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**IMPACT OF NEW PRODUCTION TECHNOLOGY SYSTEMS ON GRASS
ROOT WORKERS AND STOCK TURN WITH RESPECT TO BRAKES INDIA
LIMITED, CHENNAI**

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of*

MASTER OF BUSINESS ADMINISTRATION



**CENTRE FOR DISTANCE EDUCATION
ANNA UNIVERSITY CHENNAI
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APRIL, 2009

BONAFIDE CERTIFICATE

Certified that the Project report titled "IMPACT OF NEW PRODUCTION TECHNOLOGY SYSTEMS ON GRASS ROOT WORKERS AND STOCK TURN WITH RESPECT TO BRAKES INDIA LIMITED, CHENNAI" is the bonafide work of Ms. G.ANURADHA who carried out the work under my supervision. Certified further that to the best of my knowledge the work reported herein does not form part of any other project report or dissertation on the basis of which a degree or award was conferred on an earlier occasion on this or any other candidate.

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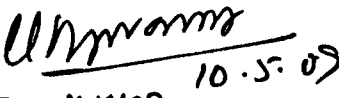
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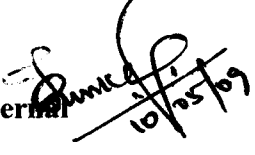
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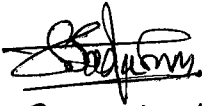
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ABSTRACT

The current recession in the global market, forces the manufacturing unit to produce products with out maintaining inventory and with less production cost. Hence the manufacturers are interested in new production technologies and systems to improve the productivity with less manufacturing cost. But generally workers will resist to the any change in the organization because of various factors

The present study is on Impact of new production technology systems on grass root workers and stock turn with reference to M/s Brakes India Ltd, Chennai.

The researcher used simple random sampling method for selecting fifty respondents from the worker level who has been involved in the new production technology system i.e., Toyota Production System (TPS).

The important factors considered for the analysis are the responses from the fifty respondents, who are randomly selected, through questionnaire and information collected from official records. Based on these data, researcher has given findings, suggestions and recommendations to the organization for future development.

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(G.ANURADHA)

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CHAPTER-1

INTRODUCTION

1.1 COMPANY PROFILE

Brakes India limited is a leading manufacturer of braking system in India for the automotive industry. The company was established as a joint venture between TVS and TRW in the year 1962. Brakes India limited has grown steadily to become a leading brake system supplier to global OEMs operating in India. With design, development and manufacturing capability that matches global standards in quality and safety, Brakes India limited is capable of providing complete braking system technology from concept to completion.

In 1981, Brakes India limited entered into technical collaboration with quall cast (derby foundries) ltd., U.K. For the manufacturing of the permanent mould ferrous casting, a technology newly introduced in India. In the same year, Brakes India limited established a **Foundry Division** at Sholinghur to manufacture **Permanent Mould Grey Iron** castings.

Brakes India limited has two broad divisions. They are the Brake division and the Foundry division. The Brake division is India's largest manufacturer of complete Brake system for automotive and non-automotive application including Hydraulic brake, clutch Actuation, heavy duty brake, foundation brake equipment, clutch fluid. The foundry division is equipped with state-of-the-art technology to manufacture sand-casting both grey and SG iron. It is India's largest manufacturer of permanent mould ferrous die-casting. The strength of Brakes India limited lies in:

- Its ability to **motivate and harness the capabilities** of its human resource develops and nurtures a strong **vendor base**.
- Its **commitment** to quality, cost, delivery, safety and customer satisfaction.

- Strong in-house Research & Development, coupled with access to **World Class Technology** through collaboration and affiliations worldwide enables Brakes India to provide the **Best Braking Solutions and Castings** to its customers.
- Sales turnover of its Brakes divisions exceeds **Rs. 5 Billion**. Brakes Divisions have grown steadily to become a **Leading Brake System Supplier** to global OEMs operating in India.
- Sales turnover of its Foundry division exceeds **Rs. 2 Billion**, has an installed capacity of **47,000 MTPA** for permanent Mould Grey Iron and high pressure moulded Ductile and Grey iron sand castings.
- An impressive list of customers adds testimony to the capabilities of Brakes India.

Brakes India limited's success lies in management philosophy matched by its commitment to total quality by identifying and meeting customer needs, which would include the expectation on quality, delivery, price, etc.,

Manufacturing locations of Brakes India limited:

- ◆ Padi (Chennai)
- ◆ Sholinghur (About 110 km from Chennai)
- ◆ Polambakkam (About 90 km from Chennai)
- ◆ Gurgoan (About 25 km from NewDelhi)
- ◆ Waki (Pune)
- ◆ Halol (Baroda)
- ◆ Nanjangud (About 25 km from Mysore)

MILESTONES ACHIEVED BY THE COMPANY:

YEAR	ACHIEVEMENTS
1962	Incorporated as public limited company.
1964	Commenced manufacturing of brakes at Padi factory.
1966	Introduced 'S'cam brakes for heavy commercial vehicles for

	first time in India.
1967	Introduced indigenously designed Drum Brakes for light commercial vehicles.
1968	First export of rubber seals to U.K.
1972	1. First export of tractor brakes as original equipment to Yugoslavia. 2. First export of Hydraulic brakes.
1975	R&D activities recognized by ministry of Science and Technology.
1979	Commenced manufacturing operations at Brakes Division, Sholinghur.
1981	1. Set up Foundry Division at Sholinghur. 2. Commenced production of Permanent Mould Castings in technical collaboration with Qual cast Limited, U.K.
1986	After successful R&D work, commenced manufacture of heavy duty brake and clutch fluid.
1987	1. Commenced brake assembly operations at Gurgoan for supplies of Maruthi Suzuki. 2. Commenced manufacture of Hydraulic Brake Hoses with technical support from Hitachi Cable Company, Japan. 3. Commenced original equipment supplies of tractor brakes U.K. 4. Award received for outstanding contribution in the field of Industrial Relation by the All India Association of Employers.
1988	Introduced cellular manufacture system at Brakes Division, Padi
1991	Achieved sales of 1.0 million litres of Heavy Duty Brakes and Clutch fluid in a year.
1992	1. Commenced manufacture of Ductile Iron Castings at Foundry Division.

	2. Foundry Division got certified by BVQI, for Quality Assurance System to ISO 9002 Standards.
1993	Brake Division, Padi and Gurgoan plants got certified by BVQI, for Quality Assurance System to ISO 9002 Standards
1994	1. Brakes Division, Sholinghur got certified by BVQI, for Quality Assurance System to ISO 9002 Standards. 2. Achieved sales of 2.0 million litres of Brake fluid in a year
1995	Brake Division, Nanjangud got certified by BVQI, for Quality Assurance System to ISO 9002 Standards.
1996	Commenced manufacturing operations at Polambakkam.
1998	Certified for QS 9000 requirement 3 rd edition by BVQI.
2003	1. TPM Excellence Award, First category by JIPM on 9 th December. 2. "Deming Application Prize" for Foundry Division
2004	Certified ISO/TS 16949 - 2 nd edition by BVQI on 7 th May

Brakes India Limited's key achievements:

- ISO14001 - Environmental Management systems (EMS)
- TPM Consistency Award
- Deming Award
- TS 16949 – QS 2002
- OSHAS

MAJOR CUSTOMERS:

(1) Brake system:

- Ashok Leyland
- Bajaj tempo
- Eicher motors
- Bharat earth movers
- Maruthi
- Fiat India

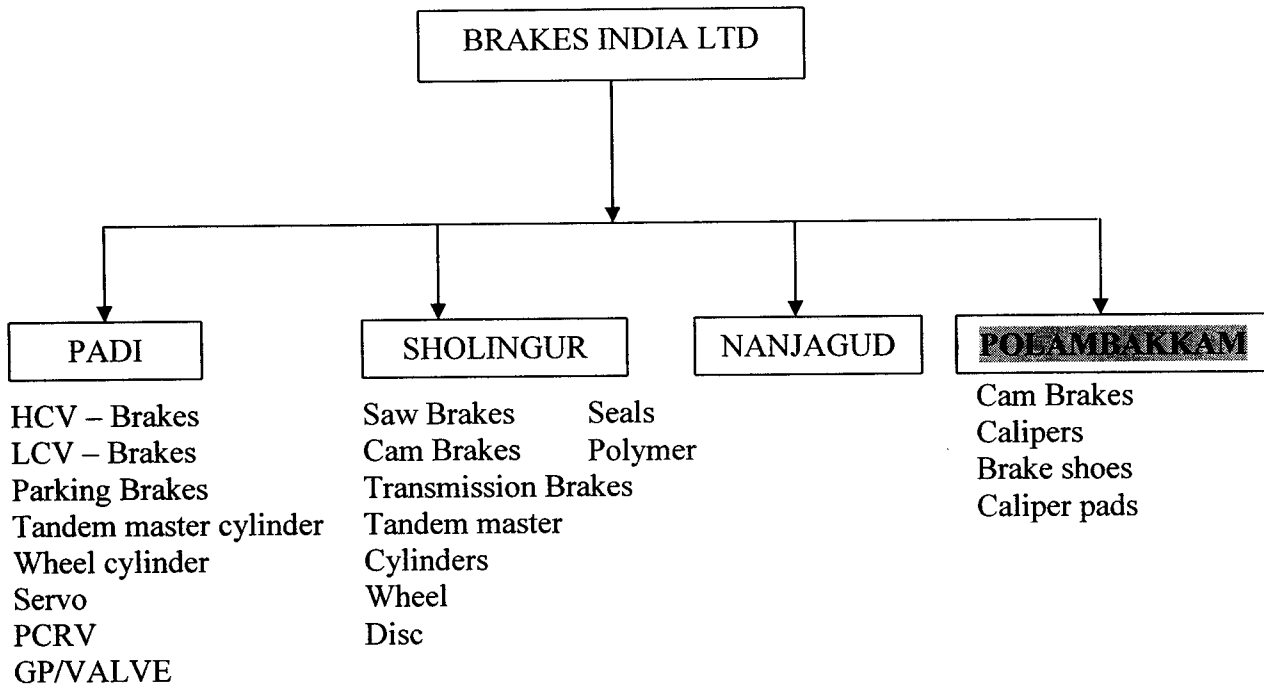
- Force motors Ltd
- Ford India Ltd
- TVS Motor Company
- John Deere
- Piaggio
- Hindusthan Motors
- General Motors (India)
- Premier automobiles
- Defence establishments
- Tata motors
- Mahindra&Mahindra

(2) Foundry Products:

- Ashok Leyland
- Kelvinator
- Voltas
- Mico
- Mahindra&Mahindra
- Godrej&Boyce

1.2 PRODUCT PROFILE

Major products manufactured by Brakes India Limited:



FOUNDRY DIVISION

- Hydraulic cylinder
- Castings
- Compressors bodies
- Valve plates
- Bearing retainers
- Rocker Shaft supports
- Torque plates
- Brake disc
- Caliper housing & carriers

RESEARCH AND DEVELOPMENT:

Brakes India Limited has received R&D recognition from the Department of Science and Technology, Government of India. It has programmers of continual research and development that is abreast with the latest technology, synonymous with modern thinking in the field of safe braking.

1.3 ORGANIZATION PROFILE

Background

Brakes India Limited is the leading manufacturer of automotive and non-automotive braking systems and ferrous casting in India. Brakes India Limited is established in the year 1962, now a joint venture between TVS Group and TRW,UK. BIL has major manufacturing plants at Chennai, Sholinghur, Nanjungud, Polambakkam, Gurgaon, Waki and Halol.

Brakes India Limited, Polambakkam plant is situated at about 90 kms down south from Chennai and 4 kms east from Melmaruvathur. This plant was established in the year 1995 and having a strength of about 400 permanent employees. The company is 13 years old and the average age of employees is 30 years.

The company is certified for Quality Management Standards- ISO/TS 16949, ISO 14001:2004, OHSAS 18001:2007 and strongly practicing TPM and Lean Management Principles in their day to day activities.

Since the company is involved in the manufacture of Automotive Brakes – A safety critical part it needs to produce highest quality products in their operations. The Quality Policy of the company gives importance in meeting customer expectations in terms of Quality, Delivery, Price and Service.

Toyota Production System (TPS)

The TPS, Toyota Production System, is implemented in the Caliper Brake Manufacturing Unit which has 12 machining cells, 3 plating Cells and 9 assembly cells.

Toyota Production System is lean manufacturing system, which involves new process technology and production systems, aims at:

- Reduction of costs – i.e., reduction of waste
- Improving the productivity.
- Increase of total sales/total assets

Concepts of TPS

- Continuous flow of production
 - ✓ Just in time: Produce necessary units in the necessary quantities at the necessary time
 - ✓ “Autonomation” – Jidoka – autonomous defects control
 - ✓ Flexible work-force - Shojinka
 - ✓ Creative thinking – Soikufu – capitalizing on worker suggestions

Systems and methods of TPS

- Kanban
- Visual control
- Production smoothing
- Machine layout and multi-function workers
- Improvement activities
- Reduction of setup time
- Functional management

Kanban card: A card in rectangular vinyl envelope

- ✓ Withdrawal Kanban: Describes quantity that subsequent process must withdraw.
- ✓ Production-ordering Kanban: Describes quantity that preceding process must produce.
- ✓ Kanbans circulate within factories and between factories.

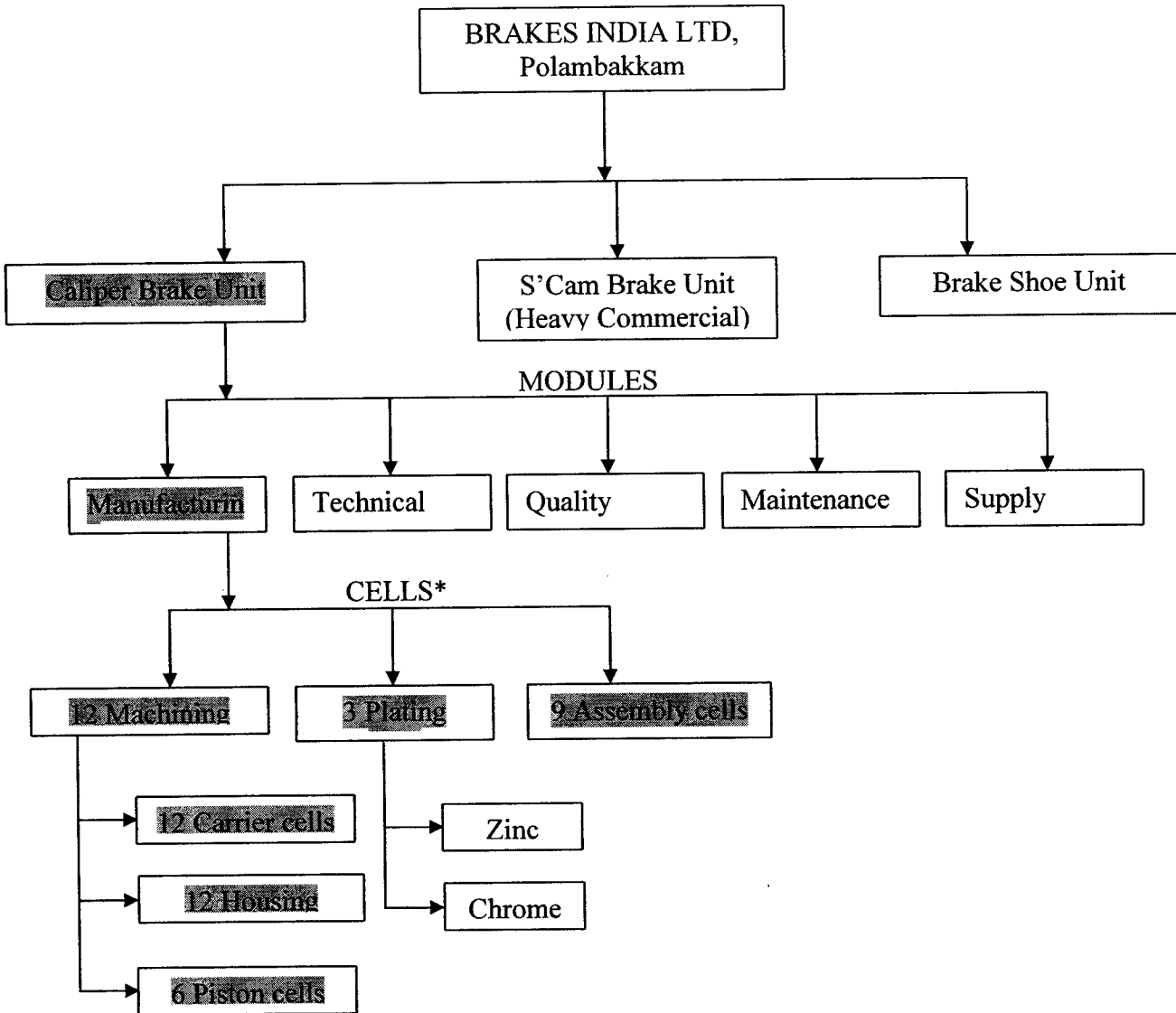
- ✓ Production Kanbans attached to parts as they are put in storage.
- ✓ If kanban is used and production at a stage fluctuates, the previous stage must hold inventory and have excess capacity. Therefore, final assembly will use minimal lot sizes to reduce fluctuation.

Visual control: Andon lights – A type of visual control that displays the current state of work (i.e., abnormal conditions, work instruction and job progress information). It is one of the main tools of Jidoka.

When a worker delays a job, he turns on a yellow light. When a worker stops a job, he turns on a red light.

Production smoothing: Minimize the variance of total output in a period by producing the same amount every day.

Machine layout and multi-function workers: Machines organized to smooth material flow. Each worker handles three different machines. Worker deals with one piece at a time.



- Each cell of machining, plating and assembly has individual carrier, housing and piston divisions

Note: The shaded portions intimate the area where TPS implemented

QUALITY POLICY:

Brakes India Limited is committed to total quality. The company shall,

1. Achieve this by identifying and meeting customer requirements on quality, delivery, price and service.
2. Strive to enhance customer satisfaction through continual improvement of the efficiency of the quality management system.
3. Comply with the statutory and regulatory requirements.

VISION

- We shall achieve customer satisfaction by providing products and services of high quality at globally competitive prices. We shall be a leading player in our chosen area of operations in the light engineering industry.
- We shall improve the quality of life of our employees and fulfill their reasonable aspirations. By creating an atmosphere of trust and care, we shall work as a cohesive team always encouraging higher standards of performance.
- We shall provide an adequate return to our stockholders and facilitate the growth of the organization.
- We recognize our vendors as our partners in progress. We shall give them a fair deal and nurture a healthy relationship.
- We shall conduct ourselves as a responsible corporate citizen known for integrity and ethics.

1.4 STATEMENT OF THE PROBLEM

It has become imperative and indispensable for the industries to look for new technologies to sustain in this competitive business world. This new technology and system certainly will have influence on the grass root workers mindset and productivity. There will be reluctance among human being whenever any change process takes place. Hence it has become much important to understand the mindset of the grass root workers who are going to apply the new technologies and systems in regular production and the influence in productivity.

1.5 NEED FOR THE STUDY

Perceptions of grass root workers towards the new production technologies and systems are vital since they are the persons who are going to apply that in regular production, In case the workers have negative approach towards the new technology and system, this will get reflected in their work and hence the productivity and product quality. The influence of new production technologies and systems in productivity is also important, which can justify for the horizontal deployment of the same in the entire organization.

1.6 OBJECTIVES OF THE STUDY

Primary Objective

- To understand the mental framework and the mindset of blue collared workmen in M/s Brakes India Ltd, Polambakkam, whenever new production technologies and systems are introduced.

Secondary Objectives

- To assess productivity enhancement with the deployment of new production technologies and systems.

1.7 SCOPE OF THE STUDY

- It enables the company to know the perception of employees towards new production technology and systems.
- This study will enable to overcome the negative impact the new technology created.
- This study helps the company to improve their various training activities and communication.
- This study will enable to understand the influence of new production technology and systems on productivity.

CHAPTER-2

LITERATURE SURVEY

2.1 REVIEW OF LITERATURE

Technology Change:

Science and technology have profoundly influenced the course of human civilization. It is used as an effective instrument for growth and change.

Today's global competition, forces manufacturing companies to re-evaluate their existing processes and technologies in order to focus on strategic activities. This has created an awareness of the importance of introducing new technologies and processes. Emeka Emmanuel Okafor said in his article that "Globalization has become a dominant issue in work organization all over the world. It has the potential to enrich not only the nation's economy but also the workplace as it can increase productivity, profitability and ease the performance of tasks" ¹. The global market for high technology goods is growing at a faster rate than that for other manufactured goods, and high-technology industries are driving economic growth around the world.

The major industrialized countries continued to emphasize high-technology manufactures in the 1990s. In 1998, high-technology manufactures were estimated at 16.6 % of manufacturing output in the United States, 16 % in Japan, 14.9 % in the United Kingdom, 11% in France and 9.0 % in Germany. The technology change results in new products, new production techniques, upgrading of quality of labour force, introduction of new skills and quality management improvements¹. Resistance to change is universal workplace challenge. The new technology or technology change can make some workers redundant in their working place which forces the management to reduce the manpower. But this may not be the same with every new technology or technology change. Also in adopting new technology, workers often fear loss of control ².

“A model of worker resistance which conceptualizes four basic agendas of resistance: deflecting abuse, regulating the amount and intensity of work, defending autonomy and expanding worker control through worker participation schemes. These four agendas of worker resistance parallel forms of the organization of the labor process as characterized by Edwards (1979) and others, with deflecting abuse being most typical of direct control, regulating the amount and intensity of work being most typical of technical control, defending autonomy being most typical of bureaucratic control, and manipulating participation opportunities being most typical of worker resistance under modern participative organizations of work”³.

Generally workers have a great emotional stake in their work place as they do at home. Some employees irrespective of their position, educational qualifications, or experiences tend to react to changes negatively and thereby resisting it⁴.

Workers resistance for new technology may be form different sources. Most commonly identified reasons for resisting changes are¹:

- Job Insecurity
- Managerial exercise of power and control
- Training and environment
- Habit
- Personal attitude
- Psychological reasons
- Financial reasons
- Fear of unknown
- Variance of goals
- Political factors
- Ways of introduction

It's a competitive advantage of an organization to identify the reasons for resistance and overcoming that⁵

“All sorts of things can happen when you are open to new ideas and playing around with things” said by Kevlar inventor, Stephanie Kwolek.

Organization should determine what social-support structures within organizations, particularly high-technology organizations, exist or should exist to assist the following groups in coping with the demands of new or changing technologies:

- Working couples, single parents or individuals with extended family obligations
- Workers and professionals with changing or interrupted careers
- Workers and professionals displaced by technology

Company leaders should develop an implementation strategy that includes helping workers overcome resistance fueled by fear of failure and embarrassment ². Recent years have seen a growing concern about the adaptability and willingness of the Indian industrial worker to cope with radical technological changes such as the introduction of Advanced Manufacturing Technologies ⁵.

Pessimism and concern about the consequences of technological change were reflected in such work as Michael (1962), and this concern contributed to the formation of the National Commission on Technology, Automation, and Economic Progress in 1964. The commission strongly endorsed the importance of technological change in raising living standards and improving the quality of work-life but acknowledged that its benefits were not costless.

Impact of technology on productivity

Productivity is a useful measure of the health of an economy since it looks at the ratio of outputs to input. As productivity increases, the real cost of a product decreases. Technological advances have long been accepted as significant contributors to productivity growth ⁶.

New technology replaces the old with the new; it brings change to the labour market. Some jobs become more productive, some jobs become obsolete and some new types of jobs are born. In the United States in the decade before 1973, ‘total factor productivity’ or TFP the measure of how efficiently inputs of capital and labour are used – was growing at about 1.9% a year⁶.

Technology management



The rapid speed of technological development and its effect on organizational strategy, structure, and processes has created a critical need for a systematic approach to managing technology. Technology Management “...links engineering, science, and management disciplines to address the planning, development, and implementations of technological capabilities to shape and accomplish the strategic and operational objectives of an organization”. This exploratory study examined the extent to which perceptions concerning technology planning, implementation, and organizational climate influence perceptions of the effectiveness of new technology.

2.2 RESEARCH GAP

Above all researches related to impact of new technology and systems on grass root workers and productivity were done when the market trend is going upwards or normal. Now the scenario has been changed due to global recession. Every industry is facing a critical situation and wants to improve productivity with less cost i.e. lean manufacturing. During recession employees will have fear of unemployment, control, reduction in pay etc. Hence their behaviour may change a lot towards new technology or systems. This study aimed to understand the influence of new production technology systems on mindset of blue collared workmen and stock turn.

CHAPTER - 3

RESEARCH METHODOLOGY

Research methodology is to systematically solve the research problem. The methods adopted in collecting the data analysis and interpretation of data.

3.1 RESEARCH DESIGN

Research design is the basic frame work which provides guidelines for whole research methodology.

Type of research: Descriptive research

Target respondents: Blue collared workmen

3.2 RESEARCH INSTRUMENTS

Method of data collection: Questionnaire and web sources

Source of data collection: Primary and secondary data

3.3 SAMPLING TECHNIQUES

The sample size of the present study consists of 50 workers selected from the worker level of manufacturing module. They were selected by way of simple random sampling method for the data from them.

Simple random sampling

Simple random sampling is the technique in which sample is go drawn that each and every unit in the population has an equal and independent chance of being included in the sample. If the unit selected in any draw is not replace in the population before making the next draw, then it is known as simple random sampling without replacement and if it is replaced back before making

the next draw, then the sampling plan is called Simple random sampling, with replacement and is amounts to sampling from an infinite population, even through the population is finite.

1. Simple random sampling gives each element in the population an equal probability of getting into the sample; and all choices are independent of one another
2. Simple random sampling gives each possible combination of equal probability of being chosen.

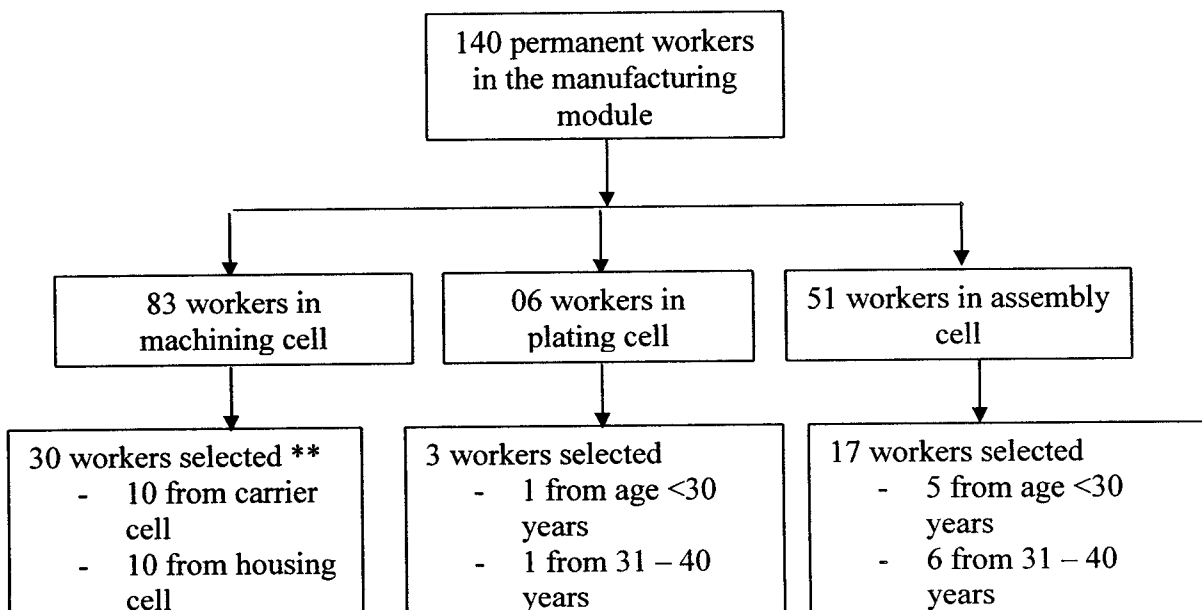
Sampling method: Random sampling

Universe: 400 employees

Population: 140 workers

Sample size: 50 workers were randomly selected to cover the different cells in the industry

Among the 140 permanent workers in the manufacturing module, 83 employees in machining cell, 6 employees in plating cell and 51 employees in assembly cell.



3.4 DATA COLLECTION

I. Primary Data

The present study is based on the primary data collected from the employees of M/s. Brakes India Ltd., Polambakkam.

II. Secondary Data

This secondary data mean second hand information was collected from official records of M/s. Brakes India Ltd., Polambakkam.

3.5 TOOL USED FOR DATA INTERPRETATION

The average method is used for interpretation of data. The formula used for this is,

$$= \frac{\text{No of the favorable response}}{\text{Total no of the respondents}} \times 100$$

3.6 LIMITATIONS OF THE STUDY

- Some of the respondents may not be giving their own perceptions for the questions asked-by the researcher due to the fear on consequences.
- The data collected using questionnaire and therefore the study is limited to the data collection

CHAPTER-4

DATA ANALYSIS AND INTERPRETATION

4.1 ANALYSIS AND INTERPRETATION

Table No: 4.1.1
Age distribution of respondents

S.No.	Age	response	response in %
1	< 30 years	16	32
2	31 - 40 years	17	34
3	41 - 58 years	17	34
	Total	50	100

Interpretation

The above table shows that the 32% respondents were in the age group < 30 years, 34% in the group 31 – 40 years and 34% in the group 41 -58 years.

Inference

Respondents selected in such a way to cover all the age group workers.

Figure No: 4.1.1

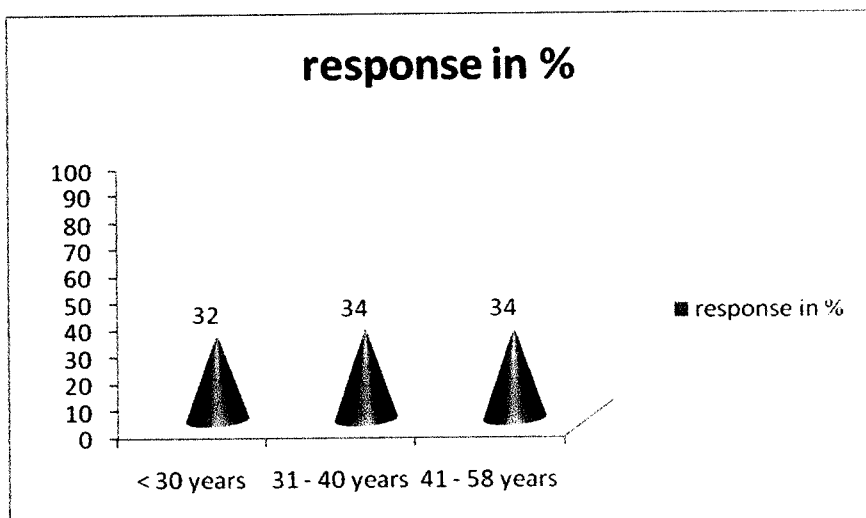


Table No: 4.1.2
Income distribution of respondents

S.No.	Monthly income, Rs	response	response in %
1	< 10000	0	0
2	10000 - 20000	50	100
3	20000 - 30000	0	0
4	> 30000	0	0
	Total	50	100

Interpretation

The above table shows that 100% of respondent's monthly earnings lie between Rs.10000 - 20000.

Inference

Though the respondents are from different age group, the monthly income lies in between the range Rs.10000 – 20000 / month

Figure No: 4.1.2
Income distribution of respondents

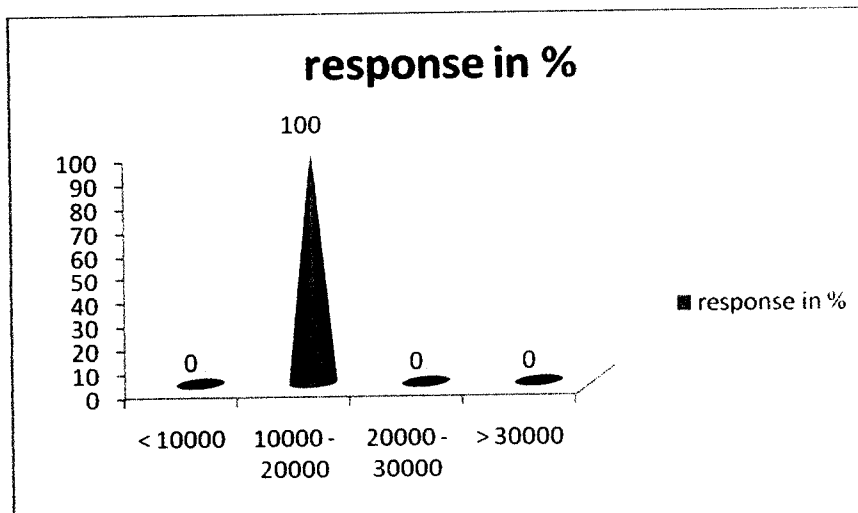


Table No: 4.1.3
Type of production technology systems changed

S.No.	Technology	response in %	response	response in %
1	Product technology	0	0	0
2	Process technology	100	50	100
	Total	100	50	100

Interpretation

The above table shows that 100% of respondents had the opinion that in the work place process technology has changed.

Inference

Respondents are unanimous in replying process technology change in the work place. It clearly indicates that they all understood the change very well.

Figure No: 4.1.3
Type of production technology systems changed

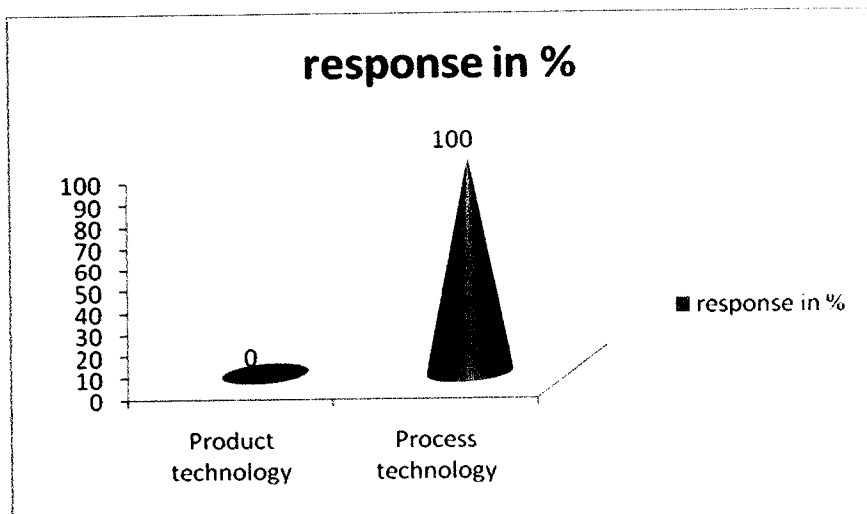


Table No: 4.1.4
Changes in organization

S.No	Yes/No	response	response in %
1	Yes	50	100
2	No	0	0
	Total	50	100

Interpretation

The above table shows that 100% of respondents felt the change in organization due to the change in the work place with new production technology systems.

Inference

Realization by 100% of respondents in the organization change helps to understand the involvement of workers in the new production technology systems.

Figure No: 4.1.4
Changes in organization

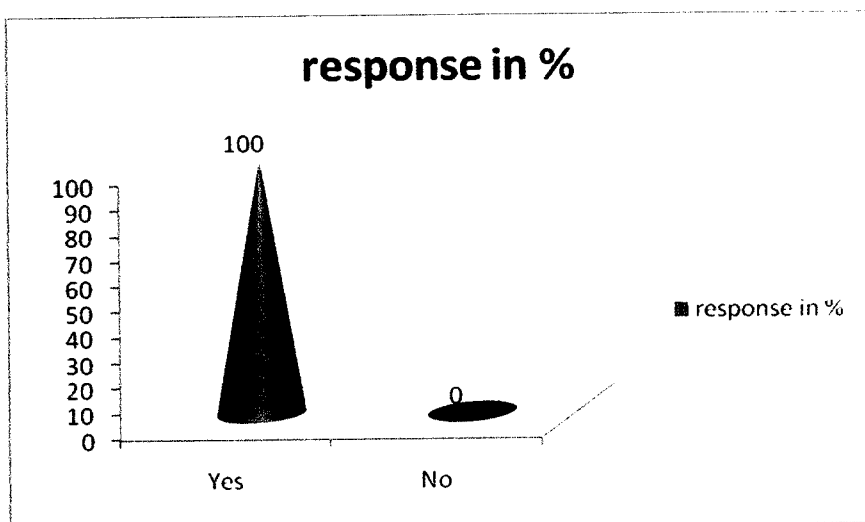


Table No: 4.1.5
Changes in the work place

S.No.	Changes	response	response in %
1	Nature of the job	38	76
2	Work place	50	100
3	Machineries	0	0
4	Ergonomics	16	32
5	Layout	50	100
6	More machineries	0	0

Interpretation

The above table shows that 76% of respondents faced change in nature of the job, 100% respondents faced change in work place, 32% respondents in ergonomics and 100% of respondents in layout.

Inference

All respondents faced one or the other changes in their cell. But all respondents faced change in the work place and layout.

Figure No: 4.1.5
Changes in the work place

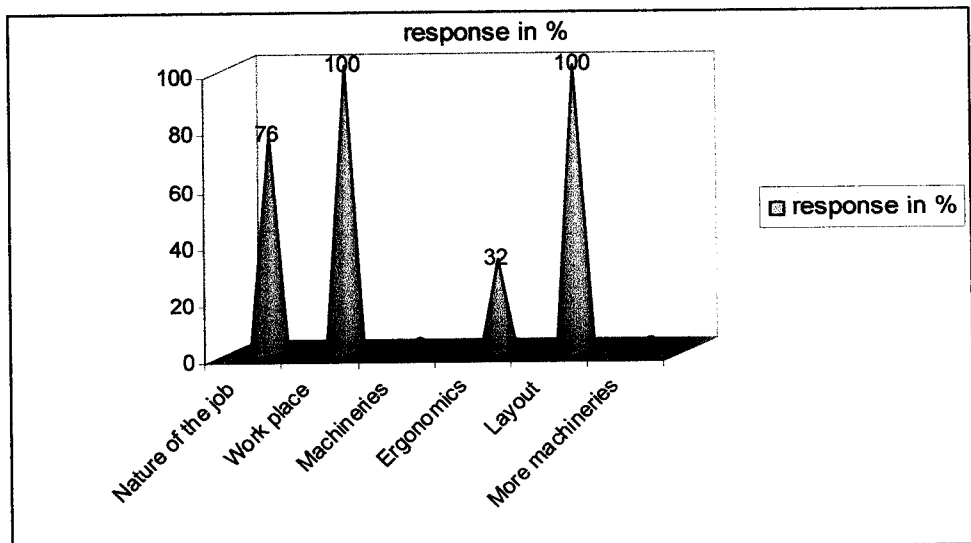


Table No: 4.1.6
Effectiveness of the new production technology systems

S.No.	Effectiveness	response	response in %
1	Motivates	42	84
2	Demotivates	0	0
3	Creates fear	8	16
	Total	50	100

Interpretation

The above table shows that nearly 84% of respondents motivated by the new production system and remaining 16% of respondents have fear.

Inference

More than three-fourth, i.e., 84% of respondents been motivated by the new production technology systems and very few have the fear. But no respondents have been de-motivated by the new system.

Figure No: 4.1.6
Effectiveness of the new production technology systems

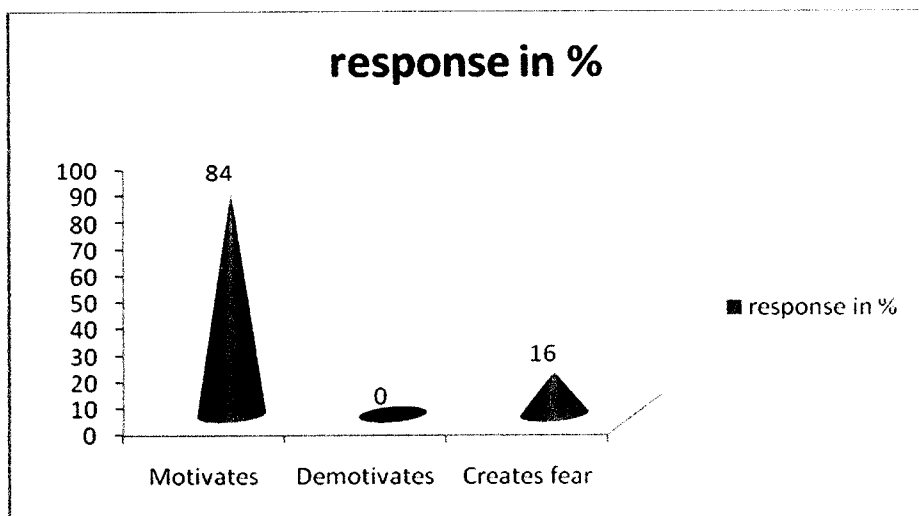


Table No: 4.1.7**Age factor on Effectiveness of the process technology & systems change**

S.No.	Age	response	response in %
1	Below 30 years	0	0
2	31 – 40 years	2	25
3	41 – 58 years	6	75
	Total	8*	100

*Eight respondents for whom the new technology systems has created fear

Interpretation

The above table shows that 75% of respondents who has got fear in the new production technology systems are in between 41 – 58 years and 25% of them are in between 31 – 40 years.

Inference

Zero respondents in the age category below 30 years, who got fear in the new technology systems and one-fourth of respondents in the category 31 - 40 years. Three-fourth of respondents whoever got fear are in the category 41 – 58 years.

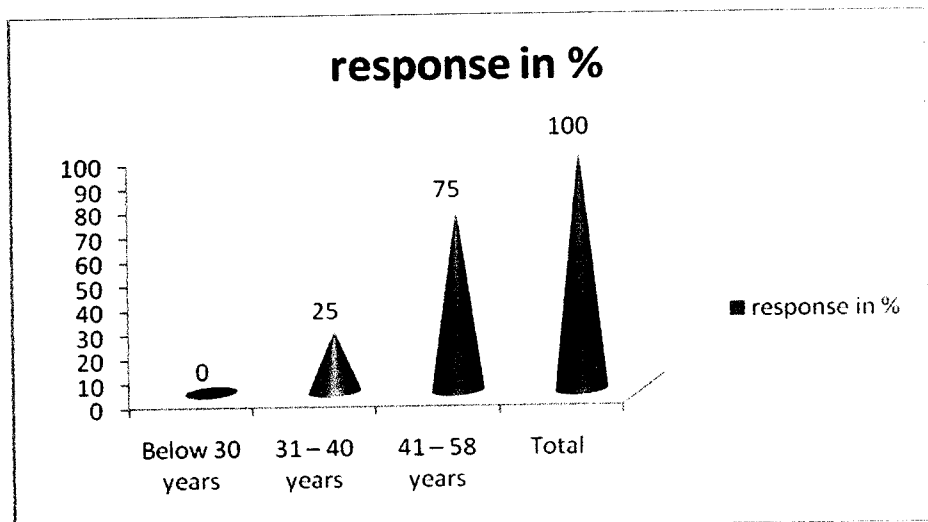
Figure No: 4.1.7**Age factor on Effectiveness of the new production technology systems**

Table No: 4.1.8

Communication of new production technology systems S.No.	Communication	response	response in %
1	Grapevine	0	0
2	Notice boards & e-mail	0	0
3	Direct meeting/discussion	50	100
	Total	50	100

Interpretation

The above table shows that 100% of respondents been communicated about the new production technology systems through direct meeting and discussion.

Inference

No informal communication i.e., grapevine or formal communication i.e., notice board or email communication provided to the respondents. Communication given exclusively through direct meeting and discussion.

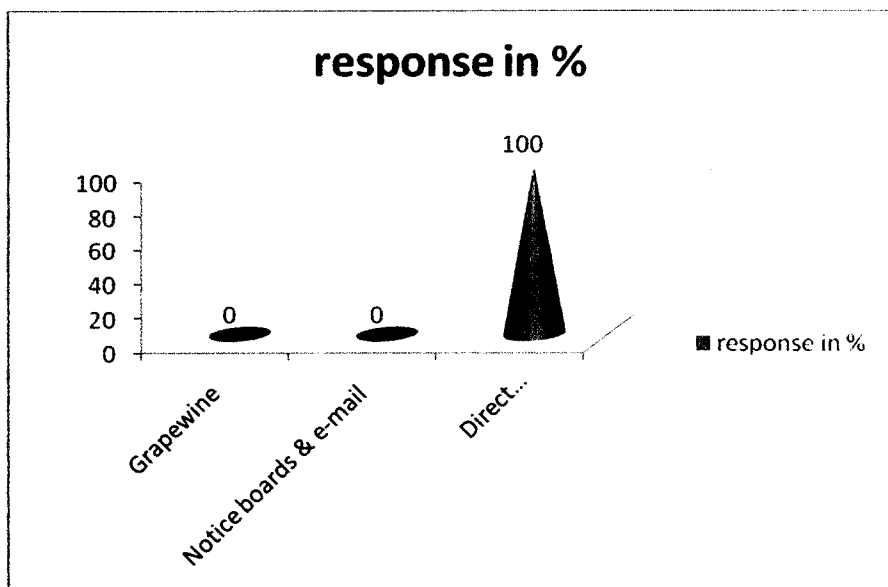
Figure No: 4.1.8**Communication of new production technology systems**

Table No: 4.1.9**Excellent mechanism for communicating the changes**

S.No	Response	response	response in %
1	Strongly agree	35	70
2	agree	11	22
3	disagree	4	8
4	Strongly disagree	0	0
	Total	50	100

Interpretation

The above table shows that 70% of respondents strongly agree, 22% of respondents agree that the company has excellent mechanism for communicating the changes, whereas 8% of respondents disagree.

Inference

Less than one-tenth of respondents disagree that the organization has excellent mechanism for communicating the changes. But no one strongly disagreed.

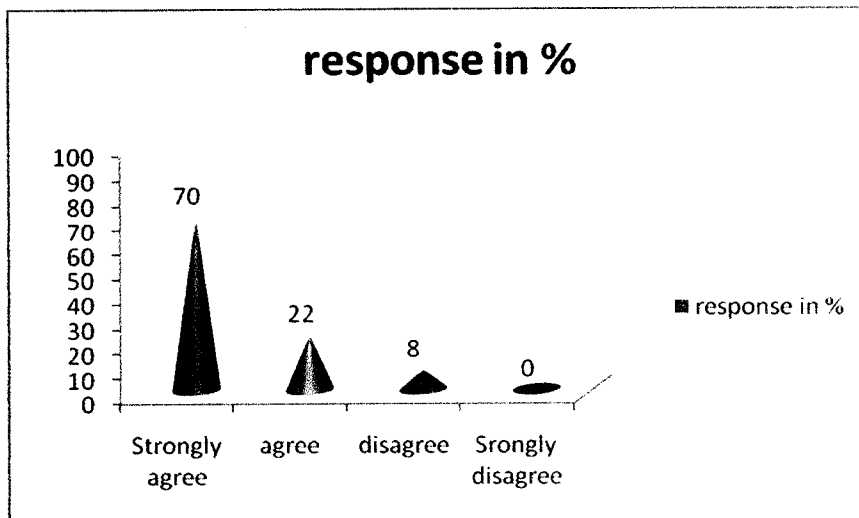
Figure No: 4.1.9**Excellent mechanism for communicating the changes**

Table No: 4.1.10**Training imparted for this production technology systems**

S.No	Yes/No	response	response in %
1	Yes	50	100
2	No	0	0
	Total	50	100

Interpretation

The above table shows that 100% of respondents have got the training on the new production technology and systems.

Inference

All the respondents been trained on the new production technology systems (TPS).

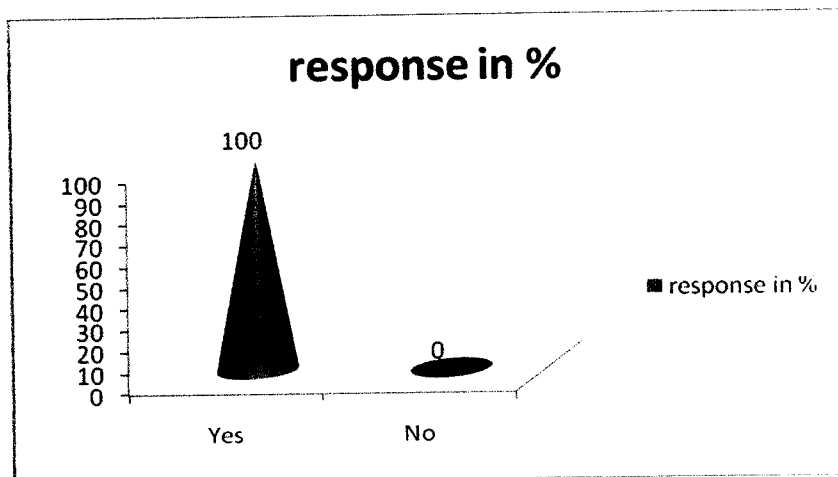
Figure No: 4.1.10**Training imparted for this production technology systems**

Table No: 4.1.11**Training method provided & preferred**

S.No	Training Methods	Provided	Provided, %	Preferred	Preferred, %
1	Class room	0	0	0	0
2	Coaching	0	0	0	0
3	On-the job	0	0	0	0
4	1) & 2)	0	0	12	24
5	2) & 3)	0	0	9	18
6	1) & 3)	50	100	29	58
	Total	50	100	50	100

Interpretation

The above table shows that 100% of respondents been provided class room training & on-the job training. 24% of respondents prefer class room training & coaching method, 18% of respondents prefer coaching method & on-the job training and 58 % of respondents prefer class room training & on-the job training.

Inference

No respondents prefer any specific single training method. Half of the respondents prefer the combination of class room and on-the job training method. And other half of the respondents coaching method also.

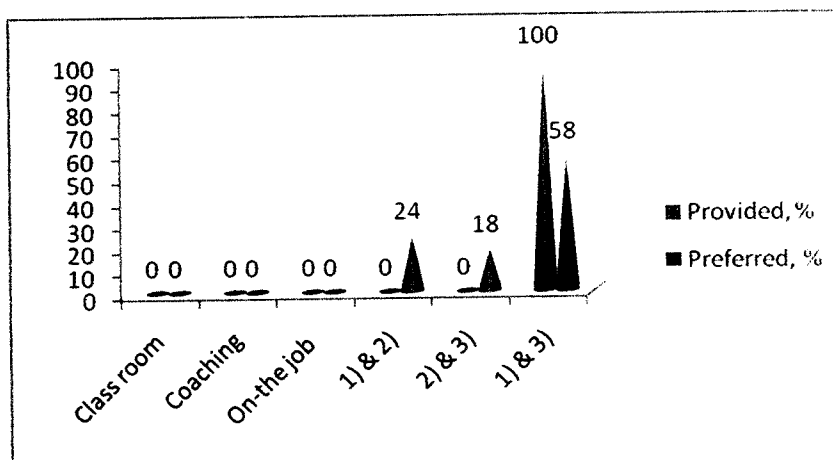
Figure No: 4.1.11**Training method provided & preferred**

Table No: 4.1.12**Adequate resources provided after training**

S.No	Yes/No	response	response in %
1	Yes	50	100
2	No	0	0
	Total	50	100

Interpretation

The above table shows that 100% of respondents agreed that they have been provided with adequate sources for reference regarding the new production technology systems after the training.

Inference

All respondents are satisfied with the resources provided by the organization regarding new production technology systems.

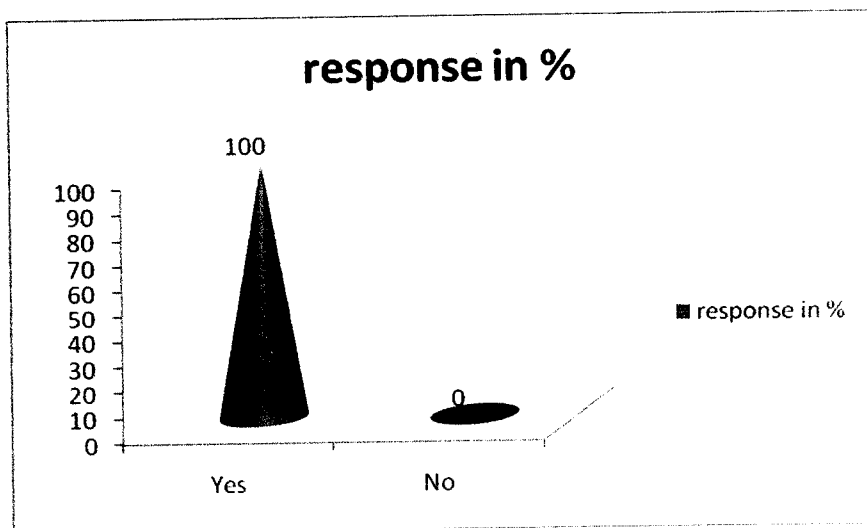
Figure No: 4.1.12**Adequate resources provided after training**

Table No: 4.1.13
Management involved employees

S.No	Opinion	response	response in %
1	Strongly agree	41	82
2	agree	9	18
3	disagree	0	0
4	Strongly disagree	0	0
	Total	50	100

Interpretation

The above table shows that 82% of respondents strongly agree and 18% of respondents agree that management involved respondents in this change of production technology and systems.

Inference

No respondents disagreed that the opinion that the organization has involved the employees in the changes

Figure No: 4.1.13
Management involved respondents

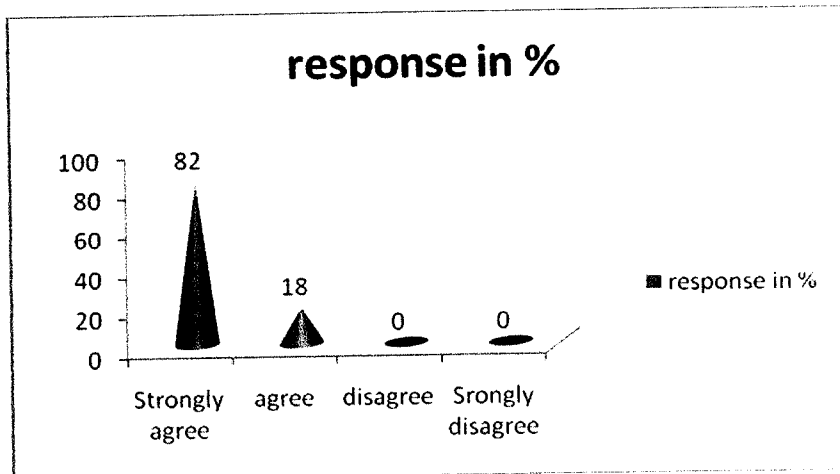


Table No: 4.1.14
Opinion about the new production technology systems

S.No	Opinion	response	response in %
1	Carry out immediately in all cells	37	74
2	Do not know	13	26
3	Not necessary	0	0
	Total	50	100

Interpretation

The above table shows that 74% of respondents feel that this production technology & systems should be carried out immediately, 26% of respondents do not know what to do.

Inference

Nearly three-fourth, i.e., 74% of respondents wanted the new production technology systems to be implemented immediately in all cells and one-fourth of respondents were not having the awareness of its importance. But no respondents claimed that this new system is not necessary.

Figure No: 4.1.14
Opinion about the new production technology systems

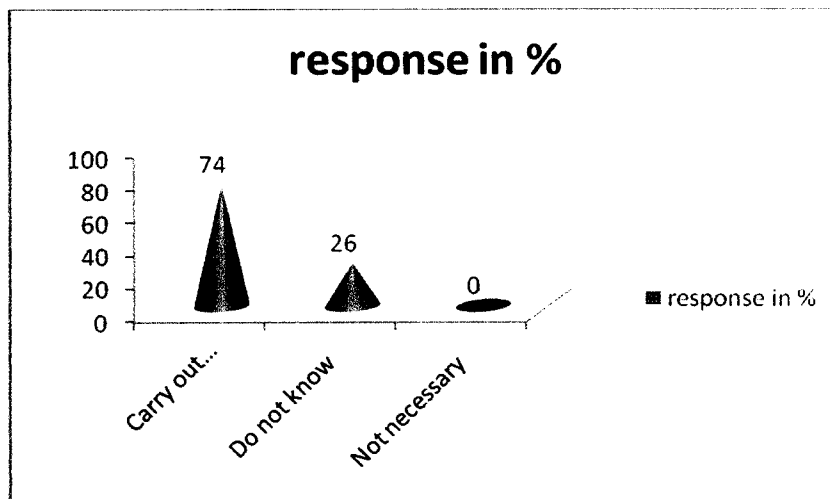


Table No: 4.1.15
Influence of the production technology systems

S.No	Factors	No. of Positive response	No. of Negative response	No. of Neutral response	Total, no	Positive %	Negative, %	Neutral, %	To
1	Personally	38	0	12	50	76	0	24	1
2	Physically	21	0	29	50	42	0	58	1
3	Technologically	50	0	0	50	100	0	0	1
4	Financially	0	0	50	50	0	0	100	1
5	Mentally	38	8	4	50	76	16	8	1

Interpretation

The above table shows that 76% of respondents positively influenced whereas 24% of respondents have no effect under personal factor. 42% of respondents positively influenced and 58% of respondents have no effect under physical factor. 100% of respondents positively influenced under technological factor. 100% of respondents have no effect under financial factor

Inference

No negative influence by the new production technology systems on the factors personal, physical, technological and financial except mental factor of grass root workers. Nearly, one-fifth i.e., 16% of respondents have some negative influence mentally.

Figure No: 4.1.15

Influence of the production technology systems
Positive %

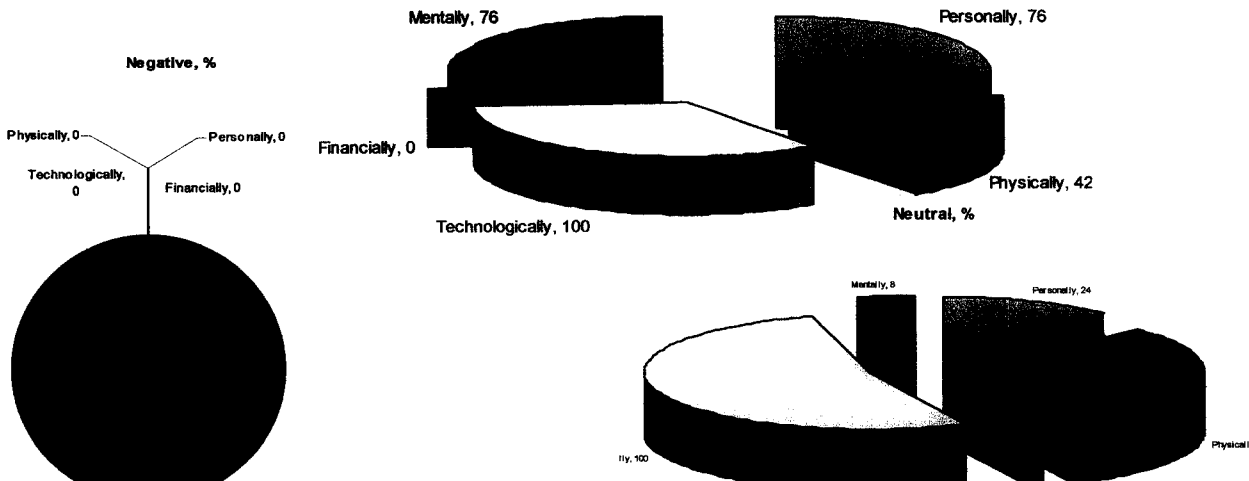


Table No: 4.1.16
Improvement in the productivity

S.No	Opinion	Response	Response, %
1	Yes	50	100
2	No	0	0
	Total	50	100

Interpretation

The above table shows that 100% of respondents have the opinion that this change in production technology and systems will improve the productivity.

Inference

All respondents realized the improvement in productivity.

Figure No: 4.1.16
Improvement in the productivity

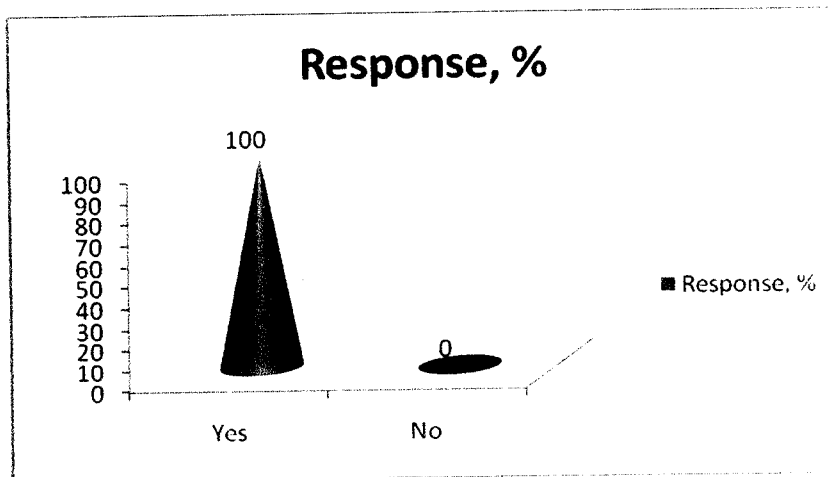


Table No: 4.1.17
Satisfaction about the changes

S.No	Opinion	Response	Response, %
1	Highly satisfied	41	82
2	Satisfied	3	6
3	Neutral	4	8
4	Dissatisfied	2	4
5	Highly Dissatisfied	0	0
	Total	50	100

Interpretation

The above table shows that 82% of respondents highly satisfied, 6% of respondents satisfied, 8% of respondents have no effect and 4% of respondents dissatisfied about the changes in the production technology and systems.

Inference

More than three-fourth of respondents satisfied with the changes made and one-sixth of respondents are not having any opinion. But less than one-sixth i.e., 4% respondents are dissatisfied which is very important issue to focus on.

Figure No: 4.1.17
Satisfaction about the changes

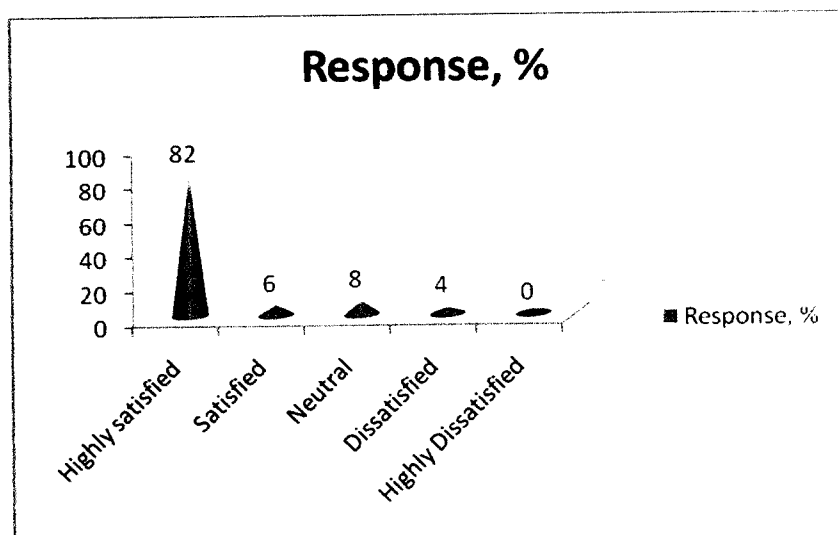


Table No: 4.1.18
Solving work related problems

S.No	Opinion	response	response in %
1	Strongly agree	39	78
2	agree	7	14
3	disagree	4	8
4	Strongly disagree	0	0
	Total	50	100

Interpretation

The above table shows that 78% of respondents strongly agree and 14% of respondents agree and 8% of respondents disagree on the opinion that new production technology and systems will solve work related problems.

Inference

One-sixth of respondents i.e., 8% disagreed that the new system change will not help in work related problem solving.

Figure No: 4.1.18
Solving work related problems

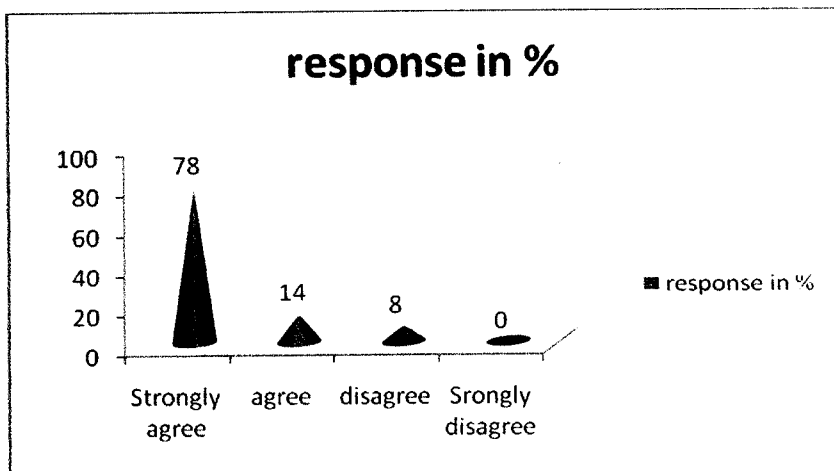


Table No: 4.1.19**Part of Production technology system changes or alienated**

S.No	Opinion	Response	Response, %
1	Yes	50	100
2	No	0	0
	Total	50	100

Interpretation

The above table shows that 100% of respondents feel that they are also a part of technological changes in the organization.

Inference

No respondents felt alienated from the production technology system changes, which is more important when any changes happening in an organization.

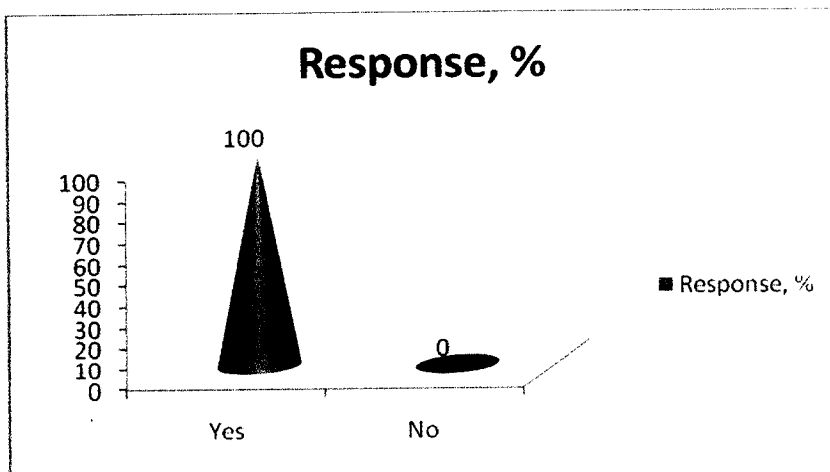
Figure No: 4.1.19**Part of Production technology changes or alienated**

Table No: 4.1.20
Response to the new production technology system

S.No	Opinion	Response	Response, %
1	Accept	50	100
2	Resist	0	0
	Total	50	100

Interpretation

The above table shows that 100% of respondents accept this change of production technology and systems.

Inference

All respondents accept the change in the production technology system.

Figure No: 4.1.20
Response to the new production technology system

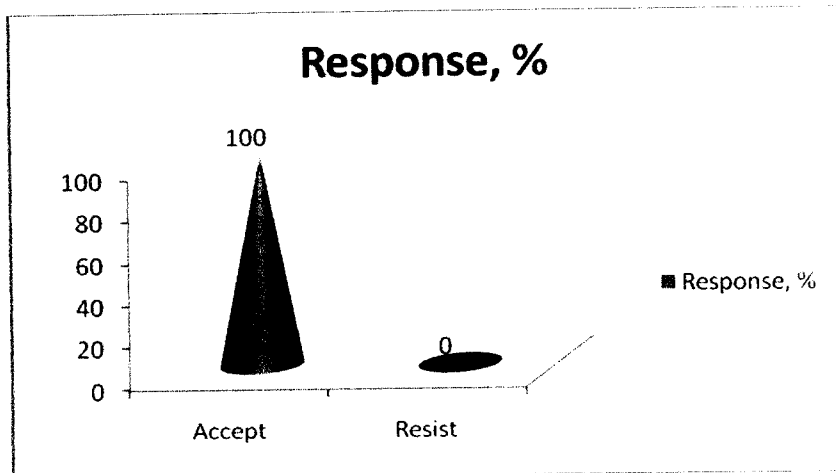


Table No: 4.2.1**Impact of new production technology systems (TPS) on Stock Turn**

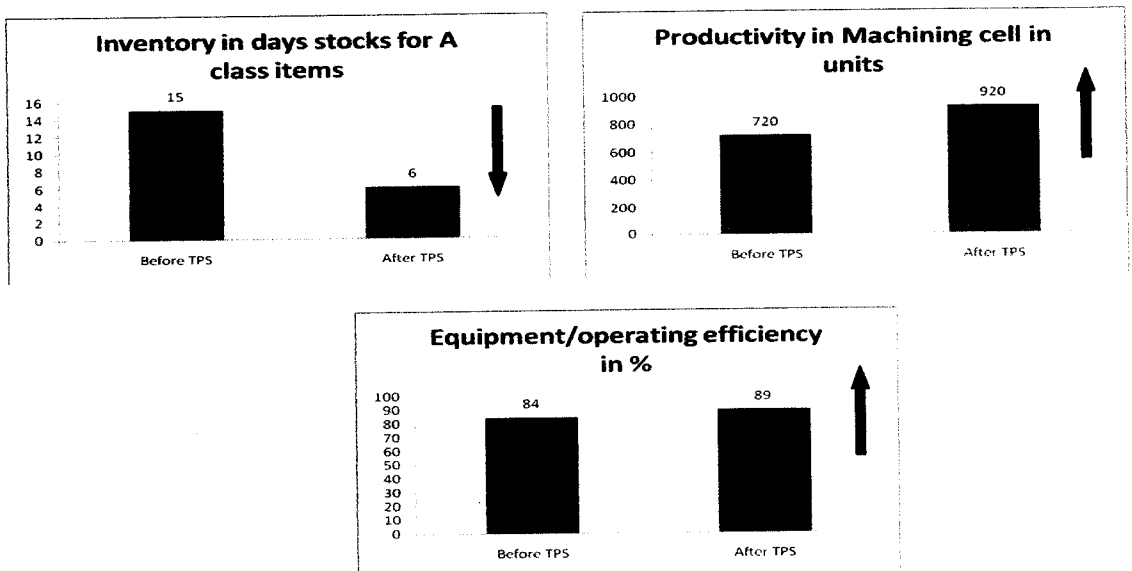
S.No	Stock turn parameters	Before TPS	After TPS
1	Inventory for A class items, stocks maintained in days	15	6
2	Productivity in Machining cell, units/day	720	920
3	Equipment/operating efficiency, %	84%	89%

Interpretation

The above table shows that after implementation of Toyota Production System (TPS) the inventory, i.e. stock maintained in days reduced from 15 days to 6 days, productivity improved from 720 units per day to 920 units and equipment efficiency increased from 84% to 89%.

Inference

More than 50% percent reduction in inventory, more than 25% increment in productivity and 5% increment in equipment/operating efficiency indicates very good stock turn and excellent implementation of lean manufacturing system through TPS.

Figure No: 4.1.20**Impact of new production technology systems (TPS) on Stock Turn**

CHAPTER – 5

CONCLUSIONS

5.1 FINDINGS FROM THE STUDY

1. Respondents selected in such a way to cover all the age group workers.
2. Though the respondents are from different age group, the monthly income lies in between the range Rs.10000 – 20000 / month
3. Respondents are unanimous in replying process technology change in the work place. It clearly indicates that they all understood the change very well.
4. Realization by 100% of respondents in the organization change helps to understand the involvement of workers in the new production technology systems.
5. All respondents faced one or the other changes in their cell. But all respondents faced change in the work place and layout.
6. More than three-fourth, i.e., 84% of respondents been motivated by the new production technology systems and very few have the fear. But no respondents have been de-motivated by the new system.
7. Zero respondents in the age category below 30 years, who got fear in the new technology systems and one-fourth of respondents in the category 31 - 40 years. Three-fourth of respondents whoever got fear are in the category 41 – 58 years.
8. No informal communication i.e., grapevine or formal communication i.e., notice board or email communication provided to the respondents. Communication given exclusively through direct meeting and discussion.
9. Less than one-tenth of respondents disagree that the organization has excellent mechanism for communicating the changes. But no one strongly disagreed.
10. All the respondents been trained on the new production technology systems (TPS).

11. No respondents prefer any specific single training method. Half of the respondents prefer the combination of class room and on-the job training method. And other half of the respondents coaching method also.
12. All respondents are satisfied with the resources provided by the organization regarding new production technology systems.
13. No respondents disagreed that the opinion that the organization has involved the employees in the changes
14. Nearly three-fourth, i.e., 74% of respondents wanted the new production technology systems to be implemented immediately in all cells and one-fourth of respondents were not having the awareness of its importance. But no respondents claimed that this new system is not necessary.
15. No negative influence by the new production technology systems on the factors personal, physical, technological and financial except mental factor of grass root workers. Nearly, one-fifth i.e., 16% of respondents have some negative influence mentally.
16. All respondents realized the improvement in productivity.
17. More than three-fourth of respondents satisfied with the changes made and one-sixth of respondents are not having any opinion. But less than one-sixth i.e., 4% respondents are dissatisfied which is very important issue to focus on.
18. One-sixth of respondents i.e., 8% disagreed that the new system change will not help in work related problem solving.
19. No respondents felt alienated from the production technology system changes, which is more important when any changes happening in an organization.
20. All respondents accept the change in the production technology system.
21. More than 50% percent reduction in inventory, more than 25% increment in productivity and 5% increment in equipment/operating efficiency indicate very good stock turn and excellent implementation of lean manufacturing system through TPS.

5.2 SUGGESTIONS AND RECOMMENDATIONS

- The organization should take necessary steps to overcome the fear of employees on the new production technologies and systems. A special focus, like imparting special training or coaching on such group of employees are necessary.
- Communication about the new production technologies and systems can be improved still better by communicating through e-mails, notice boards and displays at necessary location.
- It is recommended that the organization should provide training depend on the understanding ability and involvement of the employees on the changes.
- The organization should take necessary actions to improve the awareness on the importance of the new production technologies and systems.
- The management should involve the employees, showing poor involvement in the new production technology systems, directly in implementing and establishing the same.
- The management should involve the employees in working with the new technology and systems in problem solving, which will enable them to understand the ability of the same.
- The management may provide incentives or rewards to the employees who are making remarkable performance in the new production technology and systems.

- The organization may provide suggestion box system to understand the perceptions of the employees regarding the changes.

- Organization can horizontally deploy this new production technology system to all cells in the manufacturing unit.

5.3 CONCLUSIONS

The study is about the impact of new production technology systems on grass root workers and productivity with respect to M/s Brakes India Limited, Chennai. The researcher would like to conclude that the new production technologies adopted in Brakes India Limited, have greater positive impact and marginally negative impact on grass root workers. The negative impact and neutral behaviour can be avoided if the organization concentrate on the suggestions and recommendations mentioned above.

The new production technology systems has its own limitations, which can be eliminated with the above mentioned suggestions, are negligible when compared to its advantages

The output of new production technology systems (Toyota Production System) is appreciable and hence can be deployed in the over all manufacturing unit of M/s Brakes India Ltd, Chennai.

Questionnaire

Personal details

Designation	
Department	
Gender	
Education	
Total experience	
Experience in M/s Brakes India Ltd	

- 1 Age

 Below 30 years 31 - 40 years 41 - 58 years Above 58 years

- 2 Monthly income in Rs.

 < 10000 10000 - 20000 20000 - 30000 > 30000

- 3 What technology change happened in your work place?

 Product technology Process technology

- 4 Is there any change in the organisation due to the change in the technology?

 Yes No

- 5 What are the changes you feel that has taken place with the introduction of new technology?

 Nature of the job Work place Machineries Ergonomics

 Layout Added more machines

- 6 What is the effectiveness of these changes?

 Motivates Demotivates Creates fear No effect

- 7 How this technology change is communicated to you ?

 Through grapevine communication (informal communication)

 Through notice boards, e-mails etc

 Through direct meeting or discussion between management and workers

- 8 Generally the organization has excellent mechanism for communicating the changes

 Strongly agree agree disagree strongly disagree

- 9 Whenever any change takes place in the organisation, whether training is imparted?

 Yes No

Strongly agree agree Neutral disagree

strongly disagree

19 Do you feel you are a part of any technological changes or feel alienated?

Yes

No

20 What is your response to the change made in your organization?

accept

resist

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