the customers as per P.O clause and 16% of the customers get after reminder to vendor.

The above table unveils that 24% of the customers get for quality plan for approval along with diagram, 44% of the customers after approval of diagram, 20% of the customers along with inspection call letter and 12% of the customers submit after reminder by vendor.

With regard to the no. of times submission of quality plan for final approval, 32% of customers approve once, 24% of the customers ask for two times and 44% of the customers require more than two times.

It is inferred from the above table that 24% of the customers accept inspection and testing with vendor QP, 44% of the customers with customer QP, 24% of the customers with consultant QP and 8% of the customers with the combination of a&b/b&c/a,b&c.

The above table depicts that 28% of the customers are informed for inspection with documents, 28% of the customers with specification and 32% of the customers with vendor test report 12% of the customers have no procedures.

The above table reveals that 24% of the customers find their panels complete in all aspects for inspection, 40% of the customers with minor deviations and 36% of the customers with major deviations. There is no trouble shooting for any panel during inspection.

The above table shows that 24% of the panels inspected by vendor only, 32% of the panels inspected by customers, 24% of the panels inspected by consultant and 20% of the panels inspected by customers & consultants.

It is inferred from the above table that the time of inspection for 20% of the customers additional requirement is not accepted by vendor, 36% of the customers requirement is accepted with reluctance & delivery extension, 28% of the customers requirement is accepted with extra cost and 16% of the customers requirement is accepted at free of cost.

The above table shows that 24% of the customers get their panels dispatched immediately, 20% of the customers as per vendor schedule, 40% of the customers as per P.O schedule and 16% of the customers get delayed in special packing & forwarding as per P.O terms.

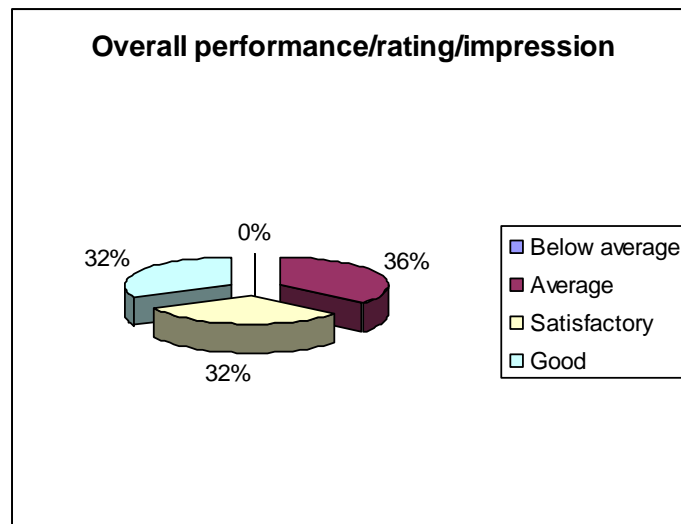
The above table depicts that 8% of the panels delivered within customer schedule, 32% of the panels delivered with penalty, 44% of the panels with delay delivery and 16% of the panels with non-compliance in delivery schedule.

It is inferred from the above table that 20% of the customers get operation & maintenance manuals along with panel, 28% of the customers get their manuals along with dispatch documents, 36% of the customers get their manuals as incomplete set and 16% of the customers not get their panels in time.

The above table shows that 24% of the customers find operations & maintenance manual useful for operating technicians, 8% of the customers find it useful for supervisors, 32% of the customers find it useful for commissioning staff and 36% of the customers find it useful for all concerned departments.

The above table unveils that 32% of the customers get 12 month from date of installation as guarantee period for replacement, 20% of the customers get 18 month from date of commissioning, 20% of the customers get 24 month from date of supply and 28% of the customers specify no guarantee in their documents.

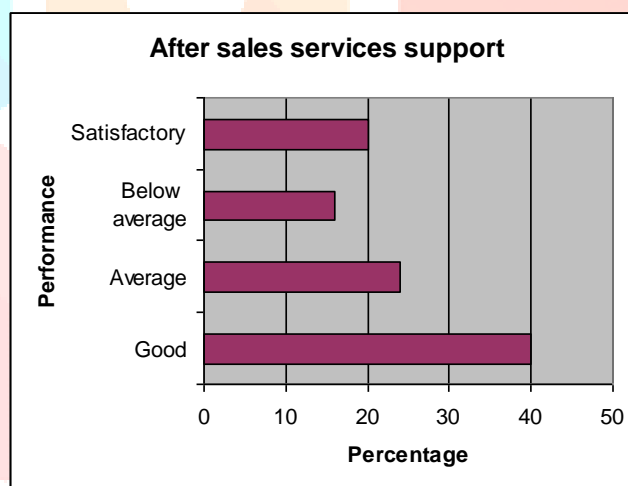
Fig 1 Distribution of customers based on the overall performance/rating/impression



Inference

It is inferred from the fig no 1 that 36% of the customers rating is average, 32% of the rating is satisfactory and 32% of the customers rating is good.

Fig 2 Distribution of customers based on the after sales services support



Inference

The fig no 2 shows that 40% of the customers get good after sales service support, 24% of the customers get average, 16% of the customers get below average and 20% of the customers get satisfactory after sales services support.

Table 2. Chi square test to find out the relationship between the submission of final specification and drawings for approval and submission of quality plan for approval.

Submission of final specification and drawings for approval.

| Options | Frequency | Percentage |
|--------------------|-----------|------------|
| Within a week | 7 | 28 |
| Within 2 weeks | 5 | 20 |
| As per P.O clause | 9 | 36 |
| Reminder by vendor | 4 | 16 |
| Total | 25 | 100 |

Ho: Submission of final specification and drawings for approval and submission of quality plan for approval are independent

Ha: Submission of final specification and drawings for approval and submission of quality plan for approval are dependent.

Submission of quality plan for approval.

| Options | No. of customers | In Percentage |
|-----------------------------------|------------------|---------------|
| Along with diagrams | 6 | 24 |
| After approval of diagrams | 11 | 44 |
| Along with inspection call letter | 5 | 20 |
| Reminder by vendor | 3 | 12 |
| Total | 25 | 100 |

Submission of Final Specification for Customer's approval * Submission of quality Plan for Customer's approval Cross tabulation**Count**

| | | Submission of quality Plan for Customer's approval | | | | Total |
|---|---------------------|--|---------------------------------|-----------------------------------|--------------------------|-----------|
| | | Along with drgs | After customer approval of drgs | Along with inspection call letter | Reminder vendor required | |
| Submission of Final Speci for Customer's approval | Within a week | 2 | 3 | 2 | | 7 |
| | Within two weeks | 1 | 3 | 1 | | 5 |
| | As per P.O clause | 2 | 2 | 2 | 3 | 9 |
| | Reminder to vendors | 1 | 1 | 2 | | 4 |
| Total | | 6 | 9 | 7 | 3 | 25 |

Chi-Square Tests

| | Value | df | Asymp. Sig. (2-sided) |
|------------------------------|----------|----|-----------------------|
| Pearson Chi-Square | 7.855(a) | 9 | .549 |
| Likelihood Ratio | 8.491 | 9 | .485 |
| Linear-by-Linear Association | 1.006 | 1 | .316 |
| No. of Valid Cases | 25 | | |

Inference

| Calculated chi square value | Degree of freedom | Level significance | Chi square table value | Result |
|-----------------------------|-------------------|--------------------|------------------------|-------------|
| .549 | 9 | 0.05 | 8.343 | Significant |

Since the calculated value is .549 which is lesser than the table value 8.343, we accept the null hypothesis. From the Chi-Square test we can understand that there is no relationship between the submission of final specification and drawings for approval and submission of quality plan for approval.

Table 3 Chi square test to find out the relationship between the submission of quality plan for approval and submission of quality plan for final approval.

Submission of quality plan for approval

| Options | Frequency | Percentage |
|-----------------------------------|-----------|------------|
| Along with diagrams | 6 | 24 |
| After approval of diagrams | 11 | 44 |
| Along with inspection call letter | 5 | 20 |
| Reminder by vendor | 3 | 12 |
| Total | 25 | 100 |

H₀: Submission of quality plan for approval and no. of submission of quality plan for final approval are independent.

H_a: Submission of quality plan for approval and no. of submission of quality plan for final approval are dependent.

No. of submission of quality plan for final approval.

| Options | Frequency | Percentage |
|----------------------|-----------|------------|
| One time | 8 | 32 |
| Two times | 6 | 24 |
| More than two times | 11 | 44 |
| Irregular submission | 0 | 0 |
| Total | 25 | 100 |

**Submission of no of times submission of quality plan for customers approval cross tabulation
Count**

| | | No of times Submission of quality Plan for Customers approval | | | Total |
|--|-----------------------------------|---|-----------|---------------------|-------|
| | | One time | Two times | More than two times | |
| Submission of quality Plan for Customer's approval | Along with drgs | 3 | 1 | 2 | 6 |
| | After customer approval of drgs | 4 | 2 | 3 | 9 |
| | Along with inspection call letter | 1 | 3 | 3 | 7 |
| | Reminder vendor required | | | 3 | 3 |
| | Total | 8 | 6 | 11 | 25 |

Chi-Square Tests

| | Value | df | Asymp. Sig. (2-sided) |
|------------------------------|----------|----|-----------------------|
| Pearson Chi-Square | 7.121(a) | 6 | .310 |
| Likelihood Ratio | 8.126 | 6 | .229 |
| Linear-by-Linear Association | 3.721 | 1 | .054 |
| No. of Valid Cases | 25 | | |

Inference

| Calculated square value | chi | Degree of freedom | Level significance | of Chi square table value | Result |
|-------------------------|-----|-------------------|--------------------|---------------------------|-------------|
| .310 | | 6 | 0.05 | 5.348 | Significant |

Since the calculated value is .310 which is lesser than the table value 5.348, we accept the null hypothesis. From the Chi-Square test we can understand that there is no relationship between the submission of quality plan for approval and no. of submission of quality plan for final approval.

Table 4 . Chi square test to find out the relationship between the submission of final Specification and drawings for approval and no. of submission of quality plan for final approval.

Submission of final specification and drawings for approval.

| Options | Frequency | Percentage |
|--------------------|-----------|------------|
| Within a week | 7 | 28 |
| Within 2 weeks | 5 | 20 |
| As per P.O clause | 9 | 36 |
| Reminder by vendor | 4 | 16 |
| Total | 25 | 100 |

Ho: Submission of final specification and drawings for approval and submission of quality plan for final approval are independent.

Ha: No. of submission of quality plan for approval and submission of quality plan for final approval are dependent.

No. of submission of quality plan for final approval.

| Options | Frequency | Percentage |
|----------------------|-----------|------------|
| One time | 8 | 32 |
| Two times | 6 | 24 |
| More than two times | 11 | 44 |
| Irregular submission | 0 | 0 |
| Total | 25 | 100 |

Submission of final specification for customer's approval * no of times submission of quality plan for customers approval cross tabulation

Count

| | | No of times Submission of quality Plan for Customers approval | | | Total |
|---|---------------------|---|-----------|---------------------|-------|
| | | One time | Two times | More than two times | |
| Submission of Final Speci for Customer's approval | Within a week | 5 | | 2 | 7 |
| | Within two weeks | 1 | 2 | 2 | 5 |
| | As per P.O clause | 2 | 2 | 5 | 9 |
| | Reminder to vendors | | 2 | 2 | 4 |
| Total | | 8 | 6 | 11 | 25 |

Chi-Square Tests

| | Value | df | Asymp. Sig. (2-sided) |
|------------------------------|----------|----|-----------------------|
| Pearson Chi-Square | 9.229(a) | 6 | .161 |
| Likelihood Ratio | 11.037 | 6 | .087 |
| Linear-by-Linear Association | 3.561 | 1 | .059 |
| No. of Valid Cases | 25 | | |

INFERENCE

| Calculated square value | chi | Degree of freedom | Level of significance | Chi square table value | Result |
|-------------------------|-----|-------------------|-----------------------|------------------------|-------------|
| .161 | | 6 | 0.05 | 10.645 | Significant |

Since the calculated value is .161 which is lesser than the table value 10.645, we accept the null hypothesis. From the Chi-Square test we can understand that there is no relationship between the submission of final specification and drawings for approval and no. of submission of quality plan for final approval.

CORRELATION

Table 5. Correlation table is to know whether there is positive correlation or negative correlation between response to call for discussion on tender documents and receipt of order acknowledgement.

**Response to call for discussion on
Tender documents.**

| Options | Frequency | Percentage |
|----------------------------|-----------|------------|
| Very fast | 8 | 32 |
| Reminder to be sent | 5 | 20 |
| Customer go to vendor | 6 | 24 |
| Reply at their convenience | 6 | 24 |
| Total | 25 | 100 |

Ho: Whether there is negative correlation between response to call for discussion on tender documents and receipt of order acknowledgement.

Ha: Whether there is positive correlation between response to call for discussion on tender documents and receipt of order acknowledgement.

Receipt of order acknowledgement.

| Options | Frequency | Percentage |
|----------------|-----------|------------|
| Within 2 days | 6 | 24 |
| Within a week | 7 | 28 |
| Within 2 weeks | 8 | 32 |
| Non-receipt | 4 | 16 |
| Total | 25 | 100 |

Correlations

| | | | Q3CODE | Q4CODE |
|----------------|--------|-------------------------|--------|--------|
| Spearman's rho | Q3CODE | Correlation Coefficient | 1.000 | .086 |
| | | Sig. (2-tailed) | . | .684 |
| | | N | 25 | 25 |
| | Q4CODE | Correlation Coefficient | .086 | 1.000 |
| | | Sig. (2-tailed) | .684 | . |
| | | N | 25 | 25 |

INFERENCE

The calculated value = .684

The table value = .432

Since the calculated value .684 is greater than the table value .432 it lies in the rejection region. Therefore we reject the null hypothesis. Hence we conclude that there is positive correlation between response to call for discussion on tender documents and receipt of order acknowledgement

FINDINGS

1. It is inferred that most of the customers purchase control panels from Prammen Industries, Pudukkottai.
2. PIP submit most of the offers in time. However submission of offers to few customers are delayed due to clarification on tender documents.
3. Most of the customers call for discussion on tender documents are attended very fast by PIP.
4. Majority of the customers (84%) get the receipt of order acknowledgement within 2 weeks.
5. It is inferred that 72% of the customers prefer closed type of control panels.
6. More than 80% of the customers receive final specification and drawings for their approval as per P.O. clause or within one or two weeks.
7. Customer approval for quality plan is obtained from most of the customers after approval of diagrams.
8. Quality plan are submitted in two or more times to most of the customers (62%).
9. PIP follows the customer/consultant quality plan for almost all the customers.
10. It is found that 88% of customers are informed with approved documents for inspection.
11. Inspection of panels at vendor works and vendors acceptance of additional requirement at the time of inspection are independent.
12. Delivery schedule of panels and compliance of customers delivery schedule influence each other.
13. It is observed that all the control panels are inspected by vendor/customer/consultant to maintain quality of panels.
14. Most of the customers (84%) are satisfied with after sales service. Services to other customers may be below average due to communication delay.
15. The overall performance is satisfactory between 64% to 80% of the customers.

SUGGESTIONS

1. The Prammen Industries must pay attention on the preference of electrical panels by the customers.
2. The vendor shall collect and study the tender documents in detail to avoid asking for clarification and tender extension of due date.
3. Standard format for order acknowledgement shall be printed and kept in stock. Acknowledgement shall be passed immediately on receipt of order to all customers.
4. The requirements of major customers shall be known to the design and quality department to prepare the specification drawings and quality plan of the panel and get customer approval quality.
5. Vendor shall improve the quality system and documents, so that customers can clear the panels for dispatch based on vendor inspection only to avoid delay in delivery.
6. Vendor shall meet customers periodically to know their exact requirement and day to day improvement in the design of control panels.
7. Importance shall be given for packing and forwarding of panels from submission of tender stage itself.
8. The design of the control panels shall be simplified and standardized to meet the delivery schedule of customers.

CONCLUSION

The aim of the project is to supply quality electrical panels at competitive price within stipulated delivery period of panels with customer satisfaction and increase in turnover.

Inferences have been drawn from the required data collected from various customers through the use of questionnaires. An interpretation of data along with the statistical tools has been made known to the company. The activity requires immediate attention by the manufactures as clearly shown in each table and chart to improve the overall performance rating..

BIBLIOGRAPHY

1. Kothari C.R "Research Methodology", Second Edition, Wishwaprakashan, New Delhi (2003)
2. Gupta S.P "Statistical Method" 30th Edition, Sultan Chand and Sons, New Delhi (2002)
3. Harpel W Boyd, JR Ralph Westfall Stanley Fstasch "Marketing Research" Seventh Edition, Richard Irwin Inc Publication
4. Ganokar and Ganokar "Human Resource and Personnel Management" Second Edition, New Delhi (2003)
5. Paul E.Green "Research Design" Fourth Edition, TATA McGraw Hill Publishing Company Ltd
6. M.Sankar "Research Methodology", Second Edition, Chennai (2002)
7. Leon G Schiffman and Leslie Lazar Kanuk "Consumer Behavior", Eighth Edition, Pearson Education Pvt Ltd, New Delhi
8. G V Shenoy, U K Srivastava and S C Sharma "Business Statistics" First Edition, Wiley Eastern Ltd
9. Philip Kotler "Marketing Management", Eighth Edition, Prentice Mal of India Publication
10. Rajan Saxena "Marketing Management", Second Edition, Tata Mchill (2002)

Journals

1. NIK SALEHAH NIK ABDUL AZIZ(2013) Factors influencing consumer's purchase intention of solar panel in Malaysia http://eprints.usm.my/30609/1/NIK_SALEHAH_NIK_ABDUL_AZIZ.pdf
2. Dr. Yakup Durmaz(2014) ,Influence of Cultural Factors on Consumer Buying Behaviour and an Application in Turkey, https://globaljournals.org/GJMBR_Volume14/4-The-Influence-of-Cultural-Factors-on.pdf