BUSITEMA UNIVERSITY
Pursuing Excellence

FACULTY OF ENGINEERING

DEPARTMENT OF GINNING AND TEXTILE

PREDICTION OF YARN BREAKAGE ON RING FRAME BY FAILURE MODE AND EFFECT ANALYSIS USING FUZZY LOGIC

BY

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A FINAL YEAR PROJECT REPORT SUBMITTED IN PARTIAL FULFILLMENT OF THE REQUIREMENTS FOR THE AWARD OF BACHELOR OF SCIENCE IN TEXTILE ENGINEERING DEGREE OF BUSITEMA UNIVERSITY 2018

FINAL YEAR PROJECT REPORT FOR LUBA LAWRENCE

BU/UG/2014/96

DECLARATION

I LUBA LAWRENCE Reg no BU/UG/2014/96 hereby declare that this project research is my original work and that the information contained in this project is out of my hard work and research, except where explicit citation has been made and it has not been presented to any Institution of higher learning for any academic award.

Signature ..... Lawrence

Date 23/05/2018

APPROVAL

This is to certify that the project under the title "*prediction of yarn breakage on ring frame by failure mode and effect analysis using fuzzy logic*" has been made under my supervision and is now ready for examination.

Supervisors;

Name: Dr. NIBIKORA Ildephonse

Signature: .....

Date: .....

Name: Mr. KASEDDE Alfan

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ACKNOWLEDGEMENT

I would love to extend my gratitude to a number of people who have managed to contribute towards my education.

I would like to thank the almighty God for giving me the strength to do my final year project research successfully.

I thank all the management of Busitema University, department of Ginning and Textile Engineering for the support and the encouragement.

I also acknowledge the love and care of my family and loved ones, for all the financial, moral, Spiritual, and physical support.

Lastly, to all my course mates with whom I studied with at Busitema University, thank you for your team cooperation.

DEDICATION

I dedicate this project reseach to my family members who have been there for the in the times when I needed them most.

I also dedicate it to my well-wishers for your support morally, materially and academically and all my classmates for the unity and togetherness in this period we have spent together here at campus.

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LIST OF ACRONYMS

FMEA.....FAILURE MODE AND EFFECT ANALYSIS

S.....SEVERITY

O.....OCCURANCE

D.....DETECTABILITY

RPN.....RISK PRIORITY NUMBER

MF.....MEMBERSHIP FUNCTION

FIS.....FUZZY INFERENCE SYSTEM

SSE.....SUM OF SQUARE ERROR

RMSE.....ROOT MEAN SQUARE ERROR

PREDICTION OF YARN BREAKAGE ON RING FRAME BY FAILURE MODE AND EFFECT ANALYSIS (FMEA) USING FUZZY LOGIC

1.0 CHAPTER ONE

1.1 INTRODUCTION

In a textile mill, spinning is one of the most important processes in the production line, which is the heart of the production. Ring spinning is the most widely used spinning technology today because it is universally applicable that is to say can spin all kinds of yarn, its flexible regarding product types and qualities, easy to operate and delivers yarn with good characteristics (Begum, 2011).One basic way to increase profit and quality in the ring spinning process is to keep the end breakage rate to a minimum level. The end breakage rate is a critical spinning parameter that not only affects the maximum spindle speed but may also indicate the quality of yarn, the mechanical condition of the machine and the quality of raw materials. Therefore, it is an important parameter which determines the overall working of a spinning mill. Generally two approaches have been used in studies to predict yarn breakage on the ring frame: theoretical approaches (HUANG, 1994) and statistical approaches (Ghosh .A, 2004). Statistical or empirical models have relatively higher predictive power than theoretical models. Multiple regression analyses are the most common statistical methods. However, of recent artificial neutral network has been used to predict the end breakage rates of ring spinning polyester cotton yarn (Bo, 2011). It is an efficient and powerful tool for quality prediction. However, the approaches used in predicting yarn breakages earlier have limitations therefore there are needed to opt for a better approach for predicting yarn breakage. One of the most powerful methods available for measuring the reliability and quality of products or process is failure mode and effect analysis (FMEA) incorporating fuzzy theory in prediction of yarn breakage on the ring frame is developed in this research

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