INTERNATIONAL JOURNAL OF RESEARCH IN COMMERCE, IT & MANAGEMENT

IJRCM

A Monthly Double-Blind Peer Reviewed (Refereed/Juried) Open Access International e-Journal - Included in the International Serial Directories

Indexed & Listed at:

Ulrich's Periodicals Directory ©, ProQuest, U.S.A., EBSCO Publishing, U.S.A., Cabell's Directories of Publishing Opportunities, U.S.A.,

Open J-Gage, India [link of the same is duly available at Inflibnet of University Grants Commission (U.G.C.)],

Index Copernicus Publishers Panel, Poland with IC Value of 5.09 & number of libraries all around the world.

Circulated all over the world & Google has verified that scholars of more than 3412 Cities in 173 countries/territories are visiting our journal on regular basis.

Ground Floor, Building No. 1041-C-1, Devi Bhawan Bazar, JAGADHRI – 135 003, Yamunanagar, Haryana, INDIA

http://ijrcm.org.in/

CONTENTS

CALL FOR MANUSCRIPTS

We invite unpublished novel, original, empirical and high quality research work pertaining to recent developments & practices in the areas of Computer Science & Applications; Commerce; Business; Finance; Marketing; Human Resource Management; General Management; Banking; Economics; Tourism Administration & Management; Education; Law; Library & Information Science; Defence & Strategic Studies; Electronic Science; Corporate Governance; Industrial Relations; and emerging paradigms in allied subjects like Accounting; Accounting Information Systems; Accounting Theory & Practice; Auditing; Behavioral Accounting; Behavioral Economics; Corporate Finance; Cost Accounting; Econometrics; Economic Development; Economic History; Financial Institutions & Markets; Financial Services; Fiscal Policy; Government & Non Profit Accounting; Industrial Organization; International Economics & Trade; International Finance; Macro Economics; Micro Economics; Rural Economics; Co-operation; Demography: Development Planning; Development Studies; Applied Economics; Development Economics; Business Economics; Monetary Policy; Public Policy Economics; Real Estate; Regional Economics; Political Science; Continuing Education; Labour Welfare; Philosophy; Psychology; Sociology; Tax Accounting; Advertising & Promotion Management; Management Information Systems (MIS); Business Law; Public Responsibility & Ethics; Communication; Direct Marketing; E-Commerce; Global Business; Health Care Administration; Labour Relations & Human Resource Management; Marketing Research; Marketing Theory & Applications; Non-Profit Organizations; Office Administration/Management; Operations Research/Statistics; Organizational Behavior & Theory; Organizational Development; Production/Operations; International Relations; Human Rights & Duties; Public Administration; Population Studies; Purchasing/Materials Management; Retailing; Sales/Selling; Services; Small Business Entrepreneurship; Strategic Management Policy; Technology/Innovation; Tourism & Hospitality; Transportation Distribution; Algorithms; Artificial Intelligence; Compilers & Translation; Computer Aided Design (CAD); Computer Aided Manufacturing; Computer Graphics; Computer Organization & Architecture; Database Structures & Systems; Discrete Structures; Internet; Management Information Systems; Modeling & Simulation; Neural Systems/Neural Networks; Numerical Analysis/Scientific Computing; Object Oriented Programming; Operating Systems; Programming Languages; Robotics; Symbolic & Formal Logic; Web Design and emerging paradigms in allied subjects.

Anybody can submit the **soft copy** of unpublished novel; original; empirical and high quality **research work/manuscript** ***anytime*** in ***M.S. Word format*** after preparing the same as per our **GUIDELINES FOR SUBMISSION**; at our email address i.e. infoijrcm@gmail.com or online by clicking the link **online submission** as given on our website (***FOR ONLINE SUBMISSION, CLICK HERE***).

GUIDELINES FOR SUBMISSION OF MANUSCRIPT

1. **COVERING LETTER FOR SUBMISSION:**

DATED: _____

THE EDITOR
IJRCM

Subject: **SUBMISSION OF MANUSCRIPT IN THE AREA OF.**

(e.g. Finance/Marketing/HRM/General Management/Economics/Psychology/Law/Computer/IT/Engineering/Mathematics/other, please specify)

DEAR SIR/MADAM

Please find my submission of manuscript entitled '_____' for possible publication in your journals.

I hereby affirm that the contents of this manuscript are original. Furthermore, it has neither been published elsewhere in any language fully or partly, nor is it under review for publication elsewhere.

I affirm that all the author (s) have seen and agreed to the submitted version of the manuscript and their inclusion of name (s) as co-author (s).

Also, if my/our manuscript is accepted, I/We agree to comply with the formalities as given on the website of the journal & you are free to publish our contribution in any of your journals.

NAME OF CORRESPONDING AUTHOR:
Designation:
Affiliation with full address, contact numbers & Pin Code:
Residential address with Pin Code:
Mobile Number (s):
Landline Number (s):
E-mail Address:
Alternate E-mail Address:

NOTES:

a) The whole manuscript is required to be in ***ONE MS WORD FILE*** only (pdf. version is liable to be rejected without any consideration), which will start from the covering letter, inside the manuscript.
b) The sender is required to mentionthe following in the **SUBJECT COLUMN** of the mail:
New Manuscript for Review in the area of (Finance/Marketing/HRM/General Management/Economics/Psychology/Law/Computer/IT/ Engineering/Mathematics/other, please specify)
c) There is no need to give any text in the body of mail, except the cases where the author wishes to give any specific message w.r.t. to the manuscript.
d) The total size of the file containing the manuscript is required to be below **500 KB**.
e) Abstract alone will not be considered for review, and the author is required to submit the complete manuscript in the first instance.
f) The journal gives acknowledgement w.r.t. the receipt of every email and in case of non-receipt of acknowledgment from the journal, w.r.t. the submission of manuscript, within two days of submission, the corresponding author is required to demand for the same by sending separate mail to the journal.

2. **MANUSCRIPT TITLE:** The title of the paper should be in a 12 point Calibri Font. It should be bold typed, centered and fully capitalised.

3. **AUTHOR NAME (S) & AFFILIATIONS:** The author (s) **full name**, **designation**, **affiliation** (s), **address**, **mobile/landline numbers**, and **email/alternate email address** should be in italic & 11-point Calibri Font. It must be centered underneath the title.

4. **ABSTRACT:** Abstract should be in fully italicized text, not exceeding 250 words. The abstract must be informative and explain the background, aims, methods, results & conclusion in a single para. Abbreviations must be mentioned in full.

5. **KEYWORDS:** Abstract must be followed by a list of keywords, subject to the maximum of five. These should be arranged in alphabetic order separated by commas and full stops at the end.

6. **MANUSCRIPT:** Manuscript must be in ***BRITISH ENGLISH*** prepared on a standard A4 size ***PORTRAIT SETTING PAPER***. It must be prepared on a single space and single column with 1" margin set for top, bottom, left and right. It should be typed in 8 point Calibri Font with page numbers at the bottom and centre of every page. It should be free from grammatical, spelling and punctuation errors and must be thoroughly edited.

7. **HEADINGS:** All the headings should be in a 10 point Calibri Font. These must be bold-faced, aligned left and fully capitalised. Leave a blank line before each heading.

8. **SUB-HEADINGS:** All the sub-headings should be in a 8 point Calibri Font. These must be bold-faced, aligned left and fully capitalised.

9. **MAIN TEXT:** The main text should follow the following sequence:

INTRODUCTION

REVIEW OF LITERATURE

NEED/IMPORTANCE OF THE STUDY

STATEMENT OF THE PROBLEM

OBJECTIVES

HYPOTHESES

RESEARCH METHODOLOGY

RESULTS & DISCUSSION

FINDINGS

RECOMMENDATIONS/SUGGESTIONS

CONCLUSIONS

SCOPE FOR FURTHER RESEARCH

ACKNOWLEDGMENTS

REFERENCES

APPENDIX/ANNEXURE

It should be in a 8 point Calibri Font, single spaced and justified. The manuscript should preferably not exceed ***5000 WORDS***.

10. **FIGURES &TABLES:** These should be simple, crystal clear, centered, separately numbered & self explained, and **titles must be above the table/figure**. **Sources of data should be mentioned below the table/figure**. It should be ensured that the tables/figures are referred to from the main text.

11. **EQUATIONS:**These should be consecutively numbered in parentheses, horizontally centered with equation number placed at the right.

12. **REFERENCES:** The list of all references should be alphabetically arranged. The author (s) should mention only the actually utilised references in the preparation of manuscript and they are supposed to follow **Harvard Style of Referencing**. The author (s) are supposed to follow the references as per the following:

- All works cited in the text (including sources for tables and figures) should be listed alphabetically.
- Use (**ed.**) for one editor, and (**ed.s)** for multiple editors.
- When listing two or more works by one author, use --- (20xx), such as after Kohl (1997), use --- (2001), etc, in chronologically ascending order.
- Indicate (opening and closing) page numbers for articles in journals and for chapters in books.
- The title of books and journals should be in italics. Double quotation marks are used for titles of journal articles, book chapters, dissertations, reports, working papers, unpublished material, etc.
- For titles in a language other than English, provide an English translation in parentheses.
- The location of endnotes within the text should be indicated by superscript numbers.

PLEASE USE THE FOLLOWING FOR STYLE AND PUNCTUATION IN REFERENCES:

BOOKS

- Bowersox, Donald J., Closs, David J., (1996), "Logistical Management." Tata McGraw, Hill, New Delhi.
- Hunker, H.L. and A.J. Wright (1963), "Factors of Industrial Location in Ohio" Ohio State University, Nigeria.

CONTRIBUTIONS TO BOOKS

- Sharma T., Kwatra, G. (2008) Effectiveness of Social Advertising: A Study of Selected Campaigns, Corporate Social Responsibility, Edited by David Crowther & Nicholas Capaldi, Ashgate Research Companion to Corporate Social Responsibility, Chapter 15, pp 287-303.

JOURNAL AND OTHER ARTICLES

- Schemenner, R.W., Huber, J.C. and Cook, R.L. (1987), "Geographic Differences and the Location of New Manufacturing Facilities," Journal of Urban Economics, Vol. 21, No. 1, pp. 83-104.

CONFERENCE PAPERS

- Garg, Sambhav (2011): "Business Ethics" Paper presented at the Annual International Conference for the All India Management Association, New Delhi, India, 19–22 June.

UNPUBLISHED DISSERTATIONS AND THESES

- Kumar S. (2011): "Customer Value: A Comparative Study of Rural and Urban Customers," Thesis, Kurukshetra University, Kurukshetra.

ONLINE RESOURCES

- Always indicate the date that the source was accessed, as online resources are frequently updated or removed.

WEBSITES

- Garg, Bhavet (2011): Towards a New Natural Gas Policy, Political Weekly, Viewed on January 01, 2012 http://epw.in/user/viewabstract.jsp

PRODUCTIVITY IMPROVEMENT THROUGH PREVENTIVE MAINTENANCE: THE CASE OF ATSC TEXTILE MANUFACTURING FIRM

AMARE MATEBU KASSA
ASST. PROFESSOR & CHAIR OF PRODUCTION SYSTEM ENGINEERING
SCHOOL OF MECHANICAL AND INDUSTRIAL ENGINEERING
INSTITUTE OF TECHNOLOGY
BAHIRDAR UNIVERSITY
BAHIRDAR

ABSTRACT

Through effective preventive maintenance system, there is a way for the manufacturing firms to enhance their capacity and to provide better product than they are doing at present. This paper examines how preventive maintenance improves the productivity of textile machines in textile manufacturing firms, especially focused on weaving machines (looms). The study has explored the major problems and causes of machine breakdown at the existing situations and proposed the means to avoid the breakdowns. The investigation of this work indicates an increase of 46.26 % of productivity improvement and mean time between failures (MTBF) increased to 75.41 % from 44.4 %. The mean time to repair (MTTR) also decreases from 12 hrs per breakdown to 10.04 hrs per break down which is a 10.19 % reduction.

KEYWORDS
productivity improvement, preventive maintenance.

1. INTRODUCTION

New approaches in modern service and manufacturing industries have been rummaged around, developed and implemented so as to survive in the dynamic and fierce competitive system that are becoming ever more complex. The need for driving down costs, integrating every activities and available resources of a company, empowering the employee to make decision, eliminating waste generated by failure across the value adding process, shortening of production lead time and delivery of quality assured services and products have been given due attention.

Therefore, many manufacturing firms must improve their activities for maintaining their business in the competitive world. Textile manufacturing firm is one of the manufacturing firms that must plan to improve the working process and environment for higher efficiency of production processes. Preventive maintenance is one of the techniques used to improve efficiency of production processes and to drive the maintenance costs down.

Maintenance is the process of making a certain machine or equipment available and keeps to the expected performance standard, so that it can avoid sudden break down and minimize down time cost of the equipment. There are two basic types of maintenance: breakdown maintenance and preventive maintenance. In the case of breakdown maintenance, the operators are waiting until equipment fails before repairing or servicing it. But preventive maintenance is a time-based or run-based periodically inspecting, servicing, cleaning, or replacing parts to prevent sudden failure. Moreover, in preventive maintenance system allows monitoring of machinery in order to use important/ expensive parts to the limit of their serviceable life.

Preventive maintenance system is used to: reduce the size and scale of repairs, reduce down time (increase uptime), reduce number of repairs, increases quality of output, reduce overtime for responding to emergency breakdown, increase equipment availability, decreases potential exposure to liability, lowers overall maintenance costs through better use of labor and materials, extends the useful life of equipment, finds small problems before they become big ones, and greatly reduces unplanned downtime.

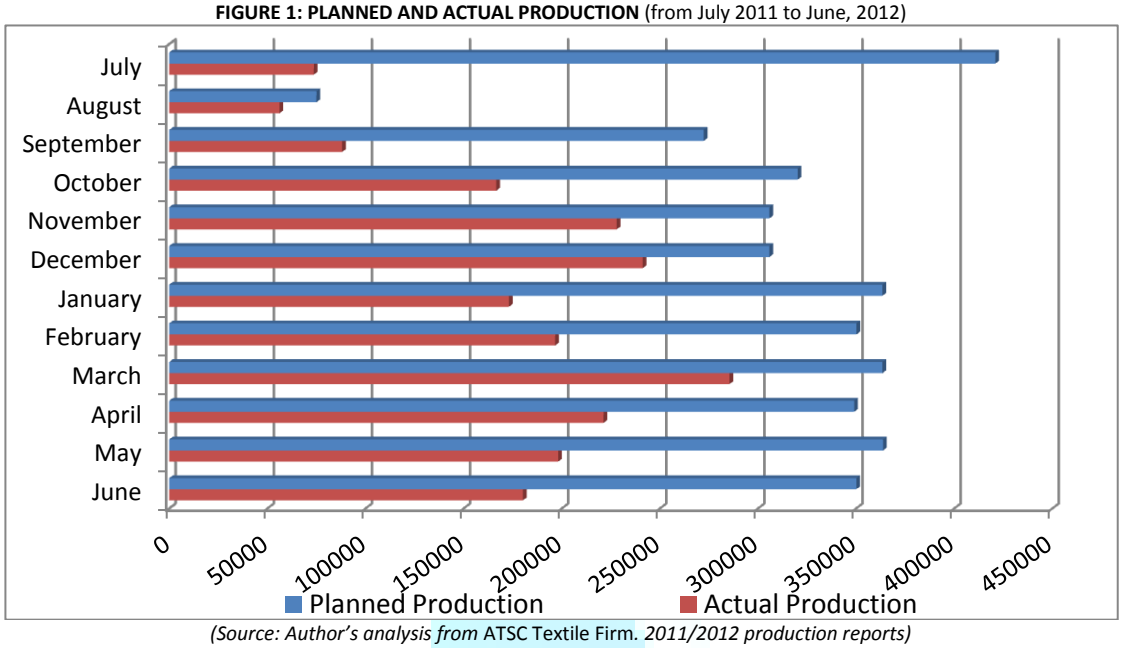
2. OVERVIEW OF ATSC TEXTILE MANUFACTURING FIRM

The textile sub-sector includes spinning, weaving and finishing plants. Most integrated textile firms (including spinning, weaving and finishing) are public enterprises in Ethiopia. The textile industry has since considerably expanded gaining an important place in the country's manufacturing sector. Textile is the most employment generating industry accounting for more than 27% of the total manufacturing employment in Ethiopia. And relatively textile industry is labor intensive compared to all other industries.

This paper has considered **ATSC Textile Manufacturing Firm** – Weaving machines (looms) as a case study. **ATSC Textile Manufacturing Firm** is one of modern textile manufacturing firms in Ethiopia and the weaving machineries (Rapier Sommet looms) are the latest ones. The company is capable of producing different items (like dyed fabric, grey fabric, bleached canvas, 100% cotton fabric, P/C grey fabric, printed fabric, etc) using these weaving machines. However, the company has been operating under its capacity due to high rate of unplanned failure, high dependency on some imported materials and spare parts, set-ups and changeovers, running at reduced speeds minor stops and idling, quality defects (like scrap, yield, rework), lack of skilled manpower, low level of development, poor quality of raw materials, and so on.

There is a great deviation between the planned and actual production of fabrics in the weaving shed. The author has considered the production data of ATSC Textile Manufacturing Firm for the fiscal year of 2011/ 2012. The production rate of the 100% Cotton grey fabric for instance shows a great fluctuation throughout the year (see figure 1). The minimum (17.5%) and the maximum of 78.9 % of the production performance have been observed in July and December respectively, 2011/2012 fiscal year.

FIGURE 1: PLANNED AND ACTUAL PRODUCTION (from July 2011 to June, 2012)



(Source: Author's analysis from ATSC Textile Firm. *2011/2012 production reports)*

3. MAINTENANCE SYSTEM OF ATSC TEXTILE MANUFACTURING FIRM

As the country is having high demand of textile products, enhancing the performance of the company through implementing well developed and organized maintenance system will not only help the company to have efficient way of maintaining its different machineries but also it contributes to the improvement of the productivity and quality of its products supplied to garment manufacturing firms. Furthermore, it enables the company to keep the level of spare parts in stock at a minimum level for effective maintenance and for savings of foreign currency. Hence, this study aims at addressing and improving the maintenance system of the company to clearly scrutinize the hidden factors, which hinder the capacity of the company.

The study has focused on weaving machines breakdown and the maintenance activities performed in the weaving shed. There are so many reasons for machine breakdowns and all of these problems are investigated in this study. The machinery that is failed may be out of function for a long period of time attributable to shortage of spare parts, poor controlling system and reporting system prevailing in the industry.

The observations and the interview with the production manager of ATSC Textile Manufacturing Firm has indicated that the company is following traditional type of maintenance system. Traditional maintenance is re-active rather than pro-active, ad-hoc and essentially costly. Reliability works focuses on a pro-active and structured program, meaning less downtime, higher productivity and improvement of bottom line. The traditional maintenance approach cannot meet the needs of today's dynamic business environment. Traditional maintenance concepts assume that failures are a fact of life, or that they can be prevented through regular preventive maintenance regimes. The traditional maintenance approach can also introduce failures of their own (MIF: Maintenance Induced Failure) due to training or procedure problems. In these scenarios, it is not uncommon to find that fixing breakdowns consumes a disproportionate quantity of budgetary resources and little is left over for effective preventive maintenance activities, or continuous improvements. Traditional maintenance approach is characterized by almost total reliance upon the "mechanic" for all actions. It is the old basic craftsman approach to maintenance.

In other words, the company is implementing the logic of "run-to-failure management system" and this is simple and straightforward. When a machine breaks down ... fix it. This means "If it is not broke, don't fix it" method of maintaining company's machinery has been a major part of company maintenance operations. The company using run-to failure management does not spend any money on maintenance until a machine or system fails to operate. Run-to-failure is a reactive management technique that waits for machine or equipment failure before any maintenance action is taken. It is also the most expensive method of maintenance management. Therefore, the maintenance cost after the breakdown is very high.

The company has a maintenance department. The maintenance staff of the department uses a reactive maintenance methods or run- to- failure and waits until the failure of the machines. There is no procedure manual for maintenance. The maintenance personnel just changes the items which failed by the operation after the failure occurs. There is no analysis done to find the causes and the effect of the failure.

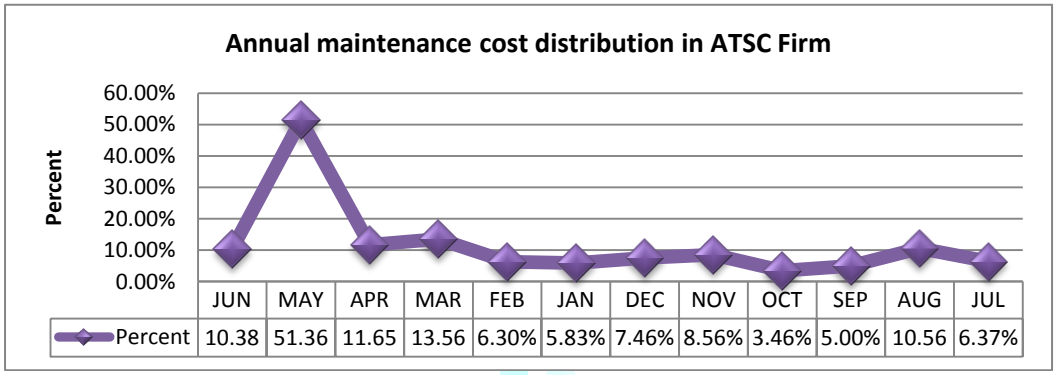
It is necessary to consider some statistics of actual maintenance performance in ATSC Textile Manufacturing Firm. The data and information has been collected in the fiscal year of 2011/2012. Table 1 indicates the ranges of maintenance costs in various months expressed as a percentage of the total manufacturing costs. The lowest band is around 3.46 % in October and the highest averages 51.36 % in May of the same fiscal year. And the expenditure on maintenance in ATSC Textile Manufacturing Firm has been estimated as 9.13 percent of total turnover; with a total annual spend of Birr 3,454,235. This expenditure is high (almost doubled) as compare to European countries, (like UK = 5.0%, Italy = 5.1%, France = 4.0%).

TABLE 1: ATSC MAINTENANCE EXPENDITURE

Month	*Total expense (Birr)*	*Maintenance expense(Birr)*	*Percent*
July	6,058,974	386,107	6.37 %
August	1,105,036	116,717	10.56 %
September	2,670,350	133,570	5.00 %
October	4,341,143	150,044	3.46 %
November	2,224,384	190,339	8.56 %
December	4,280,035	319,177	7.46 %
January	5,381,756	313,735	5.83 %
February	2,941,911	185,409	6.30 %
March	3,351,115	454,368	13.56 %
April	2,642,289	307,862	11.65 %
May	1,468,181	754,099	51.36 %
June	1,376,093	142,808	10.38 %
Total	***37,841,267***	***3,454,235***	***9.13 %***

(*Source: Author's analysis from ATSC Firm data*)

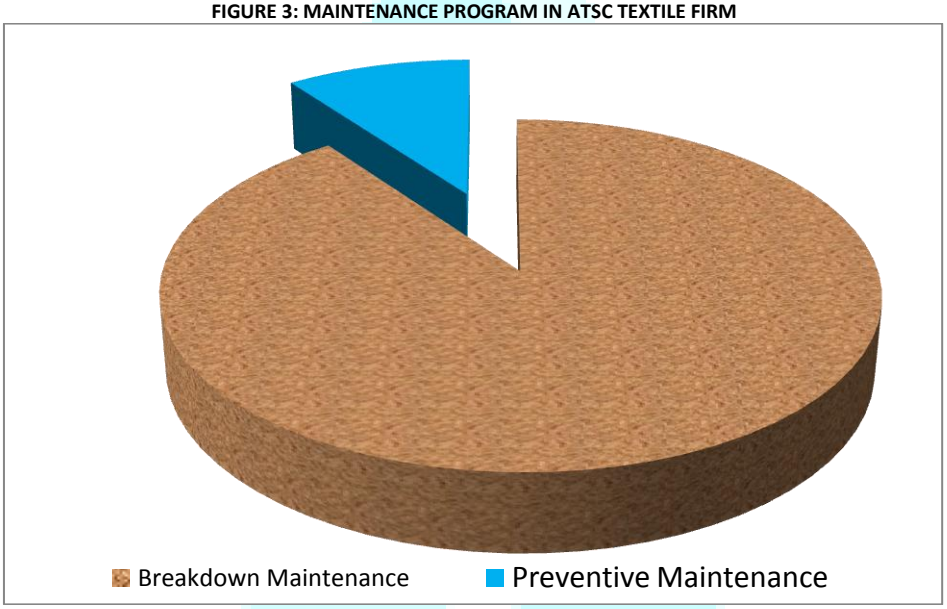
FIGURE 2: ANNUAL MAINTENANCE COST DISTRIBUTION IN ATSC.



(*Source: Author's computation based on ATSC data, 2011/2012*)

Some of the maintenance plan of the company contains cleaning and making minor inspection on the machineries. The plans are not based on the maintenance manuals. The figure below shows that the maintenance system that the company uses is almost 90 % breakdown type and very small percentage about 10 % lubrications and change of oils. The maintenance system of the company doesn't allow the maintenance operators to change any items before it break.

FIGURE 3: MAINTENANCE PROGRAM IN ATSC TEXTILE FIRM



In current situation around 39 weaving machines failed and stopped operation from 134 weaving machines in the company. Most weaving machines stopped due to shortage of spare parts and this shows that the maintenance system of the company doesn't follow the correct maintenance procedure. Hence, the weaving machines are out of operation and the company is losing its profit. The idle time records show that 49 percent of the idle time is due to the shortage of spare parts and the other minor causes are shown in the table 2.

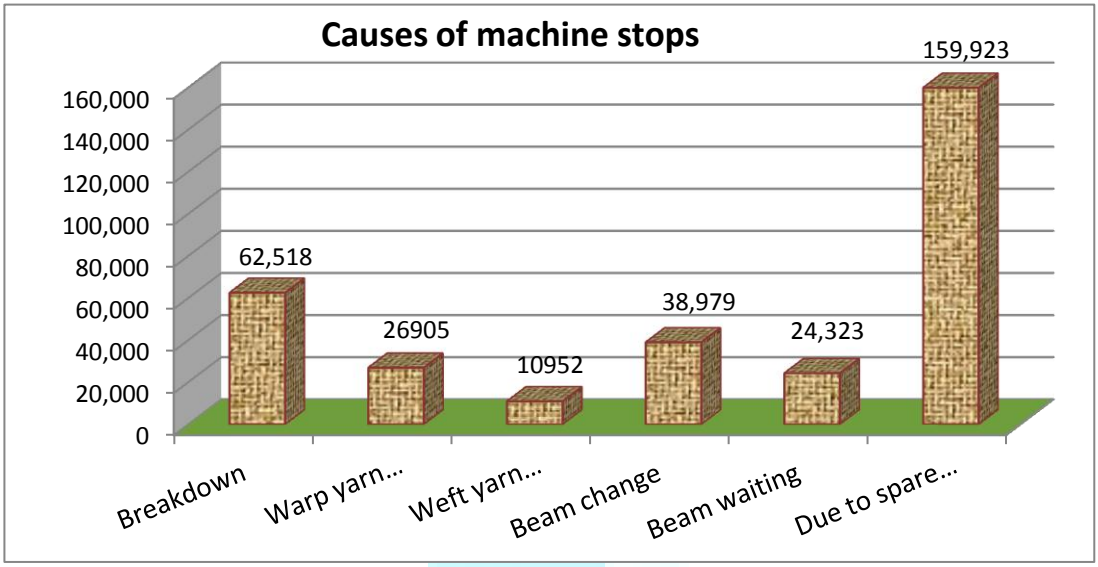
TABLE 2: REASONS FOR WEAVING MACHINE STOPS

Months	*Lost production (meters)*	*Break down*	*Warp yarn breaks*	*Weft yarn breaks*	*Beam change*	*Beam waiting*	*Due to spare parts*	*Power interrupt*
July	186410	5160	2512	873	2350	921	24170	94
August	87601	844	2335	789	1050	31	8653	99
September	297162	6480	2646	987	7060	530	5760	360
October	203843	3515	2625	905	3583	2158	10032	10246
November	198735	6042	2410	1012	5989	5404	11175	23
December	168989	4357	2087	978	8147	4735	6427	0
January	123607	4304	1896	836	2015	1504	15408	1665
February	121021	4754	2170	893	2458	1880	14376	9
March	140392	6562	2230	912	1255	1699	16244	2.5
April	146679	6890	1987	886	1811	3734	14352	184
May	140973	7080	1989	985	1639	877	14976	3.5
June	135250	6530	2018	896	1622	850	18350	2.5
Total	**1,950,662**	**62,518**	**26,905**	**10,952**	**38,979**	**24,323**	**159,923**	**12,689**

(*Source: Author's analysis from ATSC Firm data*)

The company loses about 323,600 meters per weaving machine of grey fabric annually due to the maintenance problem (figure 4). The major contributors of the loss includes: shortages of spare parts 49.4%, due to machine break down 19.3 %, due to beam change 12.1 %, due to warp yarn breakages 8.3%, due to beam waiting 7.5% , and due to weft yarn breakages 3.4 %. Therefore, about 70% of machine stops is due to the maintenance problems (machine breakdown and spare parts) and the study has been focused on the machine breakdowns. High machine breakdown leads to serious problems of low productivity. And the machine breakdown is due to incorrect adjustment, poor cleaning, and due to poor lubrication and oiling systems. Moreover, there is no suitable preventive maintenance plans to avoid machine breakdown.

FIGURE 4: CAUSES OF MACHINE STOPS IN ATSC



(*Source: Author's analysis from ATSC Firm data*)

Generally, the maintenance system of the company is based on poor integration of all functions and processes in the organization, which results in: high maintenance cost, less availability and reliability of equipments, high total maintenance hour and man hour, frequent failure of machineries, low profit, low production, and low workers dissatisfactions.

4. METHODS

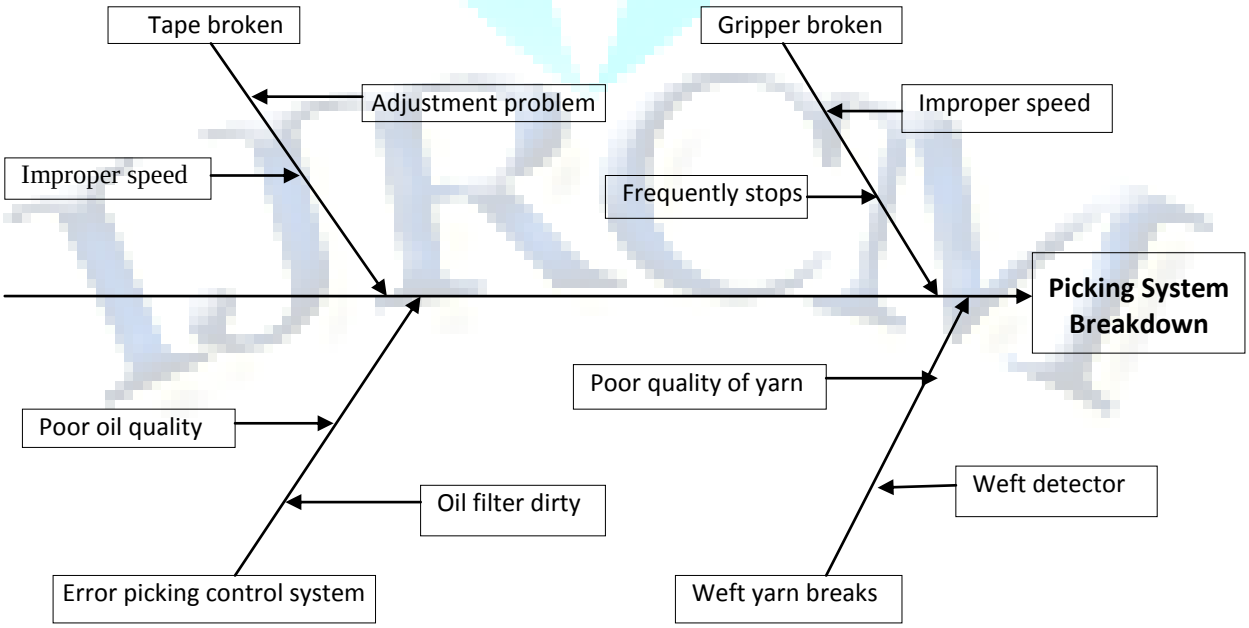
It is necessary to consider the improvement of mean time between failure (MTBF) and mean time to repair (MTTR) based on the data shown on table 2. The main problem of inefficiency is weaving machine breakdown. There are several causes for weaving machine breakdown, for example driving system, control system, shedding system, loom reed, picking – gripper problem, tuck-in system, lenos system as shown in table 3.

TABLE 3: CAUSES OF MACHINE BREAKDOWN IN ATSC (*SOURCE: AUTHOR'S ANALYSIS FROM ATSC FIRM DATA*)

	Before Preventive Maintenance		After Preventive Maintenance	
Causes of breakdown	Frequency *(Times/month)*	Average breakdown *(Hours/ month)*	Frequency *(Times/month)*	Average breakdown *(Hours/ month)*
Picking system (gripper)	4.73	37.8	1.03	7.50
Driving system	1.50	28.0	0.43	8.20
Control system	1.10	11.4	0.00	0.00
Shedding system	1.40	17.8	0.45	5.85
Loom reed	1.33	26.3	0.60	4.20
Tuck-in system	2.67	24.2	0.75	7.00
Lenos system	0.53	2.85	0.00	0.00
Total	**13.26**	**148.35**	**3.26**	**32.75**

The main cause of breakdown is picking mechanism that accounts an average of 37.8 hours per month and frequency of breakdown is 4.73 times per month. The cause and effect diagram has been considered to analyze the causes of breakdown due to picking mechanism (gripper problem). This helps to take corrective actions.

FIGURE 5: CAUSE AND EFFECT DIAGRAM OF PICKING SYSTEM BREAKDOWN



5. DISCUSSION

After the information of machine breakdown was studied and analyzed with cause and effect diagram, the maintenance plan is set as a daily, weekly, and monthly maintenance. Daily maintenance composes of cleaning, lubrication and adjustment plans. By working with maintenance plan, the average production output during 2012 fiscal year (September, October, and November) was 299,545 meters/machine. Before planned maintenance, it was 160,794 meters/machine and the output increased up to nearly 86.1 % to meet the target.

The results of comparing the machine performance before and after preventive maintenance are as follow. It was found that the weaving machine availability was 91.81% or increased by 28.9% while the percentage of machine breakdown was decreased to 62.91%. In contrast, mean time between failures: MTBF was increased to 122.70 hours/time while lost of machine breakdown was decreased 6.5%. Mean time to repair: MTTR was decrease to 10.05 hours/time and average of machine breakdown/month was decreased from 148.35 hours/month to 32.75 hours/month. Then, the efficiency of production before and after Preventive maintenance was compared. Production was more effective as shown by the increase of average efficiency to 138,571 meters/month/machine.

6. CONCLUSION

A preventive maintenance technique has utilized to improve the performance efficiency of machine in this study. As the information obtained from this study, machine breakdown times are analyzed. The data presented above shows many causes of system breakdowns. Due to the productivity improvement, preventive maintenance programs could be done for the higher machine capacity utilization and save the ATSC Textile manufacturing firm cost.

7. RECOMMENDATIONS

Based on the analysis and discussions done so far, the solutions of this study improvement have been summarized as follows: 1) Instructor's manual for setup the balance shedding was necessary, 2) Daily maintenance inspection should set and used, 3) Well-trained operators are necessary for understanding the importance of the daily lubrication of parts and cleaning weaving machines, 4) It is necessary to set the weekly changing spare parts plan for each weaving machines, 5) Plan the annual lubrication oil changing and check the lubrication systems every two months, 6) Inspection manual for setup the weaving machine.

REFERENCES

1. B.S Dhillon, (2002), "Engineering Maintenance – A modern approach", CRC press, London, UK.
2. B.S Dhillon, (2006), "Maintainability, Maintenance, and Reliability for Engineers", Taylor and Francis, New York.
3. Gaither, N. and Fraizer, G. (1999), "Production Operations Management", 8th ed, SW college, USA.
4. Paul, D. Tomlingson, (1993), «Effective Maintenance », USA.
5. Stevenson, W.J. , (1999), "Production Operations Management", 6th ed, Boston McGraw.

REQUEST FOR FEEDBACK

Dear Readers

At the very outset, International Journal of Research in Commerce, IT & Management (IJRCM) acknowledges & appreciates your efforts in showing interest in our present issue under your kind perusal.

I would like to request you tosupply your critical comments and suggestions about the material published in this issue as well as on the journal as a whole, on our E-mail**infoijrcm@gmail.com** for further improvements in the interest of research.

If youhave any queries please feel free to contact us on our E-mail infoijrcm@gmail.com.

I am sure that your feedback and deliberations would make future issues better – a result of our joint effort.

Looking forward an appropriate consideration.

With sincere regards

Thanking you profoundly

Academically yours

Sd/-
Co-ordinator

DISCLAIMER

The information and opinions presented in the Journal reflect the views of the authors and not of the Journal or its Editorial Board or the Publishers/Editors. Publication does not constitute endorsement by the journal. Neither the Journal nor its publishers/Editors/Editorial Board nor anyone else involved in creating, producing or delivering the journal or the materials contained therein, assumes any liability or responsibility for the accuracy, completeness, or usefulness of any information provided in the journal, nor shall they be liable for any direct, indirect, incidental, special, consequential or punitive damages arising out of the use of information/material contained in the journal. The journal, nor its publishers/Editors/ Editorial Board, nor any other party involved in the preparation of material contained in the journal represents or warrants that the information contained herein is in every respect accurate or complete, and they are not responsible for any errors or omissions or for the results obtained from the use of such material. Readers are encouraged to confirm the information contained herein with other sources. The responsibility of the contents and the opinions expressed in this journal is exclusively of the author (s) concerned.

ABOUT THE JOURNAL

In this age of Commerce, Economics, Computer, I.T. & Management and cut throat competition, a group of intellectuals felt the need to have some platform, where young and budding managers and academicians could express their views and discuss the problems among their peers. This journal was conceived with this noble intention in view. This journal has been introduced to give an opportunity for expressing refined and innovative ideas in this field. It is our humble endeavour to provide a springboard to the upcoming specialists and give a chance to know about the latest in the sphere of research and knowledge. We have taken a small step and we hope that with the active co-operation of like-minded scholars, we shall be able to serve the society with our humble efforts.

Our Other Journals