A Study on Improving Pre-Delivery Inspection (PDI) Practices at Tratico Engineering India Pvt. Ltd.

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ABSTRACT:

Pre-Delivery Inspection (PDI) plays an important role in ensuring product quality before delivery to customers. The purpose of this study is to analyze the effectiveness of pre-delivery inspection practices and to identify areas for improvement in the inspection process. The study is based on primary data collected through a structured questionnaire from employees working in production and quality departments. Statistical tools such as percentage analysis, chi-square test, and frequency distribution were used for data analysis. The findings of the study show that PDI helps in reducing defects and improving product quality, but there is still a need for improvement in employee training, communication, and inspection procedures. The study concludes that improving PDI practices will lead to better product quality, reduced rework, and increased customer satisfaction.

KEYWORDS: Pre-Delivery Inspection, Product Quality, Quality Control, Manufacturing, Inspection Process.

INTRODUCTION

In the modern manufacturing environment, maintaining product quality is very important for customer satisfaction and business success. Companies focus on quality control at every stage of production to reduce defects and improve efficiency. One of the most important stages of quality control is Pre-Delivery Inspection (PDI).

A pre-delivery inspection is the final inspection conducted before the product is delivered to the customer. It helps in identifying defects, checking product performance, and ensuring that the product meets quality standards. A proper PDI process helps in reducing customer complaints, improving product reliability, and maintaining company reputation.

This study focuses on improving pre-delivery inspection practices in the manufacturing industry. The study analyzes employee opinions regarding the PDI process and identifies areas where improvements can be made.

REVIEW OF LITERATURE:

1. Reis (2024) – Inspection strategy reduces quality cost and improves quality.
2. Papavasileiou (2024) – Automated inspection reduces human errors.
3. Kaur (2024) – Industry 4.0 helps in zero-defect manufacturing.
4. Zhang (2025) – AI improves quality inspection.
5. Sharmile (2025) – Statistical quality control improves reliability.
6. Al Azawei (2025) – Training and documentation improve inspection performance.
7. Recent studies (2025–2026)—AI and digital inspection improve defect detection.

OBJECTIVES OF THE STUDY:

Primary Objective:

- To study and improve Pre-Delivery Inspection (PDI) practices.

Secondary Objectives

- To study the effectiveness of PDI practices.
- To analyze employee opinions on the PDI process.
- To evaluate inspection procedures and checklists.
- To study the availability of inspection tools and equipment.
- To suggest improvements in the PDI process.

RESEARCH METHODOLOGY

Research Design:

This study uses a descriptive research design. The purpose of descriptive research is to describe the existing Pre-Delivery Inspection (PDI) practices and to analyze employee opinions regarding the effectiveness of the inspection process. This study focuses on identifying problems in the pre-delivery inspection process and suggesting improvements to enhance product quality. The data required for the study were collected directly from employees through a structured questionnaire.

Sampling Design:

Population: The population of the study consists of employees working in the production and quality departments who are involved in the pre-delivery inspection process.

Sample Size: A total of 131 respondents were selected as the sample for the study.

Sampling Technique: The convenience sampling method was used in this study. Respondents were selected based on their availability and willingness to participate in the survey.

Source of Data Primary Data:
The study is based only on primary data. Primary data were collected directly from employees using a structured questionnaire. The questionnaire included questions related to inspection procedures, availability of inspection tools, training, communication, and effectiveness of the pre-delivery inspection process.

Data analysis and interpretation

TABLE 1: GENDER

GENDER	NO. OF RESPONDENTS	PERCENTAGE
MALE	88	67.2%
FEMALE	43	32.8%
TOTAL	131	100%

INTERPRETATION:

From the above table it is interpreted that the number of male respondents is 67.2% and female respondent is 32.8%.

TABLE 2: AGE

S.NO	PARTICULARS	NO. OF RESPONDENT	NO. OF PERCENTAGE ANALYSIS
1.	Below 25	68	51.9%
2.	26-35	27	20.6%
3.	36-45	17	13%
4.	46-55	11	8.4%
5.	Above 55	8	6.1%
6.	Total	131	100%

INTERPRETATION:

The Table shows that, the majority of the employees fall under the age group of Below 25 and 26-35 which account to 51.9% and 20.6% respectively. There is about 13% of employees in the age group 36-45 ,8.4% in 46-55 and only 6.1% in the range 55 above.

TABLE 3: EDUCATIONAL QUALIFICATION

S.NO	PARTICULARS	NO. OF RESPONDENT	NO. OF PERCENTAGE ANALYSIS
1.	Graduate	51	38.9%
2.	Post Graduate	49	37.4%
3.	Higher Secondary	15	11.5%
4.	Diploma	16	12.2%
5.	Total	131	100%

INTERPRETATION:

From the above table it is interpreted that the number of respondents Qualification were Graduate is 38.9% and Post Graduate is 37.4% and Higher Secondary is 11.5% and Diploma is 12.2%

TABLE 4: DESIGNATION

S.NO	PARTICULARS	NO. OF RESPONDENT	NO. OF PERCENTAGE ANALYSIS
1.	Operation Staff	27	20.6%
2.	Supervisor	14	10.7%
3.	Manager	26	19.8%
4.	Administrative	21	16%
5.	Other	43	32.8%
6.	Total	131	100%

INTERPRETATION:

Most respondents belong to the "Other" category (32.8%), followed by Operational Staff (20.6%) and Managers (19.8%). Administrative Staff are 16%, while Supervisors are the least (10.7%).

TABLE 5: PDI EFFECTIVENESS

S.NO	PARTICULARS	NO. OF RESPONDENT	NO. OF PERCENTAGE ANALYSIS
1.	Strongly Agree	42	32.1%
2.	Agree	44	33.6%
3.	Neutral	23	17.6%
4.	Disagree	16	12.2%
5.	Strongly Disagree	6	4.5%
6.	Total	131	100%

INTERPRETATION:

From the above table, it is interpreted that most of the respondents believe that the current PDI process is effective in ensuring product quality. About 32.1% strongly agree and 33.6% agree with the statement, while 17.6% of the respondents are neutral. A smaller percentage of respondents, 12.2% disagree and 4.5% strongly disagree with the statement.

TABLE 6: PDI HELPS IN REDUCING DEFECTS

S.NO	PARTICULARS	NO. OF RESPONDENT	NO. OF PERCENTAGE ANALYSIS
1.	Strongly Agree	32	24.4%
2.	Agree	49	37.4%

3.	Neutral	26	19.8%
4.	Disagree	17	13%
5.	Strongly Disagree	7	5.3%
6.	Total	131	100%

INTERPRETATION:

From the above table, it is interpreted that the majority of the respondents have a positive opinion that PDI helps in reducing defects before delivery. About 24.4% strongly agree and 37.4% agree with the statement, while 19.8% of the respondents are neutral. A smaller percentage of respondents, 13% disagree and 5.3% strongly disagree with the statement.

TABLE 7: CHECKLIST COVERAGE

S.NO	PARTICULARS	NO. OF RESPONDENT	NO. OF PERCENTAGE ANALYSIS
1.	Strongly Agree	26	19.8%
2.	Agree	51	38.9%
3.	Neutral	32	24.4%
4.	Disagree	8	6.1%
5.	Strongly Disagree	14	10.7%
6.	Total	131	100%

INTERPRETATION:

From the above table, it is interpreted that the majority of the respondents have a positive opinion that the PDI checklist covers all important inspection points. About 19.8% strongly agree and 38.9% agree with the statement, while 24.4% of the respondents are neutral. A smaller percentage of respondents, 6.1% disagree and 10.7% strongly disagree with the statement.

TABLE 8: INSPECTION PROCEDURE CLARITY

S.NO	PARTICULARS	NO. OF RESPONDENT	NO. OF PERCENTAGE ANALYSIS
1.	Strongly Agree	33	25.2%
2.	Agree	36	27.5%
3.	Neutral	26	19.8%
4.	Disagree	16	12.2%

5.	Strongly Disagree	20	15.3%
6.	Total	131	100%

INTERPRETATION:

From the above table, it is interpreted that the respondents have mixed opinions about the inspection procedures being clearly defined and easy to follow. About 25.2% strongly agree and 27.5% agree with the statement, while 19.8% of the respondents are neutral. A notable percentage of respondents, 12.2% disagree and 15.3% strongly disagree with the statement.

TABLE 9: TOOLS AVAILABILITY

S.NO	PARTICULARS	NO. OF RESPONDENT	NO. OF PERCENTAGE ANALYSIS
1.	Strongly Agree	28	21.4%
2.	Agree	46	35.1%
3.	Neutral	25	19.1%
4.	Disagree	19	14.5%
5.	Strongly Disagree	13	9.9%
6.	Total	131	100%

INTERPRETATION:

From the above table, it is interpreted that the majority of the respondents have a positive opinion that inspection tools and equipment are properly available during PDI. About 21.4% strongly agree and 35.1% agree with the statement, while 19.1% of the respondents are neutral. A smaller percentage of respondents, 14.5% disagree and 9.9% strongly disagree with the statement.

TABLE 10: SUPPORT DURING INSPECTION

S.NO	PARTICULARS	NO. OF RESPONDENT	NO. OF PERCENTAGE ANALYSIS
1.	Strongly Agree	20	15.3%
2.	Agree	42	32.1%
3.	Neutral	35	26.7%
4.	Disagree	19	14.5%
5.	Strongly Disagree	15	11.5%
6.	Total	131	100%

INTERPRETATION:

From the above table, it is interpreted that the majority of the respondents have a positive opinion that inspection tools and equipment are properly available during PDI. About 21.4% strongly agree and 35.1% agree with the statement, while 19.1% of the respondents are neutral. A smaller percentage of respondents, 14.5% disagree and 9.9% strongly disagree with the statement.

TABLE 11: EMPLOYEE TRAINING

S.NO	PARTICULARS	NO. OF RESPONDENT	NO. OF PERCENTAGE ANALYSIS
1.	Strongly Agree	28	21.4%
2.	Agree	39	29.8%
3.	Neutral	30	22.9%
4.	Disagree	18	13.7%
5.	Strongly Disagree	16	12.2%
6.	Total	131	100%

INTERPRETATION:

From the above table, it is interpreted that a majority of the respondents agree that employees receive proper training for conducting PDI. About 21.4% strongly agree and 29.8% agree with the statement, while 22.9% of the respondents are neutral. A considerable percentage of respondents, 13.7% disagree and 12.2% strongly disagree with the statement.

TABLE 12: PROCESS IMPROVEMENT

S.NO	PARTICULARS	NO. OF RESPONDENT	NO. OF PERCENTAGE ANALYSIS
1.	Strongly Agree	21	16%
2.	Agree	51	38.9%
3.	Neutral	29	22.1%
4.	Disagree	17	13%
5.	Strongly Disagree	13	9.9%
6.	Total	131	100%

INTERPRETATION:

From the above table, it is interpreted that the majority of the respondents feel that the overall PDI process can be further improved. About 16% strongly agree and 38.9% agree with the statement, while 22.1% of the respondents are neutral. A smaller percentage of respondents, 13% disagree and 9.9% strongly disagree with the statement.

TABLE 13: DEPARTMENT COMMUNICATION

S.NO	PARTICULARS	NO. OF RESPONDENT	NO. OF PERCENTAGE ANALYSIS
1.	Strongly Agree	30	22.9%
2.	Agree	41	31.3%
3.	Neutral	34	26%
4.	Disagree	14	10.7%
5.	Strongly Disagree	12	9.2%
6.	Total	131	100%

INTERPRETATION:

From the above table, it is interpreted that the majority of the respondents feel that there is proper communication between departments during the PDI process. About 22.9% strongly agree and 31.3% agree with the statement, while 26% of the respondents are neutral. A smaller percentage of respondents, 10.7% disagree and 9.2% strongly disagree with the statement.

TABLE 14: TIME SUFFICIENCY

S.NO	PARTICULARS	NO. OF RESPONDENT	NO. OF PERCENTAGE ANALYSIS
1.	Strongly Agree	34	26%
2.	Agree	36	27.5%
3.	Neutral	32	24.4%
4.	Disagree	21	16%
5.	Strongly Disagree	8	6.1%
6.	Total	131	100%

INTERPRETATION:

From the above table, it is interpreted that the majority of the respondents feel that the time allocated for PDI is sufficient to complete inspection properly. About 26% strongly agree and 27.5% agree with the statement, while 24.4% of the respondents are neutral. A smaller percentage of respondents, 16% disagree and 6.1% strongly disagree with the statement.

TABLE 15: DEFECT IDENTIFICATION

S.NO	PARTICULARS	NO. OF RESPONDENT	NO. OF PERCENTAGE ANALYSIS
1.	Strongly Agree	21	16%
2.	Agree	35	26.7%
3.	Neutral	33	25.2%

4.	Disagree	25	19.1%
5.	Strongly Disagree	17	13%
6.	Total	131	100%

INTERPRETATION:

From the above table, it is interpreted that the majority of the respondents feel that defects are clearly identified and recorded during PDI. About 16% strongly agree and 26.7% agree with the statement, while 25.2% of the respondents are neutral. A smaller percentage of respondents, 19.1% disagree and 13% strongly disagree with the statement.

TABLE 16: PRODUCT QUALITY IMPROVEMENT

S.NO	PARTICULARS	NO. OF RESPONDENT	NO. OF PERCENTAGE ANALYSIS
1.	Strongly Agree	18	13.7%
2.	Agree	47	35.9%
3.	Neutral	30	22.9%
4.	Disagree	27	20.6%
5.	Strongly Disagree	9	6.9%
6.	Total	131	100%

INTERPRETATION:

From the above table, it is interpreted that the majority of the respondents feel that the PDI process helps in improving overall product quality. About 13.7% strongly agree and 35.9% agree with the statement, while 22.9% of the respondents are neutral. A smaller percentage of respondents, 20.6% disagree and 6.9% strongly disagree with the statement.

TABLE 17: DEPARTMENT COORDINATION

S.NO	PARTICULARS	NO. OF RESPONDENT	NO. OF PERCENTAGE ANALYSIS
1.	Strongly Agree	32	24.4%
2.	Agree	31	23.7%
3.	Neutral	27	20.6%
4.	Disagree	21	16%
5.	Strongly Disagree	20	15.3%
6.	Total	131	100%

INTERPRETATION:

From the above table, it is interpreted that the respondents have mixed opinions regarding proper coordination between production and quality departments during PDI. About 24.4% strongly agree and 23.7% agree with the statement, while 20.6% of the respondents are neutral. A considerable percentage of respondents, 16% disagree and 15.3% strongly disagree with the statement.

TABLE 18: SYSTEMATIC INSPECTION PROCESS

S.NO	PARTICULARS	NO. OF RESPONDENT	NO. OF PERCENTAGE ANALYSIS
1.	Strongly Agree	28	21.4%
2.	Agree	39	29.8%
3.	Neutral	28	21.4%
4.	Disagree	28	21.4%
5.	Strongly Disagree	8	6.1%
6.	Total	131	100%

INTERPRETATION:

From the above table, it is interpreted that the respondents have mixed opinions regarding whether the inspection process is carried out systematically without missing any steps. About 21.4% strongly agree and 29.8% agree with the statement, while 21.4% of the respondents are neutral. A considerable percentage of respondents, 21.4% disagree and 6.1% strongly disagree with the statement.

TABLE 19: MONITORING EFFECTIVENESS

S.NO	PARTICULARS	NO. OF RESPONDENT	NO. OF PERCENTAGE ANALYSIS
1.	Strongly Agree	26	19.8%
2.	Agree	33	25.2%
3.	Neutral	30	22.9%
4.	Disagree	22	16.8%
5.	Strongly Disagree	20	15.3%
6.	Total	131	100%

INTERPRETATION:

From the above table, it is interpreted that the respondents have mixed opinions regarding whether regular monitoring improves the effectiveness of the PDI process. About 19.8% strongly agree and 25.2% agree with the statement, while 22.9% of the respondents are neutral. A considerable percentage of respondents, 16.8% disagree and 15.3% strongly disagree with the statement.

CHI SQUARE TEST FOR INDEPENDENCE:

To analyze whether there is a significant association between Gender and opinion on the effectiveness of the PDI process.

Null Hypothesis (H0): There is no significant association between Gender and opinion on PDI effectiveness.

Alternative Hypothesis (H1): There is a significant association between Gender and opinion on PDI effectiveness.

Gender	Strongly	Agree	Neutral	Disagree	Strongly	Total
Male	28	30	15	10	5	88
Female	14	14	8	6	1	43
Total	42	44	23	16	6	131

CHI-SQUARE TESE			
Test	Vale	DF	Asymptotic Significance(2-sided)
Pearson Chi-square	0.86	4	>0.05
No. of Valid Cases	131		

Conclusion:

There is no significant association between Gender and opinion on the effectiveness of the PDI process.This indicates that both male and female respondents have similar perceptions regarding the effectiveness of the PDI process.

FREQUENCY DISTRIBUTION: 1.AGE

S.NO	**PARTICULARS**	**NO. OF RESPONDENT**	**NO. OF ANALYSIS**	**PERCENTAGE**
1.	Below 25	68	51.9%	
2.	26-35	27	20.6%	
3.	36-45	17	13%	
4.	46-55	11	8.4%	
5.	Above 55	8	6.1%	

6.	Total	131	100%

Finding: The majority of respondents (51.9%) are below 25 years, indicating that the sample is dominated by younger individuals**.**

2. GENDER

GENDER	NO. OF RESPONDENTS	PERCENTAGE
MALE	88	67.2%
FEMALE	43	32.8%
TOTAL	131	100%

Finding: The majority of respondents (67.2%) are male, indicating a higher male participation in the study.

3. EDUCATION QUALIFICATION

S.NO	PARTICULARS	NO. OF RESPONDENT	NO. OF PERCENTAGE ANALYSIS
1.	Graduate	51	38.9%
2.	Post Graduate	49	37.4%
3.	Higher Secondary	15	11.5%
4.	Diploma	16	12.2%
5.	Total	131	100%

Finding: Most respondents are either graduates (38.9%) or postgraduates (37.4%), indicating a well-educated sample.

4. PDI EFFECTIVENESS

S.NO	PARTICULARS	NO. OF RESPONDENT	NO. OF PERCENTAGE ANALYSIS
1.	Strongly Agree	42	32.1%
2.	Agree	44	33.6%
3.	Neutral	23	17.6%
4.	Disagree	16	12.2%
5.	Strongly Disagree	6	4.5%
6.	Total	131	100%

Finding: A majority of respondents (65.7%) have a positive opinion (agree & strongly agree) that the PDI process is effective.

5. PDI REDUCING DEFECTS

S.NO	PARTICULARS	NO. OF RESPONDENT	NO. OF PERCENTAGE ANALYSIS
1.	Strongly Agree	32	24.4%
2.	Agree	49	37.4%
3.	Neutral	26	19.8%
4.	Disagree	17	13%
5.	Strongly Disagree	7	5.3%
6.	Total	131	100%

Finding: Most respondents (61.8%) agree that PDI helps in reducing defects before delivery.

FINDINGS:

- The majority of respondents (51.9%) belong to the below-25 age group.
- The majority of respondents (67.2%) are male.
- Most of the respondents are graduates (38.9%), followed by postgraduates (37.4%).
- Majority of respondents belong to the "Others" category in designation (32.8%).
- The majority of respondents (33.6%) agree that the current PDI process is effective in ensuring product quality.
- Majority of respondents (37.4%) agree that PDI helps in reducing defects before delivery.
- Majority of respondents (38.9%) agree that the PDI checklist covers all important inspection points.
- Majority of respondents (27.5%) agree that inspection procedures are clearly defined and easy to follow.
- Majority of respondents (35.1%) agree that inspection tools and equipment are properly available during PDI.
- Majority of respondents (32.1%) agree that adequate support is provided during the inspection process.
- Majority of respondents (29.8%) agree that employees receive proper training. for conducting PDI.
- Majority of respondents (38.9%) agree that the overall PDI process can be further improved.
- Majority of respondents (31.3%) agree that there is proper communication between departments during the PDI process.
- Majority of respondents (27.5%) agree that the time allocated for PDI is

sufficient to complete the inspection properly.

- Majority of respondents (26.7%) agree that defects are clearly identified and recorded during PDI.

The majority of respondents (35.9%) agree that the PDI process helps in improving overall product quality.

- Majority of respondents (23.7%) strongly agree that there is proper coordination between production and quality departments during PDI.

• Majority of respondents (29.8%) agree that the inspection process is carried out systematically without missing any steps.

• Majority of respondents (25.2%) agree that regular monitoring improves the effectiveness of the PDI process.

SUGGESTION:

1. The organization should provide regular training programs to employees to improve their knowledge and efficiency in conducting the PDI process.

2. The PDI process should be continuously reviewed and updated to enhance overall effectiveness and reduce existing gaps.

3. Adequate time should be allocated for inspection to ensure all procedures are carried out without any errors or omissions.

4. Proper communication and coordination between departments should be strengthened to improve workflow during the PDI process.

5. The company should ensure that all necessary inspection tools and equipment are always available and properly maintained.

6. A more detailed and standardized checklist should be followed to ensure that All inspection points are covered effectively.

7. Regular monitoring and supervision should be implemented to improve the efficiency and accuracy of the PDI process.

CONCLUSION:

The study concludes that the Pre-Delivery Inspection (PDI) process is effective in ensuring product quality and reducing defects before delivery. The majority of Respondents have given positive feedback regarding the availability of inspection tools. clarity of procedures, and overall effectiveness of the PDI process. This indicates that The existing system is functioning well and contributing to maintaining product standards. However, the study also highlights certain areas that require improvement, such as employee training, communication between departments, time allocation, and process monitoring. By addressing these aspects, the organization can further enhance the efficiency of the PDI process and achieve better quality outcomes. Overall, with Continuous improvement, the PDI process can significantly contribute to higher customer satisfaction and operational excellence.

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