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**The Effect of Strategic Project Implementation Effectiveness,
Integration and Strategic Alignment on Organizational
Performance: the case of ACE (Achieving Competency Excellence) project
in Ethiopian Airlines**

Prepared by By: Aklilu Gudeta

A project work submitted to the school of graduate studies of Addis
Ababa University School of Commerce department of
Project Management in partial fulfillment of the requirements for
the degree of MA in **Project Management** in **AAU School of
Commerce**

**Submitted to:
Dr. Abdurezak Mohammed**

**JUNE, 2017
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Approved by Board of Examiners

Chairman, Department

Signature

Advisor

Signature

Examiner

Signature

Statement of Certification

This is to certify that **Aklilu Gudeta** has carried out his research work on the topic entitled “**The Effect of Strategic Project Implementation Effectiveness, Integration and Strategic Alignment on Organizational Performance: the case of ACE (Achieving Competency Excellence) project in Ethiopian Airlines**” is his original work and is suitable for submission for the award of Masters Degree in Project Management.

Advisor: Dr. Abdurezak Mohammed

June, 2017

Declaration

I certify that this research paper entitled “**The Effect of Strategic Project Implementation Effectiveness, Integration and Strategic Alignment on Organizational Performance: the case of ACE (Achieving Competency Excellence) project in Ethiopian Airlines**” has not previously been submitted for a degree nor has it been submitted as part of requirements for a degree.

I also certify that the thesis/project has been written by me. Any help that I have received in my research work and the preparation of the thesis itself has been acknowledged. In addition, I certify that all information sources and literature used are indicated in the thesis.

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Acronyms

ACE = Achieving Competitive Excellence

EAL = Ethiopian Airlines

ET = Ethiopian Airlines

H = Hypothesis

HSMC-S = Hot Section Module Center-South

MRO = Maintenance Repair & Overhaul

QCPC = Quality Clinic Process Control

RCCA = Root Cause Corrective Action

SD = Standard Deviation

SPM = Strategic Project Management

SPSS = Statistical Package for Social Science

UTC = United Technologies Corporation

5s+1 = Sort, Straighten, Shine, Standardize, Sustain & Safety

Abstract

The purpose of this paper is to explore the influence of ACE (Achieving Competency Excellence) project implementation, integration and strategic alignment on organizational performance in the case of Ethiopian Airlines MRO division. The hypotheses were simultaneously tested on a sample of 336 respondents out of 385 distributed, giving a valid response rate of 87 percent. Simple regression analysis was used to assess the relationships among the variables under investigation. The applications used to analyze and examine the hypotheses are the Statistical Package for Social Sciences V.21. The findings of this study have shown a significant effect of ACE project successful implementation, integration and strategic alignment on organizational performance at the level of ($\alpha \leq 0.05$). The results are useful in identifying areas for strategic focus to help the airline's future strategic project management. As evident from the finding section that the study was conducted in Ethiopian Airlines MRO division only, applicability of the results in other divisions may result differently. Further, as the project is conducted in the airlines industry with unique project, application of the similar study in other industries, like; education, financial, and health may not come up with the same findings.

Key words: *Strategic Project, Strategic Project Management, project implementation, Project Integration, Project Strategic Alignment and Organizational Performance*

CHAPTER ONE

1. INTRODUCTION

1.1 Background of the Study

Currently organizations are investing large sums of money, time and knowledge to stay competitive and profitable. Driven by strong competition and increasing operational costs, the global aviation industry is under paramount pressure to strengthen operational excellence and improve profitability. Airlines are heavily investing in the means to improve productivity and reduce variation in the maintenance, repair and services processes. Both the well-established and new entrees to the aviation industry need to develop and implement well-developed and proofed quality management system to stay competitive and lead the industry and/or expand to new market segments. (Nigatu, T.A., 2010)

A quality management system will help Airlines to meet their customers' expectation through improved products and services. Ethiopian Airlines (EAL) is facing fierce market competition from European and Middle East airlines such as KLM, Turkish Airlines, Emirates, Qatar and Fly Dubai. EAL implemented Achieving Competitive Excellence (ACE) project to improve its performance and stay competitive in the market. ACE is a custom-made system developed by United Technology Cooperation (UTC) and yet not proved useful in other organizations. Its implementation highly depends on organizational culture, company resource and existing quality management system. (Nigatu, T.A., 2010)

Often a smoothly run project gets a black eye because of problems during implementation. Those problems often crop up because we don't anticipate and plan for the complexity of deploying the solution. One of the main reasons strategic projects fail within the organization is the result of not thinking through an effective implementation strategy fully. Remember until implementation occurs a project remains an investment of resources. It realizes its full value only when deployed successfully and consistently across the full service in question. All projects will have a different set of ambitions and challenges that they need to overcome in deciding an appropriate implementation approach. (Grundy, 1995)

Putting projects into action is the vital step linking the implementation stage to the final achievement of strategic goals, which makes project integration to the day to day activities of the utmost importance to strategic planning efforts. Project managers' jobs are ruled by a never-ending string of time-bound goals. Achieving goals is crucial to success as a project manager, and putting projects into action is the first step toward achieving organizational objectives. (Grundy, 1995)

In some traditional project management approaches, projects are seen as independent entities under the watchful eye of the project manager. In general, while this can allow a great deal of flexibility of vision for the project manager to take a project wherever he/she wishes it to go, it also risks diverging too far from the overall goals and aims of the organization as a whole. (Hyvari, 2006)

As an alternative, many project managers are now seeing the benefits of aligning projects with organizational strategy. Here, what is lost in absolute flexibility is gained in a sense of purpose and clear contribution to the welfare of the organization. For modern organizations, unaligned projects are seen as excess weight that can hinder a company's overall performance. By aligning projects and greater strategic goals, project managers help ensure that resources are well spent and clearly affect company welfare. (Dinsmore, 1999) This research therefore, assesses the effect of strategic project implementation effectiveness, integration and strategic alignment on organizational performance in the case of ACE project in Ethiopian Airlines.

1.2. Background of the Company

Ethiopian Airlines (ET) has set a 15-year (2011-2025) Strategic Road Map under the umbrella of "Vision 2025". In Vision 2025, it is stipulated that sustained fast growth shall remain to be **Ethiopian's** Corporate Strategy. This growth strategy translates into acquisition and operation of more aircraft, flying to existing destinations with higher frequency, and operating to new destinations. The strength of the Maintenance, Repair and Overhaul (MRO) function in an airline determines not only its growth and success, but also its very existence in the business.

At **Ethiopian**, the MRO function has been the foundation of its existence and growth throughout its history. The strategy so far was to develop Maintenance & Engineering capacities sufficient

enough to support mainly the Airplanes acquired and operated by **Ethiopian**. This was supplemented by a practice of providing the MRO services to other carriers whenever there is excess capacity.

Organization & Responsibility of MRO Division

The MRO function in ET is established as one of the operating divisions in parallel with Flight Operations and reporting to the Chief Operating Officer. **Ethiopian** MRO division has the following key responsibilities

- a. Airframe Maintenance, including Line & Base Maintenance
- b. Engine Maintenance
- c. Component Maintenance
- d. Engineering Service
- e. Procurement of materials & services

Strategic Objectives of the Division

Vision

Ethiopian MRO Services shall be the most competitive and leading provider of commercial aircraft Maintenance, Repair and Overhaul (MRO) services in Africa by 2025.

Mission

- ✓ To become the leading MRO organization in Africa by providing airframe, engine and component maintenance, repair and overhaul and procurement and material services whose quality and price “value proposition” is always better than its competitors
- ✓ As a profit center of the Ethiopian Aviation Group, it ensures to be MRO organization of choice to customers, employer of choice to employees and an investment of choice for the group.
- ✓ To support the fast growth strategy of the passenger and cargo profit centers of the group and to contribute its share to the development of MRO services in Africa.

Strategic Goals

- Provide full airframe MRO services to all aircraft models operated by Ethiopian on each term (price, TAT and quality) better than the competition.
- Provide MRO services to the majority of engines and components installed on **Ethiopian** fleet at the lowest cost compared to alternate service providers.
- Generate annual revenue of USD 520 Million (and a profit of 100 Million) from third party MRO work by 2025.
 - . USD 87 Million from maintenance of 79 Airframes Per annum
 - . USD 414 Million from maintenance of 153 Engines per annum
 - . USD 19 Million from Component Maintenance per annum

1.3. Problem Statement

Today's competitive environment in the airline industry has never been tougher or more unforgiving. More and more players are one strategic misstep away from competitive extinction. Approaches that worked in the past simply don't cut it in today's hyper-competitive marketplace.

Organizations talk a good game about strategy. But without the right projects and programs to carry them out, even the most forward-thinking strategies fail. It's not enough for projects to come in on time and on budget. They must also be in sync with strategy. A project management approach to business problems and opportunities is becoming the norm rather than the exception. Projects are the tools for implementing the strategy of the organization. Effective project management starts with selecting and prioritizing projects that support the organizational vision, mission and strategy. Projects are becoming the tools of implementing the business strategy of an organization. Every project in an organization should contribute to its strategic plan. Organizations need to make sure that they integrate projects within the strategic plan.

ACE (Achieving Competitive Excellence) is a company-wide strategic project to be implemented throughout the organization. It is the company's approach to relentlessly improving

the value that it delivers to its customers. It focuses on the drivers of customer value: processes and the people who fuel them.

Even though most work processes in MRO are defined and documented, they are not necessarily efficient. In some cases, lack of harmonization is observed among different processes. In order to alleviate this problem ACE project is being implemented so as to be an operating system for the company. But the project is going very slow and some of the cells in the MRO couldn't sustain the level what they already achieved from part of the project and received a decertification notice due to weak implementation and integration of the project.

Even though the company requires all cells to implement and integrate ACE in their day to day activities in the near future as an operating system of the company, most of MRO cells are considering ACE as an additional burden in contrary to the objective. In addition, middle level and supervisory managers in the division lacks the courage of linking the ACE project to organizational strategy.

Furthermore, unless otherwise all linked departments acquire ACE gold level, the weakness of one department regarding to ACE project will directly affect the performance of another department since the MRO activities are interconnected each other. This urges successful ACE project implementation, integration and strategic alignment.

1.4. Research Questions

1. To what extent is organizational performance influenced by effective implementation of ACE project in Ethiopian Airlines MRO division?
2. To what extent is organizational performance influenced by successful integration of ACE project to the day to day activities of the cells in the division?
3. To what extent is organizational performance influenced by project strategic alignment?

1.5. Objective of the Research

1.5.1. General Objective

The general objective of this research is to assess the effect of strategic project implementation effectiveness, integration and strategic alignment on organizational performance in the case of ACE project in Ethiopian Airlines MRO division.

1.5.2. Specific Objectives

- To assess the effect of successful implementation of ACE project on departments' performance.
- To assess the effect of successful integration of ACE project to the day to day activities of the division on departments' performance.
- To assess the effect of strategic alignment of ACE project on departments' performance.

1.6. Hypotheses

H1→ There is a significant positive relationship between successful ACE project implementation and departments' performance.

H2→ There is a significant positive relationship between successful integration of ACE project and departments' performance.

H3→ There is a significant positive relationship between strategic alignment of ACE project and organizational performance.

1.7. Significance of the Study

This study will have the following significance:-

- It will provide valuable information for the decision makers and implementers of ACE project so as to improve organizational performance.
- It will help EAL MRO division employees to actively engage themselves for successful implementation and integration of ACE on their day to day activities.
- It will provide a benchmark for other divisions of the company.
- The study will play a significant role to broaden the researcher's knowledge in the area.
- Motivates other researchers to perform study on the so far untouched areas of the topic such as on another division of the company.

1.8. Scope of the Study

This research work focuses on the assessment of ACE project implementation, integration and strategic alignment in EAL MRO division and their impact on organizational performance. Other divisions of the organization are not included in the research and only one strategic project is taken for the study. Due to time limitation one time survey for the study is collected from April 05 to May 05, 2017 through self-administered questionnaire.

1.9. Organization of the Study

This research report is organized under five chapters. Chapter 1 has presented the introduction. Chapter 2 presents the review of related literature and research related to the problem being investigated. The methodology and procedures used to gather information for the study are presented in Chapter 3. The results of analyses and findings that emerged from the study and discussion are presented in Chapter 4. Chapter 5 presents conclusion limitations and recommendation.

CHAPTER TWO

2. Literature Review

2.1. Theories and Concepts

2.1.1. Overview of the ACE Project

ACE (Achieving Competitive Excellence) is a company-wide strategic project to relentlessly improving the value that the company delivers to its customers. It focuses on the drivers of customer value: processes and the people who fuel them. (Nigatu, T.A., 2010)

An airline consists of a set of connected processes. Examples include Flight Ops, Scheduling, Maintenance, Logistics, and Customer Services. Ideally, an airline uses an operating system to manage these processes. The operating system is a mechanism for controlling and improving processes to achieve desired business goals, starting with customer value and satisfaction. (Company Portal)

The ACE consists of a set of tools that help an organization identify and solve problems; improve its processes; and make strategic decisions. Through the repeated application of these tools, the organization drives the ACE operating system to: Close gaps between actual results and business goals; and Eliminate waste (achieve lean process flow).

ACE solicits feedback from customers on what is needed to do to strengthen value to them and to increase their satisfaction with the company. ACE also seeks feedback on where business, product, or service performance has fallen short. ACE is the way that the company control and improve processes that deliver customer satisfaction and business results. ACE is how the company solves problems, make critical decisions, and eliminate waste. And ACE drives partners and suppliers to match the company's level of competitive excellence. In short, ACE is the way that the company will run its business (Nigatu, T.A., 2010).

What is the ACE philosophy?

It is a philosophy that is based on the premise that when a company develops a “continuous process improvement” environment, utilizing ACE principles and tools, it can both increase productivity and improve the quality of its product. A continuous process improvement environment requires the empowerment of employees to take ownership of each operational process and develop for each process “standardized” work – which is the best way of doing a job. (Nigatu, T.A., 2010)

How does ACE work?

The ACE goal is to drive productivity and quality by means of a “continuous process improvement” approach. At the outset, employees must be taught “process mapping” in order to visualize and analyze the processes within which they work, to determine effectiveness and where to look to make improvements. Employees are empowered to seek ways to build in ‘mistake-proofing and to insert checks-and-balances wherever possible. (Nigatu, T.A., 2010)

All process improvement designs must be measured against key performance indicators (KPI) to determine effectiveness. When effectiveness is proven, the ACE objective is to lock in all proven processes in a standard work format. The standard work becomes the principle means by which all team members perform their duties.

ACE tools are used to conduct “root cause analysis” when errors otherwise known as “turn-backs” happen. Rather than to simply find a quick “fix” or ignore errors and hope they won’t reoccur, ACE tools and root cause analysis provides us with the means to root out systemic causes for errors and to modify our process to eliminate or minimize them. Having the means to convert them into opportunities for “continuous process improvement” is a central component of ACE. (“Achieving Competitive Excellence”, 2017)

Competency in ACE

Competency in ACE resides in empowered employees and in committed and involved leadership. ACE competency is built through many means:

- Awareness education
- Supervised action learning engagements (ACE Change Agent training; High-Impact projects)
- Coaching, mentoring, and teaching by expert ACE Change Agents
- Doing: experience in many different improvement projects
- Sharing of best practices
- Teaching and training others
- Quality clinics (Company Portal)

Four achievement levels measure competency in ACE:

- **Qualifying** – Awareness education; local process identification and prioritization; waste elimination and cell organization
- **Bronze** – Advanced training; application of ACE tools to achieve important improvement in selected processes; substantial cell/workgroup involvement
- **Silver** – First demonstration of step increase in customer satisfaction and business performance; major improvement in selected processes; improvement activities begun on all key processes; employee satisfaction target; significant organizational and leadership involvement
- **Gold** –Customer satisfaction and best-in-class business performance; total cell/workgroup and leadership involvement (“Achieving Competitive Excellence”, 2017)

Expected Deliverables from ACE Project

- **Business performance:** This section is a shared responsibility between the leadership of the cell and the ACE team. The objective of ACE has always been to improve customer satisfaction and business results. Starting at the Silver level, the criteria require each organization to solicit customer satisfaction feedback using both a written survey and interviews. At a minimum the feedback must check customer satisfaction with quality,

delivery, working relationships, and responsiveness to problems.

- **ACE operating system tools:** The tools supporting the ACE operating system tools are shown in the following figure. In keeping with the ACE philosophy, the ACE tools are relatively easy to learn and use, and they are accessible to virtually everyone in an organization. (“Achieving Competitive Excellence”, 2017)

Process Improvement and Waste Elimination Tools <ul style="list-style-type: none">• 5S + 1 & Visual controls• Process Management• Value Stream Mapping• Total Productive Maintenance	Problem Solving Tools <ul style="list-style-type: none">• Market Feedback Analysis• Quality Clinic Process Charts• Root Cause Corrective Action• Mistake Proofing Decision Making Tool <ul style="list-style-type: none">• Passport Process
--	---

Fig 2.1: ACE operating system tools

- **Sustained performance:** A strong indicator of an organization’s ACE maturity is its ability to sustain the improved performance that it has achieved.
- **Accountability and Gold:** Accountability for the rigorous standards of ACE has been shifted to EAL’s business leaders, who are responsible for setting and realising aggressive targets for business performance in four categories: (“UTC licenses ACE to Porsche Consulting”, 2017)
 - Customer Value & Satisfaction (Customer Focus)
 - Business Results (Financial Performance)
 - Process & Product Excellence (Quality Processes and Products)
 - Leadership, Culture & Environment (Employee Engagement)

2.1.2. Strategic Project Management

In customer driven organizations, vision, mission, and goals are set to meet the needs of the customers. The vision states, “What we want to become.” We need to communicate this vision throughout the organization. In addition, we need to make sure that everyone in the organization is aware of the organization’s mission, “What our business is and how we go to achieve our vision.” Business goals translate the vision, and the mission into broad long-term, measurable, and tangible terms. The objectives answer in detail where a corporation is heading or when it is going to get there. These objectives should set targets for all levels of the organization. Each level of the organizational objectives should support the higher-level objectives in more detail. (Porter, 1985)

Strategic management appears to be at best only partially successful in helping organizations to think strategically and to implement strategies effectively. Many strategic decisions are made in a highly incremental and fragmented way, rather than according to an overall design or 'deliberate strategy' (Mintzberg, 1994). Because of this, the business strategy itself may not in many ways be the most appropriate level at which to conduct detailed strategic thinking. A better approach, frequently, is to conduct much (but not all) of this thinking at the level of the strategic project or a group of those projects, the strategic program, sometimes known as a strategic breakthrough (Grundy, 1995).

Strategic project management is rapidly becoming a standard way of doing business in organizations. We accomplish a considerable portion of our typical firm’s effort through projects. Grundy and Brown defined strategic project management (SPM) as the process of managing complex projects by combining business strategy and project management techniques in order to implement the business strategy and to deliver organizational breakthroughs. (Grundy and Brown, 2001)

2.1.3. Strategic Project Implementation

A Guide to the Project Management Body of Knowledge defines project implementation as “coordinating people and other resources to carry out the (project) plan.” This definition of project execution is deceptively simple; under the direction of the project manager, the project team, vendors, and others carry out the tasks that are defined in the project plan in order to produce the project deliverables. (PMI, 2000)

Projects are becoming the tools of implementing the business strategy of an organization (Porter, 1985). The implementation of strategy is often much more complex and difficult than its formulation - either at the business or the corporate level. So, instead of spending 80 per cent of the time in strategic planning and 20 per cent in implementation development, arguably this should be 20 per cent in planning and 80 per cent in implementation. Project management must therefore be capable of dealing with more complexes, ambiguous and political issues than its traditional focus (Mintzberg, 1994).

According to Grundy, successful strategic project implementation must include attention to the following key points:

- Executing the work requires allocation of resources such as funds, people, and equipment. Organizational resources are limited. In addition, multiple goals frequently impose conflicting demands on resources. This requires a mechanism for allocating resources based on organizational priorities.
- Implementation requires an organizational structure that supports projects.
- Project management processes for planning, executing, and controlling are essential to ensure that we are able to implement strategies effectively and efficiently.
- We need a project selection and priority system to ensure strong linkages between projects and the strategic plan (Grundy, 1995).

All projects will have a different set of ambitions and challenges that they need to overcome in deciding an appropriate implementation approach. An effective implementation strategy thinks of the following key implementation principles: (Grundy, 1995)

- Be clear on the agreed outcomes for the project, what was agreed as constituting success;
- Build on experience taken by other projects but don't necessarily replicate the approach;
- Recognize the different approaches required if the change is mandatory or optional;
- Complement rather than replicate local resources;
- Promote early wins so people see evidence of improvement quickly;
- Learn from skeptics and enthusiasts to provide a balanced approach;
- Collect and visibly respond to feedback including time for making changes in plan;
- Adopt an implementation strategy that is sustainable in face of project risks;
- Anticipate user expectation, pitfalls and real life challenges. (Grundy, 1995)

Project Implementation Vs. Planning

Project planning and implementation are two very different things; unfortunately, too many managers pour all of their energy into ambitious planning efforts without giving enough thought to how goals actually will be achieved. Strategic planning efforts essentially take place in a laboratory devoid of the range of uncontrollable variables present in the real world. Even the best laid plans need correction and adjustment on-the-fly, making project managers' jobs that much more important. Implementing projects is important for project managers and the strategic planning process because it can reveal new issues and challenges that planner may not have anticipated, ultimately resulting in more refined strategies, products and processes. (David, 2009)

Putting projects into action is the vital step linking the planning stage to the final achievement of strategic goals, which makes project implementation of the utmost importance to strategic planning efforts. Project managers' jobs are ruled by a never-ending string of time-bound goals. Achieving goals is crucial to success as a project manager, and putting projects into action is the first step toward achieving organizational objectives. (David, 2009)

2.1.4. Strategic Project Integration

Every project in an organization should contribute to its strategic plan. How can we ensure this linkage? We need to make sure that we integrate projects within the strategic plan. This integration requires a process for prioritizing projects by their contribution to the plan.

Projects management is an important management tool to implement strategy and achieve an organization's strategic goals. Organizations are using projects to adapt to changes in the competitive environment including increasing cost pressures, scarce available resources, global competition, new technologies and a race to get products to customers first (Hyvari, 2006). Projects deliver the most benefit when they are directly linked to corporate strategy.

Project management differs from the day to day management of organizations. A project has an established objective, a defined life span, is unique, may involve several departments and professionals, and has specific time, cost and performance outcomes (Gray and Larson, 2006). The fundamental reason for a project is to bring together scarce resources, skills, technology and ideas to achieve future business benefits, or to solve a problem.

In contrast to project management, the day to day management of organizations focuses on routine activities and factors that shape constrain and prompt managers to act in pursuit of the organization's future vision (McKenna, 1999). Day to day management is therefore less focused on time and outcomes, and may be prone to inertia. Organizational goals and objectives are often high level and linked to long term time frames. Practical steps to achieve these objectives may not be clearly identified, therefore reducing the likelihood of successful strategy implementation.

Integrating projects to organizational activities can harness the energy of different thought processes to propel innovation and change in an organization (Leonard and Straus, 1997). According to Leonard and Straus (1997) operational innovation, or the invention and deployment of new ways of doing work, is by nature disruptive and should concentrate on activities that impact on the enterprise's strategic goals. Stockport (2000) states, "*strategic transformation is about the ability of an organization to transform itself to ensure long-term survival*". This is to

say that innovation and change through project integration is necessary to overcome inertia that may exist in functionally oriented organizations. Revolutionary projects can help overcome organizational inertia, and must be aligned with the strategic goals of an organization, rather than a narrowly defined project focus. (Stockport, 2000)

2.1.5. Aligning Project Management and Strategies

Research suggests that aligning project management and organization strategy produces significant benefits for the organization. Funds are spent to directly impact a company's overall performance, thereby increasing profitability and reducing unnecessary expenses. By aligning projects with strategy, organizations can ensure that they invest only in those initiatives which enable them to accomplish their objectives. (Grundy, 1995)

Alignment can also help improve project success rates and, therefore, the ability for the organization to address customer needs and expectations. Research has shown a significant increase in organizational financial performance and project success rates when projects were aligned with business strategies. (Grundy, 1995)

The essence of strategic project management is that the strategy is more important than the project. Because project managers were taught to deliver project results, it is possible to find themselves in a situation where they reached the target without actually creating value, because the strategy has changed or because they did not thought at the link between project and organization's strategic level. From this reason, I believe that the root cause of project failure is lack of clarity in the strategy. (Hotaran et al., 2010)

Here's a checklist of questions for senior executives and sponsors to help make sure the corporate projects are aligned to corporate strategy: (Dinsmore, 1999)

Is the corporation committed to using project management strategically? In most companies, hundreds of projects are underway at any given time—transformation projects, continuous improvement programs, plant expansions, maintenance fix-ups, worker empowerment, resizing, outsourcing, and quality-of-life projects. Managers, who in the old days

supervised people or acted as information brokers between lower and upper corporate levels, now serve as project managers, or as managers of project managers. Since the nature of a manager's work has changed, there must be corresponding corporate commitment to the art and science of managing projects. Things have changed and corporate policies statements must reflect those changes. The project policy statements might address timing or the use of principles and techniques.

Is there a policy of formally preparing project charters? Since projects are the means by which corporate strategies are executed, it is critical that they be guided by the original corporate philosophy, strategy, and intent. Project charters are the instrument for doing this. This charter, with the participation and approval of upper management, should answer the basic question, "In what ways will the project enhance overall corporate objectives?" The charter should also cover such topics as objectives, relationships of stakeholders, methodologies, project management philosophy, scope statement, principal interfaces, and a brief project management plan.

Is there synergy between the business group and those responsible for project implementation? To avoid the grenade-over-the-wall-syndrome, there needs to be early involvement by project implementation people. While this principle may seem sound, the practice of it presents a challenge. First, business planning people may prefer to plan without the help of perceived "outsiders." Then, there's a good likelihood that the right project people might not be sitting about just waiting to brainstorm and analyze the early stages of a business proposal. Finally, there's the effort required by senior management and sponsors to articulate the relationship between the business planning people and the project management office.

How can senior management make sure that projects don't wear away from the chartered objectives? Maintenance events, programmed into the lives of a project, are a way to keep the project aligned with corporate interests. One classic method is the two-day project management audit. This audit typically compares on-site practice against the project management plan, which is the road map for project implementation. If the audit is expanded to include the project charter and senior management sponsorship issues, this will ensure that questions of strategic project alignment are addressed. The audit can also be used to pinpoint the need for strategic adjustment, if some of the original premises have changed as the project evolved. (Dinsmore, 1999)

2.1.6. Organizational Performance

Organizational performance comprises the actual output or results of an organization as measured against its intended outputs (or goals and objectives). According to Richard et al. (2009) organizational performance encompasses three specific areas of firm outcomes: (a) financial performance (profits, return on assets, return on investment, etc.); (b) product market performance (sales, market share, etc.); and (c) shareholder value performance (in some cases, production capacity performance may be analyzed).

Continuous performance is the focus of any organization because only through performance organizations are able to grow and progress. Thus, organizational performance is one of the most important variables in the management research. Although the concept of organizational performance is very common in the academic literature, its definition is difficult because of its many meanings. For this reason, there isn't a universally accepted definition of this concept.

In the '50s organizational performance was defined as the extent to which organizations, viewed as a social system fulfilled their objectives (Georgopoulos & Tannenbaum, 1957). Performance evaluation during this time was focused on work, people and organizational structure. Later in the 60s and 70s, organizations have begun to explore new ways to evaluate their performance so performance was defined as an organization's ability to exploit its environment for accessing and using the limited resources (Yuchtman & Seashore, 1967). The years 80s and 90s were marked by the realization that the identification of organizational objectives is more complex than initially considered. Managers began to understand that an organization is successful if it accomplishes its goals (effectiveness) using a minimum of resources (efficiency).

Thus, organizational theories that followed supported the idea of an organization that achieves its performance objectives based on the constraints imposed by the limited resources (Lusthaus & Adrien, 1998). In this context, profit became one of the many indicators of performance. The authors Lebas & Euske (2006) provide a set of definitions to illustrate the concept of organizational performance:

- Performance is a set of financial and nonfinancial indicators which offer information on the degree of achievement of objectives and results (Lebans & Euske, 2006).
- Performance is dynamic, requiring judgment and interpretation.
- Performance may be illustrated by using a causal model that describes how current actions may affect future results.
- Performance may be understood differently depending on the person involved in the assessment of the organizational performance (e.g. performance can be understood differently from a person within the organization compared to one from outside).
- To define the concept of performance is necessary to know its elements characteristic to each area of responsibility.
- To report an organization's performance level, it is necessary to be able to quantify the results.

According to Center for Business Practices (2005) study, measuring project management performance and value will help organizations achieve one or more of the following goals:

- to identify the business impact of implementing project management improvement initiatives
- to compare costs to benefits of project management improvement initiatives
- to determine if a project management improvement initiative is accomplishing its objectives
- to assist in marketing future project management improvement initiatives.

The above research institute also identifies ten measures an organization should benchmark to lead to project management success. According to their description, the appropriate set of measures depends on the organization's strategy, technology, and the particular industry and environment in which they compete. These ten measures are described below:-

Return on Investment ((Net Benefits/Costs) x 100)

The most appropriate formula for evaluating project investment (and project management investment) is Net Benefits divided by Cost. By multiplying this result by 100, this calculation determines the percentage return for every dollar you've invested. The key to this metric is in

placing a dollar value on each unit of data that can be collected and used to measure Net Benefits. Sources of benefits can come from a variety of measures, including contribution to profit, savings of costs, increase in quantity of output converted to a dollar value, quality improvements translated into any of the first three measures. Costs might include the costs to design and develop and/or maintain the project or project management improvement initiative, cost of resources, cost of travel and expenses, cost to train, overhead costs, etc.

Productivity

Productivity is output produced per unit of input. Productivity measures tell you whether you're getting your money's worth from your people and other inputs to the organization. Typically the resources have to do with people, but not always. A straightforward way to normalize productivity measurement across organizations is to use revenue per employee as the key metric. Dividing revenue per employee by the average fully burdened salary per employee yields a ratio. This ratio is the average-per-employee "Productivity Ratio" for the organization as a whole. Other productivity metrics might be number of projects completed per employee, number of lines of code produced per employee. The key to selecting the right productivity measures is to ask whether the output being measured (the top half of the productivity ratio) is of value to your organization's customers.

Cost of Quality (Cost of Quality/Actual Cost)

Cost of quality is the amount of money a business loses because its product or service was not done right in the first place. It includes total labor, materials, and overhead costs attributed to imperfections in the processes that deliver products or services that don't meet specifications or expectations. These costs would include inspection, rework, duplicate work, scrapping rejects, replacements and refunds, complaints, loss of customers, and damage to reputation.

Cost Performance (Earned Value/Actual Cost)

The Cost Performance Index is a measure of cost efficiency. It's determined by dividing the value of the work actually performed (the earned value) by the actual costs that it took to accomplish the earned value. The ability to accurately forecast cost performance allows organizations to confidently allocate capital, reducing financial risk, possibly reducing the cost of

capital. CPI Standard Deviation is an even better metric, one that shows the accuracy of budget estimating.

Schedule Performance (Earned Value/Planned Value)

The Schedule Performance Index is the ratio of total original authorized duration versus total final project duration. The ability to accurately forecast schedule helps meet time-to-market windows. SPI Standard Deviation is an even better metric that shows the accuracy of schedule estimating.

Customer Satisfaction (Scale of 1-100)

Customer satisfaction means that customer expectations are met. This requires a combination of conformance to requirements (the project must produce what it said it would produce) and fitness for use (the product or service produced must satisfy real needs). The Customer Satisfaction Index is an index comprising hard measures of customer buying/use behavior and soft measures of customer opinions or feelings. Index is weighted based on how important each value is in determining customer overall customer satisfaction and buying/use behavior.

Cycle Time

There are two types of cycle time—project cycle and process cycle. The project life cycle defines the beginning and the end of a project. Cycle time is the time it takes to complete the project life-cycle. Cycle time measures are based on standard performance. That is, cycle times for similar types of projects can be benchmarked to determine a Standard Project Life-Cycle Time. Measuring cycle times can also mean measuring the length of time to complete any of the processes that comprise the project life-cycle. The shorter the cycle times, the faster the investment is returned to the organization. The shorter the combined cycle time of all projects, the more projects the organization can complete.

Requirements Performance

Meeting requirements is one of the key success factors for project management. To measure this factor you need to develop measures of fit, which means the solution completely satisfies the

requirement. A requirements performance index can measure the degree to which project results meet requirements. Types of requirements that might be measured include functional requirements (something the product must do or an action it must take), non-functional requirements (a quality the product must have, such as usability, performance, etc.). Fit criteria are usually derived sometime after the requirement description is first written.

Employee Satisfaction

An employee satisfaction index will give you one number to look at to determine employee morale levels. The ESI comprises a mix of soft and hard measures that are each assigned a weight based on their importance as a predictor of employee satisfaction levels.

Alignment to Strategic Business Goals

Most project management metrics benchmark the efficiency of project management—doing projects right. You also need a metric to determine whether or not you're working on the right projects. Measuring the alignment of projects to strategic business goals is such a metric. It's determined through a survey of an appropriate mix of project management professionals, business unit managers, and executives. Use a Likert scale from 1-10 to rate the statement: Projects are aligned with the business's strategic objectives.

2.2. Empirical Evidence

In the early 1980's and 1990's, companies began to build upon the principles of Total Quality Management and developed their own unique quality systems. The most popular and well known of these systems is Six Sigma that was developed by Motorola and successfully adopted by others such as Allied Signal (now Honeywell) and most notably, General Electric. Six Sigma can be characterized as a highly formalized, process oriented improvement tool that is data focused. The Six Sigma process is normally performed by a diverse team, who attack a quality/process problem by analyzing process variation or in statistical terms, sigma. The foundations of Six Sigma are commitment from upper management, detailed training and a regimented diagnostic approach. (Nigatu, T.A., 2010)

Another quality operating system is the less known, but very successful, Achieving Competitive Excellence (ACE) operating system. This system was developed and is practiced by United Technologies Corporation (UTC). The ACE system is broader based than the Six-Sigma approach, however, ACE is not as data oriented as the Six Sigma approach. ACE revolves around the three principle categories of process improvement and waste elimination tools, decision-making tools, and problem solving tools. These tools impact issues as diverse, but not limited to, factory floor cleanliness, market feedback analysis, machine tool preventative maintenance and set up reduction. ACE is a combination of lean manufacturing and quality improvement philosophies. (Nigatu, T.A., 2010)

ACE has been used as a successful operating system for different organizations. One of them is UTC Climate, Controls & Security. According to literature the use of ACE at UTC Climate, Controls & Security's Collierville, Tennessee facility has led to remarkable sustained results. These achievements included improvements to first pass yield by 50 percent, the cost of poor quality by 15 percent, supplier PPM by 77 percent and the employee engagement score by 22 points. The Collierville facility, which has a manufacturing space greater than 800,000 square feet, manufactures Carrier residential air conditioners and heat pumps – and its dedication to ACE has resulted in efficiencies that have helped generate more than \$3 million in savings. (“Achieving Competitive Excellence”, 2017)

The ACE Operating System is a core element of UTC's operations and business performance. It has driven significant results within the company's own operations for nearly two decades. ACE has three elements: culture, tools and competency. Successful application of ACE principles can drive measurable improvements in quality, on-time delivery, employee safety, financial returns and customer satisfaction. (“UTC licenses ACE to Porsche Consulting”, 2017)

Introduced to UTC at Pratt & Whitney in 1996, the ACE Operating System fuses advanced principles of quality and productivity management. It forms the foundation of a high-performance culture through continuous process improvement, waste elimination, problem-solving and decision-making. (“UTC licenses ACE to Porsche Consulting”, 2017)

Another company that implemented ACE operating system is PRATT & WHITNEY. At Pratt & Whitney's Hot Section Module Center-South (HSMC-S) in East Hartford, ACE has fostered a commitment to a culture of continuous improvement. The largest UTC manufacturing site in Connecticut to achieve ACE Gold, HSMC-S' dedication to ACE over the last 13 years has led to massive reductions in waste costs and drastic improvements in incident rates. HSMC-S' accomplishments include an 80 percent reduction in the cost of poor quality, a 92 percent reduction in the lost time incident rate and a 78 percent reduction in the total recordable incident rate. These improvements enable HSMC-S to efficiently produce parts for the game-changing F135 and Geared Turbofan engines. ("Achieving Competitive Excellence", 2017)

2.3. Conceptual Framework

This research work focuses on the assessment of ACE project implementation, integration and strategic alignment in EAL MRO division and their impact on organizational performance. The following picture depicts the overall conceptual framework so as to demonstrate the relationship between dependent and independent variables.

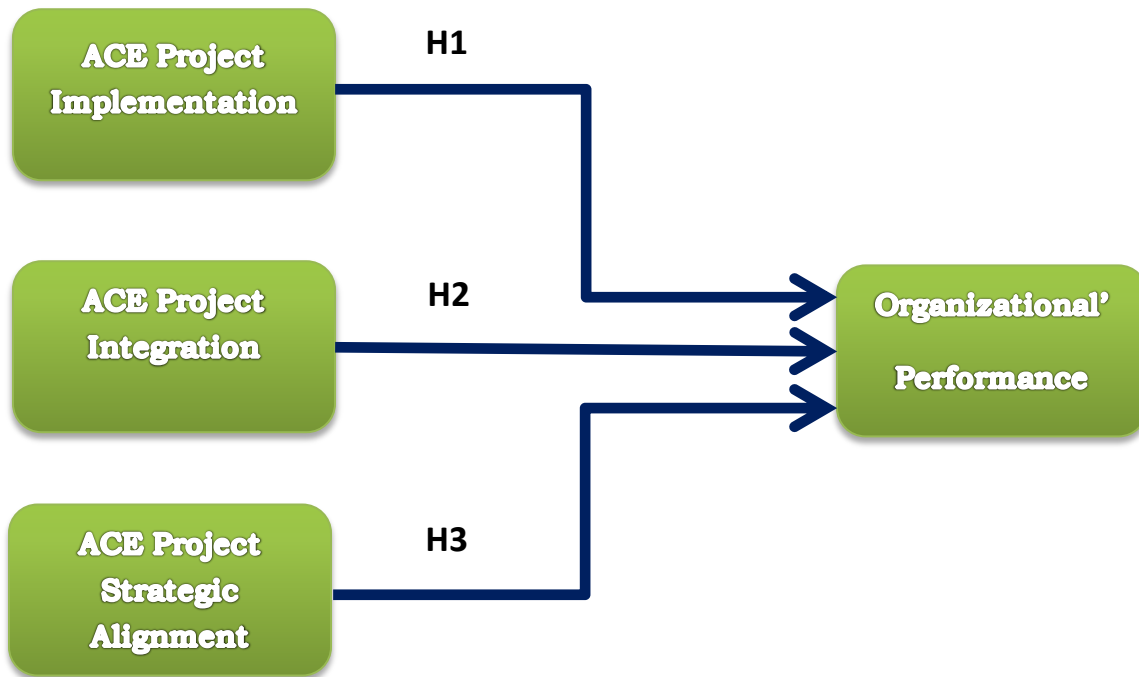


Fig 2.2: Conceptual Framework (Adapted from (Alsudiri et al, 2012)

Definition of Terms

ACE (Achieving Competitive Excellence):- is a company-wide strategic project to relentlessly improving the value that the company delivers to its customers. It focuses on the drivers of customer value: processes and the people who fuel them. (Company Portal)

Project Implementation: - A guide to the Project Management Body of Knowledge defines project implementation as “coordinating people and other resources to carry out the project plan”. (PMI, 2000)

Project Integration:- is a collection of processes required to ensure that the various elements of the projects are properly coordinated. It involves making trade-off among competing objectives and alternatives to meet or exceed stakeholder needs and expectations. (PMI, 2000)

Project Strategic Alignment: - it is the portfolio that links projects and programs to the organization’s strategic plan. Within programs and portfolios, projects are a means of achieving organizational strategy and objectives. (Grundy, 1995)

Organizational Performance: - is a set of financial and nonfinancial indicators which offer information on the degree of achievement of objectives and results (Lebans & Euske, 2006).

CHAPTER THREE

3. Research Methodology

3.1. Introduction

The previous chapters have provided a scientific background for the empirical research. This chapter outlines the research framework and methodology used to collect the data to test the three hypotheses and satisfy the three specific research objectives described in Chapter One. The research methodology includes research type, research design, research strategy approach, sampling, data source, instrument design, reliability and validity test and the data analysis techniques that are used in this study.

3.2. Research Type

Catherine (2007) refers to two types of research: pure and applied research. Pure research is that which has no obvious practical implications beyond contributing to a particular area of intellectual enquiry. Applied research on the other hand, is problem focused and is directed towards solving some particular intellectual question that has practical implications for a client outside the academic world. This study attempt to identify options in order to solve problems and its focus is thus application of findings of the study to solve problems. Therefore, the type of this study is applied research.

3.3. Research Design

Research design represents the major methodology driving the study, being distinctive and specific research approaches which are best suited to answer the research question (Catherine, 2007). The purpose of the research design, as stated by Sekaran & Roger (2009) is to achieve greater control of the study in examining the research problem.

In this research quantitative research design is used to employ quantifiable schemes to obtain more assurance than a reasonable guess would do. Exploratory research is employed for background formation, problem identification, instrument development and hypotheses formation.

Descriptive statistics were used to interpret data in general. Descriptive research sets out to describe and to interpret what is. It aims to depict the state of affairs as it exists and to describe some aspect of a phenomenon, i.e., the status of a given phenomenon. Thus, mean, range, standard deviation, correlations, frequency distributions, tabular presentations, graphs and charts are presented in the next chapter. *Inferential method* was used for testing hypothesis and investigating research objectives. Specifically, simple regression analysis was used to test all three hypotheses.

3.4. Research Strategy Approach

Zikmund (2003) presents two approaches, inductive and deductive methods. Inductive approach is initialized by specific observations in a data material from which generalizations are made without conducting literature reviews. Thus, it is creating new theory from observation, pattern identification and hypothesis. A deductive approach is the opposite, initiating by reviewing and gather theory from where collection and conclusions are based upon. Accordingly, the researcher employed a combination of deductive and inductive research strategy for this study.

3.5. Sampling

Sampling is a procedure that uses a small number of units of a given population as a basis for drawing conclusions about the whole populations (Alan & Nadeen, 2005).

3.5.1. Population

- All individuals of interest to the researcher are called population (Alan and Nadeen, 2005). The target populations for this study are employees of Ethiopian Airlines.

3.5.2. Unit of Analysis

- Unit of analysis is related with the population (specific population) that is used to collect data. The unit of analysis for this study is MRO employees of Ethiopian airlines.

3.5.3. Sampling Technique

- Convenient sampling technique is used to collect data from the respondents. Questioners were distributed to willing respondents in the MRO areas.

3.5.4. Sample Size and Data Collection

- The eventual sample size is usually a compromise between what is desirable and what is feasible. Cochran (1963) developed the formula to yield a representative sample for large population size like the current study:

$N = (Z\text{-score})^2 - \text{StdDev} * (1 - \text{StdDev}) / (\text{margin of error})^2$, Where:

- **Z-score** represents confidence level. The most common confidence intervals are 90% confident, 95% confident, and 99% confident (90%, Z-Score = 1.645; 95%, Z-Score = 1.96; 99%, Z-Score = 2.326).
- **Standard of Deviation** — how much variance is expected in the responses? Since the researcher did not actually administered survey yet, the safe decision is to use 0.5 – this is the most forgiving number and ensures that the sample will be large enough.
- **Margin of Error (Confidence Interval, level of precision)** — No sample will be perfect, so it is needed to decide how much error to allow. The confidence interval determines how much higher or lower than the population mean to let the sample mean fall (Cochran, 1963).

- Assuming a 95% confidence level, 0.5 standard deviation, and a margin of error (confidence interval) of +/- 5%.

$$((1.96)^2 \times .5(.5)) / (.05)^2$$

$$(3.8416 \times .25) / .0025$$

$$.9604 / .0025$$

$$384.16$$

385 respondents are needed

- The questionnaire is pilot studied through distribution to 15 respondents who were selected randomly. According to Zikmund (2003), a pre-testing study provides an opportunity for the researcher to determine whether the respondents have any difficulty of understanding the questionnaire. These respondents are asked to fill up the questionnaires and to inform the researcher for further improvement if there were any kind of problem with regards to language, wording, expressions and clarity of the questions.
- Once the pre-test had completed, the researcher worked on the text editing, spelling, legibility, instructions, layout, response's space, pre-coding, scaling issues, and the general presentation of the questionnaire. Finally, the questionnaires were distributed conveniently. The data that was collected was then examined and screened for missing and inappropriate response.

3.6. Data Source

- The primary data was collected through administrating questionnaire from selected employees to obtain the real feelings, opinions and comments regarding to the project. The lack of research relating to the study in Ethiopian Airlines MRO division made it necessary to collect primary data to meet the objectives of the research. In this study, therefore, the implementation, integration and strategic alignment of ACE project was specifically examined.
- In this study primary data was conducted and analyzed with the rationale of the secondary data. Secondary data was obtained through document analysis including company portal of EAL, brochures, published journal articles, books, company's website, thesis, dissertations, Internet and other external sources related to the study.

3.7. Research Instrument

- The questionnaire is a common instrument for observing data beyond the physical reach of the observer. Structured questionnaire (fixed response type) was used to collect primary data from respondent. According to Malhotra (2007), this survey approach is the most common method of primary data collection in social research and the advantages are simple administration and data consistency.
- Malhotra (2007) noted that the main advantage of conducting a self-administered questionnaire was that researchers could collect all of the completed responses within a short time. Through the questionnaire conducted in this way, any doubts that respondents may have on any question can be immediately clarified. In addition, researcher could be provided with an opportunity to introduce the research topic and motivate the respondents to offer their true responses. Self-administering questionnaires to large numbers of individuals at the same time could be less expensive and save more time compared with an interview. In consideration of these advantages, therefore, the researcher adopted the approach of a self-administered questionnaire for this study.

3.8. Reliability and Validity

The two major criteria which applied to evaluate the quality of the study are validity and reliability.

3.8.1. Reliability

- The current study used multiple items in all constructs. So the internal consistency of the items was checked. The rationale for internal consistency is that the individual items or indicators of the scale should all be measuring the same construct and thus be highly inter-correlated. Internal consistency reliability of all questions was assessed by the Cronbach's alpha coefficients of measurement items for each construct and the result is shown in the next chapter.

3.8.2. Validity

- In this study all variables (items) were inspected by the researcher, research expert (advisor) and ACE agents to ensure that research items are an adequate and a thorough representation of the construct under investigation. For the purpose of enhancing the research instrument, for testing the questionnaire for clarity and for providing a coherent research questionnaire, a detailed literature review was also be performed.

3.9. Data Analysis and Presentation

- In order to meet the research objectives of this study, all valid responses were assessed using a variety of statistical techniques. The data that had collected was examined, edited, coded, categorized, tabulated, recombined and presented for analysis to address the initial objectives of a study.
- *Summated Scale* was used to combining several variables that measured the same concept into a single variable in an attempt to increase the reliability of the measurement through multivariate measurement.
- *Descriptive statistics* were used such as mean, range, standard deviation, correlations, frequency distributions, tabular presentations, graphs and charts.
- *Inferential method* was used for testing hypothesis and investigating research objectives. Specifically, simple regression analysis including coefficient of determination, ANOVA and Beta analysis were used to test all the three hypotheses.

3.9.1. Hypotheses Testing

- *Paired sample t-test* was used to test the existence of significance difference between variables.
- According to Hair et al. (1998), *simple regression*, also known as bivariate regression, is a regression model with a single independent variable. Multiple regression analysis is a

statistic technique used to investigate the relationships between a dependent variable and two or more independent variables (Catherine, 2007). **Multiple regression** analysis is a statistical technique that allows researchers to predict someone's score on one variable on the basis of their scores on several other variables. In this research simple regression was used to test the hypotheses.

- An analysis of the survey data was performed using **SPSS**. This software has been widely used by researchers as a data analysis technique.

3.9.2. Methods of Presentation

- The data from the study was presented in the form of tables, graphs and charts as desired so as to make all the data readable and understandable by all concerned parties.

3.10. Ethical Considerations

All information collected was treated with confidentiality without disclosure of the respondents' identity. Moreover, no information was modified or changed, hence the information was presented as collected and all the literatures collected for the purpose of this study were acknowledged in the reference list.

In order to keep the confidentiality of the information given by respondents, it was not required to write their name and assured that their responses would be treated in strict confidentiality. The purpose of the study is disclosed in the introductory part of the questionnaire. Furthermore, the researcher tried to avoid misleading or deceptive statements in the questionnaire. Lastly, the questionnaires were distributed only to voluntary participants.

CHAPTER FOUR

4. Results and Discussions

4.1 Introduction

This chapter presents the results of the data analysis according to the research methodology discussed in chapter three. A detailed discussion regarding to the three research hypotheses is also presented and tested.

4.2. Results

4.2.1. Sample and Response Rates

After distributing 385 questionnaires for passengers, a total of 349 answered questionnaires were retrieved, which is 91% of the total distributed questionnaires. After checking the retrieved questionnaires, the 336 questionnaires were valid for statistical analysis. Ultimately, 87% of the total questionnaires distributed entered the analysis.

4.2.2. Missing Data

Missing data frequently occurs in a situation in which a respondent cannot respond to one or more questions of a survey (Hair et al., 1998). In this study, missing value above 1%, on a single item was considered as incomplete and the response was rejected from further analysis.

Because of low percentages of missing values considered, the primary procedure used in this study was to replace missing values with mean substitution. According to Hair et al. (1998), mean substitution is a widely used method for replacing missing data, whereby missing values for a variable are replaced with the mean value based on all valid responses.

4.2.3. Descriptive Statistics

In the questionnaire, Section A was designed to capture some basic demographic details of the respondents involved in the study. Section B was designed to capture items on ACE project implementation, integration, strategic alignment of ACE project and organizational performance.

4.2.3.1. Descriptive Demographic Analysis of Respondents

Before starting the analysis of the data some background information such as demographic data, is useful in order to make the analysis more meaning full for the readers. The samples of this study have been classified according to several background information collected during survey.

The male respondents constituted the largest share of the gender composition representing 81.5% of the respondents (274) while 18.5% (62) were female employees.

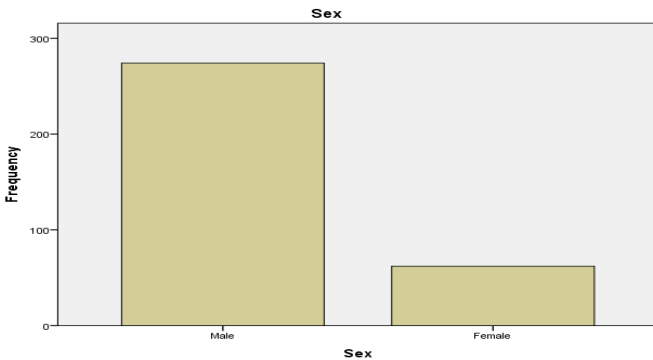


Fig. 4.1: Gender Distribution

Source: Researcher’s Survey Finding (2017)

The service year (s) was distributed as shown in Table 4.1 and Fig 4.2. As it can be seen from the figure, majority of the respondents (168, or 50%) were working between 5 and 10 years. In addition, (126, or 37.5 %) of respondents were working between 1 and 5 years. Only (11, or 3.3%) of respondents were working less than 1 year. The rest (31, or 9.2%) of the respondents were working for greater than 10 years.

Table 4.1. Service Year

Service Year(s)	Frequency	Valid Percent	Cumulative Percent
<1 Year	11	3.3	3.3
>= 1 Year and < 5 Years	126	37.5	40.8
>=5 Years and < 10 Years	168	50.0	90.8
>10 Years	31	9.2	100.0
Total	336	100.0	

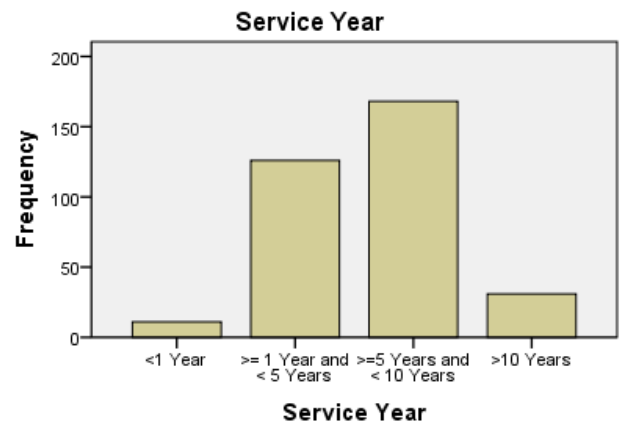


Fig. 4.2: Service Year Distribution

Source: Researcher’s Survey Finding (2017)

Regarding to the educational background majority of the respondents (278 or, 82.7%) were a holder of first degree, followed by the second largest respondents who had diploma (48, or 14.3%) and the rest were educated in the level of graduate degree (10, or 3%). None of the respondents were PHD or certificate holder.

Table 4.2: Educational Background

	Frequency	Valid Percent	Cumulative Percent
Diploma	48	14.3	14.3
Degree	278	82.7	97.0
Masters	10	3.0	100.0
Total	336	100.0	

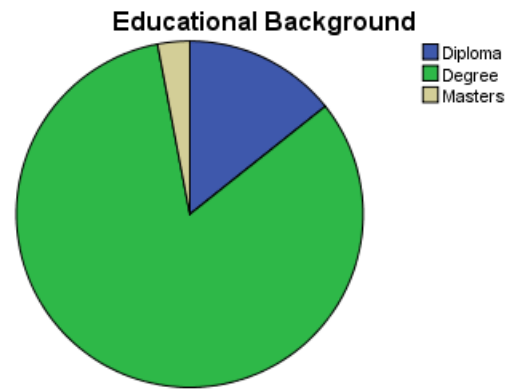


Fig 4.3: Educational Background

Source: Researcher's Survey Finding (2017)

As shown in Table 4.3, majority (107 or 31.8%) of the sample lies in a monthly income category of birr 5,001-10,000. 98 respondents or 29.2% of the samples earn a monthly income of birr 15,001-20,000. 91, or 27.1% of the respondents lie in a monthly income category of birr 10,001-15,000. The remaining (40, or 11.9%) of the respondents earn a monthly income of above birr 20,000.

Table 4.3: Monthly Income (in ETB)

	Frequency	Valid Percent	Cumulative Percent
5001-10000	107	31.8	31.8
10001-15000	91	27.1	58.9
15001-20000	98	29.2	88.1
Above 20000	40	11.9	100.0
Total	336	100.0	

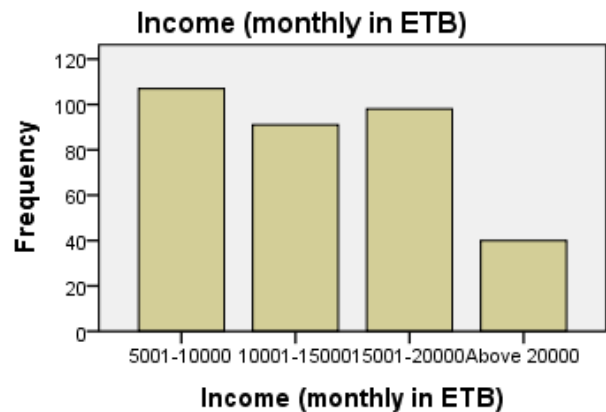


Fig 4.4: Monthly Income in ETB

Source: Researcher's Survey Finding (2017)

One of the variables asked to the respondents in section 1 was the ACE level in which their department belongs to. As shown in the following table & figure majority of the respondents (104, or 19.3%) were working in the bronze level department, (87, or 25.9 %) of respondents are working in the silver level department, (80, or 23.8%) of respondents are working in the gold level department and (65, or 19.3%) of respondents are working in the qualifying level department. This indicates that majority of the respondents 76.2% were working in a department that didn't yet get gold level.

Table 4.4 ACE Level

	Frequency	Valid Percent	Cumulative Percent
Qualifying	65	19.3	19.3
Bronze	104	31.0	50.3
Silver	87	25.9	76.2
Gold	80	23.8	100.0
Total	336	100.0	

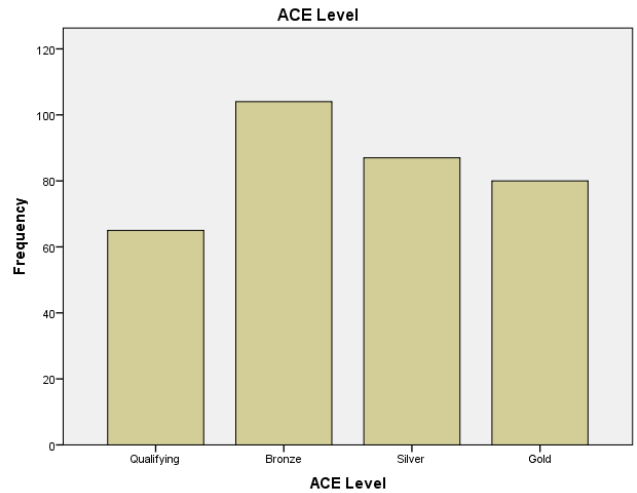


Fig 4.5: ACE Level

Source: Researcher's Survey Finding (2017)

4.2.3.2. Descriptive Analysis of Variables

4.2.3.2.1. Summated Scale

In order to reduce measurement error by improving individual variables, Hair et al. (1998) recommend using multivariate measurements, which are known as summated scales, as identified as replacement variables. Hair et al. (1998) described a summated scale as a method of combining several variables that measure the same concept into a single variable in an attempt to increase the reliability of the measurement through multivariate measurement. The ultimate goal of adopting summated scales is to avoid the use of only a single variable to represent a concept and, instead, to use several variables as indicators, all representing differing facets of the concept to obtain a more well-rounded perspective (Hair et al., 1998). The use of multiple indicators enables researchers to specify more accurately the desired responses (Hair et al., 1998).

Hair et al. (1998) show that a summated scale can be formed through the combination of several individual variables into a single composite measure. In simple terms, all of the variables are combined, and the total or, more commonly average score of the variable is used as a replacement variable.

Hair et al. (1998) indicate that a summated scale provides two specific benefits:

- A means of overcoming, to some extent, the measurement error inherent in all measured variables.
- It represents the multiple aspects of a concept in a single measure.

However, the content validity and reliability of the measure must be assessed before the creation of a summated scale. The following section will review the content validity and reliability of the measure.

4.2.3.2.1.1. Content Validity

Content validity, also known as face validity, is the assessment of the correspondence of the variables to be included into a summated scale and its conceptual definition (Hair et al., 1998). All variables (items) were inspected by the researcher and three ACE agents in the division to ensure that they were an adequate and a thorough representation of the construct under investigation. To test the questionnaire for clarity and to provide a coherent research questionnaire, a macro review was accurately performed. Some items were added, based on their valuable recommendations. Some others were reformulated to become more accurate and clear, and this was required for the purpose of enhancing the research instrument.

4.2.3.2.1.2. Reliability

In general, reliability is used to test the internal consistency among the variables or items through a summated scale (Hair et al., 1996). Cronbach's Alpha is used to measure how well a set of

items (or variables) measure a single uni-dimensional latent construct. (Malhotra, 2007). Cronbach's Alpha is low when data have a multi-dimensional structure. Malhotra, (2007) suggests that an alpha of 0.60 or greater should be considered adequate to develop a new questionnaire. Therefore, a low coefficient alpha indicates the sample of items perform poorly in capturing the construct motivating the measure. Conversely, a large coefficient alpha implies that the k-items test correlates with the true scores closely Malhotra, (2007).

ACE project implementation variable was measured using the six dimensions listed in the questionnaire, which were combined into a single scale (Cronbach's alpha = 0.750). ACE project integration variable was measured using the six items listed in the questionnaire, which were combined into a single scale (Cronbach's alpha = 0.796). ACE project strategic alignment variable was measured using the four items listed in the questionnaire, which were combined into a single scale (Cronbach's alpha = 0.769). And lastly, Departments' Performance variable was measured using the four items listed in the questionnaire, which were combined into a single scale (Cronbach's alpha = 0.857).

4.2.3.2.2. ACE Project Implementation Dimensions Analysis

The mean scores have been computed for all the six ACE implementation dimensions. These are management ACE understanding, employees ACE understanding, employees ACE participation, management ACE leadership and sponsorship, top management ACE commitment and employees ACE commitment by equally weighting the scores of all the dimensions. Respondents were asked to rate their perception on a five-point Likert type scale ranging from 1 being strongly disagree to 5 strongly agree for ACE implementation dimensions. The result is presented in fig 4.6 below.

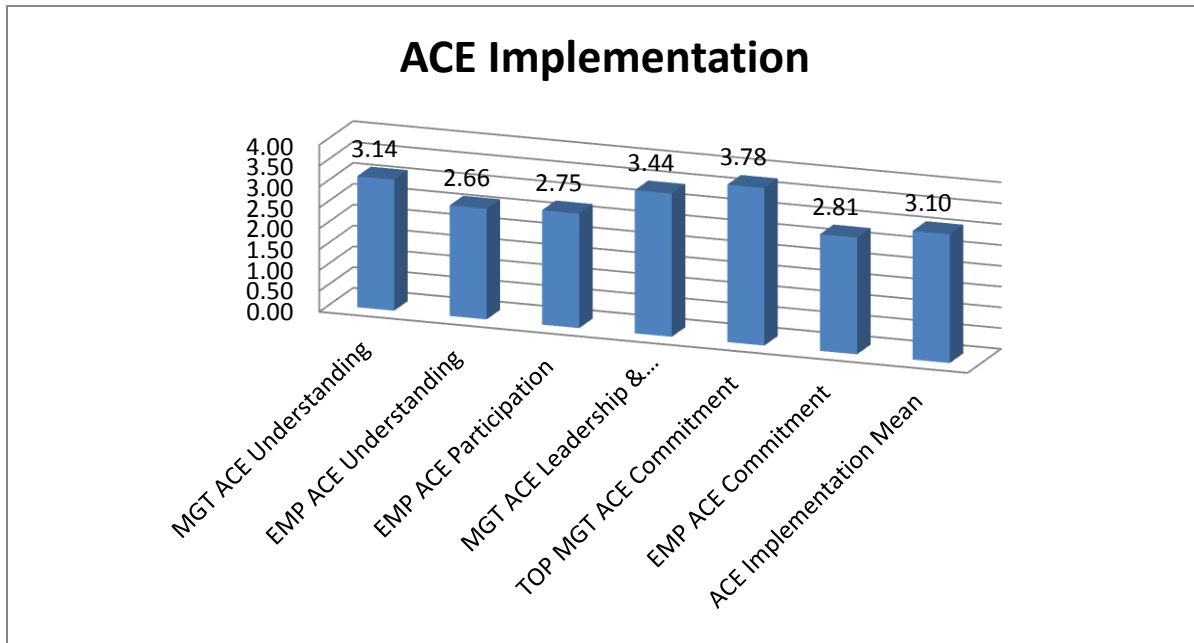


Fig 4.6: ACE Implementation

Source: Researcher's Survey Finding (2017)

The range of the mean values for ACE project implementation dimensions is between 2.66 to 3.78 for the values of employees' ACE understanding and top management ACE commitment respectively. The overall summated scale average of the mean values for ACE project implementation dimensions is 3.1.

Table 4.5: ACE Implementation Among Varies ACE Levels

		MGT ACE Understanding		EMP ACE Understanding		EMP ACE Participation		MGT ACE Leadership & Sponsorship		TOP MGT ACE Commitment		EMP ACE Commitment		ACE Implementation	
		Mean	SD	Mean	SD	Mean	SD	Mean	SD	Mean	SD	Mean	SD	Mean	SD
ACE Level	Qualifying	2.77	1.31	2.00	0.71	2.25	0.83	3.02	1.01	3.51	0.50	1.72	0.63	2.54	0.55
	Bronze	2.88	0.78	2.38	0.86	2.50	0.87	3.00	0.87	3.50	0.71	2.63	0.70	2.81	0.49
	Silver	3.64	0.98	3.00	0.88	3.14	0.78	3.37	0.70	4.00	0.72	3.13	0.79	3.38	0.42
	Gold	3.29	1.31	3.25	0.83	3.13	0.79	4.38	0.49	4.13	0.33	3.75	1.00	3.65	0.39
	Mean	3.14	1.10	2.66	0.82	2.75	0.82	3.44	0.77	3.78	0.57	2.81	0.78	3.10	0.46

Source: Researcher's Survey Finding (2017)

As we can see from the above table, the overall averages for ACE implementation is significantly vary among different ACE levels. The higher the ACE level, the higher the mean score of ACE implementation in the departments. For instance, the overall ACE implementation mean for departments in the qualifying ACE level stage is 2.54 with a standard deviation of 0.55 whereas the overall ACE implementation mean for departments in the gold ACE level stage is 3.65 with a standard deviation of 0.39. In addition, there is high score of ACE commitment and active sponsorship and leadership for ACE implementation by managers and team leaders' almost in all departments in different ACE level (3.78 and 3.44 respectively). These indicate how much ACE project has got management focus.

In contrary, very low score is given by respondents for the dimensions employees' ACE understanding, participation and commitment (2.66, 2.75 and 2.81 respectively). These indicate that management should find ways to improve employees' ACE project awareness and should develop additional strategies to improve employees' participation and commitment to ACE in order to facilitate successful implementation of ACE project throughout the division.

4.2.3.2.3. ACE Project Integration Dimensions Analysis

The mean scores have been computed for all the five ACE integration dimensions. These are ACE in business strategy formulation, ACE priority in the department, ACE & corporate strategy relationship, ACE & performance review relationship and ACE & major department's functions by equally weighting the scores of all the dimensions. Respondents were asked to rate their perception on a five-point Likert type scale ranging from 1 being strongly disagree to 5 strongly agree for ACE integration dimensions. The result is presented in fig 4.7 below.

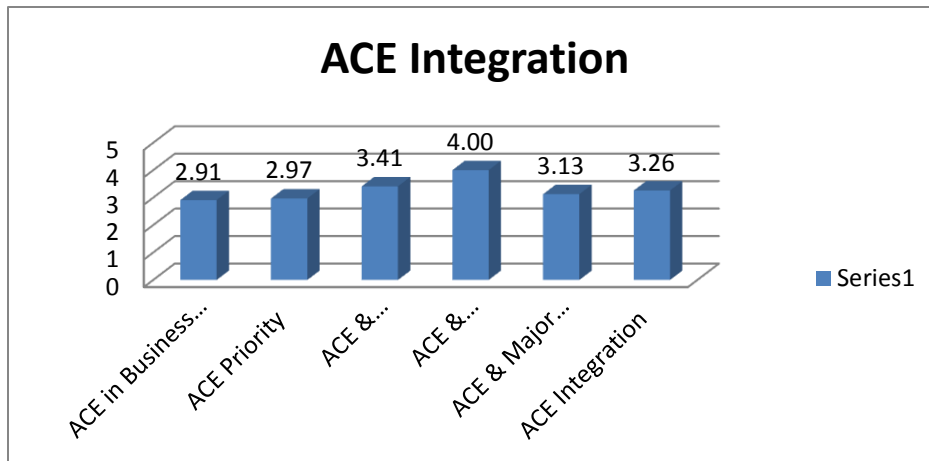


Fig 4.7: ACE Integration Dimensions

Source: Researcher's Survey Finding (2017)

The range of the mean values for ACE project integration dimensions is between 2.91 to 4.00 for the values of ACE in business strategy formulation and ACE & employees' performance review relationship respectively. The overall summated scale average of the mean values for ACE project integration dimensions is 3.26 which is higher than ACE implementation dimensions average.

Table 4.6: ACE Integration Among Varies ACE Levels

		ACE in Business Strategy Formulation		ACE Priority		ACE & Corporate Strategy R/Ship		ACE & Performance Review R/Ship		ACE & Dept's KPI R/Ship		ACE Integration	
		Mean	SD	Mean	SD	Mean	SD	Mean	SD	Mean	SD	Mean	SD
ACE Level	Qualifying	2.25	0.43	2.74	0.83	3.51	0.50	3.25	0.83	2.49	0.87	2.83	0.59
	Bronze	2.88	0.78	2.75	0.83	3.38	0.70	3.88	0.60	3.00	0.87	3.06	0.52
	Silver	2.89	0.78	3.14	0.78	3.38	0.70	4.25	0.67	3.37	0.70	3.40	0.50
	Gold	3.63	0.70	3.25	0.83	3.38	0.86	4.63	0.49	3.75	0.44	3.75	0.24
	Mean	2.91	0.68	2.97	0.82	3.41	0.69	4.00	0.65	3.15	0.72	3.26	0.46

Source: Researcher's Survey Finding (2017)

As we can see from the above table, the overall averages for ACE integration is significantly vary among different ACE levels. The higher the ACE level, the higher the mean score of ACE project integration in the departments. For instance, the overall ACE integration mean for

departments in the qualifying ACE level stage is 2.83 whereas the overall ACE integration mean for departments in the gold ACE level stage is 3.75. In addition, there is a high score in the ACE & performance review relationship dimension (overall mean of 4.00) in almost all departments in different ACE level. This indicates that the company uses ACE participation and involvement as a major factor for employees' performance review.

In contrary, relatively very low score is given by respondents for the dimensions ACE in business strategy formulation and ACE priority (2.91 and 2.97 respectively). That is, ACE project takes little part in the formulation of business strategies at departmental level and managers and team leaders give low priority to ACE in their day to day activities even though it is a strategic project.

4.2.3.2.4. ACE Project Strategic Alignment Dimensions Analysis

The mean scores have been computed for all the four ACE project strategic alignment dimensions. These are ACE corporate strategy alignment, ACE & company Strategy Importance, Management's ACE vision and ACE vs department's competency by equally weighting the scores of all the dimensions. Respondents were asked to rate their perception on a five-point Likert type scale ranging from 1 being strongly disagree to 5 strongly agree for ACE integration dimensions. The result is presented in fig 4.8 below.

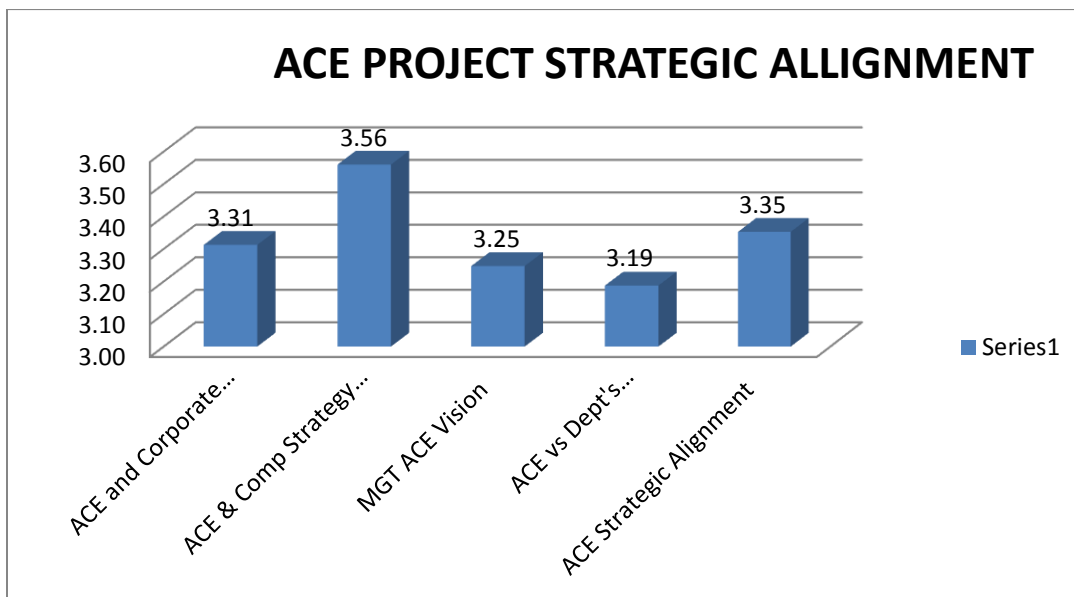


Fig 4.8: ACE Project Strategic Alignment *Source: Researcher's Survey Finding (2017)*

The range of the mean values for ACE project strategic alignment dimensions is between 3.19 to 3.56 for the values of ACE vs department's competency and ACE & performance review relationship respectively. The overall summated scale average of the mean values for ACE project strategic alignment dimensions is 3.35 which is higher than ACE implementation and integration variables average.

Table 4.7: ACE Project Strategic Alignment Analysis

		ACE & Major Dept's Function		ACE and Corporate Strategy Alignment		ACE & Comp Strategy Importance		MGT ACE Vission		ACE Strategic Alignment	
		Mean	SD	Mean	SD	Mean	SD	Mean	SD	Mean	SD
ACE Level	Qualifying	2.75	0.83	2.74	0.83	2.98	0.72	2.74	0.44	2.82	0.61
	Bronze	2.50	0.50	3.25	0.66	3.50	0.71	2.88	0.78	3.13	0.44
	Silver	3.37	0.86	3.13	0.61	3.63	0.49	3.37	0.70	3.38	0.43
	Gold	3.88	0.60	4.13	0.33	4.13	0.33	4.00	0.50	4.08	0.15
	Mean	3.12	0.70	3.31	0.61	3.56	0.56	3.25	0.61	3.35	0.41

Source: *Researcher's Survey Finding (2017)*

As we can see from the above table, the overall averages for ACE project strategic alignment is significantly vary among different ACE levels. The higher the ACE level, the higher the mean score of ACE project strategic alignment in the departments. For instance, the overall ACE strategic alignment mean for departments in the qualifying ACE level stage is 2.82 whereas the overall ACE strategic alignment mean for departments in the gold ACE level stage is 4.08. In addition, there is a high score in the ACE company strategic importance dimension (overall mean of 3.56). This indicates that majority of the respondents believe that company strategy and ACE are equally important for the organization.

In contrary, relatively very low score is given by respondents for the dimension ACE vs department's competency (3.19). That is, majority of the respondents gave less value for the concept that department's knowledge, capabilities and resources are built up through the execution of ACE.

4.2.3.2.5. Departments' Performance Dimensions Analysis

The mean scores have been computed for all the five departments' performance dimensions. These are departments' service quality, departments' on-time performance, departments' employee engagement, departments' safe & healthy environment departments' financial performance by equally weighting the scores of all the dimensions. Respondents were asked to rate their perception on a five-point Likert type scale ranging from 1 being strongly disagree to 5 strongly agree for ACE integration dimensions. The result is presented in fig 4.9 below.

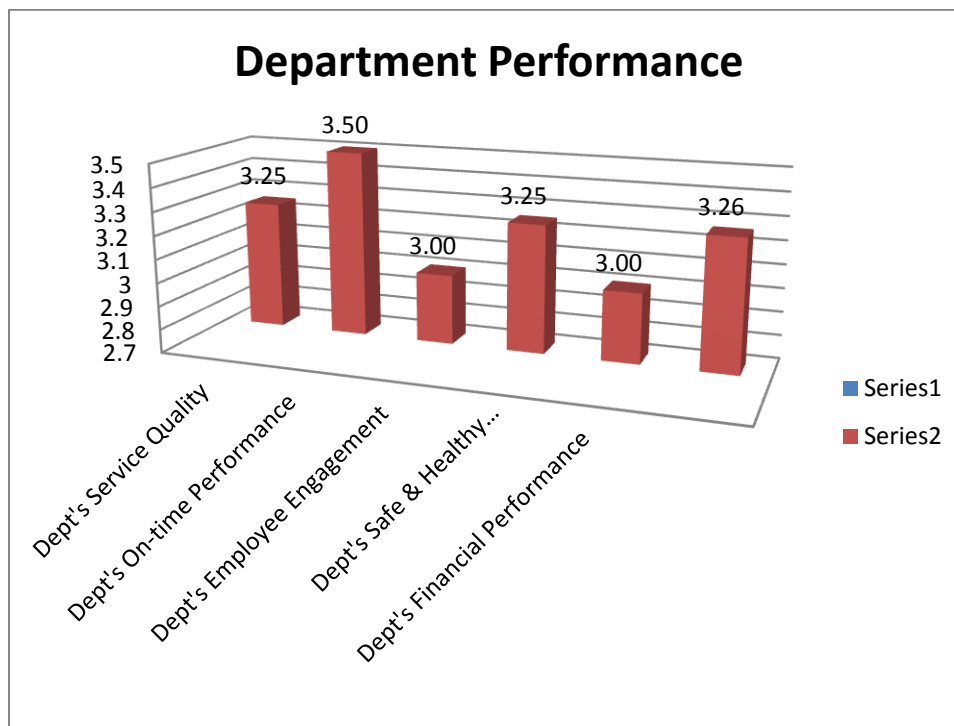


Fig 4.9: Departments' Performance

Source: Researcher's Survey Finding (2017)

The range of the mean values for departments' performance dimensions is between 3.00 to 3.50 for the values of employee engagement and departments' on-time performance respectively. The overall summated scale average of the mean values for departments' performance dimensions is 3.26.

Table 4.8: Departments’ Performance Dimensions Analysis

		Dept's Service Quality		Dept's On-time Performance		Dept's Employee Engagement		Dept's Safe & Healthy Environment		Dept's Financial Performance		DEPT Performance	
		Mean	SD	Mean	SD	Mean	SD	Mean	SD	Mean	SD	Mean	SD
ACE Level	Qualifying	2.49	0.87	2.98	1.01	2.49	0.87	3.26	0.83	2.25	0.43	2.70	0.64
	Bronze	2.63	1.00	3.00	0.71	2.50	1.12	3.38	0.70	3.25	0.66	2.95	0.49
	Silver	3.51	0.71	3.62	0.49	3.13	0.79	3.13	0.79	3.49	0.50	3.37	0.47
	Gold	4.25	0.44	4.38	0.49	4.00	0.50	3.50	0.71	4.00	0.00	4.03	0.33
Mean		3.22	0.75	3.50	0.67	3.03	0.82	3.32	0.76	3.25	0.40	3.26	0.48

Source: *Researcher’s Survey Finding (2017)*

As we can see from the above table, the overall averages for departments’ performance dimensions are significantly vary among different ACE levels. The higher the ACE level, the higher the mean score of departments’ performance. For instance, the overall departments’ performance mean in the qualifying ACE level stage is 2.7 whereas the overall departments’ performance in the gold ACE level stage is 4.03. This indicates that ACE project has been contributing favorably for the improvement of departments’ performance. In addition, there is a high score in the departments’ on-time performance dimension (overall mean of 3.5). This indicates that ACE has direct relationship with departments’ on-time performance.

4.2.3.2.6. Summary of Descriptive Analysis

The mean score for each variable have been computed as shown in fig 4.10. ACE strategic alignment variable has got relatively the highest score from all independent variables. This indicates that in overall, the division is working well on properly aligning ACE project with its strategy. In contrast, the division is weak in overall ACE project implementation. The mean score value for this variable is relatively the lowest of all independent variables.

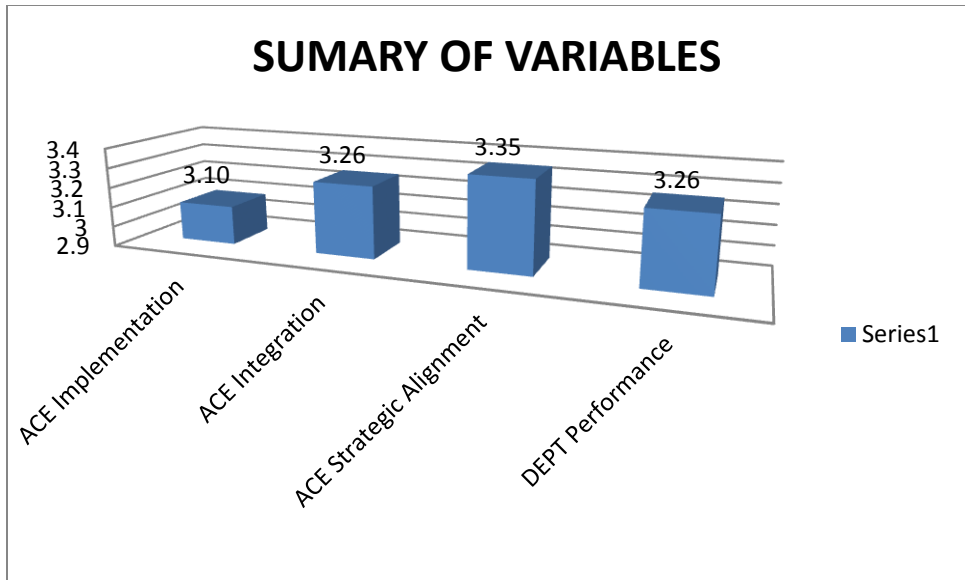


Fig 4.10 Summary of variables
Source: *Researcher's Survey Finding (2017)*

The following table summarizes the overall mean of all independent and dependent variables for each ACE level.

Table 4.9: Summary of mean score values of all independent and dependent variables

		ACE Implementation		ACE Integration		ACE Strategic Alignment		DEPT Performance	
		Mean	SD	Mean	SD	Mean	SD	Mean	SD
ACE Level	Qualifying	2.54	.55	2.83	.59	2.82	.61	2.70	.64
	Bronze	2.81	.49	3.06	.52	3.13	.44	2.95	.49
	Silver	3.38	.42	3.40	.50	3.38	.43	3.37	.47
	Gold	3.65	.39	3.75	.24	4.08	.15	4.03	.33
	Mean	3.10	0.46	3.26	0.46	3.35	0.41	3.26	0.48

Source: *Researcher's Survey Finding (2017)*

The range of the mean values for all independent variables is between 3.1 to 3.35 for the values of ACE implementation and ACE strategic alignment with almost similar standard deviation (0.46 and 0.41) respectively. The amount of dispersion of the responses (sd) is the lowest for respondents who are working on gold level departments. This indicates that most of the respondents had similar perceptions and understanding about the survey. The highest variation of responses is observed by respondents who are working on qualifying level departments specially,

for the measurement of departments' performance. This indicates relatively respondents are not sure in relating ACE independent variables with department performance.

4.2.4. Inferential Analysis of variables

4.2.4.1. Regression Analysis

Albaum (1997) noted that regression is a technique used to predict the value of a dependent variable using one or more independent variables. Malhotra (2007) showed that regression analysis is a statistical tool for the investigation of relationships between variables. In order to ascertain the causal effect of one variable upon another, researchers assemble data on the underlying variables of the causal variables upon the variable that they influence. Researchers typically evaluate the “statistical significance” of the estimated relationships, namely, the degree of confidence that the true relationship is close to the estimated relationship Malhotra (2007).

4.2.4.2.1. Assumption Testing for Regression Analysis

Meeting the assumptions of regression analysis is necessary to confirm that the obtained data truly represented the sample and that researcher has obtained the best results (Hair et al., 1998). Two assumptions for regression analysis used in this study will be discussed for the individual variables: multi-collinearity, linearity and normality (Hair et al., 1998). In the following paragraphs, each assumption is explained.

4.2.4.2.1.1. Multi-collinearity

Hair et al., (1998) explain that economic variables may move together in systematic ways when the data are the result of an uncontrolled experiment. Such variables are believed to have problems with collinearity or multi-collinearity when several variables are involved (Hair et al., 1998). Generally, as multi-collinearity rises, it will complicate the interpretation of the variables because it is more difficult to confirm the effect of any single variable, owing to their interrelationship (Hair et al., 1998). According to (Hair et al., 1998), multi-collinearity is not a violation of the assumptions of regression but it may cause serious difficulties. Hair et al., (1998) propose that these serious difficulties include: (1) variances of parameter estimates may be

unreasonably large; (2) parameter estimates may not be significant; and (3) a parameter estimate may have a sign different from what is expected.

The initial inspection of the Pearson Correlation Matrix (see Table 4.10) for the regression models revealed that the correlations between the independent variables did not exceed 0.80. While checking, the independent variables showed significant relationship with the dependent variable (above .6 preferably). Hair et al., (1998) suggest that you think carefully before including two variables with a bivariate correlation of, say, 0.8 or more in the same analysis. As it can be observed from the correlation table there is no correlation between the independent variables which is above 0.8. Therefore, all variables will be retained.

Table 4.10: Pearson Correlation Matrix

		ACE Implementation	ACE Integration	ACE Strategic Alignment
ACE Implementation	Pearson Correlation	1	.555**	.617**
	Sig. (2-tailed)		.000	.000
	N	336	336	336
ACE Integration	Pearson Correlation	.555**	1	.658**
	Sig. (2-tailed)	.000		.000
	N	336	336	336
ACE Strategic Alignment	Pearson Correlation	.617**	.658**	1
	Sig. (2-tailed)	.000	.000	
	N	336	336	336

** . Correlation is significant at the 0.01 level (2-tailed).

Source: *Researcher's Survey Finding (2017)*

4.2.4.2.1.2. Linearity

The linearity of the relationship between the dependent and independent variable represented the degree to which the change in the dependent variable is associated with the independent variable (Hair et al., 1998). In a simple sense, linear models predict values falling in a straight line by having a constant unit change (slope) of the dependent variable for a constant unit change of the independent variable (Hair et al., 1998). Conventional regression analysis will underestimate the

relationship when nonlinear relationships are present, i.e., R^2 underestimates the variance explained overall and the betas underestimate the importance of the variables involved in the non-linear relationship (Malhotra et al. 2007). Substantial violation of linearity implies that regression results may be more or less unusable (Malhotra et al. 2007).

The scatter plot of standardized residuals versus the fitted values (see Figure 4.11) for the regression models were visually inspected. The plots did not reveal any systematic pattern, thus providing support for the specified linear relationship, as suggested by (Malhotra et al. 2007).

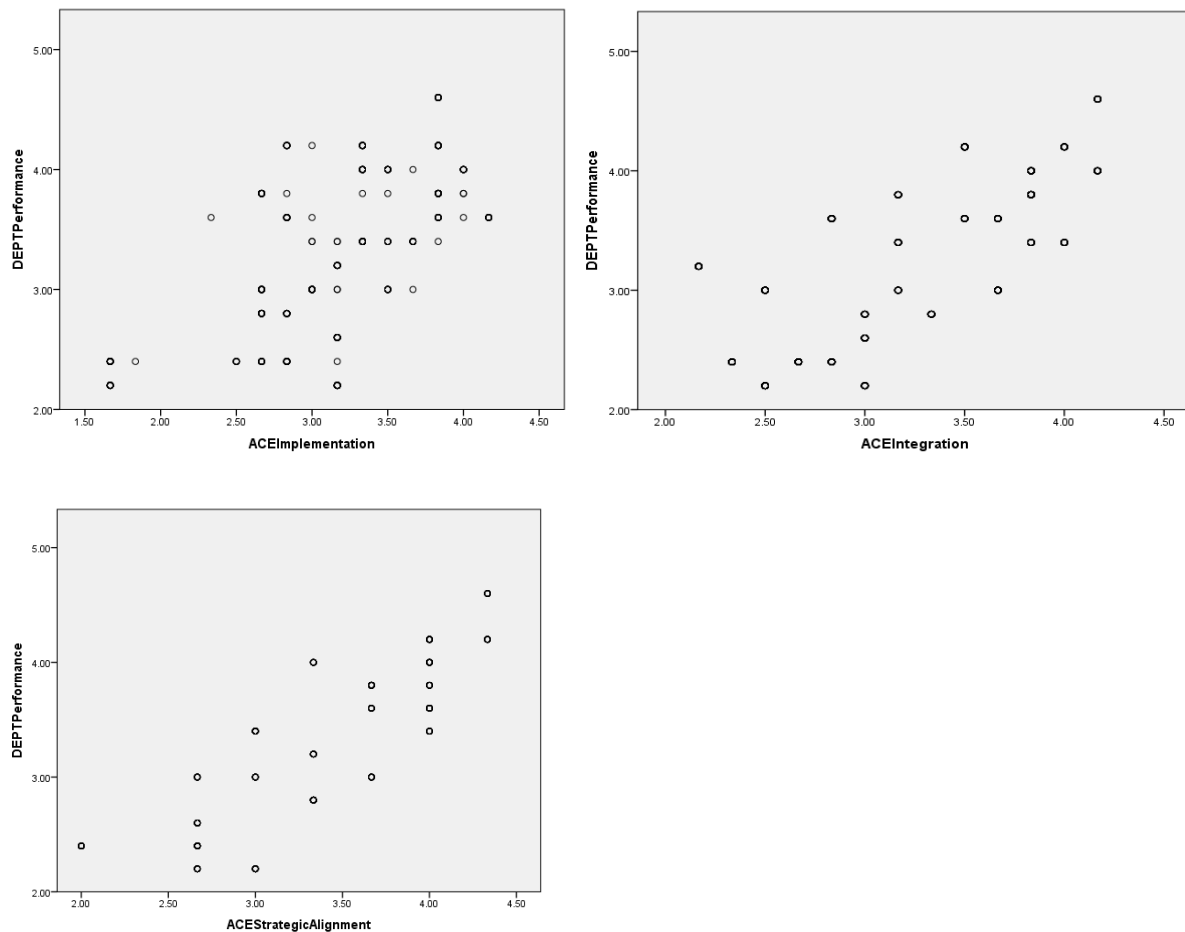


Fig 4.11: Scatter Plot of Variables for Linearity Test

Source: *Researcher’s Survey Finding (2017)*

4.2.4.2.1.3. Normality of the Error Term Distribution

In terms of this assumption, a check for normality of the error term is conducted by a visual examination of the normal probability plots of the residuals (Malhotra et al., 2007). Malhotra et

al. (2007) propose that normal probability plots are often conducted as an informal means of assessing the non-normality of a set of data. According to Hair et al. (1998), the plots are different from residuals plots in that the standardized residuals are compared with the normal distribution. In general, the normal distribution makes a straight diagonal line, and the plotted residuals are compared with the diagonal (Hair et al., 1998). If a distribution is normal, the residual line will closely follow the diagonal (Hair et al., 1998). Malhotra et al. (2007) explain that the “correlation coefficient” will be near unity if the data fall nearly on a straight line. The “correlation coefficient” will become smaller if the plot is curved.

The normality probability plots were plotted to assess normality (see Fig 4.12). The P-P plots were approximately a straight line instead of a curve. Accordingly, the residuals were deemed to have a reasonably normal distribution, as suggested by Hair et al. (1998).

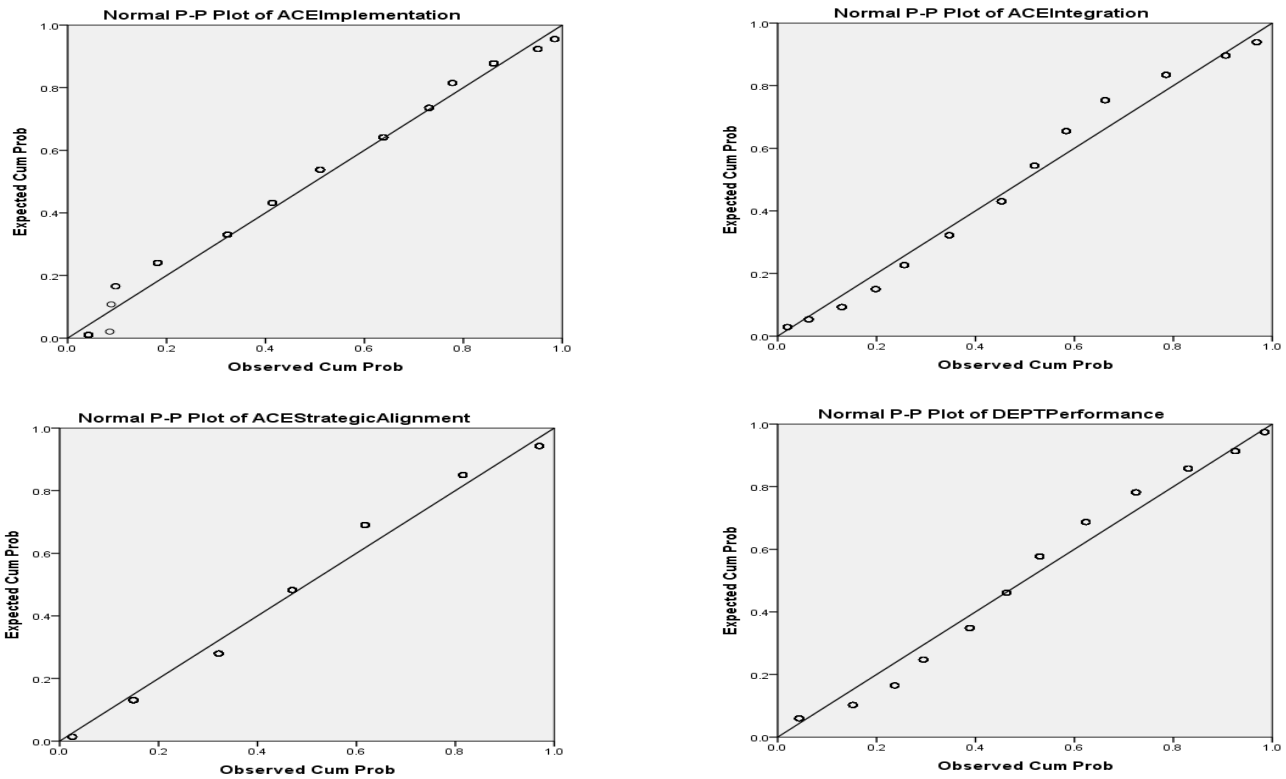


Fig 4.12: Normal P-P Plots of Variables for Normality Test
Source: Researcher’s Survey Finding (2017)

4.2.4.2.2 Hypotheses Testing

- **Hypothesis one: *There is a significant positive relationship between successful ACE project implementation and organizational performance.***

In this study, to test the effects of the variables of ACE project implementation on the variable of organizational performance, simple regression analysis was used. According to Hair et al. (1998), simple regression, also known as bivariate regression, is a regression model with a single independent variable. Hair et al. (1998) demonstrate that the ultimate goal for adopting regression analysis is to predict a single dependent variable from the knowledge of one or more independent variables. This statistical technique is termed as a simple regression when the problem involves a single independent variable (Hair et al., 1998). In general, simple regression analysis allows researchers to determine how one variable changes in relation to the change in another variable (Zikmund, 2003).

Zikmund (2003) explains that simple regression is a mathematical approach to stating the statistical linear relationship between one independent and one dependent variable. According to Zikmund (2003), the most typical type of simple regression is simple linear regression, implying that researchers use the equation for a straight line instead of some other type of curve. According to Malhotra et al. (2007), the simple linear regression model is given below:

$$y = \beta_0 + \beta_1x + \epsilon \dots\dots\dots \text{Equation 4.1: Simple linear regression model}$$

where: y = Dependent variable

x = Independent variable

β_0 = Intercept

β_1 = Slope of the line (defined as the ratio Rise/Run)

ϵ = Error variable

Tables 4.11-13 present the regression results of ACE project implementation and organizational performance of Ethiopian Airlines MRO division. In terms of the relationship ACE project implementation and organizational performance, organizational performance can be seen as a single dependent variable whereas ACE project implementation is regarded as an independent variable in a simple regression model.

Table 4.11: Model Summary for Hypothesis One

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.639 ^a	.409	.407	.52696

a. Predictors: (Constant), ACE Implementation

Source: Researcher's Survey Finding (2017)

Table 4.11 in the output includes information about the quantity of variance that is explained by predictor variable. The first statistic, R, is the correlation coefficient between the predictor variable (ACE Implementation) and the dependent variable (DEPT Performance). The **R** was (0.639) at level ($\alpha \leq 0.05$); whereas the model's coefficient of determination, **R**² was (0.409). This is frequently used to describe the goodness-of-fit or the amount of variance explained by a given set of predictor variables. This means the 40.9% of DEPT Performance changeability's or variance results from the changeability in ACE Implementation, while the remaining 59.1% are explained by other variables out of this model. This lower **R**² value indicated that besides the ACE Implementation, there are other important variables which improve DEPT Performance. Adjusted **R**² = 0.407 with estimated standard deviation 0.52696, the regression model is statistically significant since the probability level is 0.000.

Table 4.12: ANOVA^a for Hypothesis One

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	64.159	1	64.159	231.047	.000 ^b
	Residual	92.748	334	.278		
	Total	156.907	335			

a. Dependent Variable: DEPT Performance

b. Predictors: (Constant), ACE Implementation

Source: Researcher's Survey Finding (2017)

Table 4.12 in the output is an ANOVA table that describes the overall variance accounted for in the model. The F statistic represents a test of the null hypothesis that the regression coefficients are all equal to zero. Put another way, this F statistic tests whether the R square proportion of variance in the dependent variable accounted for by the predictors is zero. If the null hypothesis were true, then that would indicate that there is no (linear) regression relationship between the dependent variable and the predictor variables. The ANOVA analysis in the second table shows that, there is a significant main effect of successful ACE implementation on organizational performance $F(1, 334) = 231.047$, $p < 0.01$ at the 0.05 alpha level ($F_{\text{calculated}}, 231.047 > F_{\text{table}}, 3.85$). The mean square, which indicates the amount of variance (sums of squares) divided by the degrees of freedom, equals 64.159.

Table 4.13: Coefficients^a for Hypothesis One

Model	Unstandardized Coefficients		Standardized Coefficients	t	Sig.
	B	Std. Error	Beta		
1 (Constant)	1.089	.146		7.450	.000
ACE Implementation	.701	.046	.639	15.200	.000

a. Dependent Variable: DEPT Performance

Source: *Researcher's Survey Finding (2017)*

The B value (unstandardized coefficient) in table 4.13 indicates the effect of change in the independent variables on dependent variables. For instance, a unit increases in successful ACE Implementation results in an increase of organizational performance by 0.701, vice-versa, keeping other factors constant. In other word, a 100% change in successful ACE Implementation causes a 70.1% change on organizational performance. Therefore, *there is significant effect of successful ACE Implementation on organizational performance at level ($\alpha \leq 0.05$) and the hypothesis is accepted.*

Hypothesis two: *There is a significant positive relationship between successful integration of ACE project and organizational performance.*

To test the effects of the variables of passengers' satisfaction on the variable of level of behavioral intention, simple regression analysis was used. Table 4.14-16 present the regression results of integration of ACE project and organizational performance. In terms of the relationship between integration of ACE project and organizational performance, integration of ACE project can be seen as a single independent variable whereas organizational performance is regarded as dependent variable in a simple regression model.

Table 4.14: Model Summary for Hypothesis Two

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.738 ^a	.545	.544	.46221

a. Predictors: (Constant), ACE Integration

Source: Researcher's Survey Finding (2017)

Table 4.14 output includes information about the quantity of variance that is explained by independent variable. The first statistic, R, is the correlation coefficient between the predictor variable (ACE Integration) and the dependent variable (DEPT Performance). The **R** was (0.738) at level ($\alpha \leq 0.05$); whereas the model's coefficient of determination, **R²** was (0.545). This means the 54.5% of Department Performance changeability or variance results from the changeability in ACE Integration, while the remaining 45.5% are explained by other variables out of this model. Adjusted **R²** = 0.544 with estimated standard deviation 0.46221, the regression model is statistically significant since the probability level is 0.000.

Table 4.15: ANOVA^a for Hypothesis Two

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	85.553	1	85.553	400.461	.000 ^b
	Residual	71.354	334	.214		
	Total	156.907	335			

a. Dependent Variable: DEPT Performance

b. Predictors: (Constant), ACE Integration

Source: Researcher's Survey Finding (2017)

The ANOVA analysis in table 4.15 shows that, there is a significant main effect of ACE Integration on Department Performance $F(1, 334) = 400.461, p < 0.01$ at the 0.05 alpha level (F calculated, $400.461 > F$ table, 3.85). The mean square, which indicates the amount of variance (sums of squares) divided by the degrees of freedom, equals 85.553.

Table 4.16: Coefficients^a for Hypothesis Two

Model	Unstandardized Coefficients		Standardized Coefficients	t	Sig.
	B	Std. Error	Beta		
1 (Constant)	.423	.144		2.929	.004
ACE Integration	.870	.043	.738	20.012	.000

a. Dependent Variable: DEPT Performance

Source: Researcher's Survey Finding (2017)

The B value (unstandardized coefficient) in table 4.16 indicates a unit increase in successful ACE Integration results in an increase of Department Performance by 0.870, vice-versa, keeping other factors constant. In other words, a 100% change in successful ACE Integration causes a 87.0% change on Department Performance. Therefore, *there is significant effect of successful ACE Integration on Department Performance at level ($\alpha \leq 0.05$) and the hypothesis is accepted.*

➤ **Hypothesis Three:** *There is a significant positive relationship between strategic alignment of ACE project and organizational performance.*

To test the effects of the variable of strategic alignment of ACE project on the variable of department performance, simple regression analysis was used. Table 4.17-19 present the regression results of strategic alignment of ACE project and department performance. In terms of the relationship between strategic alignment and department performance, can be seen as a single independent variable whereas department performance is regarded as dependent variable in a simple regression model.

Table 4.17: Model Summary for Hypothesis Three

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.840 ^a	.705	.705	.37199

a. Predictors: (Constant), ACE Strategic Alignment

Source: *Researcher’s Survey Finding (2017)*

Table 4.17 includes information about the quantity of variance that is explained by independent variable. The first statistic, R, is the correlation coefficient between the predictor variable (ACE Strategic Alignment) and the dependent variable (DEPT Performance). The **R** was (0.840) at level ($\alpha \leq 0.05$); whereas the model’s coefficient of determination, **R²** was (0.705). This means the 70.5% of department Performance changeability’s or variance results from the changeability in ACE Strategic Alignment, while the remaining 29.5% are explained by other variables out of this model. This lower **R²** value indicated that besides the ACE Strategic Alignment, there are other important variables which affect department Performance. Adjusted **R²** = 0.705 with estimated standard deviation 0.37199, the regression model is statistically significant since the probability level is 0.000.

Table 4.18: ANOVA^a for Hypothesis Three

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	110.690	1	110.690	799.928	.000 ^b
	Residual	46.217	334	.138		
	Total	156.907	335			

a. Dependent Variable: DEPT Performance

b. Predictors: (Constant), ACE Strategic Alignment

Source: *Researcher’s Survey Finding (2017)*

The ANOVA analysis in table 4.18 shows that, there is a significant main effect of ACE Strategic Alignment on department Performance $F(1, 334) = 799.928, p < 0.01$ at the 0.05 alpha level ($F_{\text{calculated}}, 799.928 > F_{\text{table}}, 3.85$). The mean square equals 110.690.

Table 4.19: Coefficients^a for Hypothesis Three

Model	Unstandardized Coefficients		Standardized Coefficients	t	Sig.	
	B	Std. Error	Beta			
1	(Constant)	.138	.112		1.224	.222
	ACE Strategic Alignment	.931	.033	.840	28.283	.000

a. Dependent Variable: DEPT Performance

Source: Researcher's Survey Finding (2017)

The B value (standardized coefficient) in table 4.19 indicates a unit increases in ACE Strategic Alignment results in an increase of department Performance by 0.931, vice-versa, keeping other factors constant. In other word, a 100% change in ACE Strategic Alignment causes a 93.1% change of department Performance. Therefore, *there is significant effect of ACE Strategic Alignment on department's Performance at level ($\alpha \leq 0.05$) and the hypothesis is accepted.*

4.3. Discussion

In the previous section, all the collected data was described, examined and interpreted based on descriptive and inferential analysis techniques. During the initial stage of the analysis, general demographic variables were assessed. As a maintenance division majority of respondents were male (81.5%). Above 50% of the respondents served the company for more than 5 years. Majority of the respondents (82%) were degree holder and around 70 % of respondents in the MRO division earn a monthly income of 10,000 and above.

Each department in the MRO division has its own ACE level based on the progress of ACE project in each department. There is an assessment by change management section to acquire the next higher ACE level. At the time of survey collection, more than 75% of the respondents were working in the departments that are not yet acquired gold level.

Hypothesis one described as the effect of ACE project implementation effectiveness on departments' performance. ACE project implementation effectiveness variable was described by

summation of six items based on summated scale procedure. These six items were management ACE understanding, employees' ACE understanding, employees' ACE participation, management ACE leadership and sponsorship, top management ACE commitment and employees' ACE commitment. Departments' performance variable was described by summation of five items based on summated scale procedure. These five items were departments' service quality, departments' on-time performance, departments' employee engagement, departments' safe & healthy environment and departments' financial performance.

Based on the analysis of hypothesis one, it was found that ACE project implementation significantly influence the performance of the departments. Therefore, departments need to work on creating ACE awareness for management and employees regularly even though managers are more aware than employees based on the data collected. Employees' participation on the project was considered as another success factor for attainment of higher ACE level. In addition, motivational mechanisms should be in place so as to improve employees' commitment towards successful ACE implementation. Effective project implementation is crucial to success as a project manager, and putting projects into action is the first step toward achieving organizational objectives so as to improve its performance. (David, 2009)

The analysis of the next hypothesis measured the effect of ACE project integration effectiveness on departments' performance. ACE project integration effectiveness variable was described by summation of five items based on summated scale procedure. These five items were ACE in business strategy formulation, ACE priority in the department, ACE & corporate strategy relationship, ACE & performance review relationship and ACE & major department's functions.

From the analysis of hypothesis two, it was found that ACE project integration significantly influence the performance of the departments. Therefore, each department should develop a mechanism that links ACE project with their business strategy formulation and major department's functions. It was found that almost in all departments, participation in ACE considered during performance evaluation. Departments who gave less priority for ACE were not successful on their performance. On the other hand, majority of departments which gave high priority for ACE acquired ACE gold level earlier than others. Integrating projects to

organizational activities can harness the energy of different thought processes to propel innovation and change in an organization as it is concurred by Leonard and Straus (1997). Top management involvement, commitment and leadership are critical for successful integration as it is also agreed with Nigatu, (T.A., 2010) findings.

The analysis of the third hypothesis described the effect of ACE project strategic alignment on departments' performance. ACE project strategic alignment variable was described by summation of four items based on summated scale procedure. These four items were ACE & corporate strategic alignment, ACE & company strategy importance, management's ACE vision and ACE vs department's competency.

Based on the analysis of hypothesis three, it was found that strategically aligning ACE project significantly influence departments' performance. This indicates that since ACE is considered as a strategic project, its implementation should align with corporate strategy of the company so as to easily and quickly disseminate the project throughout the division. Furthermore, building up department's knowledge, capabilities and resources through the execution of ACE positively influence departments' service quality, on-time performance, employee engagement and financial performance. According to the analysis, majority of departments that considered ACE as important as corporate strategy were successful on their ACE level. This result is

CHAPTER FIVE

5. Summary, Conclusion and Recommendations

5.1. Introduction

In this chapter, conclusion, summary and recommendations are presented. At the end of the chapter, limitations and suggestions for future research are discussed.

5.2. Summary

In this study the researcher took one strategic project as a case and tried to assess the effect of each major phases of the project on the performance of the users' sections. Specifically, ACE project is taken as a case in Ethiopian Airlines MRO division. As a strategic project, ACE consists of a set of tools that help an organization identify and solve problems; improve its processes; and make strategic decisions.

ACE implementation effectiveness, integration to the departments' operation and strategic alignment were taken as an independent variables and departments' performance was taken as a dependent variable. The researcher selected summated scale technique to effectively measure each variable and it was reflected on the questionnaire. Among 385 distributed questionnaires, 336 questionnaires were considered valid and selected for the analysis.

Three hypotheses were initially designed based on exploratory research conducted during the initial phase of the study. These three hypotheses were simultaneously tested on a sample of 336 respondents out of 385 distributed, giving a valid response rate of 87 percent. Simple regression analysis was used to assess the relationships among the independent variables and dependent variable. The applications used to analyze and examine the hypotheses are the Statistical Package for Social Sciences V.21. The findings of this study have shown a significant effect of all the

three independent variables (ACE project successful implementation, integration and strategic alignment) on organizational performance at the level of ($\alpha \leq 0.05$).

5.3. Conclusion

Every day, in almost every country in the world, customers define competitive excellence when they decide to purchase products and services or those of a competitor's. Only by offering superior value to customers will Ethiopian Airlines continue to grow and prosper. But the standards for value are elusive, because of changing customer preferences, motivated by new competition, new technology, and a host of other economic, social, political, and environmental factors. Therefore, quest for competitive excellence has no end.

The purpose of this study was thus, to investigate the impact of implementation effectiveness, successful integration and strategic alignment of ACE project on departments' performance in Ethiopian Airlines MRO division. In this study it was found that there is a gap in implementation, integration and strategic alignment of ACE project throughout the division.

Among the three independent variables, ACE strategic alignment variable has got relatively the highest score from all independent variables. This indicates that in overall, the division is working well on properly aligning ACE project with its strategy. In contrast, the division is weak in overall ACE project implementation. The mean score value for this variable is relatively the lowest of all independent variables. The mean score of all the three independent variables and dependent variable are in rank order from the lowest to the highest for ACE qualifying, bronze, silver and gold level respectively.

The overall averages for independent and dependent variables are significantly varied among different ACE levels. According to the finding of this study, the higher the ACE levels, the higher the mean scores for independent and dependent variables in the departments.

The regression result of the study has shown a significant positive effect of all the three independent variables (ACE project successful implementation, integration and strategic alignment) on organizational performance. The results are useful in identifying areas for strategic focus to help the airline's future strategic project management.

5.4. Recommendations

Based on the analysis of this study, the following recommendations have been forwarded to Ethiopian Airlines MRO division staffs and decision makers so as to significantly improve their performance through successful implementation, integration and strategic alignment of ACE project.

- ☞ ACE awareness should be regularly created for employees and proper assessment should be performed about ACE competency during promotional exams and higher level assignments. ACE training curriculum should be prepared; trainees' trainer should be developed. Training arrangement should be done in collaboration of change management and Ethiopian Aviation Academy.
- ☞ ACE implementation should be designed in a way that helps every employee to participate on the project. The ACE agent in each cell should develop and continuously follow departments' annual semi-annual quarterly, monthly and weekly plan and its implementation thoroughly. Each team leader in the departments should facilitate and control the implementation of the plan.
- ☞ To successfully implement ACE project, managers and team leaders' active sponsorship, leadership and commitment towards the project should be in place at all times in each department and it should be reflect on their KPIs. Proper mechanism of reporting daily, weekly, monthly, quarterly, semi-annually and annually ACE activities to ACE agent and change management.
- ☞ Various financial and non-financial motivational mechanisms should be in place so as to improve employees' participation and commitment towards successful ACE implementation. Regular ACE achievement celebration ceremonies should be organized by ACE agents in each department in the division. Successful ACE achievers should be periodically, identified and recognized by each sections in the division.

- ☞ ACE should be taken into account in the formulation and implementation of business strategy. In other words, business strategy formulation and implementation should be integrated with ACE tools and processes. ACE should be given high importance by managers and team leaders on accomplishing their day to day activities and ACE should not be considered as a separate activity on the implementation of business strategies, instead, it should be considered as operating culture by both employees and management.
- ☞ The division should keep up considering employees and departments' participation on ACE during the performance evaluation of employees and departments. There should be a day-to-day recording and follow-up mechanism of each individual's ACE activities so as to use the data for employee's KPI.
- ☞ ACE should be the primary mechanism for coordinating and integrating all the main functions of each department. Specifically, all operations in the department should be clearly depicted in the cell's process map. The section's processes should be continuously improved by using ACE tools like 5S+1 & visual control, process management, value stream mapping and total productive maintenance for equipment downtime management. Problems in the departments should be solved using market feedback analysis, mistake proofing, Quality Clinic Process Charts (QCPC), Root Cause Corrective Action (RCCA) and mistake proofing. All decisions that require higher management involvement should be passed immediately through passport process ACE tool.
- ☞ Managers, team leaders and employees should share a vision of how ACE will support the business strategy. Meetings, discussions and workshops should be planned and regularly executed to share the common vision towards ACE. Benchmarks for various ACE achievements should be continuously assessed from each cell, organized and distributed to all units in the division.
- ☞ Departments' knowledge, capabilities and resources should be build-up through the execution of ACE. Lessons learned from ACE execution should be regularly documented and distributed. All employees in the departments should be engaged on all ACE tools either simultaneously and/or in a rotation base to build their competency on the use of ACE tools.

5.5. Limitations and Suggestion for Future Research

The following section is intended to address some of the limitations surrounding this study so they may be eliminated in future research.

The outcome of the study is solely dependent on the individual responses of the respondents that participate in the study. Moreover, as the sample is small compared to the total population, the results might not be generalizable beyond the specific division from which the sample is drawn. This study employed the cross sectional data and it is difficult to determine the time series link across variables. Hence, the research result may differ if it is conducted in other time. The limitation of sample size implied that the finding cannot be generalized across all divisions in Ethiopian Airlines. Therefore, the researcher proposes to conduct a longitudinal research with more sample and improvement sampling method to generalize the study results.

The topic was a good one but because of its limitations, there is a need for further research. As evident from the finding section that the study was conducted in Ethiopia only, applicability of the results in other countries may result differently. Further, as the study is conducted in the airlines industry, implementation of ACE project in other industries, like; education, financial, and health may not come up with the same findings. Thus, the analysis and discussion based on the perceptions of the sample respondents may vary if the sample was collected at a different industry, time of year and from a different geographic region. Moreover, different sampling methods (e.g. personal interviews, experiment) may also add insight into the perceptions of MRO staffs. Finally, the researchers also suggest involving other variables such as ACE project planning, project scoping, monitoring and evaluation, controlling etc... in the further research.

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Appendix : Questionnaire

ADDIS ABABA UNIVERSITY

SCHOOL OF COMMERCE

Questionnaire

I am a graduate student at Addis Ababa University School of Commerce and currently I am conducting a research for the completion of my masters in Project Management. This project work is a study to assess the effect of ACE implementation, integration and strategic alignment on Ethiopian Airlines MRO division's performance.

Your willingness and cooperation in giving reliable information is well appreciated and the information you provide will be used only for academic purpose and will be kept in strict confidentiality.

If you need further information about this study, or have problem in completing this questionnaire please contact me via +2519 11 12 92 66 or toakeg@gmail.com. There is no need to write your name. It is your full right to participate in the survey in order to enable it achieves its objective. So are you willing to stay with the questionnaire for few minutes to answer the question?

Put 'X' mark in the box you chose

Yes

No

If yes, please go to the next page. If no, please return the questionnaire.

Thank you!

Section A

1. Respondent ID (optional) _____

2. Department _____

Please mark your answer with an "X".

3. Sex Male 0 Female 0

4. Service year(s) in ET < 1 year 0 >=1 and <5 years 0

 >=5 and < 10 years 0 >= 10 years 0

5. Educational Background

 Certificate 0 Diploma 0 Degree 0

 Masters 0 PHD 0 Other _____

6. Income (monthly in ETB)

 Below 5000 0 5001-10000 0 10,001-15,000 0

 15,001-20,000 0 above 20,000 0

7. ACE level of your department

 Qualifying 0 Bronze 0

 Silver 0 Gold 0

Section B

Please, rate the following questions by using: -

5 → Strongly Agree 4 → Agree 3 → Neutral
 2 → Disagree 1 → Strongly Disagree

SN	Questions	1	2	3	4	5
ACE IMPLEMENTATION						
8	Managers and team leaders have a good understanding of ACE.					
9	All employees of the department have a good understanding of ACE.					
10	All employees of the department are participating in the implementation of ACE.					
11	ACE has managers and team leaders' active sponsorship and leadership in my department.					
12	Top management in the division is committed to the implementation of ACE.					
13	All employees of the department are committed to the implementation of ACE.					
ACE INTEGRATION						
14	ACE project takes part in the formulation of business strategies at departmental level.					
15	Managers and team leaders give high priority to ACE in their day to day activities.					
16	ACE and corporate strategies are implementing at the same time.					
17	An individual's contribution to ACE is considered during performance reviews.					
18	Organization metrics and department KPI's are linked and cascaded to ACE.					

SN	Questions	1	2	3	4	5
19	ACE is currently, the primary mechanism for coordinating and integrating all the main functions of the department.					
ACE STRATEGIC ALIGNMENT						
20	Company strategy and ACE are aligned in my department.					
21	Company strategy and ACE are equally important.					
22	Managers and team leaders share a vision of how ACE will support the business strategy.					
23	Department's knowledge, capabilities and resources are built up through the execution of ACE.					
PERFORMANCE OF THE DEPARTMENT						
24	My department provides perfect quality services					
25	My department provides on-time delivery of products and services to its internal/external customers					
26	All employees of the department are highly engaged					
27	All employees of the department are working in a healthy and safe environment, and					
28	My department has best-in-class financial returns in terms of cost saving, rework, waste elimination, efficient work processes etc....					

What do you suggest for sustainability of ACE in your department?

Thank you, for taking your time!