ST. MARY'S UNIVERSITY

SCHOOL OF GRADUATE STUDIES

Root causes analysis on-timely product delivery problem in BerhanenaSelam Printing Enterprise

By

Debebe W/senbet Misganaw

ID No: SGS/0477/2012A

June, 2021

Addis Ababa, Ethiopia

ROOT CAUSES ANALYSIS ON-TIMELY PRODUCT DELIVERY PROBLEM IN BERHANENA SELAM PRINTING ENTERPRISE

By

DEBEBE W/SENBET MISGANAW

ID No: SGS/0477/2012A

A THESIS SUBITTED TO ST. MARY'S UNIVERSITY, SCHOOL OF GRADUATE STUDIES, IN PARTIAL FULFILLMENT OF THE REQUIREMENTS FOR THE DEGREE OF MASTERS OF BUSINESS ADMINISTARTION

June, 2021

Addis Ababa, Ethiopia

DECLARATION

I,Debebe W/senbet, declare that the thesis "**Root causes analysis on-timely product delivery problem in Berhanena Selam Printing Enterprise"** is my original work under the guidance and suggestion of the Research advisor.It is offered for the partial fulfilment of the requirement for the degree of Master of Business Administration .The thesis has not been submited for any degree in St.Mary's university or any other university and all sources of material used for the project have been appropriately acknowledged.

Name _____ Signature _____

Date _____

C E R T I F I C A T ION

This is to certify that Debebe W/senbet Misganaw, student of MA in Business Administration St.Mary's University, School of graduate studies, has been working under my supervision and guidance for this project work.Here the thesis entitled "**Root causes analysis on-timely delivery problem in BerhanenaSelam Printing Enterprise"**which he has now submitted is genuine and original work.

Name _____ Signature _____

Date _____

ST. MARY'S UNIVERSITY

SCHOOL OF GRADUATE STUDIES

FACULITY OF BUSINESS

ROOT CAUSES ANALYSIS ON-TIMELY PRODUCT DELIVERY PROBLEM IN

BERHANENA SELAM PRINTING ENTERPRISE

BY

DEBEBE W/SENBET MISGANAW

ID No: SGS/0477/2012A

APPROVED BY BOARD OF EXAMINERS

_____	_____	_____
Advisor	Signature	Date
_____	_____	_____
Dean, Graduate Stud	Signature	Date
_____	_____	_____
External Examiner	Signature	Date
_____	_____	_____
Internal Examiner	Signature	Date

Acknowledgements

It is my pleasure to thank my advisor, Assistant Prof. Tiruneh Legesse, for his guidance and encouragement in preparing and finishing this project work. Most genuine gratitude goes to my best friends and others who have helped me in giving feedback, printing and collecting questionnaires. Mostly they have helped me in many ways to accomplish this program from the beginning. I thank you very much all of you. I am also grateful for the BSPE's employees who have shown their sincere co-operation in filling and returning of questionnaires in time.

Lastly, I would like to thank my classmates, who have helped me in providing various materials and support me in providing constructive ideas in this project.

Thank you,

Debebe W/senbet

Acronyms

BSPE-BerhanenaSelam Printing Enterprise

CT - Cycle Time

CTR -Cycle Time Reduction

LVHV - Low-Volume High-Variety

MTO -Make-To-Order

NPT -Non-Productive Time

NV - Non Value

OTD -On- Time Delivery

OPD - Original Promised Date

OTR -On-Time Receipt

PT - Productive Time

RCA -Root Cause Analysis

RCCA -Root Cause Corrective Action

KPI-Key performance indicators

Table of Contents

List of Figure

List of Tables

Table page no

Abstract

On-Time Delivery is an order fulfillment metric in which the supplier delivers the complete order at the right time. Coordinating the buyer's and supplier's demand planning processes can greatly increase On-Time Product Delivery percentages. BerhanenaSelam Printing Enterprise is one of a huge governmental organization in Ethiopia. However, the company usually faces a problem of not able to delivery its products on time. Therefore the general objective of this research is to identify the root causes of on- time product delivery problems in the Enterprise. While its specific objectives are:- to identify evidence for the dalliance of Jobs in the company,and to identify job delay factors. In doing the identification work top factors/causes of delay have been identified through a literature survey.

Data was collected through questionnaire and personal observation prepared based on various scholars work. The validity of the instrument was checked by the company's production professionals.Qualitative approach with descriptive method was used in this paper.Descriptive statistics and mean were utilized to analyze the data. Interpretation is made on the mean, frequency, and percentage of the data.

Findings of the research indicated that the root causes on-timely product delivery problem of Berhanenaselam printing Enterrprise are:-Obsolete technology, Shortage of equipment, Inadequate modern equipment, Inadequate production of raw material in the country, Low efficiency of equipment, Frequent equipment breakdowns, Ineffective project planning and scheduling, Shortage of printing materials, and Escalation of material prices.

Based on the major findings what is implied is discussed and recommendations are given to each delay factors.

The problems are not specifically happen in one section of the production department but they would be indicated in each section in one or in other way.Therefore, the company should see each of the root causes and take corrective actions on each to improve on-timely product delivery.

Key Term: - On-Time Delivery, Delay factor, Supply chain

CHAPTER ONE

INTRODUCTION

In this chapter Back ground of the study, Statement of the problem,Research questions, Objective , Definition of important terms , Significance of the study,Scope of the study,and Organization of the study will be presented.

1.1.Background of the Study

One of the main challenges that a low-volume high-variety (LVHV) product manufacturing industry faces is to improve customer on- time delivery (OTD) against the original promised date (OPD) in a make-to-order (MTO) situation. A systematic root-cause analysis is carried out in the LVHV industry to find the true root cause and eliminate it.

The current market place needs optimized design–for-use, frequent design changes, and smaller production runs of greater variety, all with fluctuating demands. On- time delivery (OTD) is one of the top industrial metrics that needs to be met by the firm's original promised date (OPD) to the customer. To improve OTD, on-time receipt (OTR) of material from suppliers and subcontractors is required. To achieve any realistic and sustained improvement in OTD performance, all the functional units and associated systems must be considered. The system and the people involved in the planning and manufacturing for the control and maintenance cycles of LVHV situations are integrated with a user interface to support CFT operations through basic and transactional data.

The multi- product industry offers a variety of choices; but again, in a multi-product situation, it is difficult to meet all the requirements of the customer's package with detailed specifications (Forslund,H.Johnsson, P. & Mattsson, S-A, 2009). Industries intend to meet these demands by offering a wide variety of products. Industries that try to satisfy the rapidly changing needs and wants of customers quickly with appropriate products have an advantage over their competitors.Inresponse to technological innovation and constantly varying customer requirements, a shift from conventional mass production to batch production has accelerated in

recent years (Agarwal,A.,Minis,I.& Nagi,R.,2000).Modular product design is one of the productive ways of achieving product variety(Alford,D.,Sackett,P.&Nelder,G.,2000). The modular approach enables producers to offer a greater range of end products without increasing the variety of components (McCutcheon,D.M., Raturi, A.S. &Meredith, J.R., 1994; Alford et al.2000). Through the use of modularity to configure the design of product variations, the negative impact of product variety on operational performance can be reduced (Jina, J., Bhattacharya, A.K. &Walton, A.D., 1997). A mature industry must consider product familiar synergy and achieve commonality between components and subsystems (McDermott, C.M. &Stock, G.N., 1994). Industries can offer high variety in the market through component-sharing while retaining low variety in their operations (Ramdas, K., Fisher, M. & Ulrich, K., 2003); but this is not common to all industrial products. In 2016, Mandal found that firmsface challenges in remaining in the market due to increasing customer preferences for newer technologies.

LVHV increases purchasing and material costs (Ulrich, K.&Randall,T.,2001). Increased purchasing costs can be mainly attributed to the increase in variety and the reduction in volume of purchased parts and components (Fisher, M.L. & IttnerC.D., 1999). Suppliers may experience losses due to component variety, with a potentially negative impact on component prices,delivery times,and component inventory levels (Forza,C.,Rungtusanatham,M.& Salvador,F.,2002).In LVHV manufacturing, it is difficult to develop the most profitable partnership with the supplier in achieving delivery quantity, frequency, and price(Jina et al.,1997). Increasing product variety increases the costs and complexity of manufacturing (Alford et al., 2000). When product variety increases, the performance of the firm's internal operations decreases due to higher direct manufacturing costs increased manufacturing overheads, longer delivery times, and higher inventory levels (Forza et al., 2002). With an increase in variety, assembly line balancing becomes problematic, and component planning and production scheduling become more complex (Fisher, M.L., MacDuffie, J.P. & Sethuraman, K., 1996). Focusing on the MTO environment and using queuing models, conditions were created in which an increase in product variety improves both individual product performance and system performance (Gupta, D. & Srinivasan, M.M., 1998).

Increasing variety has an impact on various logistics and operational costs. Variety includes many indirect costs that are difficult to predict, and are often neglected when making decisions about introducing variety (Martin, M. & Ishii, K., 2002).

This paper deals the case of Berhanenaselam Printing Enterprise in which there is a problem of on-time product delivery. To overcome this problem a root causes analysis is needed. Based on this root causes analysis some recommendations have been given.

1.2. Statement of the Problem

On-Time Delivery is an order fulfillment metric in which the supplier delivers the complete order at the right time. There are different types of factors contributing to on-time delivery problem.Identifying those problems and try to give solution is very crucial for the success of any company.Most of the time companies using Make-to-order have products with low volume high variety.

Low volume high variety increases purchasing and material costs in the production work (Ulrich, K.& Randall,T.,2001). Increased purchasing costs can be mainly attributed to the increase in variety and the reduction in volume of purchased parts and components (Fisher, M.L. & Ittner C.D., 1999). Suppliers may experience losses due to component variety, with a potentially negative impact on component prices,delivery times,and component inventory levels (Forza,C.,Rung tusanatham,M.& Salvador,F.,2002).In LVHV manufacturing, it is difficult to develop the most profitable partnership with the supplier in achieving delivery quantity, frequency, and price (Jina et al.,1997). Increasing product variety increases the costs and complexity of manufacturing (Alford et al., 2000). When product variety increases, the performance of the firm's internal operations decreases due to higher direct manufacturing costs increased manufacturing overheads, longer delivery times, and higher inventory levels (Forza et al., 2002). With an increase in variety, assembly line balancing becomes problematic,and component planning and production scheduling become more complex (Fisher, M.L., MacDuffie, J.P. & Sethuraman, K., 1996).

Everyone must be fully aware of possible shipping lead times, along with delays, and the full logistics of actually receiving order. Achieving a high On-Time Delivery % requires planning

on both sides. Buyers need to have dynamic demand planning processes so that they know exactly which pieces are needed for a given Job. The supplier should also be demand planning, so they are not caught off guard with orders they cannot fulfill. Co-ordinating the buyer's and supplier's demand planning processes can greatly increase On-Time product Delivery percentages. With On-Time Delivery visibility, every person involved in a Job is able to see exactly where an order is, where it is going, when it will arrive, and, most importantly, whether something is wrong. On-time product delivery is one of the most important factors in the collection of money. Problems related to not able to deliver on time causes to have a very high amount of fine. In addition to this, it causes loose of customers.

Therefore, it is very important for every service or product providers to identify whether there is a problem of on-time product delivery in their company.Unless and otherwise companies can identify the root causes of on-time product delivery problem and put possible solution to solve the problem, they can not resist market compitition.

BerhanenaSelam Printing Enterprise (BSPE) is one of a make-to-order company,which has a LVHV products.The company faced on-time product delivery problem.But,there is no study regarding the root causes of delay in the company.As a result of this ,it is very important to identify evidence for the dalliance,to identify Job delay factors ,and to give solutions to the identified factors of deliance.

Therefore, the purpose of this study is to assess root causes analysis on-timely product delivery problem in the Enterprise

1.3.Research questions

Based on the above stated problem the study has tried to address the following research questions:-

1. What are the evidence for delay of Jobs in the company?
2. What are the factors contributing to Job delays in the organization?

1.4. Objective

Establishing the end goal is the core of any study. Accordingly, this study has the following general and specific objectives.

1.4.1. General Objective

The general objective of this research is to identify the root causes of on-time delivery problems in BerhanenaSelam Printing Enterprise (BSPE).

1.4.2. Specific Objectives

The specific objectives of the study are

1. To identify evidence for the dalliance of Jobs in the company.

2. To identify Job delay factors.

1.5. Definition of important terms

Consultant refers to a person who provides expert advice professionally.

Contractor refers to a person or firm that undertakes a contract to provide materials or labor to perform a service or do a job.

Design refers to a plan or documents produced to show the look and function of object before it is made.

Design documents refers to the drawings, specifications and other design documents required by this Contract and created (or, where the context requires, to be created) by the Contractor for the performance of the Works.

Design engineer refers to a person who study, research and develop ideas for new products and the systems used to make them.

Site investigation refers to the process of collecting information, assessment of the data and reporting potential hazards beneath a site or printing area.

Sub-contractor refers to a firm or person that carries out work for a company as part of a larger project.

1.6. Significance of the Study

In BSPE there is no root causes analysis for delayed delivery which can help for decision making. Now a days a company which can identify its main problem in detail will have a good look at on the problem and it is possible to give solution on the matter or even it is possible to minimize the problem or to force it to stay as it is as long as its impact is not significant.Therefore,having the root causes of on-time delivery problem can help the organization to identify in which area is the problem arises, what action should be taken to overcome such type of problems, what will be the relation between the organization and suppliers to improve the delivery on time and all other matters can be seen if there is a good root cause analysis.

A root cause analysis allows an employer to discover the underlying or systemic, rather than the generalized or immediate, causes of an incident. Correcting only an immediate cause may eliminate a symptom of a problem, but not the problem itself. Therefore, the root cause analysis study has significance.

At the very basic level, root cause analysis is a methodology used to find the underlying cause of the defect. As it signifies to product development, Root cause analysis is a systematic procedure for putting the defects in categories and analyzing them before release, after the release or both. When RCA is performed properly, it shows the points in the development cycle that are causing the main and recurring defects. Root Cause Corrective Action (RCCA) is when corrective actions are applied to solve the problems that occur during RCA. The corrective

actions are carried out far upstream in the procedure as possible, as catching failures upstream prevents rework, saves time and money by not letting the problem to take place.

The main benefit of RCA is that it finds the fundamental errors in the development process, enabling teams to enact right measures to fix the problems and stop them from recurring ahead. Hence, there is lesser rework and fewer defects in the final product.

1.7.Scope of the Study

Conducting research on root causes of on-timely delivery problems in printing Enterprises throughout Ethiopia will be very complex, specially for beginners.It is also time consuming to do so. As a result, the researcher has focused on one governmental organization namely, Berhanenaselam Printing Enterprise. The enterprise has 3 branches in Ethiopia, of these 2 are located at Addis Ababa while the other one is in Awassa. Hence, the study was carried out in all branches found in Addis Ababa and departments found at the head quarter focusing on the production department.This study did not consider National Examination and Assessment Agency Job-orders.When jobs of the agency started, all other works related to the job will be closed.Not only this but also the company will purchase all the necessary material or resouce at the stated price.Due to this there is no delliance in the agency work.

1.8.Organization of the Study

The study paper comprises five chapters. The first chapter is introduction of the study. Chapter two is concerned with review of related literature. In this chapter, other scholars work is reviewed and presented with proper acknowledgment. The third chapter deals with research design and methodology.In this chapter, research design,population and sampling design,types of data to be collected and used,methods of data collection,data analysis methods,and data quality assurance are discussed.Chapter four discussed about results and disscussion. The last chapter of the paper deals with summary of major findings, conclusions, and recommendations.

CHAPTER TWO

REVIEW OF RELATED LITERATURE

In most counties printing work is in a digital level.Due to this, it is very difficult to get on-time product delivery problm like our country.As a result ,it is very difficult to get a direct literature related to this.Therefore ,taking identified problems in the construction industries will give high-light to identify root causes of delliance.

2.1.Introduction

There is some similarity in the printing sector and in the construction sector in the process of their work. In printing sector works are done based on job orders .Similarly there is a job order in construction too. In both sectors the works have a limited time of period for completion. After a Job completed another new Job will be started .The main difference may lies on in printing enterprises the machineries are fixed in one place and works its part in its fixed area or place. While in Construction Company, there is a free movement of machineries in which they are needed.

In both sectors service will be delivered by a high capacity, knowledgeable, and equipped with the necessary machineries contractors. In both sectors there are clients, consultant and contractor. As long as there is similarity in the process and the problem faced in both sectors, taking inputs in the construction sector in to the printing sector will not have a problem.It is well known that better study is done in causes of dalliance in construction companies than in printing sectors. Having these ideas, the next literature review will be based on the construction company and the related important points will be taken for the printing company too.

In most countries, experience and the literature revealed that successful construction projects should be completed before project due dates and within budget. Therefore, causes of time delay are of critical importance to the profitability of most construction projects. Many researchers, in the literature, have identified these problems as factors that affect the delay in

construction projects and will affect company's performance and overall economy of the country as well. The delay in construction projects by many factors is usually linked to the performance of time, cost, and quality.

A construction project is commonly acknowledged as successful when it is completed on time, within budget, in accordance with specifications and to stakeholders'satisfaction. In construction industry, contractors tend to maximize their profit for market growth. To achieve this aim, it is crucial for contractors'to carefully identify the factors that affect the success of projectand estimate their impacts before bidding stage. The same thing should be done in printing too.Construction projects may differ in size, duration, objectives, uncertainty, complexity, pace and some other dimensions. Delay means non-completion of project within the specified duration agreed upon in contract. It is widely accepted that construction project schedule plays a key role in project management due to its influence on project success (V. Luu, S. Kim, N. Van Tuan, S. Ogunlana, 2009). Delays are common in various construction projects and cause considerable losses to project parties. The common results of delays are as follows:(1) Late completion of project; (2) Increased cost; (3) Disruption of work; (4) Loss of productivity; (5) Third party claims;(6) Disputes; and (7) Abandonment or termination of contracts. Therefore, delays in construction projects give rise to dissatisfaction to all involved parties. Most correspondents agreed that financial difficulties faced by the contractor and too many change orders by the owner are the leading causes of construction delay. Severe weather conditions and changes in government regulations and laws ranked among the least important causes (G. Sweis, R. Sweis, A. Hammad, and A. Shboul, 2008).

There are other reasons for the dalliance of delivery of products. The following can be taken as some of the reason for delay of delivery:-cycle time, cycle time reduction, scale of economies, product variety, plant performance measures, and supply chain.

2.2.Factors Contributing to Delay

Construction industry has a very poor reputation in copingwith delays. Delay analysis is either ignored or done subjectivelyby simply adding a contingency. As a result, many major projects fail to meet schedule deadlines.

As the process of construction projectis very complicated with combination of various parties'endeavors, many stages of work carrying a long period till the completion; there are many factors that contribute with delay causes in construction projects. In 2006, M. Sambasivan and Y.Soon investigated the causesand effects of delays facingin the Malaysian construction industry. A questionnaire was designed and distributed among the three major groups of participants (Owners, Consultants, and Contractors). They identified main causes of delay and ten (10) most important causes were as follows: (1) Contractor's improper planning;(2) Contractor's poor site management; (3) Inadequate contractor experience; (4) Inadequate owner's finance and payments for completed work; (5) Problems with sub-contractors;(6) Shortage in material; (7) Labor supply; (8) Equipment availability and failure; (9) Lack of communication between parties; and (10) Mistakes during the construction stage. They identified main effects of delay and they were as follows: (1) Time overrun; (2) Cost overrun; (3) Disputes; (4) Arbitration ;(5) Litigation; and (6) Total abandonment.

In 1997, P. Kaming, P. Olomolaiye, G. Holt and F. Harris examined thirty-one (31) high-rise projects in Indonesian construction projects. They identified eleven (11) variables of delays. They pointed out that the most important factors were as follows: (1) Design changes; (2) Poor labor productivity; (3) Inadequate planning; and (4) Resource shortages.

In 2010, F. Fugar and A. Agyakwah-Baah focused on delays for constructing building projects in Ghana. The study sought the views of owners, consultants, and contractors on the relative importanceof the factors that cause delays in building construction projects in Ghana. The study showed that all the three groups of respondents generally agreed that out of a total of thirty-two (32) factors the top ten influencing factors in causing delay arranged in descending order of importance are as follows: (1)Delay in honoring certificates; (2) Underestimation of the costs of projects; (3) Underestimation of the complexity of projects;(4) Difficulty in accessing bank credit; (5) Poor supervision;(6) Underestimation of time for completion of projects by contractors;(7) Shortage of materials; (8) Poor professional management;(9) Fluctuation of prices/rising cost of materials; and(10) Poor site management. The thirty-two (32) factors were categorizedinto nine major groups and were ranked. The results show that owners, consultants, and contractors all agreed that the financing group of delay factors was the most influential factor.Material factors were considered the second most important factor causing delay in

construction projects followed by scheduling and controlling factors. In 2011, M. Haseeb, X. Lu, A. Bibi, M. Dyian and W. Rabbani mentioned the thirty-seven (37) factors that cause delay and their effects on the success and completion of project and grouped into seven (7) groups. The most common factor of delay is natural disaster in Pakistan like flood and earthquake and some others like financial and payment problems, improper planning, poor site management, insufficient experience, shortage of materials, and equipment. They covered the delay factors and cause of delay and some suggestion for reducing these delays in large construction projects in Pakistan. In 2005,S. Han ,and in 2007 , I. Dikmen, M. Birgonul, S. Hanassumed that a total number of twenty-three (23) risk factors stemming from project and country levels lead to cost overrun risk. According to their risk model, nine (9) factors were affecting country risk, and fourteen (14) factors were causing project risk. They proposed a fuzzy risk assessment methodology to quantify cost delay risk in construction projects and developed a tool to implement the proposed methodology.

A computer program was developed for an international construction company, and applicability of this system, during risk assessment at the bidding stage, was tested by using real company and project information.Identification and categorization of delay factors by synthesis of the existing literature are as follows :(1) Consultant Related Factors category was identified as one of the delay causes groups in construction projects. Several studies have identified consultant related factors causing delays (A. Odeh and H. Battaineh, 2002; D. Long, S. Ogunlana, T. Quang and K. Lam, 2004; S. Assaf and S. Al-Hejji, 2006). Based on these studies, the researcher identified eight (8) factors of consultant related delays; (2) Contractor Related Factors category were identified as second group of delay causes.

Several studies have identified contractor related factors causing delays (S. Ogunlana, K. Promkuntong and V. Jearkjirm, 1996; D. Chan and M. Kumaraswamy, 1997; M. Abd-Majid and R. McCaffer, 1998; A. Odeh and H. Battaineh, 2002; D. Long, S. Ogunlana, T. Quang and K. Lam, 2004; S. Assaf and S. Al-Hejji, 2006). Based on these studies, the researcher identified thirteen (13) factors of contractor related delays; (3) Design Related Factors category were identified as another group of delay causes. Several studies have identified design related factors causing delays (D. Chan and M. Kumaraswamy,1997;S. Assaf and S. Al-Hejji,2006).Based on these studies, the researcher identified eleven (11) factors of design related delays; (4) Equipment Related Factors category was identified as fourth group of delay causes. Several studies have identified equipment related factors causing delays (S. Ogunlana et

al., 1996; D. Chan and M. Kumaraswamy, 1997; M. Abd-Majid and R. McCaffer, 1998; A. Odeh and H. Battaineh, 2002; D. Long et al., 2004; S. Assaf and S. Al-Hejji, 2006) Based on these studies, the researcher identified seven (7) factors of equipment related delays; (5) External Related Factors category was identified as another group of delay causes.

Several studies have identified external related factors causing delays (S. Ogunlana et al., 1996; A. Al-Momani, 2000; A. Odeh and H. Battaineh, 2002; D. Long et al., 2004; S. Assaf and S. Al-Hejji, 2006). Based on these studies, the researcher identified seventeen (17) factors of external related delays; (6) Labor Related Factors category was identified as sixth group of delay causes. Several studies have identified labor related factors causing delays (S. Ogunlanaet al., 1996; D. Chan and M. Kumaraswamy, 1997; M. Abd-Majid and R. McCaffer, 1998; A. Odeh and H. Battaineh, 2002; S. Assaf and S. Al-Hejji, 2006).Based on these studies, the researcher identified nine (9) factors of labor related delays; (7) Material Related Factors category was identified as another group of delay causes.

Several studies have identified material related factors causing delays(D. Chan and M. Kumaraswamy,1997;M. Abd-Majid and R. McCaffer,1998;A. Odeh and H. Battaineh,2002;Y. Frimpong, J. Oluwoyeand L. Crawford,2003;S. Assaf and S. Al-Hejji,2006). Based on these studies, the researcher identified nine (9) factors of material related delays; (8) Owner Related Factors category were identified as eighth group of delay causes. Several studies have identified owner related factors causing delays (S. Ogunlana et al., 1996; A. Odeh and H. Battaineh, 2002; D. Long et al., 2004; S. Assaf and S. Al-Hejji, 2006). Based on these studies, the researcher identified nineteen (19) factors of owner related delays; and (9) Project Related Factors category was identified as ninth and final group of delay causes.

Several studies have identified project related factors causing delays (D. Chan and M. Kumaraswamy, 1997; S. Assaf and S. Al-Hejji, 2006; I. Dikmen, 2007).Based on these studies; the researcher identified six (6) factors of project related delays.

Job Delay Factors

There are ninety-nine (99) factors and are categorized into nine(9) major categories .The delay factors are stated as follows:- (1) Lack of consultant experience in construction projects;(2) Conflicts between consultant and design engineer; (3) Delayin approving major changes in scope of work by consultant; (4)Delay in performing inspection and testing; (5) Inaccurate site investigation; (6) Inadequate project management assistance;(7) Late in reviewing and

approving design documents; (8)Poor communication and coordination between owner and contractor; (9) Frequent change of subcontractors; (10) Inadequate contractor experience; (11) Inappropriate construction methods; (12) Incompetent project team; (13) Ineffective project planning and scheduling; (14) Obsolete technology; (15)Poor communication and coordination between owner and consultant; (16) Poor site management and supervision; (17)Rework due to errors; (18) Unreliable sub-contractors; (19)Inadequate site investigation; (20) Inappropriate contractor'spolicies; (21) Poor financial control on site; (22) Complexity of project design; (23) Design changes by owner or his agent during construction; (24) Design errors and omissions made by designers; (25) Insufficient data collection and survey before design; (26) Lack of design team experience in construction projects; (27) Mistakes and delays in producing design documents;(28) Misunderstanding of owner's requirements by design engineer; (29) Poor use of advanced engineering design software; (30) Unclear and inadequate details in drawings;(31) Incomplete project design; (32) Defective design made by designers; (33) Equipment allocation problem; (34) Frequent equipment breakdowns; (35) Improper equipment; (36)Inadequate modern equipment; (37) Low efficiency of equipment;(38) Shortage of equipment; (39) Slow mobilization of equipment; (40) Accidents during construction; (41) Changes in government regulations and laws; (42) Different tactics patterns for bribes; (43) Delay in obtaining permits from municipality; (44) Delay in performing final inspection and certification by third party; (45) Delay in providing services from utilities (water, electricity, etc.); (46) Global financial crisis;(47) Loss of time by traffic control and restriction at job site; (48) Sudden failures actions; (49) Price fluctuations; (50)Problem with neighbors; (51) Slow site clearance; (52) Unexpected surface & subsurface conditions (soil, water-table,etc.); (53) Unfavorable weather conditions;(54) Inadequate production of raw material in the country; (55) Inappropriate government policies; (56) Thefts done on site; (57) Absenteeism;(58) Low motivation and morale of labor; (59) Low productivity of labor; (60) Personal conflicts among labor; (61)Shortage of labor; (62) Slow mobilization of labor; (63) Labor strikes due to revolutions; (64) Unqualified/inadequate experienced labor; (65) Labor injuries on site; (66) Changes in material types and specifications during construction; (67) Damage of sorted materials; (68) Delay in manufacturing materials;(69) Escalation of material prices; (70) Late delivery of materials;(71) Poor procurement of construction materials; (72)Poor quality of construction materials; (73) Shortage of construction materials; (74) Unreliable suppliers; (75) Change orders; (76) Conflicts between joint-ownership; (77) Delay inapproving design documents; (78)

Delay in progress payments (Funding problems); (79) Delay in site delivery; (80) Improper project feasibility study; (81) Lack of capable representative;(82) Lack of owner experience in construction projects; (83)Lack of incentives for contractor to finish ahead of schedule;(84) Poor communication and coordination between consultantand contractor; (85) Slowness in decision making; (86)Suspension of work by owner; (87) Inadequate planning;(88) Mode of financing and payment for completed work;(89) Long period between design and time of bidding/tendering;(90) Inappropriate contractual procedure; (91) Additional work; (92) Bureaucracy in bidding/tendering method; (93)Selecting inappropriate contractors; (94) Complexity of project (project type, project scale, ...etc.); (95) Inadequate definition of substantial completion; (96) Ineffective delay penalties; (97)Legal disputes between project participants; (98) Original contract duration is short; and (99) Unfavorable contract clauses.

The type of delays discussed above fit for the printing sectors too. Therefore, they were changed to the printing sector and were used for the intended purpose.

2.3. Cycle time (CT)

Multiple ways can be used in defining the term “cycle time” based on the type of company, industry, firm or organization. When defining CT in manufacturing industries, it can be stated based on the average time should it take to process a product starting from receiving of the raw materials up to when the product is complete. For service organization or industry CT can be defined or expounded in relation to the time a customer states his or her needs (or wants) and the total time should it take to complete the requested service. A manufacturing cycle comprises all activities starting the order entry stage up to shipping stage (Swamidass and Majerus, 1991). CT comprises process time during which a work piece is processed or machined so that to bring the work piece closer to final shape or size and delay time, in which the work piece is spent whilst waiting to go to the subsequent step (Sreelekshmy et al., 2013). In a standard and straight forward concept, cycle time comprises both VA activities and NV activities times, e.g. order entry, inspection time, processing time, storage time, transportation time, and waiting time. Production cycle time include non-production time and production time. Production time can be explained in comparison to technological time, manufacturing

time and set-up time, non-technological time, control time, transportation time, and packaging time. CT helps to improve the sustainability and competitiveness of an industry (Chen, 2013). Likewise, shorter CT is reported to have a great impact on the 'operational planning in production', and it also helps in improving the efficiency of the 'customer order fulfillment' (Stalk, 1998); Hopp and Spearman, 2008).

In 2014, Patel and Shah define 'cycle time' as the time necessary to accomplish a certain task or activity at each well-defined station. Typically, there is a relationship between 'cycle time' and 'service time (ST)'. The CT is larger than the ST.Likewise,in 2014,Anyaeche and Adegbilero explain CT in comparison to the differences between the beginning of the particular task and completion. Additionally, CT should comprise both non-productive and productive work along with any identified 'idle time' (Anyaeche and Adegbilero, 2014). Furthermore, Chen (2013) explains CT as a manufacturing lead time or flow time of a given task or job with consideration to the time needed for the job to be accomplished in the particular industrial unit. Thus, mathematically 'cycle time' can be given by equations (1) and (2) (Patel and Shah, 2014).

$$\text{Cycle time} = \text{Service time} + \text{Idle Time} \quad (1)$$

$$\text{Cycle time (CT)} = \frac{\text{Useful production time available per day}}{\textit{Output per day}} = \frac{T}{Q} \quad (2)$$

Figure 1 shows various manufacturing cycle time factors. These factors should be reduced as much as possible in the manufacturing industries**.**

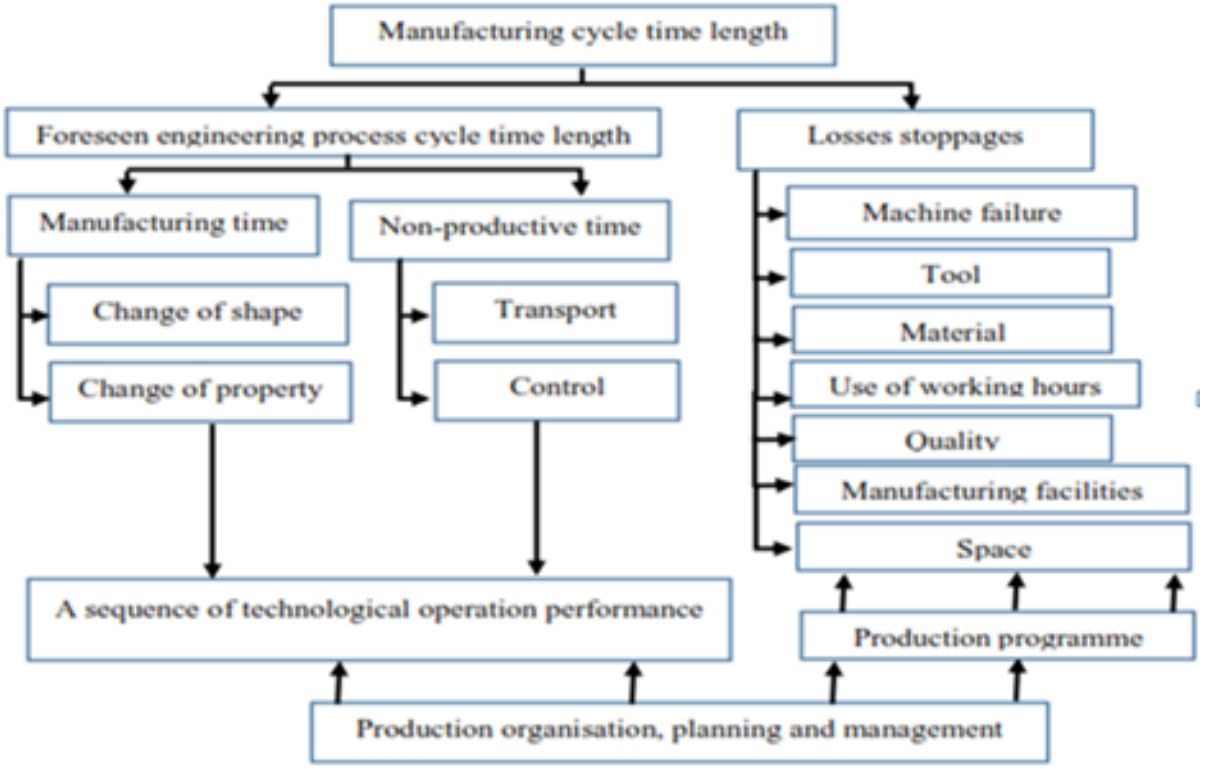

Figure 1:-Several factors on manufacturing cycle time duration (Jovanovic et al. 2014)

2.4.Cycle time reduction

Cycle time reduction (CTR) stands in the side of minimizing CT which can be done by recognizing and employing more efficient and proficient (effective) techniques in accomplishing systematically defined tasks. Such a practice necessitates reducing or plummeting all the NV tasks or activities. The NV tasks or activities are activities which do not increase value or improve value to the particular product, i.e. the absence of such activities has no known effect on the produced outputs. There are numerous instances of the 'non-value added' activities to which the CT gets plummeted or removed in manufacturing industries. Such examples include machine set-up, repair due to defects, test inspection, schedule delays, et cetera. The process of reducing the 'cycle time' can have a substantial influence on the 'bottom line' of a company if the appropriate techniques become instigated (KumbharNiranjan and Satpute,2014b).In 2014b,Kumbhar et al.explain cycle time reduction on how it provides

tremendous benefit to any manufacturing company. The process of reducing cycle time means a decrease of the non-value added activity (Hetzel, 1993). By doing so, there are some of the benefits from this reduction as follows: reduced costs, better-quality communication, lead to rationalized processes, improve on-time delivery (dependability), upsurge throughput for the company, lessen the process variability and enhance schedule integrity (Leachman and Ding, 2011; Kumbhar et al., 2014b).

The research by Chen (2013) provides insightful concepts on the importance of being able to shorten the task or job cycle time for the industry. The pointed out reasons include: first; each received order or job epitomizes a great 'opportunity cost' for the particular industry or firm, and in case that there is a long CT, then this implies that it is challenging to change the "opportunity cost into profits" in the short-range (Saraswat, Kumar and Kumar Sain, M.,2015). Second; lengthy job'cycle times' have a negative impact on the accretion of the 'work-in-progress (WIP)'. Such a situation result to complicate or challenge the entire management of the shop floor.

2.5. Scale of economies

Manufacturing companies are continuously facing the challenge of operating their manufacturing processes and systems in order to deliver the required production rates of high quality products of increasing complexity, with limited use and waste of resources.

Coping with product variety forces a manufacturing firm to confront a fundamental firm to confront a fundamental trde-off the increased revenue that can result from more variety versus increased costs through the loss of scale economies.Faced with this trade off, manufacturers may follow one of two divergent paths:

1) Low variety and a "focused factory," or

2) High variety and flexible manufacturing

Scale economies result when fixed cost inputs can be distributed over an increasingly high volume of a standardized output.Incontrast, economies of scope result from complementarities in production processes that allow a variety of products to be produced more cheaply in

combination, using low-volume batches, than individually in high-volume batches (Panzer and Wilig, 1982, Goldhar and Jelinek,1983).Flexible,programmable technologies increase the feasibility of achieving economies of scope and offer managers the possibility of customizing products for the consumer without paying the increasing costs of product variety. However, as observed by Jaikumar (1986), simply procuring flexible manufacturing systems is nopanacea for handling the complexity arising from product variety.

2.6.The Impact of Product Variety on Manufacturing Performance

There are many ways in which product variety might be expected to decrease productivity and quality in automotive assembly plants. As the number of platforms and body styles increases within a plant, it may lead to higher set-up costs at the body framing area due to switching between platforms and body styles. As both parts and option complexity increase, direct labor productivity and quality might suffer, as production workers face a more complicated array of different parts- and less predictable combinations of parts to install. Balancing the assembly line for consistent cycle times at each work station also becomes more difficult due to multiple models and varied option combinations. Line speed must be set to accommodate the vehicles (and sequence of vehicles) requiring the most assembly time. These latter types of complexity may have an even greater negative impact on indirect labor productivity. The tasks facing production support staff become more complex, both within the assembly plant (e.g. scheduling machines, performing setups, parts inspection and delivery, rework for quality defects) and in dealing with suppliers (e.g. scheduling parts deliveries,expediting parts orders, and coordinating negotiations and other communications).

2.7.Plant Performance Measures

Productivity:-Productivity reflects the efficiency with which physical inputs have been transformed in to outputs. Different productivity measures can be computed depending on the treatment of inputs and outputs (Hayes, Wheel wright, and Clark, 1988). Single factor productivity measures the output per unit of a single input such as labor, capital, or materials. Total factor or multifactor productivity measures the ratio of output to a weighted sum of all

input types. Using labor hours rather than financial data alleviates the problems associated with differences in wages, accounting treatments, and exchange rates that are typically encountered in international comparisons, but over looks differences in capital inputs between plants.While it is theoretically desirable to include measures of capital and other inputs, it can be difficult to acquire these data and ensure their comparability across countries.

2.8.Supply Chain

A supply chain is a structure that includes a complete production and the operational process and encompasses the upstream raw materials to downstream product sales (Christopher, 2016). A supply chain is a process established by all of the partner firms, including suppliers, manufacturers, distributors and retailers (Stadtler, 2015). A successful supply chain is a chain in which all partners must understand each other and must have a good relationship to meet all of their missions and objectives (Shieh-Liang, Tran, & Ha, 2016) and also achieve superior competitive capabilities, such as those related to cost, quality, delivery, and flexibility (Joshi, Nepal, Rathore, & Sharma, 2013). In addition, product innovation is also be deemed to be a competitive capability (Wong, C. W., Wong, C. Y., &Boonitt, 2013; Vickery, Koufteros, &Droge, 2013). Thus, a successful supply chain also means the achievement of product innovation capabilities.

To improve a successful supply chain, close integration and co-ordination are usually deemed to be critical factors (Lii&Kuo, 2016; Panayides, 2017). Resources usually involve capacity, equipment, humans, and other factors.The ability to adjust and redistribute resources is needed when manufacturers and their partners are handling existing orders but then new orders come in. This ability allows them to immediately analyze and integrate existing available resources and further adjust or redistribute them to address the new orders (Fischl, Scherrer-Rathje, &Friedli, 2014).

To improve resource adjustment and redistribution ability, the information used by manufacturers and partners in production and operations should be completely transparent. Information transparency means that related internal resource information, including capacity, human

resources, equipment, and others, should be fully released (Shou, Zheng, & Zhu, 2016). When all information is released, manufacturers and partners are able to understand the resource usage situation and quickly adjust and redistribute available resource to address a new order.

In establishing integration, manufacturers and partners should first formulate a cooperative-conscious construct (Wang, Childerhouse, Kang, Huo, & Mathrani, 2016; Liao, Kuo, & Ding, 2017). Based on the conscious construct, there is a need to further integrate physical and information resource flows (Rodrigues, Dalcol, Pizzolato, & Maruyama, 2013; Świerczek, 2014). When the physical and information resource flows are integrated, partners can effectively collaborate with regard to any production activity in the supply chain, which will further increase the practical efficiency and satisfy the requirements of businesses' and customers' orders (Soliman, 2015).

Some studies have explored how use information technology to improve supply chain integration (Tseng & Liao, 2015; Vanpoucke, Vereecke, & Muylle, 2017).However, establishing integration among partners is difficult (Mason & Lalwani, 2006). In 2009,Hsieh and Hung noted that the main reason for this difficulty is that different partners may have different, possibly conflicting, objectives. Coordination is communication among partners (Mustafa Kamal & Irani, 2014; Qrunfleh & Tarafdar, 2014) and can sometimes require a negotiation (Panda, Modak, & Pradhan, 2015). To effectively coordinate, related studies usually provide valuable suggestions from two perspectives. The first perspective is the development of a coordination mechanism, such as designing information communication technology (Ghobakhloo, Tang, Sabouri, & Zulkifli, 2014; Liu, Shang, & Lai, 2015) or management skills (GAO & Tian, 2014; Masten & Kim, 2015).

Some barriers can be solved through coordination, but some barriers may be difficult to solve through coordination because these barriers are derived from the external environment or the individual partner's internal structure and need to be solved by a specific approach. Therefore, studies have begun to identify and explore these barriers. For example, in 2014, Awasthi and Grzybowska defined 17 barriers that affect the establishment of integration, and in 2016, Byrom, Lawley, and Clements found barriers that may affect the establishment of physical and information resource integration. Additionally, Lam (2013) indicated that the method of maintaining the partners' relationships is the big- gest barrier after coordination.

In addition to integration and coordination, recently, a few studies, such as those by Colurcio, Caridà, and Edvardsson (2017); Chiadamrong and Piyathanavong (2017), found that manufacturers and their partners who possess resource adjustment and redistribution ability may affect the improvement of the supply chain. According to the concept of Fischl, Scherrer-Rathje, & Friedli in 2014, a resource usually involves capacity, equipment, humans, and others. When any order is taken, the manufacturer and its partners need to analyze the order demands and make further plans related to their resources to handle the order. The resource adjustment and redistribution ability means that when manufacturers and their partners are handling existing orders but a new order appears, they can quickly analyze and integrate their existing available resources and further adjust or redistribute resources to address the new order (Fischl et al., 2014)

CHAPTER THREE

RESEARCH DESIGN AND METHODOLOGY

The purpose of this chapter is to describe the research methodology .The procedures applied to collect data, the study area population and sampling and data analysis techniques.

3.1.Research Design

Qualitative research approach with descriptive research methods were used in the study. Descriptive method set out to describe and to interpret what is going on. Descriptive research, according to Best (1970, quoted in Cohen, Lawrence, & Keith, 2000, p. 169) is concerned with "conditions or relationships that exist; practices that prevail; beliefs, points of views, or attitudes that are held; processes that are going on; effects that are being felt; or trends that are developing." Descriptive researches are more concerned with facts.

Accordingly, this study has attempted to describe Root causes analysis on-timely product delivery problem in BerhanenaSelam Printing Enterprise.

3.2.Population and Sampling Design

BerhanenaSelam Printing Enterprise has a total of 1,200 Employees based on the company human resource information and payroll of April 2021.Of these 900 are workingin the production department while others are in support department. This study targeted in the production department in which there is a high level of dalliance in the production and delivery process.Therefore, the total population size to be 900.

As stated above, the total population of the study is 900 employees. As stated by Singh (2006, p.6) "descriptive research typically uses larger samples; it is sometimes suggested that one should select 10-20 per cent of the accessible population for the sample." Accordingly, this

study has utilized the maximum which is 20% of the population size. Therefore, the study's sample size of 180 is fair enough to represent the population.

In order to give equal chance to all employees, questionnaires were distributed to 2 branches and 1 main office in Addis Ababa using simple random sampling method.25 questionnaires were distributed to each branch and 130 to the main office. The total distributed questionnaires were 180.

Distribution of questionnaires

Description	No of questionnaires distributed
Main office	130
Abuare Branch	25
Merhatibeb Branch	25
Total Distributed questionnaires	180

3.3.Types of Data to be collected and used

Employees of the factory have complete and up to date information on matters which are taking place in the organization. Therefore, instead of focusing on delayed jobs taking information from the direct participant or employees facing the problem can give short and precise answer to the problem in hand. As a result, the primary source of data has been the employees who are working in the factory.

3.4.Methods of Data Collection

Demographic variables such as gender, age, educational background and the like were directly collected from employees through questionnaire. Besides, variables such as main dalliance factor or root causes of delay were collected mainly through questionnaire.

Data on previous works conducted in the subject matter were reviewed from related literature mainly from books, journals, bulletins, and others.

Questionnaires were administered by the researcher.Finally of the total distributed questionnaires, 140 were returned in time.Of these, 5 questionnaires were filled by an employee

who is not covered in the study. Hence, it reduces the usable questionnaires to 135 which implies response rate of 75 %.

The main research instrument utilized in this study is questionnaire. The questionnaire contains two parts. The first part is about demographic characteristics of respondents. This part consists of five items such as gender, age, educational background,and year of service in BSPE.

The second part is related to the research questions. 90 items were developed on a five-point Scale.Respondents were requested to choose their level of agreement on a given item as follows. 5 “Very high effect , ”4“High effect,” 3 “Average effect”, 2 “Little effect” and 1 “Very little effect”.The 90 items were divided in to 8 categories.These are Contractor Related Factors, Design Related Factors, Equipment Related Factors, External related factors, Labors related factors, Materials Related Factors, Owner Related Factors, and Job related factors

3.5. Data Quality Assurance

Validity

As stated earlier, the questionnaire was developed with due care containing 95 items, 5 of which are demographic items. Delay factor measurements were adopted from various scholar works.Items in the questionnaire were prepared using a five point scale except the demographic items.Maximum effort was exerted to create logical link between the items in the questionnaire and the objectives of the study.

Therefore, in order to ensure content validity of the items incorporated in the instrument two professionals have examined the instrument before it was distributed.One of these professionals is production manager of the company and the other one is the production head of the company.Besides, the instrument was given to my advisor and my friend to comment on it. Accordingly, based on their comments the questionnaires were distributed to the sample population.

3.6.Data Analysis Methods

The 140 questionnaires collected from respondents were first checked if any unintended respondents have filled or to identify any damaged questionnaire. Accordingly, 5 have been found in the questionnaires and it was eliminated.The usable sample size remains 135.Then, the 135 questionnaires were sorted.

After completion of inserting data in the computer, various statistical analysis tools were utilized.Demographic variables were measured using descriptive statistics and frequencies. Counting and percentage is used to interpret the data. They are presented using tabulation.The 90 items developed to assess the root causes of on time delivery problem of the company were also measured using descriptive statistics and frequencies. Data are presented using tabulation. Lastly major findings are interpreted based on the result.

3.7. Ethical Considerations

The researcher addressed ethical considerations and keep the privace.Before starting the work,approval for conducting the study was obtained from the HRM department of BSPE.Following this,the questionnaires was given out to the respondents.This research has been directed in conformity with the informed consent of participants.A guarantee was given to the respondents that their names would not be exposed in the research study and that results from the research would be presented only interms of general findings and that information about specific participants would not be realeased.The participants were then guaranted of the privacy and confidentiality of the results which could increase the probability of truthful answer to the questions.

CHAPTER FOUR

RESULTS AND DISCUSSION

As discussed earlier, questionnaire was designed and distributed to 180 employees of the Enterprise who are currently working in the company. Accordingly, 140 questionnaires were returned, of these 5 questionnaires were filled by an employees who are not covered in the study, and these questionnaire were excluded from the study. As a result, the usable number of questionnaires is reduced to 135 which are about 75% of the total distributed questionnaires. The response rate is fair enough to represent the sample.

4.1.Response Rate

The first part of the questionnaire consists of five items about demographic information of the respondents.It covers the personal data of respondents, such as gender, age, educational background,and year of service in the company. The following subsequent tables will reveal the total demographic characteristics of the respondents.

Table 4-1 Summary of respondents'age, gender, educational back ground, and year of service

Gender of respondents	Age of respondents						Total	Percentage
	20-24	25-29	30-34	35-39	40-44	Above 45		
Male	3	4	4	13	22	39	85	63
Female	1	3	3	10	13	20	50	37
Total	4	7	7	23	35	59	135	100
Educational background	Certificate	Diploma (12+2)	BA/BSC	MA	Other		Total	
Number of respondents	15	58	45	7	10		135	
Year of service	1-5	6-10	11-15	16-20	Above 20		Total	
Number of respondents	3	7	15	45	65		135	

Source: own Survey data, 2013

As shown in table 4-1, of the total respondents 63% (85) were male and the remaining 37% (50) were female. With regard to respondents' age category, the highest group of respondents i.e. 59 (43.70 %) fall under age category of above 45. The next higher group 35 (25.93%) and 23 (17.03%) fall under age category of 40-44 and 35-39 respectively. This implies that about 86.67% of the respondents are above 35 years of age. The company is said to be filled by aged workers. The remaining group 7 (5.19 %), 7(5.19 %) and 4(2.96 %) are under age category of 30-34, 25-29 and 20-24 respectively.

The above table 4-1 also demonstrates educational background of the respondents.As indicated in the table, 58(42.96%) of the total respondent are holder of diploma followed by first degree holders 45(33.33%).This implied that the company has fairly educated employees.

The company has been in operation for moret han 95 years.The above table 4-1 indicated that about 48 %(65) of the total respondents have more than 20 years of service in BSPE.This indicates ,they can be well experienced in thier field of work.

4.2.Evidence for the delay of Jobs in BSPE

From BSPE marketing department data base 2020 information regarding Job were obtained and presented below.Since the organization has a very high transactions in the second and in the third quarters, the data taken for the evidence of whether there is a problem of dalliance of Job has been taken in the stated period.Data in the second and third quarters that is from October to March 2020 was taken and summarized as follows:-

Table 4-2 Summary of evidence for the presence of delayed product delivery in BSPE

S/n	Printing type	Performance measurement level								
		Total no of jobs	Job completed before its agreed time		Job completed on its agreed time		Job delayed up to 7 days before delivery		Job delayed more than 7 days before delivery	
			No	%	No	In %	No	In %	No	In %
1	Seal Printing	575	72	12.52	20	3.48	180	31.30	303	52.70
2	Governmental news paper (Eth.press)	383	107	27.94	261	68.15	8	2.09	7	1.82
3	Private news paper	257	25	9.73	154	59.92	75	29.18	3	1.17
4	Other gov. news paper	167	25	14.97	74	44.31	65	38.92	3	1.80
5	NegaritGazita	76	16	21.05	1	1.32	16	21.05	43	56.58
6	Books printing	13	5	38.46	-	-	2	15.38	6	46.15
7	Security printing	127	57	44.88	4	3.15	13	10.24	53	41.73
8	Other printing	332	49	14.76	7	2.11	42	12.65	234	70.48
9	Organizational own use printing	42	1	2.38		-	6	14.29	35	83.33
Overall perform. %ge		1,972	357	21	521	20	407	19	687	40

Source:-BSPE marketing department data base 2020

From the above table 4-2:-for the year 2020 budget year of the company, the available jobs for the second and third quarters were 1,972 out of this 357(21%) of the jobs were completed before its agreed time.Whereas, 521(20%) of the total jobs were completed on the stated promised day.While, the remaining jobs which is 1094(49%) did not meet the stated promised date of delivery.This indicated that there were a problem of on-timely product delivery in the company.

4.3. Job delay factors analysis and interpretation

4.3.1. BSPE Related Factors of delay

The respondents were asked to rank Contractor related factors contributing to job delliance. Table 4-3 shows the results of Contractor related factors contributing to the delliance of Job in BSPE.

Table 4-3:-BSPE Related Factors contributing to delay

Items	Frequency					Total valid responses	Mean	Rank
	1	2	3	4	5			
Frequent change of subcontractors	8	-	53	53	23	135	3.61	4
Inadequate contractor experience	38	15	23	45	15	135	2.89	11
Inappropriate printing methods	-	38	38	45	15	135	3.28	6
Incompetent project team	15	38	8	53	23	135	3.22	7
Ineffective Job planning and scheduling	-	-	8	83	45	135	4.28	2
Obsolete technology	-	-	15	23	98	135	4.61	1
Poor communication and coordination between owner and consultant	8	8	23	68	30	135	3.78	3
Poor production management and supervision	15	30	45	23	23	135	3.06	9
Rework due to errors	8	23	23	53	30	135	3.56	5
Unreliable subcontractors	23	15	45	45	8	135	3.00	10
Inadequate-production-area investigation	23	8	38	53	15	135	3.22	7
Inappropriate contractor's policies	15	15	53	38	15	135	3.17	8
Poor financial control on production	23	30	38	38	8	135	2.83	12
Total	173	218	405	615	345	6,008	44.50	

Table 4-3 shows that "Obsolete technology" , "Ineffective Job planning and scheduling," and " Poor communication and coordination between owner and consultant " with an average mean value of 4.61,4.28,and 3.78 respectively are the first three important types of delliance factors which are significantly affecting the Job time. However, "Frequent change of subcontractors",

"Rework due to errors", and "Inappropriate printing methods" with an average mean value as 3.61,3.56 and 3.28 respectively are at 4th,5th,and 6th respectively in ranking Contractor related factors affecting the Job time. Whereas, "Inadequate production area investigation"and "Incompetent project team", "Inappropriate contractor's policies" ,"Poor production management and supervision","Unreliable subcontractors","Inadequate contractor experience"and " Poor financial control on production" with an average mean value as 3.22,3.17,3.06,3,2.89 ,and 2.83 respectively are at 7th,8th,9th,10th,11th and 12th respectively in ranking Contractor related factors.

4.3.2. Design Related Factors of delay

The respondents were asked to rank Design related factors contributing to job delliance. Table 4-4 shows the results of Design related factors contributing to the delliance of Job in BSPE.

Table 4-4 Design Related Factors contributing to delay

Items	Frequency					Total valid responses	Mean	Rank
	1	2	3	4	5			
Complexity of Job design	15	45	30	30	15	135	2.89	8
Design changes by owner or his agent during printing	-	15	30	68	23	135	3.72	1
Design errors and omissions made by designers	15	30	68	15	8	135	2.78	10
Insufficient data collection and survey before design	-	30	45	53	8	135	3.28	5
Lack of design team experience in printing Jobs	8	23	45	30	30	135	3.39	4
Mistakes and delays in producing design documents	-	30	38	45	23	135	3.44	3
Misunderstanding of owner's requirements by design engineer(design document preparer)	15	38	53	15	15	135	2.83	9

Poor use of advanced engineering design software	8	15	38	30	45	135	3.67	2
Unclear and inadequate details in documents	-	38	60	23	15	135	3.11	7
Incomplete Job design	8	23	60	30	15	135	3.17	6
Defective design made by designers	8	30	53	30	15	135	3.11	7
Total	75	315	518	368	210	4,778	35.39	

Table 4-4 shows that “Design changes by owner or his agent during printing” , “Poor use of advanced engineering design software” ,and " Mistakes and delays in producing design documents"with an average mean value of 3.72,3.67,and 3.44 respectively are the first three important types of delliance factors which aresignificantly affecting the Job time. However, “Lack of design team experience in printing Jobs”, “Insufficient data collection and survey before design” ,and “Incomplete project design” with anaverage mean value as 3.39, 3.28 and 3,17 respectively are at 4th, 5th,and 6th respectively in ranking Design related factors affecting the Jobs time. Whereas, “Defective design made by designers”, and“Unclear and inadequate details in documents”, “Complexity of Jobs design” ," Misunderstanding of owner’s requirements by design engineer(design document preparer)", and " Design errors and omissions made by designers"with an average mean value as 3.11,2.89,2.83 and 2.78 respectively are at 7th , 8th , 9th , and 10th respectively in ranking Design related factors.

4.3.3. Equipment Related Factors of delay

The respondents were asked to rank Equipment related factors contributing to job delliance. Table 4-5 shows the results of Equipment related factors contributing to the delliance of Jobs in BSPE.

Table 4-5 Equipment Related Factors contributing to delay

Items	Frequency					Total valid responses	Mean	Rank
	1	2	3	4	5			
Equipment allocation problem	8	23	45	38	23	135	3.33	4
Frequent-equipment breakdowns	8	8	15	8	98	135	4.33	2
Improper equipment	15	8	30	45	38	135	3.61	3
Inadequate modern equipment	-	-	23	30	83	135	4.44	1
Low efficiency of equipment	-	8	15	38	75	135	4.33	2
Shortage of equipment	-	8	8	38	83	135	4.44	1
Slow-mobilization-of equipment	30	30	15	38	23	135	2.94	5
Total	60	83	150	233	420	3,705	27.44	

Table 4-5 shows that “Inadequate modern equipment” and “Shortage of equipment” with the average means value of 4.44 is the first important types of Equipment related factors which are significantly affecting the Job time. However,“Frequent equipment breakdowns”,and “Low efficiency of equipment” with the average mean value of 4.33 are the second important types of Equipment related factors which are significantly affecting the Jobs time. Whereas," Improper equipment","Equipment allocation problem",and "Slow mobilization of equipment" with an average mean value as 3.61,3.33 and 2.94 respectively are at 3rd , 4th,and 5th respectively in ranking Equipment related factors.

4.3.4. External Related Factors of delay

The respondents were asked to rank External related factors contributing to job delliance. Table 4-6 shows the results of External related factors contributing to the delliance of Jobs in BSPE.

Table 4-6 External Related Factors contributing to delay

Items	Frequency					Total valid responses	Mean	Rank
	1	2	3	4	5			
Accidents during printing process or at time of operation	23	45	30	15	23	135	2.78	7
Changes in government regulations and laws	30	38	23	30	15	135	2.72	8
Different tactics patterns for bribes	-	30	30	60	15	135	3.44	4
Delay in obtaining permits from ministry of revenue to print	60	15	15	38	8	135	2.39	10
Delay in performing final inspection and certification by third party	68	15	-	38	15	135	2.39	10
Delay in providing services from utilities (water, electricity, etc.)	23	38	23	53	-	135	2.78	7
Global financial crisis.	-	30	23	38	45	135	3.72	3
Loss of time by traffic control and restriction at job site	53	15	38	23	8	135	2.39	10
Sudden failures actions	60	-	23	38	15	135	2.61	9
Price fluctuations	-	15	15	68	38	135	3.94	2
Problem with neighbors	53	15	15	38	15	135	2.61	9
Slow site clearance	-	38	38	38	23	135	3.33	5
Unfavorable weather conditions	38	15	45	23	15	135	2.72	8
Inadequate production of raw material in the country	-	-	15	60	60	135	4.33	1
Inappropriate government policies	53	23	23	30	8	135	2.39	10
Thefts done on production area	8	30	60	15	23	135	3.11	6
Total	465	360	413	600	323	6,435	47.67	

Table 4-6 shows that “Inadequate production of raw material in the country”,“Price fluctuations” ,and “Global financial crisis"with an average mean value of 4.33,3.94,and 3.72 respectively are the first three important types of delliance factors which are significantly affecting the Jobs time. However, “Different tactics patterns for bribes”, “Slow site clearance”,

and “Thefts done on production area” with an average mean value as 3.44,3.33, and 3,11 respectively are at 4th, 5th, and 6th respectively in ranking External related factors affecting the Job time. Whereas, “Accidents during printing process or at time of operation”and "Delay in providing services from utilities (water, electricity, etc.)", “Changes in government regulations and laws" and "Unfavorable weather conditions","Sudden failures actions"and"Problem with neighbors","Delay in obtaining permits from ministry of revenue to print","Delay in performing final inspection and certification by third party","Loss of time by traffic control and restriction at job site"and "Inappropriate government policies"with an average mean value as 2.78,2.72,2.61 and 2.39 respectively are at 7th , 8th , 9th,and 10th respectively in ranking External related factors.

4.3.5. Labors Related Factors of delay

The respondents were asked to rank Labors related factors contributing to job delliance. Table 4-7 shows the results of Labors related factors contributing to the delliance of Job in BSPE.

Table 4-7 Labors Related Factors contributing to delay

Items	Frequency					Total valid responses	Mean	Rank
	1	2	3	4	5			
Absenteeism	8	45	38	15	30	135	3.11	5
Low motivation and morale of labor	8	23	30	53	23	135	3.44	2
Low productivity of labor	15	15	23	53	30	135	3.50	1
Personal conflicts among labor	30	45	30	15	15	135	2.56	7
Shortage of labor	15	15	30	60	15	135	3.33	4
Slow mobilization of labor	-	30	45	38	23	135	3.39	3
Labor strikes due to revolutions	75	-	23	15	23	135	2.33	9
Unqualified / inadequate experienced labor	30	30	23	45	8	135	2.78	6
Labor injuries on production area	23	68	8	30	8	135	2.50	8
Total	203	270	248	323	173	3,638	26.94	

Table 4-7 shows that “Low productivity of labor”, “Low motivation and morale of labor” ,and “Slow mobilization of labor" with an average mean value of 3.50, 3.44, and3.39 respectively are the first three important types of delliance factors which are significantly affecting the Job time. However, “Shortage of labor”, “Absenteeism” ,and “Unqualified/inadequate experienced labor” with an average mean value as 3.33,3.11 and 2.78 respectively are at 4th, 5 th, and 6th respectively in ranking Labors related factors affecting the Job time. Whereas, “Personal conflicts among labor”, “Labor injuries on production area”, and " Labor strikes due to revolutions" with an average mean value as 2.56,2.50, and 2.33 respectively are at 7th , 8th , and 9th respectively in ranking Labors related factors.

4.3.6. Materials Related Factors of delay

The respondents were asked to rank material related factors contributing to job delliance. Table 4-8 shows the results of material related factors contributing to the delliance of Job in BSPE.

Table 4-8 Material Related Factors contributing to delay

Items	Frequency					Total valid responses	Mean	Rank
	1	2	3	4	5			
Changes in material types and specifications during printing process	-	8	38	45	45	135	3.94	3
Damage of sorted materials	8	15	60	38	15	135	3.28	7
Delay in manufacturing materials	-	38	45	30	23	135	3.28	7
Escalation of material prices	-	-	38	45	53	135	4.11	1
Late delivery of materials	-	15	15	60	45	135	4.00	2
Poor procurement of printing materials	8	23	23	38	45	135	3.67	6
Poor quality of printing materials	8	-	30	60	38	135	3.89	4
Shortage of printing materials	-	8	23	53	53	135	4.11	1
Unreliable suppliers	-	23	30	45	38	135	3.72	5
Total	23	128	300	413	353	4,590	34.00	

Table 4-8 shows that “Escalation of material prices”and "Shortage of printing materials", “Late delivery of materials”,and"Changes in material types and specifications during printing process" with an average mean value of 4.11,4.00,and 3.94 respectively are the first three important types of delliance factors which are significantly affecting the Job time. However, “Poor quality of printing materials”, “Unreliable suppliers”, and “Poor procurement of printing materials” with an average mean value as 3.89,3.72,and 3.67 respectively are at 4th, 5th, and 6th respectively in ranking material related factors affecting the Job time. Whereas, “Damage of sorted materials”and “Delay in manufacturing materials"with an average mean value as 3.28 are at 7th in ranking material related factors.

4.3.7. Owner Related Factors of delay

The respondents were asked to rank owner related factors contributing to job delliance. Table 4-9 shows the results of owner related factors contributing to the delliance of Job in BSPE.

Table 4-9 Owner Related Factors contributing to delay

Items	Frequency					Total valid response	Mean	Rank
	1	2	3	4	5			
Change orders	8	23	38	53	15	135	3.33	5
Conflicts between joint-ownership	68	8	23	30	8	135	2.28	15
Delay in approving design documents	8	23	45	53	8	135	3.22	7
Delay in progress payments (Funding problems)	15	8	45	45	23	135	3.39	4
Delay in site delivery or delay in completing previous work and start the new.	23	8	45	45	15	135	3.17	8
Improper Jobs feasibility study	45	30	8	38	15	135	2.61	13
Lack of capable representative	15	8	23	53	38	135	3.67	1
Lack of owner experience in printing Jobs	8	8	53	45	23	135	3.50	2
Lack of incentives for contractor to finish ahead of schedule	8	15	60	45	8	135	3.22	7

Poor communication and coordination between consultant and contractor	8	15	45	60	8	135	3.33	5
Slowness in decision making	8	8	45	68	8	135	3.44	3
Suspension of work by owner	38	23	30	38	8	135	2.67	12
Inadequate planning	8	23	38	45	23	135	3.39	4
Mode of financing and payment for completed work	23	30	23	38	23	135	3.06	9
Long period between design and time of bidding/tendering	23	15	45	38	15	135	3.06	9
Inappropriate contractual procedure	23	8	45	30	30	135	3.28	6
Additional work	23	30	23	23	30	135	2.89	10
Bureaucracy in bidding/tendering method	23	45	15	38	15	135	2.83	11
Selecting inappropriate contractors	53	23	15	30	15	135	2.50	14
Total	420	345	660	810	323	7,943	58.83	

Table 4-9 shows that “Lack of capable representative”," Lack of owner experience in printing Jobs",and"Slowness in decision making" with an average mean value of 3.67,3.50,and 3.44 respectively are the first three important types of delay factors which are significantly affecting the Job time. However, “Delay in progress payments (Funding problems)”and "Inadequate planning", “Change orders”and"Poor communication and coordination between consultant and contractor",and “Inappropriate contractual procedure” with an average mean value as 3.39,3.33,and 3.28 respectively are at 4th,5th, and 6th respectively in ranking Owner related factors affecting the Job time.Whereas,“Delay in approving design documents”and"Lack of incentives for contractor to finish ahead of schedule","Delay in site delivery or delay in completing previous work and start the new","Mode of financing and payment for completed work" and"Long period between design and time of bidding/tendering","Additional work","Bureaucracy in bidding/tendering method","Suspension of work by owner","Improper Job feasibility study","Selecting inappropriate contractors " , and"Conflicts between joint-ownership" with an average mean value as 3.22,3.17,3.06,2.89,2.83,2.67,2.61,2.50,and 2.28 are at 7th,8th,9th,10th,11th,12th,13th,14th,and 15th in ranking Owner related factors.

4.3.8. Job Related Factors of delay

The respondents were asked to rank Job related factors contributing to job delliance. Table 4-10 shows the results of Job related factors contributing to the delliance of Job in BSPE.

Table 4-10 Job Related Factors contributing to delay

Items	Frequency					Total valid responses	Mean	Rank
	1	2	3	4	5			
Complexity of Job (Job type, Job scale, etc.)	38	23	30	38	8	135	2.67	5
Inadequate definition of substantial completion	30	23	38	30	15	135	2.83	4
Ineffective delay penalties	8	8	23	90	8	135	3.61	1
Legal disputes between Job participants	68	-	38	15	15	135	2.33	6
Original contract duration is short	-	23	53	45	15	135	3.39	2
Unfavorable contract clauses	15	45	30	30	15	135	2.89	3
Total	158	120	210	248	75	2,393	17.72	

Table 4-10 shows that “Ineffective delay penalties”,“Original contract duration is short”,and"Unfavorable contract clauses" with an average mean value of 3.61,3.39,and 2.83 respectively are the first three important types of delay factors which are significantly affecting the Job time.Whereas,“Inadequate definition of substantial completion”,"Complexity of Job (Job type, Job scale, etc.)",and " Legal disputes between Job participants" with an average mean value as 2.83,2.67,and 2.33 are at 4th,5th,and 6th in ranking Job related factors.

CHAPTER FIVE

FINDINGS, CONCLUSIONS AND RECOMMENDATIONS

In this chapter summery of major findings both in the evidence for delay of Jobs in the company with its implication ,and factors contributing to Job delays in the company with its implication will be presented.After that conclusions and recomendations will be presented.

5.1.Summary of Major Findings

5.1.1. Evidence for delay of Jobs in the company with its implication

For the year 2020 budget year of the company, the available Jobs for the second and third quarters were 1,972 out of this 357(21%) of the job was completed before its agreed time.However,521(20%) of the total job was completed on the stated promised day.Whereas,the remaining jobs which is 1094(49%) did not meet the stated promised date of delivery .This implies that the company did not meet its promised date of delivery.As the result of this ,it is very important to consider the root causes of on-time product delivery problem of the company.

5.1.2. Factors contributing to Job delays in the company with its implication

BSPE Related Factors of delay

From lists stated under contractor related factor of delay the research indicated that the three important root causes of delay are:-‘’Obsolete technology’’, ‘’Ineffective Job planning and scheduling’’, and ‘’Poor communication and coordination between owner and consultant’’.

Obsolete technology significantly limits organization and team’s ability to respond to recent changes in the market. Using Outdated Technology affects on-time delivery of products in the

following ways:- as people spend more time navigating administrative tasks than they do actually engaging with customers and each other in value-added ways,technology is evolving at such a rapid pace that it becomes increasingly difficult to compete if the business relies on outdated tech, people expect an exceptional user experience when they interact with technology, limits the ability to respond to the needs of the organization and to changes in the market.

Ineffective Job planning and scheduling is the second root cause of on-time product delivery problem in the contractor related factor of delay in BSPE. Poor planning means that the schedule that the team members are supposed to follow is not set out. There will be no deadlines to meet hence creating a lazy atmosphere among the team members. This means that the Job will not be completed on time and the result will be a shoddily done work.

Poor communication and coordination between owner and consultant is the third root cause of on-time delivery problem in the contractor related factor of delay in BSPE. It can result in several problematic issues, such as:the creation of uncertainty,a conflict on the designation of resources,lack of collaboration and poor teamwork,gossiping and friction,miscommunication on deadlines and work processes,and decrease in morale and engagement.All these matters delay Jobs.

Design Related Factors of delay

From lists stated under design related factors of delliance the research indicated that the three important root causes of delay are: - ‘’ Design changes by owner or his agent during printing’’, ‘’ Poor use of advanced engineering design software’’, and ‘’ Mistakes and delays in producing design documents’’.

Design changes by owner or his agent during printing is the first root cause of on-time delivery problem in the Design related factor of delay in BSPE.When there is a change in design,it will be very difficult to align previos work with the new changed one.As a result,it needs much raw material or returning of raw materials.If the change is decreasing the quatity it may not have as such very high difficulty.However the change results in increasing of quantity it needs to buy raw materials which is not available easily.This makes the Job to be delayed.

Poor use of advanced engineering design software is the second root cause of on-time delivery problem in the Design related factor of delay in BSPE.Having advanced design software

connects multi-plant operations with real-time visibility and collaboration to maximize throughput and on-time delivery.Advanced software has become a must for modern-day manufacturing operations due to customer demand for increased product mix and fast delivery combined with downward cost pressures.

Mistakes and delays in producing design documents is the third root cause of on-time product delivery problem in the Design related factor of delay in BSPE.Mistakes can spoil materials,labour force and time of delivery.This implies in mistakes there is a huge loss of time specially when mistake leads to rework.The same is true for delays in producing design documents.

Equipment Related Factors of delay

From the lists of Equipment related factors of delay the research indicated that the three important root causes of delay are:-"Inadequate modern equipment" and "Shortage of equipment ", "Frequent equipment breakdowns", and "Low efficiency of equipment".

Inadequate modern equipment is the first root cause of on-time product delivery problem in the Equipment related factor of delay in BSPE. Modern equipment increases productivity. With the help of modern technology workers can do a lot of work with less effort and in less time.There are a lot of modern technological devices and machines which can easily increase the productivity of the workers in printing. With the help of modern equipment, workers can easily transport the raw materials from one place to another place.Therefore, inadequate modern equipment and shortage of equipment has a very high impact on-time delivery.

Frequent equipment breakdowns is the second root cause of on-time product delivery problem in the Equipment related factor of delay in BSPE.It causes high equipment downtime, shorter asset life,high interruptions to critical operations, decrease work place safety,spoil compliance, and decrease efficiency (assets in bad condition perform worse).As a result of this,there will be a high delay in delivery time.

Low efficiency of equipment is the third root cause of on-time product delivery problem in the Equipment related factor of delay in BSPE.It increases the number of unnecessary resources

used to produce a given output including personal time and energy. It maximizes the waste of resources such as physical materials, energy, and time while accomplishing the desired output.

External Related Factors of delay

From the lists of External related factors of delay the research indicated that the three important root causes of delay are:- “Inadequate production of raw material in the country”, “pricefluctuations”, and “Global financial crises”.

Inadequate production of raw material in the country is the first root cause of on-time product delivery problem in the External related factor of delay in BSPE. There are times when demand is higher; at this time unless there is adequate production of raw material in the country buying the raw material from abroad will take much time.As a result of this ,much time will be spent by waiting the raw material.

A Price fluctuation is the second root cause of on-time product delivery problem in the External related factor of delay in BSPE.Due to lack of economic stability in Ethiopia,there is a very high price fluctuation.The company may give price quotation to its customers to print and hand over the product.Unfortunately,there may be a change in price of raw material.This makes the raw materials to be disappear or to be hold by some retailers.As a result of this ,the delivery time will take much time until the complete raw material is available in the market.

A global financial crisis is the third root cause of on-time product delivery problem in the External related factor of delay in BSPE. In a financial crisis, asset prices see a steep decline in value, businesses and consumers are unable to pay their debts and financial institutions experience liquidity shortages. A financial crisis may be limited to banks or spread throughout a single economy, the economy of a region, or economies worldwide.As a result of this, it will be very difficult to get raw materials from the market and it will cause a high deliance of a Job.

Labors Related Factors of delay

From the lists of Labors related factors of delliance the research indicated that the three important root causes of delay are: -“Low productivity of labour”, “Low motivation and morale of labour”, and “Shortage of labor”.

Low productivity of labour is the first root cause of on-time product delivery problem in the Labors related factor of delay in BSPE. Labor productivity is a measure of worker output used in both business and the economy as a whole. A small-business owner focuses on labor productivity as a means of streamlining costs and maximizing output. Getting the most out of workers requires a business owner to invest in the company and build facilities with an eye to the long-term health of the business. Labor productivity is the rate of output per worker in the business per unit of time usually per hour. Basically, productivity is how much each worker produces per hour compared to what each worker is earning to perform the job. Comparing the company's labor productivity rate with an established standard or expected rate of output is very crucial.Other wise, low productivity of labour will have a high effect on the delivery time.
Low motivation and morale of labour is the second root cause of on-time delivery problem in the labors related factor of delay in BSPE. Low motivation and morale can be destructive in a business setting and can lead to dissatisfaction, poor productivity, absenteeism and even turnover. What causes low motivation and morale will vary among organizations but the effects will generally be the same. Low motivation and morale causes adisconnect between employees, peers, jobs, managers and the company. Companies and teams with high morale are unmistakable in the workplace. When others are struggling to get the bare minimum done, these teams often excel with ease, exceed expectations and do it all with a smile on their face. Therefore, low motivation and morale of labour has high effect on delivery time.

Shortage of labor is the third root cause of on-time product delivery problem in the Labors related factor of delay in BSPE.When works are at peak time ,the company will hire new employees to overcome the problem of shortage of labour.Since all of the newly hired workers are not skilled, they will lag the work.As a result of this ,shortage of labor has important contribution to the delay of product delivery.

Materials Related Factors of delay

From the lists of Materials related factors of dalliance the research indicated that the three important root causes of delay are: -’’Escalation of material prices” and “Shortage of printing materials”, “Late delivery of materials”, and“Changes in material types and specifications during printing process".

Owner Related Factors of delay

From the lists of Owner related factors of dalliance the research indicated that the three important root causes of delay are: - “Lack of capable representative”, “Lack of owner experience in printing Jobs”, and “Slowness in decision making”.

5.2.Conclusions

This study concentrated on root causes analysis on-timely product delivery problem in BSPE. The objective of this study was to identify the root causes of on-time product delivery problems in the Enterprise.On-time product delivery is the key factor to succeed in current competitive markets.The study used qualitative approach with descriptive research methods to find out the root causes analysis on-timely product delivery problem,which was conducted by using questionnaire and personal observation, along with reviewing the reliable sources that are most likely to provide the reliable information to answer the research question.

However, there are different factors which have an effect on the dalliance of Job in the Enterprise,from the research result the following are top/the root causes of on-timely product delivery problems in the Enterprise:- obsolete technology,shortage of equipment,inadequate modern equipment,inadequate production of raw material in the country,low efficiency of equipment,frequent equipment breakdowns,ineffective Job planning and scheduling,shortage of printing materials,escalation of material prices,and late delivery of materials.

The finding of the research can be generalizesd in broader concept as:-the root causes of on-timely product delivery problems in the Enterprise are related to technology, equipment, raw materials with their prices, ineffective Job planning and scheduling.All the delay factors can also be put in supply chain system.If the company can manage the supply chain system.Almost all the problem can be solved easily if a well organized supply chain is made.

The researcher recommended some practical solutions that should be taken into account to improve or avoid the noticed root causes of on-timely product delivery problem that would be helpful to reduce the risk of any possible problems through the delivery performance. Some recommendations based on the findings were: (1) the company should prepare short term and long term plans to change its equipment; (2) the company should try its best to form a supply chain system with other companies;(3) In Job planning and scheduling the company should determine critical path,build slack time in to schedule,and crash when necessary;(4) The company should try to avoid or reduce non-value adding movements such as movement of semi-processed products from one department to another department;(5) the company should try to use scale of economies with in the job order.;(6) However there is product variety, the

company should try to select the highest cost and quantity products to produce; and (7) The Company should use the plant performance measures to improve on-time product delivery.

The limitation of this study is regarding a small sample size used and the non-inclusiveness of suppliers' opinion, which is not always likely possible to give the real picture about the findings, unlike if a larger sample size which includes all the concerned party is investigated under the same conditions.The researcher's lack of prior experience in conducting research, lack of awareness among our society to fill out questionnaires with due care and return on time and absence of prior works on the subject matter in Ethiopian context would have some impact on the results of the study.

This study provides many opportunities for future research, and indicates the need for further investigation. Further research on the same topic by including more functions like Finance to have their thoughts about the root causes of on-timely product delivery problem effect on their credit sales collection process can be made.

5.3.Recommendations

The following points are forwarded by the researcher as major areas that the company should focus to correct the existing problems.

Obsolete technology

To prevent unsuitable or old technology from killing a business, there is a need to choose the right technology to switch to. It’s not about having the coolest or latest device, application or software system; above all, it’s about adopting relevant tools that enhance the overall productivity.

Choosing the right technology for a business and a company strategy requires a commitment of time and resources. Rushing into the wrong investment can be very costly, so it is worth the company's full attention.Organizations must remain focused on its competitive edge. Modernization efforts must create value for the enterprise. Investors and other stakeholders are as demanding as ever.Obsolate technology can be improved by making the best supply chain both in the local and foreign suppliers.

Shortage of equipment

In BSPE the amount of job the company receives and the number of machineries available to handle those jobs is not equal.As a result, it causes dalliance.To overcome these problems the company can set strategies in to long term and short term strategy.

In the long term strategy the company can allocate a budget to buy new additional machineries from local suppliers or from international suppliers.While the short term strategy can be giving subcontract to other similar companies or leasing machineries for limited time period.

Shortage of equipment can be improved by using cycle time reduction or thorough study of the cycle time.

Inadequate modern equipment

BSPE may have equipments which can perform different printing jobs.However,from the finding of the study it is shown that there is inadequate modern equipment in the organization.To overcome this problem the organization can use both long term and short term strategies.The long term strategy can be selecting the appropriate modern equipment and purchasing it.While the short term strategy can be when modern equipment is needed for the job out-soucing may be used or the machineries can be leased .

The organization can use scale of economies to use the available modern equipments in a proper manner.

Inadequate production of raw material in the country

The inadequate production of raw material in the contry can be overcome by creating supply chain.If the condition is not favorable to do so, merging the printing enterprise with the raw material producing company can be the other strategy.If both of them are not possible, using foreign supplier can be the choice .But now adays there is a problem of foreign currency in our coutry.As a result, it is better to buy from companies which can access the foreign currency and pay them in local currency.

Low efficiency of equipment

The equipment efficiency is one of the many business performances measuring tool in the manufacturing sector.Factory's growth and earning is directly linked with equipment/machinery efficiency. That is why every business must take care of improving and maintaining equipment efficiency. To overcome the problem of low efficiency of equipment the company may see the age of the equipment, frequency of the equipment breakdown, unplanned employees absentism, failing to monitor production, wasting productive time, stiching quality issues, demotivated work force, using obsolete equipment and so on.Therefore, the company needs to check the stated area and take corrective actions.If the problem is on the machinery itself ,asking manufacturers of the machinery for upgrading the machine is best.If the upgrading is not possible, taking purchase of high efficiency machinery is the best.

Frequent equipment breakdowns

Whenever there is frequent equipment breakdowns, it is important to record the cost incurred in each time and take the frequency of the problem to decide whether the equipment to be avoided or not.It is also very important to identify whether the frequent break down is due to the user of the equipment, the obsolecense of the equipment, the problem of the repairer, poor quality of spare part ,improper operation,failure to perform preventive maintenance, too much preventive maintenance, failure to continuously monitor equipment,and so on.

Ineffective Job planning and scheduling

To avoid ineffective Job planning and scheduling the company should

1. Determine the Critical Path in which the company should do :-List all necessary Tasks, Prioritize the Tasks, make a Gantt chart, and determine the Critical Path
2. Build Slack Time into the Schedule

Deliberately adding slack time into Job timeline is a smart way to stay on schedule. Slack time allows delaying a task when necessary, without affecting the rest of the Job schedule.

3. Crash when Necessary

Sometimes, stakeholders request a quicker turnaround time, and Job managers are expected to deliver a completed Job in a shorter time frame, with no reduction in scope. Crashing is a powerful Job time management tool in which one can reduce the time to completion for tasks in the critical path.

4. Before the job begins, the company must make sure that the work is properly understood and agreed to by the job sponsor and key stakeholders. The company need to work with the sponsor and stakeholders to ensure that there is a common perception of what the Job will deliver, when it will be completed, what it will cost, who will do the work, how the work will be done, and what the benefits will be.

Frequent performance measurement with continous assessment is very important to avoid ineffective Job planning and scheduling.Therefore, the company may use this.

Shortage of printing materials

Since there are different types of raw materials that are needed in the printing process, most of the time too much printing materials will not be hold in stock .In addition to this the holding storage cost, high tied up cash, and variability of cumtomers need make not to have much raw material.To overcome the problem of shortage of printing materials, the company should start to organize supply chain with other companies both in local and abroad.

Escalation of material prices

Proper market study has a very high effect to be beneficiary from escalation of material prices.Price escalation will not be asked by BSPE if the job is started before the increament of raw materials prices.But in the future the company should introduce such type of concepts to its customer.When proforma is given to customers, the time for the validity of the proforma should be short enough to accommodate escalation of material prices.

Late delivery of materials

Unless BSPE organize its marketing department to assess the market needs and able to collect the necessary material from the market, the problem of late delivery will be a high problem.So, the company should identify his main customers and their needs then it should make raw material to be available at a minimum level to balance the late delivery of materials.Use of the supply chain system can solve the problem completely.Therefore,the company should try its best to form supply chain system with other companies even by supporting the suppliers in finance.

Reference

Agarwal, A., Minis, I. & Nagi, R. (2000).Cycle time reduction by improved MRP-based production planning.International Journal of Production Research,38(18), pp.4823–4841.

Alford, D.,Sackett, P. & Nelder,G.(2000).Mass-customization:An automotive perspective. International Journal of Production Economics, 65, pp.99-110.

Anyaeche, C.O.,and Adegbilero, B.O., (2014)."Performance Evaluation of a Production Firm Using System Cycle Time Approach".Industrial Engineering Letters, Vol. 4, No. 1, pp. 24–34.

Awasthi, A., &Grzybowska, K. (2014). Barriers of the supply chain integration process. In *Logistics* (pp. 15-30). New York: Springer International Publishing.

A. Odeh, and H. Battaineh (2002). Causes of construction delay: traditional contracts. International Journal of Project Management, 20, 67–73.

A. Al-Momani (2000). Construction delay: a quantitative analysis. International Journal of Project Management, 18, 51–59.

Byrom, D., Lawley, M., & Clements, M. (2016).Barriers to supply chain integration in the Australian seafood industry. A Stakeholder Approach to Managing Food: Local, National, and Global Issues, 4,186-199.

Chen, J., & Dong, M. (2014). Available to promise based flexible order allocations in ATO supply chains. International Journal of Production Research, 52(22), 6717-6738. https://doi.org/10.1080/00207543.2014.911419

Chen, T., (2013)."Asystematic cycle time reduction procedurefor enhancing the competitiveness and sustainability of a semi-conductor manufacturer". Sustainability, Vol. 5, No. 11, pp. 4637–4652.

Christopher, M. (2016). Logistics & supply chain management. UK: Pearson.

Colurcio, M., Caridà, A., &Edvardsson, B. (2017).Conceptualizing resource integration to advance service innovation.In Innovating in Practice (pp. 237-259). Switzerland, Cham: Springer.

D. Long, S. Ogunlana, T. Quang, and K. Lam (2004). Large construction projects in developing countries, a case study from Vietnam.International Journal of Project Management, 22, 553–561.

D. Chan, and M. Kumaraswamy (1997). A comparative study of causes of time delays in Hong Kong construction projects.International Journal of Project Management, 15 (1), 55–63.

Fisher,M.L.,MacDuffie,J.P.& Sethuraman,K.(1996).Product variety and manufacturing performance: Evidence from the international automotive assembly plant study.Management Science,42(3),pp.350-369.

Fisher, M.L. &IttnerC.D. (1999).The impact of product variety on automobile assembly operations: Empirical evidence and simulation analysis.Management Science, 45(6), pp.771-786.

Forslund,H.Johnsson,P.&Mattsson,S-A.(2009).Order to delivery process performance in delivery scheduling environments.International Journal of Productivity and Performance Management,58(1),pp.41-53.

Forza,C.,Rungtus anatham,M. & Salvador,F.(2002).Modularity,product variety,production volume,and component sourcing:Theorizing beyond generic prescriptions.Journal of Operations Management,20, pp.549–575

Fischl, M., Scherrer-Rathje, M., & Friedli, T. (2014).Digging deeper into supply risk: a systematic literature review on price risks. Supply Chain Management: An International Journal, 19(5/6), 480-503. https://doi.org/10.1108/SCM-12-2013-0474

F. Fugar,andA. Agyakwah-Baah(2010).Delays in building construction projects in Ghana.Australasian Journal of Construction Economics and Building,10 (1/2), 103–116.

Gupta, D. & Srinivasan, M.M.(1998).How does product proliferation affect responsiveness? Management Science, 44(7), pp.1017-1020.

Goldhar, J. D. and M. Jelinek (1983). "Plan for Economies of Scope," Harvard Business Review, 61, 6, 141-148.

Ghobakhloo, M., Tang, S. H., Sabouri, M. S., &Zulkifli, N. (2014). The Impact of information system- enabled supply chain process integration on business performance: A Resource-based analysis. International Journal of Information Technology & Decision Making, 13(05), 1075-1113. https://doi.org/10.1142/S0219622014500163

Gao, T., & Tian, Y. (2014). Mechanism of supply chain co-ordination based on dynamic capability framework-the mediating role of manufacturing capabilities.Journal of Industrial Engineering and Management, 7(5), 1250. https://doi.org/10.3926/jiem.1266

G. Sweis, R. Sweis, A. Hammad and A. Shboul (2008) . Delays in construction projects: the case of Jordan.International Journal of Project Management,26 , 665–674.

Hetzel, W.B., (1993). Cycle Time Reduction and Strategic Inventory Placement Across a Multistage Process. Massachusetts Institute of Technology.

Hopp, W.J. and Spearman, M.L., (2008). Factory Physics, Vol. 2, New York: McGraw-Hill/Irwin New York.

Hayes, R, S. Wheelwright, and K Clark (1988). Dynamic- Manufacturing. Free Press, New York.

Hsieh, C. S., & Hung, J. W. (2009). Integration agent negotiation and data global consistency forms automatic and none Bullwhip effect supply chain. WSEAS Transactions on Information Science and Applications, 6(6), 1037-1050.

I. Dikmen, M. Birgonul, and S. Han (2007).Using fuzzy risk assessment to rate cost over-run risk in international construction projects.International Journal of Project Management, 25,494–505.

Jina,J.,Bhattacharya,A.K,& Walton,A.D.(1997).Applying leanprinciples for high product variety and low volumes: Some issues and propositions. Logistics Information Management,10(1),pp.5–13.

Jovanovic, J.R., Milanovic, D.D., and Djukic, R.D., (2014). "Manufacturing Cycle Time Analysis and Scheduling to Optimize Its Duration", StrojniškiVestnik – Journal of Mechanical Engineering, Vol. 60, No. 7–8, pp. 514–524.

Joshi, D., Nepal, B., Rathore, A. P. S. & Sharma, D. (2013).On supply chain competitiveness of Indian automotive component manufacturing industry. International Journal of Production Economics, 143(1), 151-161.https://doi.org/10.1016/j.ijpe.2012.12.023

Jaikumar, J.(1986). "Post-Industrial manufacturing." Harvard Business Re- view, 64, 6 ,69-76.

Khan, W.N. and Sharma, S., (2014). "Cycle Time improvement in structure section of an automobile Industry: A case study", 2014 1st International Congress on Computer, Electronics, Electrical, and Communication Engineering *(ICCEECE2014)*, Vol. 59, IPCSIT Press, Singapore, pp. 149–154.

Kumbhar, S.K., Niranjan, M.R., and Satpute, S.T., (2014b)."Assembly Line Production Improvement by Optimization of Cycle Time.". Proceedings of 10th IRF International Conference, 01st June-2014, Vol. 2, Pune, India, pp. 124–128.

Kumar, S.S., and Kumar, M.P., (2014)."Cycle time reduction of a truck body assembly in an

automobile industry by lean principles.".Procedia Materials Science, Vol. 5, pp. 1853–1862.

Kwon, I. W. G., Kim, S. H., & Martin, D. G. (2016). Health care supply chain management; strategic areas for quality and financial improvement. Technological Forecasting and Social Change, 113, 422-428. https://doi.org/10.1016/j.techfore.2016.07.014

Lii, P., &Kuo, F. I. (2016). Innovation-oriented supply chain integration for combined competitiveness and firm performance. International Journal of Production Economics, 174, 142-155. https://doi.org/10.1016/j.ijpe.2016.01.018

Liu, Z., Shang, J., & Lai, M. (2015). Incentive mechanism for knowledge sharing in e-commerce service supply chain: complementarity, integration and risk attitude. Journal of Electronic Commerce Research, 16(3), 175-193. http:// www.jecr.org /sites /default /files /16_3_p02.pdf

Lam, J. S. L. (2013). Benefits and barriers of supply chain integration: Empirical analysis of liner ship- ping. International Journal of Shipping and Transport Logistics, 5(1), 13-30. https://doi.org/10.1504/IJSTL.2013.050553

Leachman, R. c, and Ding, S., (2011). "Short Papers Semi-conductor Manufacturing" IEEE Transactions on Automation Science and Engineering, Vol. 8, No. 1, pp. 112–117.

Martin, M. & Ishii, K.(2002).Design for variety:Developing standardized and modularized product plat form architectures.Research in Engineering Design,13,pp.213–235.

McCutcheon, D.M., Raturi, A.S. & Meredith, J.R.(1994).The customization-responsiveness squeeze. Sloan Management Review, 35, pp.89.

McDermott,C.M.& Stock,G.N.(1994).The use of common parts and design in high tech industries:Astrategicapproach.Productionand Inventory Management.Journal, 35,pp.65-68.

Mandal,S.(2016).An empirical investigation on integrated logistics capabilities,supply chain agility and performance. International Journal of Services and Operations Management, 24(4), pp.504–530.

Mason, R., & Lalwani, C. (2006). Transport integration tools for supply chain management. International-Journal-of-Logistics:Research.and.Applications,9(1),57-74. https://doi.org/10.1080/13675560500534599

Mustafa Kamal, M., & Irani, Z. (2014).Analyzing supply chain integration through a systematic literature review: a normative perspective. Supply Chain Management: An International Journal, 19(5/6), 523-557. https://doi.org/10.1108/SCM-12-2013-0491

Masten, K. A., & Kim, S. L. (2015). So many mechanisms, so little action: The case for 3rd party

supply chain coordination. International Journal of Production Economics, 168, 13-20. https://doi.org/10.1016/j.ijpe.2015.06.005

M. Sambasivan (2007). Y. Soon, Causes and effects of delays in Malaysian construction industry.International Journal of Project Management, 25, 517–526.

M. Haseeb, X. Lu, A. Bibi, M. Dyian, and W. Rabbani(2011).Problems of projects and effects of delays in the construction industry of Pakistan.Australian Journal of Business and ManagementResearch,1 (5), 41–50.

M. Abd-Majid,and R. Mc-Caffer (1998). Factors of non-excusable delaysthat influence contractors'performance.Journal of Management in Engineering, ASCE 14 (3), 42–49.

Panzar, J. c. and R. D. Willig (1982)."Economies of Scale in Multi-Output Production," Quarterly J.of Economics 91 (1977), 481-493. Schonberger, R., Japanese Manufacturing Techniques, Free Press, NewYork.

Panayides, P. M. (2017). Global supply chain integration and competitiveness of port terminals.In Ports, cities, and global supply chains (pp. 43-56). Routledge.

Patel, H., and Shah, S.C., (2014). "Review on Cycle Time Reduction in Manufacturing Industries".Journal of Emerging Technologies and Innovative Research *(JETIR)*, Vol. 1, No. 7, pp. 955–957.

Panda, S., Modak, N. M., &Pradhan, D. (2016). Corporate social responsibility, channel coordination and profit division in a two-echelon supply chain. International Journal of Management Science and Engineering Management, 11(1), 22-33. https:// doi.org/ 10.1080/ 17509653.2014.968815

Prashar, A., (2018). "Toward cycle time reduction in manufacturing SMEs: Proposal and evaluation", Quality Engineering. Taylor & Francis, pp. 1–16.

P. Kaming, P. Olomolaiye,and G. Holt(1997). F. Harris, Factorsinfluencing construction time and cost in Indonesia construction industry.Journal of Construction Management and Economics, *15*, 83–94.

Qrunfleh, S., & Tarafdar, M. (2014). Supply chain information systems strategy: Impacts on supply chain performance and firm performance.International Journal of Production Economics, 147, 340-350. https://doi.org/10.1016/j.ijpe.2012.09.018

Ramdas,K.,Fisher,M .& Ulrich,K.(2003).Managing variety for assembled products:Modeling component-systems-sharing.Manufacturing&ServiceOperations management,5(2),pp.142–156.

Rodrigues, E. F., Dalcol, P. R. T., Pizzolato, N. D., & Maruyama, Ú. (2013). Virtual organization model: the new organization and value chain framework.International Journal of Environmental-Technology and Management,16(5-6),437-450.https:// doi.org/ 10.1504/ IJETM.2013.059445

Swamidass, P.M., and Majerus, C., (1991). "Statistical control of manufacturing cycle time and project time: Lessons from statistical process control." International Journal of Production Research, Vol. 29, No. 3, pp. 551–563.

Sreelekshmy, K.K.R., Rajesh, P.G., Santhosh, M.B. and Anoop, K.S., (2013). "The Impact of Lean Production on the Cycle Time : A Case Study of a Welding Assembly Line in Kerala", IJSRD - International Journal for Scientific Research & Development, Vol. 1, No. 6, pp. 6–9.

Saraswat, P., Kumar, D., and Kumar Sain, M., (2015). "Reduction of Work in Process Inventory and Production Lead Time in a Bearing Industry Using Value Stream Mapping Tool".International Journal of Managing Value and Supply Chains (IJMVSC), Vol. 6, No. 2, pp. 27–35.

Shou, Z., Zheng, X. V., & Zhu, W. (2016). Contract ineffectiveness in emerging markets: An institutional theory perspective. Journal of Operations Management, 46, 38-54. https:// doi.org/10.1016/j.jom.2016.07.004

Shahi, S., Pulkki, R., Leitch, M., & Gaston, C. (2017).Integrating operational planning decisions through- out the forest products industry supply chain under supply and demand uncertainty. International Journal of Forest Engineering,29(1),1-11. https:// doi.org/ 10.1080/ 14942119.2017.1371544

Stalk, G., (1998). "Time–The next source of competitive advantage." Harvard Business Review, Vol.66, No. 4, pp. 41–51.

Stadtler H. (2015). Supply Chain Management: An Overview. In: H. Stadtler, C. Kilger, H. Meyr (Eds) Supply Chain Management and Advanced Planning. Springer:-Texts in Business and Economics. Berlin, Heidelberg: Springer.

Shieh-Liang, C., Tran, N. T. H., & Ha, N. T. T. (2016). Concerns of Vietnamese producing-exporting seafood SMEs (VPESSMEs) on supply chain. International Business Research, 9(6), 120-130. https://doi.org/10.5539/ibr.v9n6p120

Soliman, F. (2015). Does the cloud system drive supply chain Sustainability?In Cloud Systems in SupplyChains (pp. 224-245). UK: Palgrave Macmillan.

S. Assaf,andS. Al-Hejji (2006). Delay causes in large construction projects.International Journal of Project Management, *24* (4) ,349–357.

S. Ogunlana, K. Promkuntong, and V. Jearkjirm(1996).Constructiondelays in a fast growing economy: comparing Thailand with other economies.International Journal of Project Management, *14* (1), 37–45.

Tseng, P. H., & Liao, C. H. (2015). Supply chain integration, information technology, market orientation and firm performance in container shipping firms. The International Journal of Logistics Management, 26(1), 82-106. https://doi.org/10.1108/IJLM-09-2012-0088

Ulrich,K.&Randall,T.(2001).Product-variety,supply-chain-structure,and-firm-performance: Analysis of the US bicycle industry. Management Science,47(12),pp.1588-1604.

Vanpoucke,E.,Vereecke,A.& Muylle,S.(2017).Leveraging the impact of supply chain integration through information technology.International Journal of Operations & Production Management,37(4)pp.510–530.

Vanpoucke, E., Vereecke, A., &Muylle, S. (2017). Leveraging:- the impact of supply chain integration through information technology.International Journal of Operations & Production Management, 37(4), 510-530.https:// doi.org /10.1108 /IJOPM-07-2015-0441

Vickery, S. K., Koufteros, X., &Droge, C. (2013). Does product platform strategy mediate the effects of supply chain integration on performance? A dynamic capabilities perspective,IEEE Transactions on Engineering Management, 60(4), 750-762. https:// doi.org/ 10.1109/ TEM.2013.2266301

V.Luu, S. Kim, N. Van Tuan and S. Ogunlana (2009).Quantifying schedule risk in construction projects using bayesian belief networks.International Journal of Project Management,27 ,39–50.

Wong, C. W., Wong, C. Y., & Boon-itt, S. (2013). The combined effects of internal and external supply chain integration on product innovation. International Journal of Production Economics, 146(2), 566-574. https://doi.org/10.1016/j.ijpe.2013.08.004

Wang, B., Childerhouse, P., Kang, Y., Huo, B., &Mathrani, S. (2016). Enablers of supply chain integration: interpersonal and interorganizational relationship perspectives. Industrial Management & Data Systems, 116(4), 838-855. https://doi.org/10.1108/IMDS-09-2015-0403

Y. Frimpong, J. Oluwoye, and L. Crawford(2003). Delay causes and costoverruns in construction of groundwater projects in developingCountries, Ghana as a casestudy.International Journal of Project Management,21, 321–326.

Appendix A- Questionnaire

St. Mary's University School of Graduate Studies

Department of Business Administration

This questionnaire is designed to collect data on root causes analysis on timely delivery problem in order to carryout project work entitled "**Root causes analysis on-timely product delivery problem in BerhanenaSelam Printing Enterprise**" for partial fulfillment of Masters of Arts Degree in Business Administration. It is intended for academic purpose only. Besides, the output of the study will help as input forthe company's decision makers.

Note

- Please do not write your name
- Put "a"or "r" mark in the box to the point which highly reflect your idea
- All information will be treated confidentially
- Your honest and unbiased response will greatly contribute for the research to achieve its objective.
- I thank you very much, in advance, for your sincere cooperation.
- If you have any question contact on Mobile no:-09-11-94-72-64

I. Bio Data

1. Gender Male ☐ Female ☐

2. Age 20-24 ☐ 25-29 ☐

30-34 ☐ 35-39 ☐

40-44 ☐ above 45 ☐

3. Educational Background Certificate ☐ MA ☐

Diploma (12+2) ☐ PhD ☐

BA/BSC Degree ☐ Other_____

4. Years of service in BSPE 1-3 ☐ 7-9 ☐

4-6 ☐ 10-13 ☐

Above 13 ☐

II.Research Related Questions

The following questions are presented on a five point scale. If the item has very high effectin your response choose 5 (very high effect), if the item you consider has high effect choose 4 (High effect), if the item you consider has average effect choose 3 (Average effect), if the item you consider has little effect choose 2 (Little effect) and if the item you consider has very little effect choose 1 (Very little effect).

5 = "Very high effect"

4 = "High effect"

3 = "Average effect"

2 = "Little effect"

1 = "Very little effect"

A. BSPE Related Factors

No	Items	1	2	3	4	5
1	Frequent change of subcontractors					
2	Inadequate contractor experience					
3	Inappropriate printing methods					
4	Incompetent project team					
5	Ineffective Job planning and scheduling					
6	Obsolete technology					
7	Poor communication and coordination between owner and consultant					
8	Poor production management and supervision					
9	Rework due to errors					
10	Unreliable subcontractors					
11	Inadequate production area investigation					
12	Inappropriate contractor's policies					
13	Poor financial control on production					

B.Design Related Factors

No	Items	1	2	3	4	5
1	Complexity of Job design					
2	Design changes by owner or his agent during printing					
3	Design errors and omissions made by designers					
4	Insufficient data collection and survey before design					
5	Lack of design team experience in printing Jobs					
6	Mistakes and delays in producing design documents					
7	Misunderstanding of owner's requirements by design engineer(design document preparer)					
8	Poor use of advanced engineering design software					
9	Unclear and inadequate details in documents					
10	Incomplete Job design					
11	Defective design made by designers					

C. Equipment Related Factors

No	Items	1	2	3	4	5
1	Equipment allocation problem					
2	Frequent equipment breakdowns					
3	Improper equipment					
4	Inadequate modern equipment					
5	Low efficiency of equipment					
6	Shortage of equipment					
7	Slow mobilization of equipment					

D. External related factors

No	Items	1	2	3	4	5
1	Accidents during printing process or at time of operation					
2	Changes in government regulations and laws					
3	Different tactics patterns for bribes					
4	Delay in obtaining permits from ministry of revenue to print					
5	Delay in performing final inspection and certification by third party					
6	Delay in providing services from utilities (water, electricity, etc.)					
7	Global financial crisis.					
8	Loss of time by traffic control and restriction at job site					
9	Sudden failures actions					
10	Price fluctuations					
11	Problem with neighbors					
12	Slow site clearance					
13	Unfavorable weather conditions					
14	Inadequate production of raw material in the country					
15	Inappropriate government policies					
16	Thefts done on production area					

E. Labors related factors

No	Items	1	2	3	4	5
1	Absenteeism					
2	Low motivation and morale of labor					
3	Low productivity of labor					
4	Personal conflicts among labor					
5	Shortage of labor					
6	Slow mobilization of labor					
7	Labor strikes due to revolutions					
8	Unqualified/inadequate experienced labor					
9	Labor injuries on production area					

F. Materials Related Factors

No	Items	1	2	3	4	5
1	Changes in material types and specifications during printing process					
2	Damage of sorted materials					
3	Delay in manufacturing materials					
4	Escalation of material prices					
5	Late delivery of materials					
6	Poor procurement of printing materials					
7	Poor quality of printing materials					
8	Shortage of printing materials					
9	Unreliable suppliers					

G. Owner Related Factors

No	Items	1	2	3	4	5
1	Change orders					
2	Conflicts between joint-ownership					
3	Delay in approving design documents					
4	Delay in progress payments (Funding problems)					
5	Delay in site delivery or delay in completing previous work and start the new.					
6	Improper Job feasibility study					
7	Lack of capable representative					
8	Lack of owner experience in printing Jobs					
9	Lack of incentives for contractor to finish ahead of schedule					
10	Poor communication and coordination between consultant and contractor					
11	Slowness in decision making					
12	Suspension of work by owner					
13	Inadequate planning					
14	Mode of financing and payment for completed work					
15	Long period between design and time of bidding/tendering					
16	Inappropriate contractual procedure					
17	Additional work					
18	Bureaucracy in bidding/tendering method					
19	Selecting inappropriate contractors					

H.Job related factors

No	Items	1	2	3	4	5
1	Complexity of Job (Job type, Job scale, etc.)					
2	Inadequate definition of substantial completion					
3	Ineffective delay penalties					
4	Legal disputes between Job participants					
5	Original contract duration is short					
6	Unfavorable contract clauses					

Appendix B- List of Branches and Departments covered in the study

Sr No	Branch Name	Department
1	**Merhatibeb(Piassa)**	
2	**Abuare**	
3	**Arat kilo(main office)**	Pre-press
		press
		Cutting and Binding
		Graphic and Design

Thank You!