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EFFECT OF TEAM COMMUNICATION AND TEAM COORDINATION ON TEAM PERFORMANCE AT MINISTRY OF AGRICULTURE, LIVESTOCK AND IRRIGATION

TUN AUNG
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ACADEMIC YEAR (2019-2022)

Supervised by:

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Submitted By:

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"This thesis submitted to the Board of Examiners in partial fulfillment of the requirement for degree of Master of Business Administration"

Supervised by:

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ACCEPTANCE

This is to certify that the thesis entitled **"Effect of Team Communication and Team Coordination on Team Performance at Ministry of Agriculture, Livestock and Irrigation"** has been accepted by the Examination Board for awarding Master of Business Administration (MBA) degree.

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Yangon University of Economics

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NOVEMBER, 2022

ABSTRACT

This study intends to present effect of team communication and team coordination on team performance at Ministry of Agriculture, Livestock and Irrigation. The scope of the study covers only 70 managerial staff, who has been participating in projects as team members from total of 267 staff in Mechanical Circle No-2 at Irrigation, Water Utilization and Management Department, Ministry of Agriculture, Livestock and Irrigation. The structured questionnaires are used to collect the primary data. The primary data are collected by personal interview method. Secondary data are collected from the documents and reports of Ministry of Agriculture, Livestock and Irrigation, previous papers, and related texts. For data analysis, both descriptive method and linear regression method are applied. From descriptive analysis, it is found that most of the managerial staff have team oriented attitude, they are implementing the government projects under the team leadership through sound communication among team members. During the project implementation period, team members used to monitor the work accomplishment and work quality each other for not making wastes, and provide constructive feedback, suggestions and required aids (e.g. techniques) for accomplishment of tasks without delays and over-budget. Moreover, they are collaborating for a good performance of the team. Thus, their team performance by both project completion and project quality is significantly high. The multiple regression analysis shows that the task interdependence and team orientation are influencing a team communication, which has positive effect on team monitoring, feedback and backup. This means the flawless communication among team members let them to provide effective support and constructive suggestions each other. However, only giving feedback and providing resources can support significantly to team coordination. Monitoring each other is not effective for greater coordination. Team coordination eventually leads to good team performance by both task accomplishment and by task quality.

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LIST OF ABBREVIATIONS

ADB	Asia Development bank
D.V	Dependent Variable
EU	European Union
I.V	Independent Variable
IFAD	International Fund for Agricultural Development
IWUMD	Irrigation and Water Utilization Management Department
JICA	Japan International Cooperation Agency
MOALI	Ministry of Agriculture, Livestock and Irrigation

CHAPTER I
INTRODUCTION

In this turbulent world, everything is changing rapidly in several sectors such as political, economic, social, technological, environmental, and legal. It is important to emphasize teamwork for living aligned with changing environment stepping ahead and getting competitive advantage among several organizations.

In Myanmar, agricultural growth is critical to ensure the food security encompassing in all parts of the country. The Government and Ministry of Agriculture, Livestock and Irrigation are carrying out to meet the rising demands for food, and therefore Irrigation, Water Utilization and Management is developing required strategies to take responsibility for provision of supplying irrigation water sufficiently in needed areas, including enhancement of underground water, so as to fulfilling drinking water especially for the dried regions, and providing flood protection in inundated areas and sea water protection works.

In the government organizations' Ministries of Myanmar, many tasks are implemented as projects. Among the government's ministries, the Ministry of Agriculture, Livestock and Irrigation has been taking the responsibility for the completion of government projects which are contributing to the economic empowerment and promoting the social economic development of the State. As to Myanmar is a country endowed with an abundance of land and water resources, additional irrigation facilities have to be enlarged with its potential. Ministry of Agriculture, Livestock and Irrigation can be obviously seen as the ministry which has been implementing various projects as Eastern States Agribusiness Projects located in eastern Kayin state and southern Shan state, and Western States Agribusiness Projects located in southern Chin state and northern Magway region with IFAD, Agriculture Development Support Project concentrated in irrigation systems in Bago East, Nay Pyi Taw, Mandalay, Sagaing and Yangon regions., Irrigated Agricultural Inclusive Development Project implemented in the Central Dry Zone region, straddling large parts of Mandalay, Magway and lower Sagaing divisions, Agricultural Income Improvement Project in Shwebo and technical cooperation project "the Project for Improvement of Accessibility of Rice Certified Seeds" with JICA, and several projects supported by EU, ADB, World Bank and other regional and international funds.

Irrigation and Water Utilization Department has finished sum of (870) irrigation projects including (245) Reservoirs, (144) Weirs, (72) Lakes, (199) Sluices, and (210) Pump Irrigations till to March, 2022. This department is also undertaking supplying agricultural water and drinking water and generating hydro power from some reservoirs in accordance with the rules and regulations.

There were also (230) number of embankments with total length of (2519) miles which have been built to protect total effective area about (2.7) million acres including urban, rural and cultivable land from flood and salinity intrusion. Thus, it is important at this ministry to practice the project management, especially team management for successful completion of the projects in time. Aamodt, M. G, (2015) defined team management as the ability of an individual or an organization to administer and coordinate a group of individuals to perform a task.

Team management can be approached from two common processes: supporting process and teamwork process. Teamwork refers to the processes of interdependent activities that are used to achieve team tasks (i.e., task work) in the pursuit of team goals. Teamwork contains behaviors such as coordination, mutual adjustment, compensatory behavior, communication, flexibility/adaptability, and cohesion (McIntyre et al., 1988).

Teamwork has traditionally been described in terms of classical systems theory in which team inputs, team processes, and team outputs are arrayed over time. Here, team inputs include the characteristics of the task to be performed, the elements of the context in which teamwork occurs, and the attitudes team members bring to a team situation. Team process includes the interaction and coordination among members required for performing team tasks and achieving specific goals. Team outputs consist of the products that result from team performance (Hackman, 1987; Ilgen, 1999; McGrath, 1984).

Teamwork process consists of five typical elements: communication among team members, monitoring the progress of the tasks of the team members, giving feedback to team members based on monitoring outcomes, providing back up (supporting necessary resources, services and suggestions) to team members regarding the monitoring results, and coordination among team members.

According to Robbins and Judge (2017), communication must include both the transfer and the understanding of meaning, and increased understanding of the functions and processes of communication can lead to positive changes in organizational behavior. Ojomo (2004) defined communication as the process of sharing information, feelings, thoughts, ideas and messages with others. Rothwell (2001) states that communication as a

transactional process of sharing meaning of information with other person. Ojiambo (1993 as cited in Kemoni, 2004) averted that communication associates the giving and receiving of information, signals or messages by talking, gestures and writing. Odini (1999) diagnoses communication as one of the core competencies that all information professionals should possess. According to Davis (1968), "Communication is defined as the process of passing information and understanding from one person to another".

Communication performs the exchange of information between two or more team members in the prescribed manner and by using proper terminology. The purpose of communication is to define clearly or acknowledge the receipt of information. Communication encompasses a management function and creates feedback by clarifying to team members what they must do, how well they are doing it, and how they can improve their performance, acts as a fundamental mechanism providing emotional feelings of team members, supports, fulfills the of needs of team members and solves work related problems, and provides information to group members needed to make decisions.

According to Daft and Marcic (2015), communication is the process by which information is exchanged and understood by two or more people, usually with the intent to influence of motivate behavior. Team leaders are communication champions and they gather important information from both inside and outside the organization and then create powerful decisions using this information. Good communication provides a sense of stability and predictability, poor or unhealthy communication gives a sense pressure and tension that causes fear which is counterproductive to efficiency.

Monitoring is defined as observing the activities and performance of their teammates (Dickinson et. al., 1992). This implies that team members can provide constructive feedback regarding errors and offer advice for improving performance to each other (Cannon-Bowers et al., 1995). Monitoring implies that team members are individually competent and that they subsequently provide feedback and backup behavior.

Morgan et al. (1986) found that members of successful teams praise the accomplishments of other team members and are supportive when a team member makes a mistake. Morgan et al. (1986) further suggested that team members be adept at giving feedback in a non-threatening way and be prepared to accept constructive feedback. Feedback involves the giving, seeking, and receiving of information among members. Giving feedback refers to providing information regarding other members' performance.

Seeking feedback refers to requesting input or guidance regarding performance. Receiving feedback and accepting positive and negative information, teamwork becomes much easier, faster and efficient due to willingness of communication, giving feedback, and cooperating to each other.

Backup behavior involves assisting the performance of other team members. Team members must have an understanding of other members' tasks and be willing and able to provide and seek assistance when needed. Oser, McCallum, Morgan, and Salas (1989) found members' willingness to ask for help when in need of assistance was positively related to team performance. Peron (1993) found workers trained in performing backup behaviors subsequently improved their team performance. Backup behavior implies that members have an understanding of other members' tasks. It also motivates team members to be willing and able to provide and seek assistance when needed each other.

Coordination refers to team members executing their activities in a timely and integrated manner. Team members coordinate their actions to solve problems and complete their tasks. Coordination of team members reflects the execution of team activities such that members respond as a function of the behavior of others. Simply, successful coordination implies that the team members execute their activities in a timely and integrated manner to produce synchronized performance (Dickinson & McIntyre, 1997).

For the completion of projects in time and within the desired budget, supporting process must be prepared by top management and top management sets these antecedences to facilitate the teamwork at their organization. This supporting process includes arranging task interdependence in the team, team leadership and team orientation.

Task interdependence within a team is the extent to which team members have to interact with each other in order to complete their tasks (Langfred,2000). Task interdependence has been defined as the relationship among group members' task or the extent to which members of groups rely on one another to perform their tasks (Saavedra et al., 1993). This definition is based upon several earlier sources (e.g. Kiggundu,1983; Thompson, 1967; Ven & Ferry, 1980). Task interdependence provides mutual interactions with group discretion to decide the particular course of inputs and outputs among members. The more task interdependence is higher, the more team members have

desires to share resources in order to attain goals and then their actions are more closely coordinated.

According to Davis, (1968), “Leadership is the ability to persuade others to seek defined objectives enthusiastically. It is the human factor which binds a group together and motivates it towards aims and objectives.” Leadership is ability to influence people in an organization to achieve defined objectives and accomplish the future visions by motivating, stimulating and inspiring the subordinates working with success oriented mindset based on 5 C’s of competency, commitment, confidence, consistency and creativity under strategic commands.

Competence is not just another word for ability, and it can be developed with appropriate direction and support. Commitment is a combination of confidence and motivation. Confidence is a measure of one’s self-assuredness, a feeling being able to do a task well without much supervision. Motivation is a person’s interest in and enthusiasm for doing a task well. Consistent leaders work hard, set goals for themselves and their employees, and sustain those goals. Creativity is exploring thoughts or ideas that are different in some way from previous views.

Team leadership is a process of providing direction, structure, and support for team members. Team leadership need not necessarily reside within a single appointed individual with formal authority; it may emerge within any team member as the situation warrants (Dickinson & McIntyre, 1997; Larson & LaFasto, 1989). Team leadership emphasizes to support team guiding direction, stabilizing team structure, and fulfilling requirements of team members to achieve team objects. Team leadership creates an environment where openness and honesty in all aspects of communication are encouraged. Team leadership clearly set and defines team’s goals encouraging team members by participation with their own suggestions as brainstorming.

All organizations need strategic leadership to get success among this globalization age. According to Charles et al., 2015 strategic leadership is about to most effectively management a team’s strategy making process to create competitive advantage. The strategy- making process is the process by which managers select and then implement a set of strategies that aim to achieve a competitive advantage. Strategic leaders create the strategy-making process by formulating and implementing strategies that enables a team to achieve a competitive advantage and superior performance.

Teamwork orientation defined as the extent to which members have a positive attitude towards working in a team (Fransen et al., 2011); (Mathieu et al., 2008), is an

essential aspect of teamwork (Salas et al., 2005). Team orientation is the attitude that team members have team spirit concerning one another and the team's tasks. It identifies the acceptance of team norms, cohesiveness in team members, and self-awareness as a team member. Team members who have a high level of team orientation are more willing to participate in the team's activities emphasizing team goals and objectives.

The effectiveness of team management (supporting tasks and team work) can be assessed with team performance. Team performance can be defined as "it is the objective or subjective judgment of team that how effectively a team can meet its valued objectives" (Salas et al.,1992), (Morgan et al., 1986) stated that teams have two parallel performance tracks that develop over time. The task-work track focuses on operations-related behaviors relatively idiosyncratic to the tasks to which teams were assigned. The teamwork track reflects activities that strengthen relationships, communication, and coordination within related teams.

Team performance means that the extent to which a team is able to meet its output goals (e.g., quality, functionality, and reliability of outputs), the expectations of its members, or its cost and time objectives (Ancona & Caldwell, 1992). Team performance includes team achievement, task accomplishment, and team and task quality. Team members with a strong sense of purpose, persistence and accomplishment perform better at work. A person who can align a task and responsibility to their sense of duty is much more likely to complete it. Team achievement helps team members to foster engagement, increase productivity, and reduce tension in the work environment ensuring effective team performance. Quality work is the task one completes successfully within the targeted timeframe, according to the specifications without cost overrun satisfying the expectations of everyone involved and all stake holders.

This study highlights the effectiveness of team communication and team coordination on team management at Irrigation and Water Utilization Management Department, Ministry of Agriculture, Livestock and Irrigation. The major variables of this study are task inter-dependence, team leadership, team orientation, team communication, team monitoring, team feedback, team backup, team coordination and team performance.

1.1 Rationale of the Study

In the contemporary environment, many organizations including government organizations are conducting the large projects with respective teams for effective completion without delay and without budget overrun. In Myanmar, which is relying on

agriculture based economy, the role of the Ministry of Agriculture, Livestock and Irrigation (MOALI) is important for nation's economic development. Effective contribution to national economic development through the effective completion of projects related to agriculture, livestock and irrigation largely depends on team performance of various teams, in which staff from Irrigation and Water Utilization Management Department (IWUMD) are participating for high team performance; achievement, accomplishment and quality of teamwork of each and every team must be emphasized by authorities of this ministry.

Poor quality of team and task skills may lead to the delays, higher costs, and even increased risk. Delay and late accomplishment of tasks may lead to higher costs, wastage of time, and blurred team's goal. Team members may be stressful, dissatisfied and the community may be unhappy, and this may lead to poor achievement. Poor achievement may lead team members to be low enthusiasm, lack of motivation, lack of interest, weak willingness, and these situations may lead to difficulties to go ahead for the team.

Team's poor performance usually creates many wastes (by time, by energy, and by cost) for the ministry, for the government. Therefore, team performance from every aspect should be excellent at government departments. This team performance is influenced by teamwork management. In any work team, communication is back bond and sufficient information is needed to support all functional level, business level and corporate level. It is more than importance that to be secure and fast flow of information widespread into all team members in a particular or a particular time.

All the projects have been scheduled to finish in time and it is important to monitor team performance periodically and regularly. Without regular monitoring system, unnecessary waste of time, cost and poor quality will be resulted. Monitoring team performance lets the team determine strengths and weaknesses to see a clear, objective picture of where individuals are doing well, and where they're really struggling to achieve high performance teamwork.

Feedback is one of the most critical tools for teams encouraging team members to give each other praise when things are going well, and helping and giving advise how tasks to be done in a different way when things are not. It is required to give feedback at any time, any person, anywhere and any situation for all team members to perform their duties effectively. Therefore, feedback is strategically important to give in time and sufficiently among team members to finish their tasks without any hindrance. If not so, the tasks will not be finished in time and there may be cost overrun and have wastage as a

negative result. By creating a clear and honest feedback, it saves the time of correcting someone's task, reduces errors into minimum level, and prevent failing target.

Backup system in a team is important to give team members meeting their needs in a timely manner resulting higher team performance. Team members suffer in their beliefs and trusts resulting higher uncertainties and lower level of team performance when there is lack of backup behavior occurs in a team.

In a team, coordination is an essential element which integrates and synchronizes the efforts of team members so as to provide unity of action to pursuit common goals. Coordination is an invisible hand which binds all strengths and ability of team members to achieve team objectives in time. Therefore, coordination is key player to the process of teamwork so that team members work together properly and interdependently.

Successful teamwork is mainly relying on top management's support and arrangement. They must arrange/assign the tasks for high interdependencies each other. Strong team leadership must also be appointed for giving sound guidance and supervisions. Moreover, not only top management's team orientation but also organization's team orientation is required for effective implementation of teamwork.

In addition, there needs a deep team sense to team members building mutual respect among leaders and team members to express positive emotions with each other. Team sense indicates team members' openness and candor, acceptance of assignment, understood and accepted goals, progress and results, shares trust, involvement and participation.

When real teamwork exists, team members basically have trust among them, and are more open and honest with each other. Real teamwork motivates team members to accept assignments willingly and then they also work hard to get their jobs done right and to meet deadlines. A team needs purpose, direction, and goals accepted by the members, and they work collaboratively to achieve these goals. Understanding of team members why it is so important for the goals to be reached is the key success to achieve these goals. Teamwork requires focusing on their objectives which consistently emphasize the progress of the team, and their activities need to be aligned with those goals. For a healthy team, team members must cooperate and get the work done sharing trust on one another getting along well and enjoy each other's company. Team also requires team spirit that team members involving in their work actively and participating in team activities with keen interest generating higher team performance. This study analyzes the effect of team

communication and team coordination on team performance at Ministry of Agriculture, Livestock and Irrigation.

1.2 Objectives of the Study

The objectives of this study are as follows:

1. To examine the effect of task-interdependence, team leadership and team orientation on team communication at Irrigation and Water Utilization Management Department, Ministry of Agriculture, Livestock and Irrigation
2. To analyze the effect of team communication on monitoring, feedback and backup of teams at Irrigation and Water Utilization Management Department, Ministry of Agriculture, Livestock and Irrigation
3. To evaluate the effect of monitoring, feedback and backup on team coordination at Irrigation and Water Utilization Management Department, Ministry of Agriculture, Livestock and Irrigation
4. To analyze the effect of team coordination on team performance at Irrigation and Water Utilization Management Department, Ministry of Agriculture, Livestock and Irrigation

1.3 Scope and Method of the Study

This study focuses only on team communication and team coordination of the managerial staff in Irrigation and Water Utilization Management Department, Ministry of Agriculture, Livestock and Irrigation. At this department, the managerial staffs are engineers, accountants, administrative officers, and other management staff.

There are four Mechanical Divisions/Circles in Irrigation and Water Utilization Management Department, Ministry of Agriculture, Livestock and Irrigation. There have 70 managerial staff in total of 267 staff in Mechanical Circle No-2 at Irrigation and Water Utilization Management Department, Ministry of Agriculture, Livestock and Irrigation.

In this study, primary data is collected from these 70 managerial staff. Thus, the census sampling method is applied. The structured questionnaire is applied to collect data. Personal interview method is used to collect data from 20th, August to 10th, September, 2022. For data analysis, the descriptive method and linear regression method is applied. Secondary data are surfed from the documents and reports of Irrigation and Water Utilization Management Department, Ministry of Agriculture, Livestock and Irrigation, previous papers, and related texts.

1.4 Organization of the Study

The study is divided into five chapters. Chapter (I) is the introduction to this study that includes objectives of the study, rationale of the study, scope and method of the study, and the organization of the study. Chapter (II) describes the models of the teamwork, concepts and definitions of the antecedents and elements of teamwork, measurement of team performance and empirical studies of relationships of antecedents, teamwork and team performance, and conceptual framework of this study. Chapter (III) shows Profile and Team Management at Irrigation and Water Utilization Management Department. Chapter (IV) highlights the analysis on effect of team communication and coordination on team performance at Irrigation and Water Utilization Management Department, and Chapter (V) explains the conclusion part presenting the summery of the main findings and discussions, critical analysis of the results, suggestions, recommendations, and the needs for other studies.

CHAPTER II
THEORETICAL BACKGROUND

This chapter presents models of teamwork, concepts and definitions of the antecedents and elements of teamwork, measurement of team performance and empirical studies of relationships of antecedents, teamwork and team performance, and conceptual framework of this study.

2.1 Models of Teamwork

Different theorists explained different models of teamwork. Among them, some major models are Task-oriented Model, Normative Model, Pro MES Model, Team Behavior Model, and Team Component Model.

(a) Task-oriented Model

Some researchers emphasize task-oriented analysis of team performance (Dickinson, 1969; Dieterly, 1988; Naylor & Dickinson, 1969; (Shiflett et al.,1982). Task oriented means focusing on the completion of particular tasks as a measure of success, and according to Artificial Intelligence in Design'94 by Gero and Sudweeks, Task-oriented Models model activities that have to be performed to solve a design problem-tasks and how they have to be perform-task structure and the problem solving methods that can be used to perform them.

To get success for teams, team members must firstly understand their tasks clearly, i.e., what they want to achieve and then they must prepare their task-related components making interaction with each other collaboratively and collectively. Dickinson (1969) emphasizes task structure, work structure, and communication structure. Task structure refers to the clarity to the team member, work structure means the work flow through the organization, and communication structure is a network by which information and ideas flow among team members in all functional and cross functional levels.

According to the task-oriented model, there is a need to integrate complicated interactions among different aspects of a task, and a need to design a temporary grouping of team members to accomplish a particular mission. These task complexity and task

organization can strengthen the team communication structure, team coordination and team cooperation enhancing effective team performance.

(b) Normative Model

Hackman (1983) presents a normative model based on the assumption that organizational context and group design affect team processes. Organizational context is a form of communicative variable that influences the relationship in both internal and external networks of the organization. Group design involves randomly assigning participants to two (or more) groups with at least one treatment group and one control group. Data from each group are compared (Cooper et al.,2007).

According to Hackman (1990), three dimensions of performance are critical. The first dimension is productive output, a typical task-work relationship in dimension. A team's ability depends almost entirely on its capability to raise its output per team member. According to The Age of Diminishing Expectations (Krugman, 1994), productivity isn't everything, but in the long run it is almost everything.

The second dimension is the critical behaviors of team effectiveness that facilitate the team's ability to work well together. To work well together is based on the values, beliefs and behaviors of team members. Hackman (1983) argues that team effectiveness is facilitated by team members' ability to work together and foster the growth and well-being of team members.

The third important dimension of a team's performance is regarding perceptions of a reasonable exchange in the owned opinion of its team members' involvement in the decision making process. Team members must have the feeling that they are performing both for the gaining of the organization and for their own needs from working in the team.

(c) Pro MES Model

Pro MES means Productivity Measurement and Enhancement System which is a highly effective management model for measuring and improving productivity, effectiveness and overall performance of team members in a team. Pritchard and his colleagues (Pritchard,1995); (Pritchard et al.,1988) developed a system known as Pro MES, for "productivity measurement," which provides an interesting contrast in approaches to work team performance, effectiveness, or productivity. Pro MES model emphasizes performing team effectiveness, giving feedback, applying goal-setting

principles, and establishing reward systems to team members. Pro MES aims to enhance the uniqueness of teamwork by collecting idiosyncrasies of each team member. Giving feedback to team members understanding the importance of their participation and how it relates to effectiveness of teamwork is a key factor for team members. The more the team members pay attention to raise output, the more effectiveness increases sharply in a team.

(d) Team Behavior Model

Morgan et al., (1986) state that teams have two parallel performance tracks that developed over time. The task-work track focuses on operations-related behaviors relatively idiosyncratic to the tasks to which teams were assigned. The teamwork track reflects activities that strengthen relationships, communication, and coordination within teams.

As for task track, team members must have required skills individually and cooperatively to complete assignments by the team combining their skills, experience and knowledge. As for teamwork track, ability and capability of cooperative strength that creates high performance of the team. This team behavior is essential for every team to make sustainable improvement and commitment to have big success.

(e) Team Component Model

This teamwork model is based on research in team training by McIntyre and Salas (1995) that describes components of teamwork necessary for successful performance. Dickinson and McIntyre (1997) developed a framework of team process behaviors which emphasizes the sharing of information and coordination of activities among team members in order to achieve high, effective team performance. Positive attitudes toward teamwork for a successful team require team members to know their own task as well as the tasks of other team members who interact with each other. Thus, team members are willing to coordinate their activities by monitoring their own performance and the performance of other team members and by providing feedback and backup behaviors. Components of this team process model include communication, team orientation, team leadership, monitoring, feedback, backup behavior, and coordination (Dickinson et al., 1992); (Dickinson & McIntyre, 1997).

2.2 Working Definitions of Antecedents, Teamwork and Team Performance

Working definitions of Antecedents, Teamwork and Team Performance are described as below:

2.2.1 Antecedents of Teamwork

Liu (2006) presented the three antecedents of teamwork: Task Interdependence, Team Leadership and Team Orientation. These factors are influencing factors which are pre-conditional requirements for a team and are highly interrelated to each other to form a good teamwork.

Antecedent means logically the conditional part of a hypothetical proposition, i.e., situational factors for organizational setting, or pre-conditions that satisfy the requirements for a team so as to make teamwork more effective. Task- interdependence, team leadership and team orientation are identified as antecedents which lead to improving team creativity.

(a) Task Interdependence

Task interdependence is a kind of team building and it shows the degree to which members work with others to plan and execute their tasks effectively. According to Thompson (1967), there are four elements of task interdependence and those are pooled, sequential, reciprocal, and team methods of exchange that reflect increasing levels of dependence among individuals and increasing needs for coordination.

The lowest level of interdependence is the pooled interdependence, where each member makes a contribution to group output without direct interaction among work group members resulting in group performance as the sum of individual ones. The next level is sequential interdependence, which requires group members to act one after another, and each step needs to be performed successfully and in the correct order. Reciprocal interdependence is a type of two-way interaction. The final level of task interdependence is team interdependence, where team members jointly diagnose, problem solve, and collaborate to complete an assigned task. These four levels of task interdependence provide a strategy for conceptualizing the nature, process and performance of a team.

(b) Team Leadership

Leadership is the ability to influence people toward the attainment of organizational goals (Daft and Marcic, 2015). Leadership is considered primarily as an input to team process and performance, focused on the importance of functional leadership in teams (Salas et al.,2004). Good leadership influences individuals to follow and build a team creating teamwork for high effectiveness.

According to the T7 model of team effectiveness developed by Lombardo and Eichinger (1995), team effectiveness emphasizes on collaboration within and among teams presenting seven elements categorized as factors of internal teams (Thrust, Trust, Talent, Teaming skills, and Tasks skills) and the factors of external team (Team leader fit and Team support from organization).

Effective leadership needs to develop cohesiveness and foster positive perception of team norms among team members. Excellent leadership is about building up trust and empowering team members, and enabling them to contribute their expertise creating a synergy effect that the team can become more than the sum of its parts. Team leadership is a critical component of teamwork in a team, and team leadership was found to be positively associated with team orientation.

(c) Team Orientation

Team orientation means building good relationship between team leaders and team members, and among team members in a team. Team orientation refers to the collaborative effort above individual job accomplishment which results in the team sustainable and continuous development. The more team members relate to each other collaboratively, the more diverse skills, knowledge and experiences lead to achieve a common goal. Creating opportunities for team members to build good relationships and trust with each other to ensure the entire team works well together is a key characteristic of team orientation.

To have a good relationship, team building is crucial for every team. According to Tuckman (1965), there are five phases of group development: Forming, Storming, Norming, Performing and Adjourning. In forming stage, team acquaints and establishes ground conducts, and formalities are preserved and members are seen as strangers. In storming stage, team members start to meet each other showing their feelings, but till view themselves as individuals rather than part of the team resisting control by group leaders and showing hostility. In norming stage, team members feel themselves as the

part of the team and realize that they can accomplish more tasks exchanging their opinions each other. In performing stage, the team members work in an open and trusting atmosphere where they value flexibility as the key. In the adjourning stage, the team conducts an assessment of the year planning for transitioning period and recognizing members' contributions.

2.2.2 Teamwork

Teamwork consists of behaviors such as coordination, mutual adjustment, compensatory behavior, communication, flexibility/adaptability, and cohesion (McIntyr et al.,1986). Teamwork refers to the processes of interdependent activities that are used to achieve team tasks (i.e., task work) in the pursuit of team goals.

Teamwork requires bringing together the right combination of personality, experience, skills and knowledge, defining clear roles and responsibilities, anchoring everyone on a well-defined vision, mission, and objectives, establishing clear channels of communications and information sharing so as to interact with each other, getting everyone pulled together in the same direction. Teamwork can be developed with five elements of tasks: team communication, monitoring, feedback, backup, and team coordination.

Team communication is not just sending information, but sharing information in a planned way (Daft and Marcic, 2015). Effective team communication is the "active and sufficient exchange of information between team members providing information to each other in the appropriate and timely manner"

Monitoring behaviors facilitate clarity of communication, high levels of honesty and trust, and good team orientation in a team. Understanding each other and giving mutual respect is a core value of effective teamwork. Team members must be individually competent and must trust each other forming mutual assistance according to the needs of the teamwork.

Giving feedback is a principal driver of a successful team. Team members of successful teams usually praise the accomplishments of their tasks and are willing to support and give advice when a team member makes a mistake. Team members are usually adept at giving feedback in a quick response and prepared to accept constructive feedback.

Backup is assisting each other among team members, among top management level, middle management level and bottom management level. Giving backup and building trust is essential to get high effective performance of a team.

Team coordination is a synchronizer combining and stabilizing a team's efforts to get harmonious actions. This rhythmic strategy leads the team to reach a crucial manner keeping all efforts of teams all together at all the time creating high, effective performance of a team.

2.2.3 Team Performance

Organizations which have emphasized more on teams have resulted in increased employee performance, greater productivity and better problem solving at work (Cohen & Bailey, 1997). Team performance is conceptualized as a multilevel process (and not a product) arising as team members engage in managing their individual-level and team-level task-work and teamwork processes (Kozlowski & Klein, 2000). Effective teamwork leads team members satisfying their team achievement, task accomplishment and team quality resulting in effective and efficient team performance.

Various studies have reported a positive relationship between teamwork and organizational performance (Amabile, 1996). Aamodt and Michael (2015) defined team management as the ability of an individual or an organization to administer and coordinate a group of individuals to perform a task.

2.3 Measurement of Teamwork

According to (Salas et al., 1992), a team is defined as a distinguishable set of two or more people who interact dynamically, interdependently, and adaptively toward a common and valued goal, objective and mission, who have each been assigned specific roles or functions to perform, and who have a limited life-span of membership. The scope of team activity, roles and nature of team members and objectives of teamwork are likely to be considered to form a high effective team. According to Brannick and Prince (1997), a comprehensive measurement of teamwork should contain both process and outcome measures. Although there is assessing performance as outcome is fairly common in many areas of applied psychology, it is needed to consider many potential impediments to team process. Normally, teams are valued for their outcomes, but team process measures concentrate on problems encountered by teams, whereas outcome measures may obtain other factors that are not attributable to teamwork. Although there have been many studies

conducted to develop team process measures, no agreement has been made upon a set of factors, skills, or activities that can fully explain teamwork. Developing measures of performance criteria that are valid and reliable is often the starting point of research in teamwork practices. In teamwork, it is needed to measures, how team members effectively interact, communicate and behave each other, monitor team process is going smoothly or not, practice the feedback behavior, watch and maintain the backup system is working well or not, and then emphasize the degree of coordination. Furthermore, there are techniques to reinforce teams from social relations, clarify tasks, develop team norms, and create a team contract. Using these techniques at the beginning of a team project, teams are more like to be effective.

2.4 Measurement of Team Performance

Team performance generally refers to an evaluation of the results of performance with no consideration of the costs of achieving the results (Ingram, 1996). Team performance is closely related to team effectiveness, and is a key indicator for a team to create an environment where team members can perform to the best of their ability by emphasizing rhythmic activity of team members who work together with keen interest and high motivation to each other providing feedback on the entire team. Team performance includes team achievement, task accomplishment, and team and task quality.

Achievement is getting things done successfully with effort, skill, or courage. Team achievement usually comes from: how team members complete their duties specified in their job description, how team members fulfill all responsibilities required by their job, or how team member fail to perform essential duties, do team members never neglect aspects of the job that they are obligated to perform or not, and do team members meet all the formal performance requirements of the job.

Accomplishment is something that has been achieved successfully. Task accomplishment usually comes from: the team performance which meets or exceeds expectations of the team objectives in a timely manner, i.e. team output meets team goals with standardized limits or above average of the organization, team value, beliefs and behavior that the team as a whole performs team objectives in an efficient manner.

Task quality is a measurement of the quality and quantity of work, initiative behaviors of team members and their interpersonal skills, strategy on planning and allocation of material, and overall performance of the team.

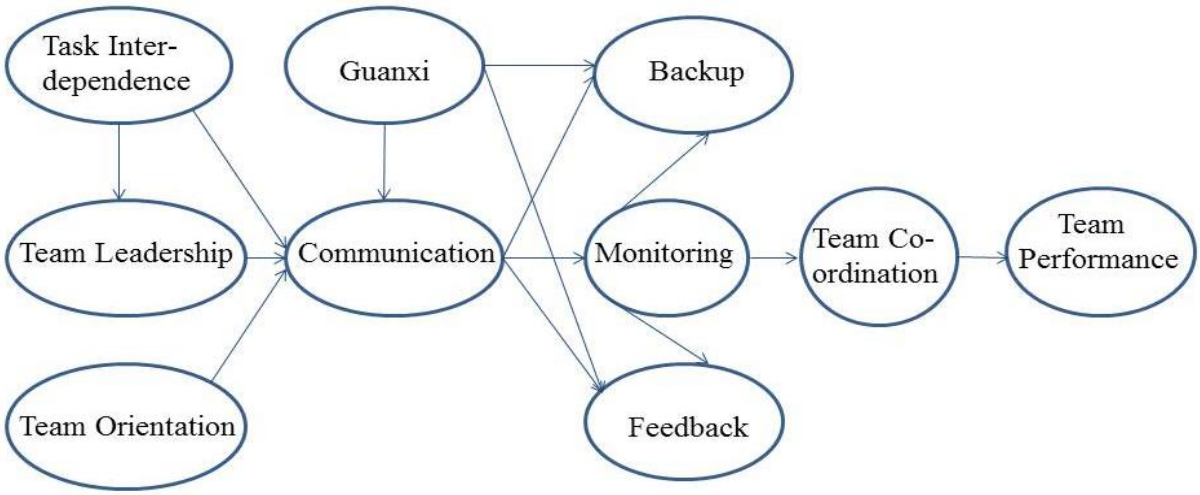
2.5 Empirical Studies

To develop the conceptual framework of the study, the five previous research models are reviewed.

(a) Model of Teamwork in Chinese Organizations

Figure (2.1) shows the Model of Teamwork in Chinese Organizations (Liu, 2006). This model of teamwork includes the following variables: task interdependence, team orientation, team leadership, guanxi, communication, monitoring, feedback, backup, coordination, and team performance.

Figure (2.1) Model of Teamwork in Chinese Organizations



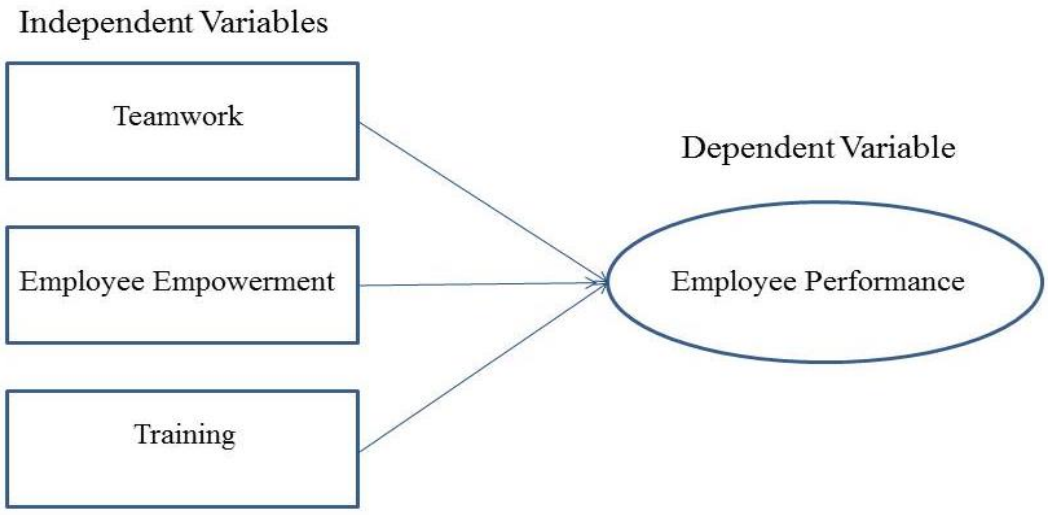
Source: Liu, 2006

This model explains the definition of teamwork to describe teams, to identify variables related to teamwork, to develop a new framework and measure of teamwork in organizations, and to test the psychometric properties of the measure as well as the structural relationships of the new framework of teamwork in teams. This study also shows the influence of cultural value that emphasizes exchange and reciprocity in relationships on teamwork in organizations.

(b) Model of Effect of Teamwork, Employee Empowerment and Training on Employee Performance

Figure (2.2) shows the effects of teamwork, employee empowerment and training on employee performance (Ahmad & Manzoor, 2017), and indicates relationship between independent variables (teamwork, employee empowerment, training) and dependent variable (employee performance).

Figure (2.2) Effect of Teamwork, Employee Empowerment and Training on Employee Performance



Source: Ahmad & Manzoor, 2017

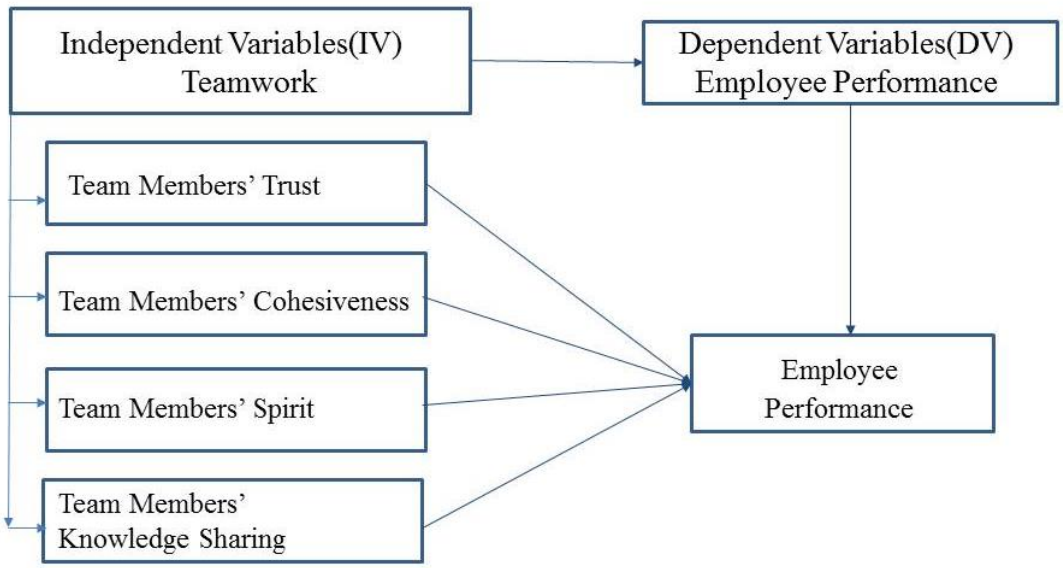
This model focuses on the direct effects of teamwork, employee empowerment and training on employee performance in some organizations. Only a few researches were carried out on employee performance and its relationship with teamwork, employee empowerment and training. This study explains the relationship between teamwork, employee empowerment and training, and examines their effects on employee performance.

(c) Model of The Effect of Teamwork on Employee Performance in Some Selected Private Banks in Mogadishu-Somalia

Figure (2.3) shows the Effect of Teamwork on Employee Performance (Abdulle & Aydintan, 2019) explaining the relationship between team members' trust, team

members' cohesiveness, team members' spirit, team members' knowledge sharing, and the Effect of Teamwork on Employee Performance.

Figure (2.3) Model of Effect of Teamwork on Employee Performance in Some Selected Private Banks in Mogadishu-Somalia



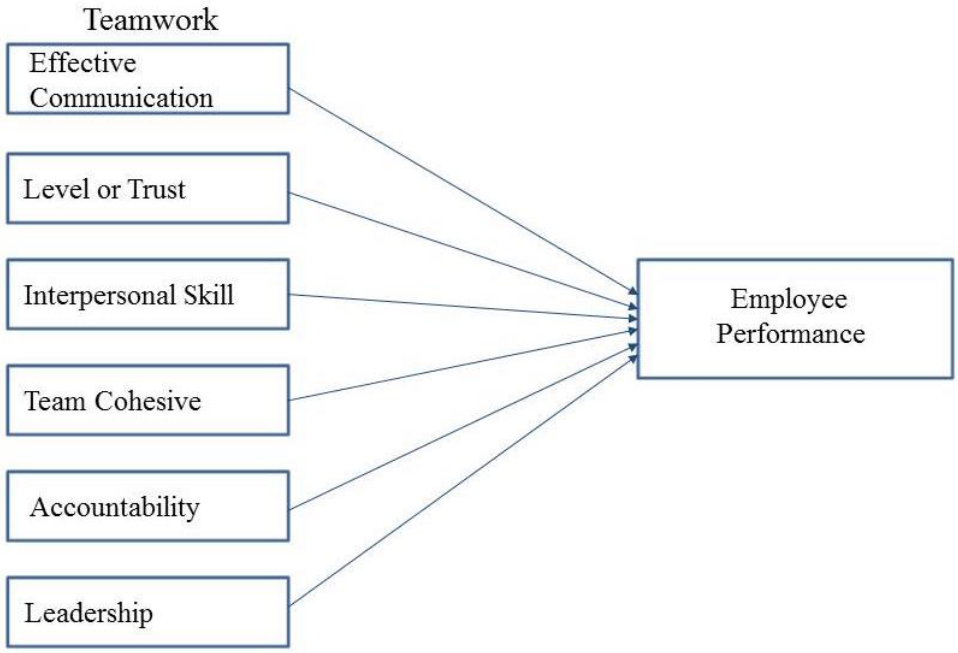
Source: Abdulle & Aydintan, 2019

This model explains the effect of teamwork on employee performance in some selected organizations, and assesses the effect of team members' trust, cohesiveness, spirit or "esprit de corps", and knowledge sharing on employee performance in the study's selected organizations.

(d) Model of Impact of Effective Teamwork on Employee Performance

Figure (2.4) shows Impact of Teamwork on Employee Performance (Salman & Hassan, 2016) and explains the relationship between effective communication, level of trust, interpersonal skills, team cohesiveness, accountability and leadership on employee performance, and examines the Impact of Teamwork on Employee Performance.

Figure (2.4) Impact of Teamwork on Employee Performance



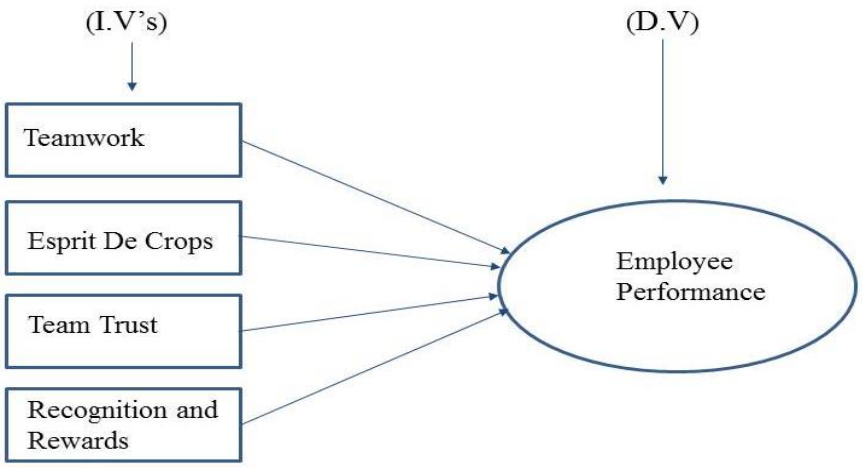
Source: Salman & Hassan, 2016

This model examines the effect of effective communication, level of trust, interpersonal skills, team cohesiveness, accountability and leadership on employee performance.

(e) Model of Effect of Teamwork on Employee Performance

Figure (2.5) shows the Effect of Teamwork on Employee Performance (Manzoor et al., 2011), and states the relationship between teamwork, esprit de corps, team trust, recognition and rewards, and employee performance.

Figure (2.5) Effect of Teamwork on Employee Performance



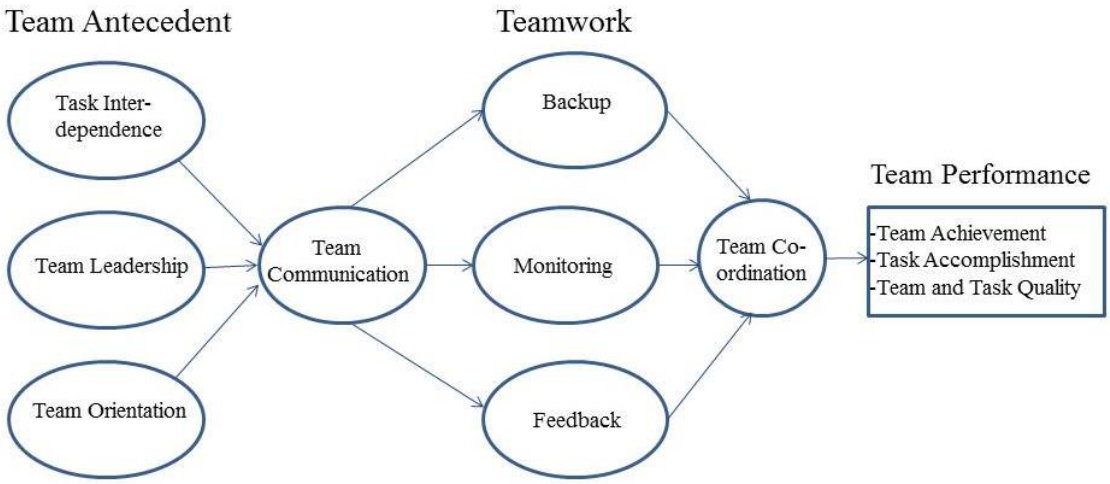
Source: Manzoor et al., 2011

This study recommends adaptation of teamwork activities in order to enhance employee performance. This study examines the effect of teamwork, esprit de corps, team trust, recognition and rewards on employee performance and also to find out the relationship between employee teamwork and employee performance.

2.6 Conceptual Framework of the Study

This study is based on the framework developed by Liu, 2006. Liu, 2006 stated a seven teamwork components model, and Figure (2.6) shows the Conceptual Framework of this Study.

Figure (2.6) Conceptual Framework of the Study



Source: Own compilation adapted from previous studies (2022)

This study emphasizes the effect of influencing factors and teamwork on team performance. Team antecedent (influencing factors) includes task interdependence, team leadership, and team orientation. Teamwork includes five components: team communication, team monitoring, team feedback, team backup, and team coordination. Team performance includes team achievement, task accomplishment, and team and task quality. Firstly, this study analyses the effect of antecedent (task interdependence, team leadership and team orientation) on team communication, and secondly analyses the influencing effect of team communication on monitoring, feedback and backup behaviors, and then analyses the effect of monitoring, feedback and backup behaviors on team coordination, and finally analyses the effect of team coordination on team performance. Thus, this study examines the effect of team communication and team coordination on team performance at Irrigation and Water Utilization Management Department, Ministry of Agriculture, Livestock and Irrigation in Myanmar.

CHAPTER III

PROFILE AND TEAM MANCGEMENT AT IRRIGATION AND WATER UTILIZATION MANAGEMENT DEPARTTMENT

This chapter presents the profile of Irrigation and Water Utilization Management Department and Status of Heavy Machinery under Mechanical Division, IWUMD, and explores the management practices of Mechanical Division under Irrigation and Water Utilization Management Department, Ministry of Agriculture, Livestock and Irrigation in Myanmar.

3.1 Profile of Irrigation and Water Utilization Management Department

The profile of Irrigation and Water Utilization Management Department can be seen with four parts: background, aim and objectives, organization structure, and main functions.

3.1.1 Background of Irrigation and Water Utilization Management Department

Irrigation culture has a long history in Myanmar, being practiced since the time of the Ancient Myanmar Kingdom of Pyu Dynasty which is more ancient than Bagan Kingdom Era. Meiktila Lake, Kinda and Nga Pyaung Diversion Weir in Kyaukse District, Old Mu Canal and Mahananda Lake in Shwebo District were masterpieces of Ancient Myanmar irrigation technology. The British established a Public Works Department in Myanmar in the year 1861, for maintenance of building and construction of new irrigation facilities in Lower Myanmar. After that, construction of infrastructure including roads and buildings as well as exclusive irrigation works implementation as Shwebo Canal, Mandalay Canal and Mone, Mann, Salin Canals were significantly accelerated. Moreover in the delta, there is more concern about drainage and flood protection and construction and maintenance works of embankments were conducted during 1881 and 1917. In 1917, Building and Road Branch and Irrigation Branch were established under the Public Works and managed by different Chief Engineer.

In 1929, Public Works Department and Irrigation Department were established separately and aiming to carry out specific works. In 1963, irrigation works and government officials of Kachin, Kayah and Shan State were transferred to the Irrigation Branch. In 1966, Irrigation Department not only conducted Operation and Maintenance of

existing Irrigation Facilities for agricultural development but also laid down new project formulation throughout the country, and then Irrigation Department was expended its organizational frameworks. In 1972, all departments and corporations under Ministry of Agriculture and Forestry were reorganized and Irrigation Branch together with Rural Farm Improvement Corporation and extension service for farm land Branch were combined and named as Irrigation Department.

The Irrigation Department is led by a Director General, composed of (6) primary branches and (6) other branches correlated to it. The primary branches are Administration, Planning and Works, Procurement, Accounts, Design, and Works Inspection. The secondary branches are Geology, Hydrology, Survey & Investigation, Drilling & Blasting, Hydropower and Irrigation Technology Center respectively. The normal (14) Maintenance Divisions of the respective States and Regions, have been encouraged with further establishments of the Nay Pyi Taw, the Shan State (Northern) and Shan State (Eastern) Division, and thus total (17). There also exist (9) Construction Divisions under the control of Directors.

In 15 January of 2016, two departments, Irrigation Department and Water Resources Utilization Department were combined and born as Irrigation and Water Utilization Management Department under the Ministry of Agriculture and Irrigation. And then, Ministry of Agriculture and Irrigation was combined with Ministry of Cooperative and Ministry of Livestock, Fisheries and Rural Development and after reorganizing (3) ministries change into one ministry which is named as Ministry of Agriculture, Livestock and Irrigation on 1st April, 2016. Under the Ministry of Agriculture, Livestock and Irrigation, total (13) No of departments are constituted and correlated each other including Irrigation and Water Utilization Management Department. After State Administration Council was established, Ministry of Agriculture, Livestock and Irrigation was divided into two as Ministry of Agriculture, Livestock and Irrigation and Ministry of Cooperative and Rural Development on 17 June of 2021. And Ministry of Agriculture, Livestock and Irrigation was reorganized with (9) Departments and (2) Universities including Irrigation and Water Utilization Management Department.

The Irrigation, Water Utilization and Management Department under the Ministry of Agriculture, Livestock and Irrigation has been actively engaged in developing the agricultural sector and socio-economic sector of people aligned with the 17 SDGs (Sustainable Development Goals) adopted by all United Nations in 2015 as a universal call to action to end poverty, protect the planet, and ensure that by 2030 all people enjoy

peace and prosperity through attaining agricultural water and domestic water used and protecting and mitigation of natural disaster in Myanmar.

3.1.2 Aim and Objectives of Irrigation and Water Utilization Management Department

The aim of Irrigation and Water Utilization Management Department is that "To build and maintain the necessary infrastructure for flood mitigation and long-term security due to climate change, irrigation and drinking water scarcity; and to carry out water resource management activities".

The policy of Irrigation and Water Utilization Management Department is "To conduct water management in accordance with climate change adaption in order to comply with necessity of local requirement together with ensure water safety for future generation".

Objectives of Irrigation and Water Utilization Management Department are:

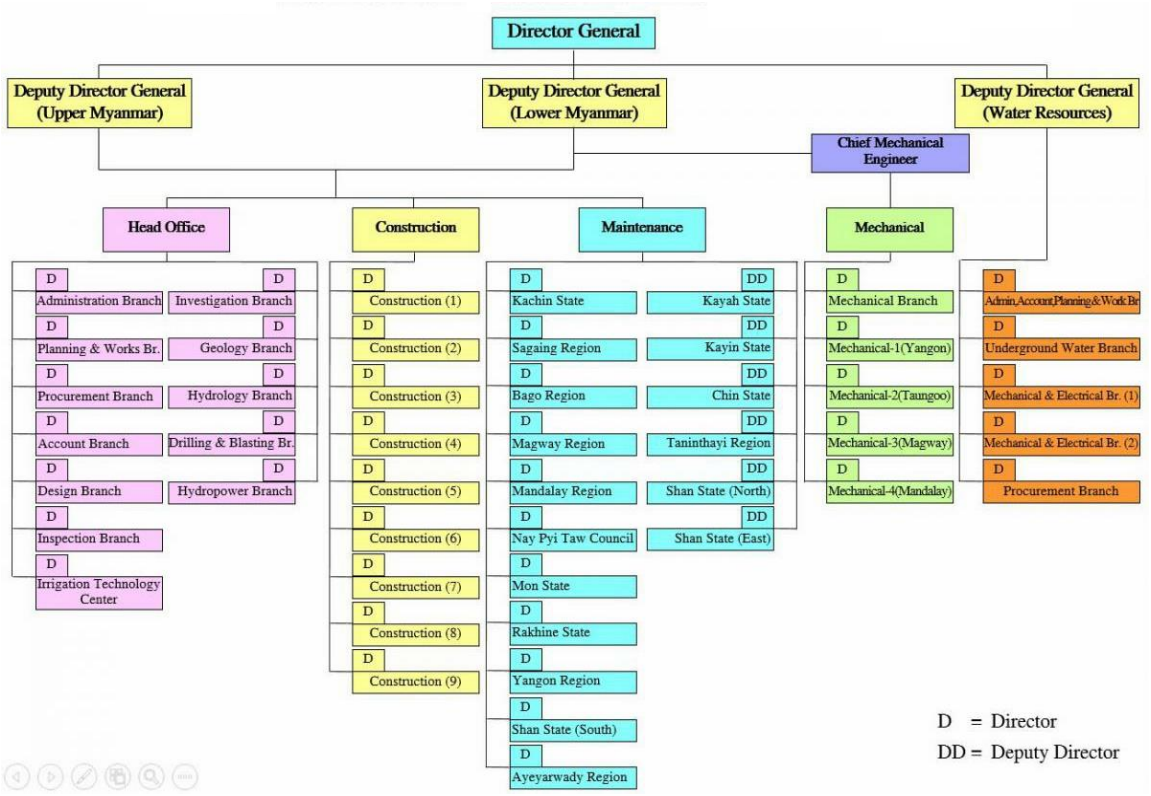
(1) To mitigate natural disaster especially for flood and reduce water scarcity for irrigation and drinking water due to climate change and

(2) To manage water resources for future sustainability by implementing water related infrastructures

3.1.3 Organization's Structure of Irrigation and Water Utilization Management Department

The organization structure of Irrigation and Water Utilization Management Department is shown in Figure 3.1.

Figure 3.1 Organization's Structure of Irrigation and Water Utilization Management Department



Source: Irrigation and Water Utilization Management Department, 2020

According to the organization structure of Irrigation and Water Utilization Management Department, there are three divisions under the management of director general: Deputy Director General (Upper Myanmar), Deputy Director General (Lower Myanmar) and Deputy Director General (Water Resources). Under the director General, two Deputy Director Generals are responsible for management and activities of the former Irrigation Department and one Deputy Director General is responsible for management and activities of the former Water Resources Utilization Department.

There are three functional departments such as construction, maintenance and mechanical divisions. The head office can directly control each of these functional divisions. There are (4) Mechanical Divisions, each under a Director have been established at Yangon, Taungoo, Magway and Mandalay. The Divisions assist in dispatching necessary machinery and equipment to projects under construction and also meet the mechanical needs of the State and Region Maintenance Divisions. There are (843) number of earth moving equipment and (1776) number auxiliary equipment as total of (2619) number under Mechanical Division and heavy machinery inventory list at the end of June 2022 is shown in Fig (3.2).

Fig (3.2) Status of Heavy Machinery under Mechanical Division, IWUMD

Sr. No.	Type of Machine	Dispatches to Projects	Dispatches to State/Region	Dispatches to Workshop	Total
Earthmoving Equipment					
1	Tracked Dozer CL 1	24		31	5
2	Tracked Dozer CL 2	131	81	63	275
3	Tracked Dozer CL 3	10	8	13	3
4	Hydraulic Excavator	175	214	71	460
5	Motor Grader	14	1	5	2
6	Scraper	1		1	2
	Sub Total	**355**	**304**	**184**	**843**
Auxiliary Equipment					
1	Loader	41	4	17	6
2	Dump Truck (DF)	211	68	113	392
3	Dump Truck (DO)	3		27	3
4	Loader Back Hoe	1	2	2	5
5	Mobile Crane	25		22	4
6	Crawler Crane	2		1	3
7	Compactor	17	1	9	2
8	Roller	1	2	7	1
9	Sheep Foot Roller	36	3	46	8
10	Tipper	118	67	5	190
11	Water Bowser	91	12	17	120
12	Diesel Bowser	60	9	2	7
13	Rock Crusher	1		2	3
14	Batching Plant	9	2	2	1
15	Agitator Truck	21	4	6	3
16	Crawler Drill	11	31		4
17	Amphibious Back Hoe	1	11		1
18	Shotcreting Machine	7		1	8
19	Concrete Pump Truck	3			3
20	Concrete Pump Truck	3		2	5
21	Compressor	17	46		6
22	Generator (> 50 KVA)	28	58	5	9
23	Truck	102	91	36	229
24	Concrete Sprayer	1		1	2
25	Core Drill	17	38		5
26	Jumbo Drill	2		3	5
27	Transporter	6	1	14	2
28	Diaphragm Machine			2	2
29	Mini Back Hoe	55	40	35	130
30	Transport Barge		4		4
31	Hydraulic Grab			1	1
32	Pile Hammer				
33	Fire Vehicle	2	1	8	1
34	Mobile Workshop	1		2	3
	Sub Total	**893**	**495**	**388**	**1776**
	Total	**1248**	**799**	**572**	**2619**

Source: Irrigation and Water Utilization Management Department, 2022

Chief Mechanical Engineer is playing at both line and staff roles: as staff to support machine utilization purpose for new construction projects and maintenance works in upper and lower Myanmar divisions, and as line to directly control the mechanical division. There are total of (12,699) employee at Irrigation and Water Utilization Management Department, and there is (1,882) employee in mechanical division up to June, 2022. Under Mechanical Branch, there are four sub-divisions named as Mechanical Circle-1 situated in Yangon, Mechanical Circle-2 situated in Taungoo, Mechanical Circle-3 situated in Magway, and Mechanical Circle-4 situated in Mandalay. In Mechanical Circle-2, there is a total of (267) employee and among them, (70) staff is serving in managerial position. Team management of the mechanical engineers and staff mechanical division coordinating and cooperating with civil engineers and other relative departments, controlling of machine deployment and operation management maintaining efficient and effective use of ground engaging equipment, sustaining skills and performance of machine operators and mechanics is one key drivers to finish targeted projects according to the aim, objectives of Irrigation and Water Utilization Management Department strategically fit with national planning.

3.1.4 Main Functions of Irrigation and Water Utilization Management Department

Main Functions of Irrigation and Water Utilization Management Department are:

(1) To Carry out construction of new projects including hydro electricity generating with Multipurpose Dam projects after studying feasibility of project with aspect of local development using without negative impacts on natural resources.

(2) To perform operation and maintenance of the existing irrigation facilities and irrigation networks for effective and efficient utilization of agricultural water.

(3) To undertake construction, rehabilitation, operation and maintenance for flood protection of dikes and polders.

(4) To undertake construction and rehabilitation of small embankments and tanks to fulfill the safety of drinking water and greening of areas in accordance with necessity of locality.

(5) To provide technical assistance for operation and maintenance of Village Embankment and Village Irrigation works.

(6) To involve the land consolidation process with other relevant departments including of systematic and effective water management practice.

(7) To conduct the training to farmers in water user groups for enhancement of irrigation technologies together with irrigation water use efficiency.

(8) To make sure for fully supply of irrigation water in pumped irrigation projects.

(9) To supply more irrigation water from pumped irrigation projects and ground water tube wells in Central Dry Zone, especially in Sagaing, Magway and Mandalay Regions.

(10) To extend ground water exploration works to fulfill irrigation water and domestic water without negative impacts on natural resources.

(11) To convert from diesel driven pumped irrigation projects to electric power driven pumped irrigation project depending on availability of Electric power.

(12) To educate water saving technologies for farmers in pumped irrigation projects and ground water tube wells sites.

3.2 Team Management Practices at Irrigation and Water Utilization Management Department

In this study, the team management practices explored by qualitative analysis (In-depth interview and observation) are task Interdependence, team leadership, team orientation, team communication, monitoring, feedback, backup, and team coordination.

3.2.1 Task Interdependence

Task interdependence is team essence which creates a network relating, linking and interacting in each and every aspect of team tasks and team members in the whole team. Team members take their own responsibilities, and at the same time they take care of other team members' tasks to get success team's common objectives and goals. Team members well understand that there may not be success for the team with just only finishing their tasks individually.

Especially for targeted and strictly limited projects (e.g. monuments of opening ceremony were strictly targeted to held one dam in one month in 1999s), and now as in the environment of high competition, it is not sufficient with normal routines and thus work load (task work) is separately divided by management as the requirement of the time-based schedule, and then preparatory works needed for the targeted progress is rigidly carried using the resources in an efficient manner, i.e., operation management control is practiced according to the timely progress such as hourly, daily, weekly, monthly, and yearly through and with high effective task interdependence among team

members. And therefore, government project scheduled with time and budget limits were completed according to the expectation.

For completion of projects in time, capability of machineries together with strenuous effort of mechanical crews is very important. Team members under the mechanical branch are ready position all day and night. They prepare their machines to have ready position through preventive maintenance, and they repair their machines through corrective maintenance managing the mechanical engineers, mechanics and operators, and supporting staff. Transporting machines to the required location without any distortion such as accidents, and road crossing, river crossing and bridge crossing is prepared in a secure manner. Furthermore, make machine utilization and operation control process is effectively managed by locating resources such as men, money, materials, methods and machineries. Especially, mechanical division is responsible for specified machine output, machine efficiency, machine utilization and operation control through cooperation and coordination with other interrelated teams.

Nowadays, cross functional and cross cultural communication becomes essential to have required information from all sources such as in-between and out of the organization. One thing needed to consider is cultural differences in organization, and there needs to build a strong interaction through good social relation with all stake holders. Thus, Irrigation and Water Utilization Management Department enhances fulfilling the requirements for the targeted progress by asking for requirements from all parts of supply chain in time by overwhelming the sharing of information in all cross functional and cross cultural communication.

In this turbulently changing world, there needs a change of organizational structure embedded with creative thinking which could get ahead whenever encounter difficulties during operation. Building up a new organizational structure which may be in temporary such as grouping sub-teams with selected members for supporting purposes according to the demand point rather than existing front line, middle line and back line, for strengthening the organization is an essential. In IWUMD, team management emphasizes for performing team effectiveness, giving feedback and backup, setting vision, mission and objectives, and establishing reward and support systems to team members enhancing the uniqueness of teamwork.

In Irrigation and Water Utilization Management Department, almost all the natural conditions of projects are not the same, and there always needs a creative means for starting and entering into the project sites, performing project according to the

demand. Especially for the effective use of earth moving equipment, mechanical team needs to be continuous strengthening its creativity in all maintenance, operation and machine utilization management for sustainable development practices.

Building up a strategic team, or special taskforce to feed necessary actions as fast as possible is a key for the team running continuously in a smooth attainment of the scheduled. The taskforce is shipped around the corner through the key controlled points and emergency point urgently. In IWUMD, selected team members have required skills individually to complete assignments, and by combining their skill, experience and knowledge as for the task track, they have required ability and capability to have cooperative strength that creates high performance of the team as for the teamwork track.

Team members in IWUMD usually focus on special consideration of uniqueness activities to solve a design task structure and to performed work structure, and communication structure. A clear understanding of task work with fast-smooth-capable work flow through effective activities not only aligned with but also supportive to existing procedure is a must. Free flow of widely and strongly supportive network system among team members in all functional, cross functional levels, and all sub-organizational levels is a major breakthrough.

A talented creation in technological, sociological and ideological manner for overcoming abnormal conditions during operation is a must. Although almost all the technicians could solve several general-normal problems, some technical problems requires technical details, or technical advice to provide team in time, and therefore team leader needs self-fulfilling technical knowhow, and social skills to encourage the team members to get rid of unsecured condition. Sometimes, the problem is coming from unexpected channel, and not only for controlling the team with unity, stability and harmony in psychological way but also performing cooperation, coordination and collaboration in an ideological way, and thus using effective-creative combination of team models through high task interdependence practices leads IWUMD to have superior performance and competitive advantage among the rivalries.

According to Hall (2011), task interdependence can be seen into four different types of processes: pooled interdependence, sequential interdependence, reciprocal interdependence and comprehensive interdependence. According to pooled interdependence, team management builds sub-teams and leads these sub-teams to do their specific task such as several machine combinations in worksite. And then, this sub-teams collects and combines their outputs in a common progress. According to sequential

interdependence, team members perform their works in prescribed order in order to finish a task, i.e. common progress has been targeted hourly, daily, weekly, monthly, yearly, and so on. And then, according to reciprocal interdependence, similar to that of sequential interdependence in the fact that specific tasks are performed by team members, yet there is no chronological order to finish the project. The interrelationship is the driving force of this type of interdependence due to a team member's contributions can become the outputs of another team member. Finally, a successive developed team needs to reach comprehensive interdependence that exists when highly empowered team members have high levels of interaction and coordination. Thus, team management performs strong collaboration through high effective communication, and enhances comprehensive interdependence eliminating groupthink and stimulates the team members toward achieving objectives as getting successive completion of construction projects and maintenance works at dams, weirs and water distribution networks using effective machine combination in IWUMD.

3.2.2 Team Leadership

Team Leadership is a magnetic compass directing to a certain place according to the planning and organizing team members by building team's core values and strengthening team performance, giving instruction and guide lines required for team's continuous success, leading and influencing team members by encouraging and giving supports, monitoring and controlling the team to maintain team's performance in an effective and efficient manner through strong and effervescent communication, coordination, cooperation, and collaboration within team members. Furthermore, there needs a teamwork behavior to form a great team coming together is to strive for the five C's, which stand for communication, camaraderie, commitment, confidence and coach-ability. As soon as a team begins working on each of these areas, significant changes to teammates occur noticeably.

3.2.3 Team Orientation

Team orientation is building positive, constructive attitude among team leaders and team members, and in between team members. As soon as a team begins working on each of these areas, significant changes to teammates create better team orientation. Team orientation is essential to build high performance teamwork encouraging collective effort rather than individual task competition. Team oriented leaders usually focus on the goals,

well-being and motivations of individuals, and a team-oriented environment can have better employee morale, more likely to discuss their thoughts and provide valuable information, more involvement in their roles resulting higher productivity enhancing sustainable development for a team.

3.2.4 Communication

Communication is a process of transferring information from a sender to a receiver. As for a team, especially for a project, clarity, correctness, conciseness and concreteness of information are essential to complete a task in a timely manner. Concreteness is an aspect of communication that means being specific, definite, and vivid rather than vague and general. In an increasingly diverse and multicultural world, businesses become more international, and workplaces more diverse, it's crucial to communicate with sensitivity. Moreover, intercultural communication is vital to improve engagement, encouragement and trust in an increasingly divided society.

3.2.5 Monitoring

Monitoring is a kind of encompassing the wide range of team performance, giving required instructions and required supports to every aspect of team's tasks in cross functional level. Monitoring is not only a kind of overseeing the whole process of teamwork but also putting the right person in the right place for the right time in an efficient and effective manner.

3.2.6 Feedback

Feedback stands for giving advices without putting the blame on anybody in a team process. It should be constructive way aimed at achieving a positive outcome by providing someone with comments, advice, or suggestions that are valuable for the organization both in the short and in the long term.

3.2.7 Backup

Backup Nature is a behavior of taking responsibility and accountability by superior person for the tasks deployed to team members, in the other way, assisting the performance for all team members. Giving backup nature is an essential behavior for building trust among team leaders and team members, and among each team member.

3.2.8 Team Coordination

Team coordination means going together with relative team members to get higher effective performance of a team. Team coordination brings team's success by encouraging collaborative efforts of each team member. Team members organize in all inclusive means, exchange ideas freely with each other, decide to perform collectively and take actions with strategic effort in team coordination.

3.3 Employee Perception on Team Management Practices

In this study, 70 employees are surveyed to explore their perceptions on team management practices of Irrigation and Water Utilization Management Department. For descriptive analysis, the mean values are calculated, and interpreted as five point Likert scale ranging from 1(Strongly disagree) to 5 (Strongly agree): Sözen and Güven, (2019) scored Likert scale of this sort on the mean scale of 1.00-1.80 to mean Strongly Disagree, 1.81-2.60 to mean Disagree, 2.61-3.40 to mean Neither/Nor Agree, 3.41-4.20 to mean Agree, and 5 4.21-5.00 Strongly Agree.

3.3.1 Perception on Task Interdependence

The survey results from descriptive analysis of employee perception on task interdependence are shown in Table (3.1).

Table (3.1) Perception on Task Interdependence

Sr. No.	Items	Mean
1	I work closely with others of the team in doing my work	4.37
2	I frequently must coordinate my efforts with others in the team	4.30
3	My own performance is dependent on receiving accurate information from other team members	4.39
4	The way I perform my job has a significant impact on other team members	4.26
5	My work requires me to consult with other team members fairly frequently	4.44
	Overall Mean	**4.35**

Source: Survey Data, 2022

According to the results shown in Table (3.1), employee in Irrigation and Water Utilization Management Department consult with each fairly and frequently, i.e. they have high effective task interdependence because they have strong team spirit and they regard on their team's core values. They do their tasks closely tied with others, coordinate and contribute their skills, perform their tasks without any distraction to team members, especially regard on organizational citizenship behavior such that they all are proud of being a membership in IWUMD which is a major organization for fulfilling the basic needs for food and water of citizens in agricultural means emphasizing with their keen interest, and accepting themselves as nation builders.

3.3.2 Perception on Team Leadership

The survey results from descriptive analysis of employee perception on team leadership are shown in Table (3.2).

Table (3.2) Perception on Team Leadership

Sr. No.	Items	Mean
1	Work with other members to develop communication methods and areas of responsibility	4.33
2	Ask other members to follow standard procedures	4.61
3	Stress the importance of meeting deadlines	4.53
4	Provide encouragement when other members attempt to meet new challenges	4.24
5	Are willing to listen to problems/complaints of other members	4.63
	Overall Mean	**4.47**

Source: Survey Data, 2022

According to the results shown in Table (3.2), most of the employee at Irrigation and Water Utilization Management Department are willing to listen to problems/complaints of other members. Because, team members value their team's core values such as team cohesiveness, friendship and compassion, and usually pay attention to understand the difficulties team members are facing, and regard these problems as common problem and solve with empathy.

3.3.3 Perception on Team Orientation

The survey results from descriptive analysis of employee perception on team orientation are shown in Table (3.3).

Table (3.3) Perception on Team Orientation

Sr. No.	Item	Mean
1	Participate in all relevant aspects of the team willingly	4.33
2	Cooperate fully with one another	4.36
3	Enjoy working with other team members	4.49
4	Feel proud of personal contributions to team output	4.56
5	Regard other team members in a positive way	4.46
6	Feel that accomplishment of team goals is important	4.59
	Overall Mean	**4.47**

Source: Survey Data, 2022

According to the results shown in Table (3.1), most of the employees at Irrigation and Water Utilization Management feel that accomplishment of team goals is important. Because, team members accept that the success of the team includes the benefits of organization together with their personal development.

3.3.4 Perception on Team Communication

The survey results from descriptive analysis of employee perception on team communication are shown in Table (3.4).

Table (3.4) Perception on Team Communication

Sr. No.	Items	Mean
1	Clarify procedures in advance of assignments	4.47
2	Acknowledge and repeat messages to ensure understanding	4.47
3	Communicate with proper terminology and procedures	4.64
4	Verify information prior to making a report	4.59
5	Discuss task-related problems with others	4.50
	Overall Mean	**4.53**

Source: Survey Data, 2022

According to the results shown in Table (3.4), employee at Irrigation and Water Utilization Management Department communicate with proper terminology and procedures, because they well understand that communication is key player in team management especially for this turbulent world fulfilling required knowledge for their survival, and they communicate in an effective way building proper communication culture.

3.3.5 Perception on Monitoring

The survey results from descriptive analysis of employee perception on team monitoring are shown in Table (3.5).

Table (3.5) Perception on Monitoring

Sr. No.	Items	Mean
1	Make sure other team members are performing appropriately	4.59
2	Recognize when a team member makes a mistake	4.49
3	Recognize when a team member performs correctly	4.47
4	Discover errors in the performance of another team member	4.57
5	Watch other team members to ensure that they are performing according to guidelines	4.34
6	Notice which members are performing their tasks especially well	4.64
	Overall Mean	**4.52**

Source: Survey Data, 2022

According to the results shown in Table (3.5), most of the employee at Irrigation and Water Utilization Management Department notices that "which members are performing their tasks especially well" and "which members are not", because almost all employees at this department do their duties with their keen interest without both making any distraction each other and accepting their responsibilities not only just as perfunctory.

3.3.6 Perception on Feedback

The survey results from descriptive analysis of employee perception on team feedback are shown in Table (3.6).

Table (3.6) Perception on Feedback

Sr. No.	Items	Mean
1	Respond to other members' requests for performance information	4.44
2	Ask the supervisor for input regarding their performance and what needs to be worked on	4.51
3	Use information provided by other members to improve behavior	4.66
4	Ask for advice on proper procedures	4.53
5	Provide helpful suggestions to other members	4.53
	Overall Mean	**4.53**

Source: Survey Data, 2022

According to the results shown in Table (3.6), most of the employee at Irrigation and Water Utilization Management Department use information provided by other members to improve team behavior. Because they value information from top management level and report to top management information from lower level and suggestions from same ranks.

3.3.7 Perception on Backup

The survey results from descriptive analysis of employee perception on team backup behavior are shown in Table (3.7).

Table (3.7) Perception on Backup

Sr. No.	Items	Mean
1	Take the place of another member who is unable to perform a task	4.24
2	Seek opportunities to aid other team members	4.29
3	Help another member to correct a mistake	4.47
4	Provide assistance to those who need it when specifically asked	4.60
5	Ask for help when needed	4.41
6	Maintain their own duties in the process of helping others	4.51
	Overall Mean	**4.42**

Source: Survey Data, 2022

According to the results shown in Table (3.7), employees at Irrigation and Water Utilization Management Department provide assistance to those who need it when specifically asked, because team members rigidly stand on their organizational believes, values and norms providing assistance behaviors to team members each other.

3.3.8 Perception on Coordination

The survey results from descriptive analysis of employee perception on team coordination are shown in Table (3.8).

Table (3.8) Perception on Coordination

Sr. No.	Items	Mean
1	Complete individual tasks without error in a timely manner	4.31
2	Are familiar with the relevant parts of other members' jobs	4.41
3	Carry out individual tasks in synchrony	4.59
4	Avoid distractions during critical assignments	4.53
5	Work together with other members to accomplish team goals	4.50
	Overall Mean	**4.47**

Source: Survey Data, 2022

According to the results shown in Table (3.8), employees at Irrigation and Water Utilization Management Department carry out individual tasks in synchrony, because they accept synergy effect that one plus one more than two, and they do understand there may not sustainable development if they do their duties individually without grasping effective team management practices.

CHAPTER IV
ANALYSIS ON EFFECT OF TEAM COMMUNICATION AND TEAM COORDINATION ON TEAM PERFORMANCE AT IRRIGATION AND WATER UTILIZATION MANAGEMENT DEPARTMENT

This study examines the effect of task-interdependence, team leadership and team orientation on team communication at Irrigation and Water Utilization Management Department, analyzes the effect of team communication on monitoring, feedback and backup of teams at Irrigation and Water Utilization Management Department, evaluates the effect of monitoring, feedback and backup on team coordination at Irrigation and Water Utilization Management Department, and analyzes the effect of team coordination on team performance at Irrigation and Water Utilization Management Department under the Ministry of Agriculture, Livestock and Irrigation, Myanmar.

This chapter focuses on effect of team communication and team coordination on team performance of 70 managerial staff in Irrigation, Water Utilization, and Management Department, Ministry of Agriculture, Livestock and Irrigation, and there are engineers, accountants, mechanics, administrative officers, and other management staff in the demographic profile.

4.1 Demographic Profile of Respondents

In this study, the demographic factors contain the gender, age group, marital status, education, designation/section, and service years at Irrigation and Water Utilization Management Department. Primary data are collected from 70 employees who are working at Irrigation and Water Utilization Management Department (participated in managerial levels of team work at government projects). Demographic profile and summarized data of these 70 employees are shown in Table (4.1).

Table (4.1) Demographic Profile of Respondents

Sr. No.	Demographic Factors	No. of Respondents	Percentage (%)
	Total Respondents	**70**	**100**
1	Gender		
	Male	57	81
	Female	13	19
2	Age Group (Years)		
	20 – 30	1	2
	31 – 40	28	40
	41 – 50	15	21
	Above 50	26	37
3	Marital Status		
	Married	58	83
	Unmarried	12	17
4	Education		
	Under Graduate	2	3
	Bachelor Degree	67	95
	Master Degree	1	2
5	Section		
	Supervision	4	6
	Administration	6	9
	Finance and Statistics	6	9
	Maintenance	35	50
	Operation and Management	14	20
	Technology	5	6
6	Service Years		
	Under 10 Year	25	38
	10 - 20 Year	10	14
	21- 30 Year	32	46
	Above 30	3	2

Source: Survey Data, 2022

By the information of gender composition in Table (4.1), the survey includes 57 males and 13 females. In term of percent, 81% of the respondents are male and 19% are female. This is because of the nature of the job which is more related to the male workers. Dominant age group of the respondents is under the age of 40. In the analysis of age of respondents, the age levels have been grouped into four: 20-30 years, 31-40 years, 41-50 years and above 50 years. In Table (4.1), 20% is the age between 20 and 30, 40% is at the age between 31 and 40, 21% is at the age between 41 and 50, and 37% is at the age above 50. According to the survey results, 40% of respondents who are between 31 and 40 year indicate that most of the workforce in Irrigation and Water Utilization Management Department are young, growing people.

In marital status, 58 respondents as 83% of respondents are married, and 17 respondents as 17% of respondents are unmarried. This has been also relating with the workplace nature that employees go to the government projects located in uttermost regions in the country and married with the natives as the result of living and working long time at there until the projects are completed.

The educational level shows that almost all of the employees are graduates with bachelor degrees. The employees could continue their education in working according to the strategy of the department that all employees should have lifelong learning aligned with the rapidly changing environment. They could support their department with their skills, knowledge and experiences using their learning effect.

According to the working positions, there are 4 respondents as 6% in supervisor level, 6 respondents as 9% in administration, 6 respondents as 9% in finance and statistics, 35 respondents as 50% in maintenance, 14 respondents as 20% in operation and management, and 5 respondents as 6% in technicians. There are 50% of maintenance engineers working in this department aligned with the work nature in machine repair works, and 20% in machine utilization and management control process at construction and maintenance projects under Irrigation and Water Utilization Management Department.

Analyzing service years, there are 25 respondents as 28% under 10 years, 10 respondents as 14% between 10 to 20 years, 32 respondents as 46% between 21 to 30 years, 3 respondents as 2% above 30 years respectively. According to this profile, 46% of strong working force with well-valuable experience is leading this organization and 28% of experience with nearly 10 year is marching as forthcoming leading generation.

4.2 Team Performance of Respondents

In this study, team performance is measured with three aspects: team achievement, task accomplishment, and team and task quality. The first element (team achievement) of respondent employees is analyzed descriptively by calculating mean values. The results are shown in Table (4.2).

Table (4.2) Perception on Team Achievement

Sr. No.	Items	Mean
1	Team members always complete their duties specified in their job descriptions	4.51
2	Team members fulfill all responsibilities required by their job	4.37
3	Team members never neglect aspects of the job that they are obligated to perform	4.49
4	Team members meet all the formal performance requirements of the job	4.50
5	Team members have common understanding regarding the role and tasks of each other	4.70
	Overall Mean	**4.51**

Source: Survey Data, 2022

As shown in Table (4.2), overall mean value is 4.51 and this states that most of the respondents are proud of their team's achievement. They are sure that they have been taking responsibilities as team members, for accomplishment of the projects.

According to the survey data as shown in Table (4.2), the highest mean value is 4.7 and this states that team members have common understanding regarding the role and tasks of each other. The lowest mean is 4.37, however it is greater than 4.0, and this states that team members fulfill all responsibilities required by their job.

The second element of team performance (task accomplishment) is also analyzed with mean values as shown in Table (4.3).

Table (4.3) Perception on Task Accomplishment

Sr. No.	Items	Mean
1	Accomplish team goals	4.34
2	Meet or exceed expectations of the team	4.30
3	Meet performance goals in a timely manner	4.53
4	Produce team output that meets standards of the organization	4.26
5	Meet team objectives in an efficient manner	4.50
	Overall Mean	**4.39**

Source: Survey Data, 2022

The overall mean value is 4.39 and this states that team members have high moral by getting their team accomplishment according to the team's strategic goals that they have to finish their tasks during the target date within the approved budget, and therefore they pay highly attention on teamwork to get success at their tasks at an effective and efficient manner.

According to the survey data shown in Table (4.3), the highest and lowest mean value are 4.53 and 4.26 (both greater than 4.0) and this states that the team meets performance goals in a timely manner, and the lowest mean value is 4.26 and this states that the team members produce team output that meets standards of the organization.

The third element of team performance (team and task quality) is also analyzed with mean values as shown in Table (4.4).

Table (4.4) Perception on Team and Task Quality

Sr. No.	Items	Mean
1	Continuously fulfill knowledge of tasks	3.99
2	Maintain Quality of work	4.10
3	Have initiative behaviors	4.11
4	Good at interpersonal skills	4.07
5	Meet overall performance of the team	4.34
	Overall Mean	**4.12**

Source: Survey Data, 2022

The overall mean value is 4.12 and this states that team member emphasize team achievement and task accomplishment enhancing the standardization of the team without errors enhancing higher level task quality in their projects.

According to the survey data shown in Table (4.4), the highest mean value is 4.34 and this states that team members have strenuous effort to meet overall performance of the team. The lowest mean value is 3.99, however, it is greater than 4.0 and this states that team members continuously fulfill required knowledge of tasks understanding and keeping lifelong learning.

4.3 Analysis on Effect of Task Interdependence, Team Leadership and Team Orientation on Team Communication

In this study, to reach the study objective (1), the multiple regression analysis is conducted. The results are shown in Table (4.5).

Table (4.5) Analysis on Effect of Task Interdependence, Team Leadership and Team Orientation on Team Communication

Variables	Unstandardized Coefficients		Standardized Coefficients	t	Sig.	Collinearity Statistics	
	B	Std. Error	Beta			Tolerance	VIF
(Constant)	0.839	0.324	0.000	2.590	0.012		0.000
TI	0.442***	0.083	0.540	5.361	0.000	0.424	2.357
TL	0.147	0.120	0.137	1.221	0.227	0.342	2.928
TOR	0.250*	0.140	0.245	1.788	0.076	0.229	4.367
R	0.846						
R Square	0.716						
Adjusted R Square	0.703						
F Value	55.406***						
Durbin-Watson	1.859						

Source: Survey Data, 2022

(* Significant at 1%, ** Significant at 5%, * Significant at 10%, TI: Task Interdependence, TL: Team Leadership, TOR: Team Orientation)

According to the results from multiple regression analysis as shown in Table (4.5), the task interdependence and team orientation have positive significant effect on team communication at 1% and 10% significant level. In general, the higher the R- square, the better the model fits the data, the closer the R-square value is to 1, the better the fit, and so the value of R- square in table (4.5) indicates that the model is strongly fit. It can be strongly concluded that task interdependence influences more than team orientation on team communication, nevertheless, Team leadership has no significant effect on team communication.

In Irrigation and Water Utilization Management Department, when implementing projects, team members have self-managed abilities to send notifications to designated authorities, to coordinate each other and to share information each other. Thus, for effective communication among team members, task interdependence and team orientation nature is important. They can communicate effectively without the close supervision of leaders.

4.4 Analysis on Effect of Team Communication on Monitoring, Feedback and backup

This study finds out the effect of team communication on monitoring, feedback and backup. The linear regression analysis result of the effect of team communication on monitoring is shown in Table (4.6).

Table (4.6) Analysis on Effect of Team Communication on Monitoring

Variables	Unstandardized Coefficients		Standardized Coefficients	t	Sig.	Collinearity Statistics	
	B	Std. Error	Beta			Tolerance	VIF
(Constant)	0.487	0.268	0.000	1.820	0.073	0.000	0.000
C	0.893***	0.059	0.879	15.183	0.000	1.000	1.000
R	0.813						
R Square	0.661						
Adjusted R Square	0.656						
F Value	132.733***						
Durbin-Watson	1.970						

Source: Survey Data, 2022

(* Significant at 1%, ** Significant at 5%, * Significant at 10%, C: Team Communication)

According to the results from linear regression analysis as shown in Table (4.6), team communication has positive significant effect on monitoring nature at 1% significant level. This states that communication strongly effects on monitoring, and team members in Irrigation and Water Utilization Management Department could build effective monitoring system to performing a high effective communication system in their organization. According to R- square value is greater than 0.5 and it could be roughly concluded that the regression model is strategically fit. R-squared measures the strength of the relationship between the model and the dependent variable on a convenient 0 – 100% scale. Here, higher R-squared values represent smaller differences between the observed data and the fitted values.

Table (4.7) shows the linear regression analysis results for the effect of team communication on feedback.

Table (4.7) Analysis on Effect of Team Communication on Feedback

Variables	Unstandardized Coefficients		Standardized Coefficients	t	Sig.	Collinearity Statistics	
	B	Std. Error	Beta			Tolerance	VIF
(Constant)	0.239	0.273	0.000	0.875	0.385	0.000	0.000
C	0.944***	0.060	0.886	15.716	0.000	1.000	1.000
R	0.879						
R Square	0.772						
Adjusted R Square	0.769						
F Value	230.509***						
Durbin-Watson	2.086						

Source: Survey Data, 2022

(* Significant at 1%, ** Significant at 5%, * Significant at 10%, C: Team Communication)

According to the results from linear regression analysis as shown in Table (4.7), team communication has positive significant effect on feedback nature at 1% significant level. This states that team members in Irrigation and Water Utilization Management Department could have built constructive feedback system among their team cross functional levels. R-squared is the percentage of the dependent variable variation that a linear model explains. According to the data in Table (4.7), R- square value 0.772 and it indicates that the regression model is fit.

The linear regression analysis is conducted and survey results from this analysis of team communication on backup are shown in Table (4.8).

Table (4.8) Analysis on Effect of Team Communication on Backup

Variables	Unstandardized Coefficients		Standardized Coefficients	T	Sig.	Collinearity Statistics	
	B	Std. Error	Beta			Tolerance	VIF
(Constant)	0.196	0.368	0.000	0.533	0.595	0.000	0.000
C	0.932***	0.081	0.813	11.521	0.000	1.000	1.000
R	0.813						
R Square	0.661						
Adjusted R Square	0.656						
F Value	132.733***						
Durbin-Watson	1.970						

Source: Survey Data, 2022

(* Significant at 1%, ** Significant at 5%, * Significant at 10%, C: Team Communication)

According to the results from linear regression analysis as shown in Table (4.8), team communication has positive significant effect on backup nature at 1%, significant level. This states that communication strongly effects on backup, and team members in Irrigation and Water Utilization Management Department could build sufficient backup system to performing a high effective communication system in their organization. According to analysis values, R- square is 0.661 and it indicates that the regression model is better due to the higher the value of R2, the more dependent the dependent variable's performance on the independent variable and vice versa.

Thus, in Irrigation and Water Utilization Management Department, the smooth and effective communication (information sharing, reporting, giving instruction, consensus decision making, etc.,) is highly supporting to providing resources (human, physical, financial, technology) required to project accomplishment. Effective supervision and team management system in Irrigation and Water Utilization Management Department has been embedded as the results of continuous monitoring and maintaining good organizational practices through building high effective communication system. In addition, constructive feedback nature among the team members in Irrigation and Water Utilization Management Department has been practicing among each other, and effective

outcomes are blooming in all parts of organization. Thus, getting competitive advantage among the rivalries and building sustainable development, Irrigation and Water Utilization Management Department has been emerging as a key driver of national economic growth for Myanmar.

4.5 Analysis on Effect of Monitoring, Feedback and Backup on Team Coordination

This study analyzes the effect of monitoring, feedback and backup on team coordination. The multiple regression analysis is conducted and survey results from this analysis of team communication on monitoring, feedback and backup are shown in Table (4.9).

Table (4.9) Analysis on Effect of Monitoring, Feedback and Backup on Team Coordination

Variables	Unstandardized Coefficients		Standardized Coefficients	T	Sig.	Collinearity Statistics	
	B	Std. Error	Beta			Tolerance	VIF
(Constant)	-0.266	0.290	0.000	-0.918	0.362	0.000	0.000
M	0.034	0.089	0.030	0.382	0.704	0.423	2.362
F	0.455***	0.130	0.385	3.513	0.001	0.221	4.522
BC	0.569***	0.093	0.544	6.103	0.000	0.335	2.984
R	0.908						
R Square	0.824						
Adjusted R Square	0.816						
F Value	103.209***						
Durbin-Watson	1.544						

Source: Survey Data, 2022

(* Significant at 1%, ** Significant at 5%, * Significant at 10%, M: Monitoring, F: Feedback, BC: Backup)

According to the results from multiple regression analysis as shown in Table (4.9), feedback and backup nature have positive significant effect on team coordination at 1% significant level. Team members in Irrigation and Water Utilization Management Department value their roles and responsibility and give strong backup, and they all engage their tasks with self-keen-interest giving positive and constructive feedback each other strengthening high effective team coordination. Team members in Irrigation and Water Utilization Management Department respect their team core values, obey rules and regulations, assist each other and they are so proud of being membership in their organization so as to no need to watch and monitor each other.

4.6 Analysis on Effect of Team Coordination on Team Performance

This study finds out the effect of team coordination on team achievement, task accomplishment and team and task quality. The survey results from linear regression analysis of team coordination on team performance (team achievement, task accomplishment and team and task quality) are shown in Table (4.10).

Table (4.10) Analysis on Effect of Team Coordination on Team Achievement

Variables	Unstandardized Coefficients		Standardized Coefficients	t	Sig.	Collinearity Statistics	
	B	Std. Error	Beta			Tolerance	VIF
(Constant)	2.528	0.384	0.000	6.585	0.000	0.000	0.000
Co	0.418***	0.085	0.510	4.895	0.000	1.000	1.000
R	0.510						
R Square	0.261						
Adjusted R Square	0.250						
F Value	23.962***						
Durbin-Watson	1.741						

Source: Survey Data, 2022

(* Significant at 1%, ** Significant at 5%, * Significant at 10%, Co: Team Coordination)

According to the results from linear regression analysis as shown in Table (4.10), team coordination has positive significant effect on team achievement at 1% significant level. Team coordination is essential for a team getting team achievement, and it drives and stimulates successive behavior in team members performing one task assignment after another.

Table (4.11) shows the linear regression analysis results for the effect of team coordination on task accomplishment.

Table (4.11) Analysis on Effect of Team Coordination on Task Accomplishment

Variables	Unstandardized Coefficients		Standardized Coefficients	t	Sig.	Collinearity Statistics	
	B	Std. Error	Beta			Tolerance	VIF
(Constant)	2.286	0.353	0.000	6.477	0.000	0.000	0.000
Co	0.497***	0.079	0.609	6.332	0.000	1.000	1.000
R	0.609						
R Square	0.371						
Adjusted R Square	0.362						
F Value	40.095***						
Durbin-Watson	1.854						

Source: Survey Data, 2022

(* Significant at 1%, ** Significant at 5%, * Significant at 10%, Co: Team Coordination)

According to the results from linear regression analysis as shown in Table (4.11), team coordination has positive significant effect on task accomplishment at 1% significant level. Coordination meets not only how team members' roles and tasks are specified and clarified but also their actual engagement in task activities to accomplish group objectives. Through and with effective team coordination, team objectives become more precise, manageable, practical, effective and efficient, beneficial, and team members more align their contributions with task achievement in practice.

Table (4.12) shows the linear regression analysis results for the effect of team coordination on team and task quality.

Table (4.12) Analysis on Effect of Team Coordination on Team and Task Quality

Variables	Unstandardized Coefficients		Standardized Coefficients	t	Sig.	Collinearity Statistics	
	B	Std. Error	Beta			Tolerance	VIF
(Constant)	1.044	0.641	0.000	1.629	0.108	0.000	0.000
Co	0.689***	0.143	0.505	4.829	0.000	1.000	1.000
R	0.505						
R Square	0.255						
Adjusted R Square	0.244						
F Value	23.316***						
Durbin-Watson	1.682						

Source: Survey Data, 2022

(* Significant at 1%, ** Significant at 5%, * Significant at 10%, Co: Team Coordination)

According to the results from linear regression analysis as shown in Table (4.12), team coordination has positive significant effect on team and task quality at 1% significant level. The analysis shows that the better the coordination in teams, the higher quality task could be performed, and the poorer the coordination, the lower the task quality could have in practice.

As shown in Table (4.12), the results from linear regression analysis show the team members in Irrigation and Water Utilization Management Department have good cooperation practices by forming concrete backup behavior, constructive and positive feedback nature. They could transform this effort to becoming both a high effective team and high quality tasks enhancing high effective team coordination resulting high effective team performance in their whole organization.

CHAPTER V
CONCLUSION

This study intended to examine the effect of communication and coordination on team performance, and this chapter consists of three main categories. The first part is findings and discussions from previous chapters. The second part is suggestions and recommendations according to the findings of the study. The third part is the limitations and needs for further research of the job satisfaction.

5.1 Findings and Discussions

This study attempts to explore the effect of team communication and team coordination on team performance of employees at Irrigation and Water Utilization Management Department, Ministry of Agriculture, Livestock and Irrigation. In this study, primary data are collected from 70 employees who are working at managerial level in Mechanical Circle No-2 at Irrigation and Water Utilization Management Department, Ministry of Agriculture, Livestock and Irrigation. According to the nature of work, almost all of the employees are male working in heavy duty operation. Almost all of the employees have high acceptance level and they all are ready to go anywhere at any time in every day and night, and they have ability to perform their tasks in an efficient manner according to the guidelines and instructions assigned by the authorized person.

It is also found that task accomplishment is important together with team achievement to perform team goal for a team. This study shows that the tactics of listening to the problems/complaints by other team members, and leading the team collectively and solving the problems collectively is way that could overcome the unforeseen difficulties in time. The study mentions that communicating each other in all cross functional levels through with proper terminology and appropriate procedures is essential in teamwork, and taking the duties with keen interest and well accepting the responsibilities not only just as perfunctory perform the tasks effectively is the key performance indicator for IWUMD. The study point out that searching and accepting information in all channels and distributing in an efficient way is a core competency for a team in this turbulent world, and creating organizational citizenship behavior assists to each other to raise their moral and team spirit in the team. Thus, this study satisfies that

carrying out individual tasks in synchrony using the synergy effect, one plus one more than two enhances sustainable development, and grasps effective team performance.

According to the analysis, it is found that team members work interdependently with each other through common understanding to have team achievement, and through eagerness to have task accomplishment for one project after another leads the team to meet team performance goals in a timely manner, and to get higher level task quality with high effective team performance.

The respondents are willing to corporate and coordinate with their colleagues, enabling their task significance level. This is strongly related to their satisfaction at job, and furthermore, they have become more confident at job related environment. This factor also gives them the opportunity to find out how well they are doing at work and how well they contribute their skill, knowledge and experiences. Moreover, this factor enables the Irrigation and Water Utilization Management Department to get a higher ability of colleagues and this in turn improves the role of completing tasks creating competitive advantage and superior performance among the rivalries.

5.2 Suggestions and Recommendations

This study attempts to explore to analyze the effect of team communication and team coordination on team performance of employees at Irrigation and Water Utilization Management Department. According to the analysis on task interdependence, team leadership and team orientation, it is found that just only task interdependence and team orientation positively influence the team communication, but team leadership does not. As it has already been found that team leadership is essential driver for a team and communication is key role player in this turbulent world. Task interdependence is strongly influence on team communication, and that is because team management on IWUMD has been constructed not only team orientation in Forming, Storming, Norming, Performing and Adjourning stages but also valuing in the participation of all team members at sharing their ideas and decision making practices, thus this good practice should be maintained and strengthen in all cross sectional levels. In addition, there should be lifelong learning programme which may fulfill both the needs and wants of employee and satisfy requirement of the work especially for performing proper communication through proper terminology.

According to the analysis on effect of team communication on monitoring, feedback and backup, it is found that communication positively and strongly influences on all the three elements. Monitoring behavior, building trust for strengthening feedback behavior, and encompassing backup behavior around the team are needed to maintain as organizational culture in IWUMD, and all team members need to promote initiative behavior giving feedback in a positive and constructive way and team management also gives strong backup fulfilling needs and wants of team members.

According to the analysis on effect of monitoring, feedback and backup on team coordination, it is found that just only two feedback and backup behaviors positively and strongly influence on team coordination, and monitoring does not. Even though monitoring does not effect on coordination, monitoring with constructive feedback should be a core value across the whole team to get ahead among government and non-government organization for the team's sustainable development.

According to the analysis of effect of team coordination on team performance, it is found that team coordination positively and strongly influence on team performance (team achievement, task accomplishment, and team and task quality). For team members in IWUMD, it is required to keep and build stronger coordination not only internal organization but also external organization maintaining the existing team coordination.

The employees at Irrigation and Water Utilization Management Department usually participate in making decision process with self-leading and self-participating practice, because they are not willing to waste their time with the diplomatic procedures and the team members prefer having a chance to show their responsibilities and accountabilities enabling effective team performance with their productive teamwork. Strategic leadership with encouraging team members through effective team management is a competitive edge embedded in Irrigation and Water Utilization Management Department.

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5.3 Limitations and Needs for Further Research

This study has a few limitations. One of the limitations of this study is that the survey is done only to the 70 employees in managerial level at Irrigation and Water Utilization Management Department. Especially, it represents the results relating about team communication and team coordination of the managerial staff in Mechanical Circle No. 2 at Irrigation and Water Utilization Management Department, Ministry of Agriculture, Livestock and Irrigation. Hence, this study does not represent whole of

construction equipment and operation management team in water resources management. Another one is time limitation and this one-time investigation may affect the representativeness of the organization. The findings in this study may be needed to extend in a large scale with further findings and studies. The results derived from this study can be used to guide additional study that improves understanding of the complex teamwork process in other organizations. Moreover, effect of maintenance of machines on team performance, effect of machine utilization and operation management on team performance, effect of machine utilization on total quality management in Mechanical Engineering Firms in Myanmar should also be investigated in the future.

REFERENCES

Aamodt, M. G. (2015). *Industrial/organizational psychology: An applied approach*. Cengage Learning.

Abdulle, A. and Aydintan, B., 2019, The Effect of Teamwork on Employee Performance in Some Selected Private Banks in Mogadishu, Somalia, *Journal of Business Research-TURK, 11*(3), 1589-1598.

Ahmad, I. and Manzoor, S. R., 2017, Effect of Teamwork, Employee Empowerment and Training on Employee Performance, *International Journal of Academic Research in Business and Social Sciences*, *7*(11), 380-394.

Amabile, T. M. (1996) *Creativity and innovation in organizations* (Vol. 5) Boston: Harvard Business School.

Ancona, D. G., & Caldwell, D. F. (1992): Bridging the boundary: External activity and performance in organizational teams: *Administrative science quarterly*, 634-665.

Brannick, M. T., & Prince, C. (1997): An overview of team performance measurement. In M. T. Brannick, E. Salas, & C. Prince (Eds.), *Team performance assessment and measurement: Theory, methods, and applications* (pp.19-43). Mahwah, NJ: Lawrence Erlbaum Associates.

Cannon-Bowers, J. A., Salas, E., Tannenbaum, S. I., & Mathieu, J. E. (1995): Toward theoretically based principles of training effectiveness: A model and initial empirical investigation: *Military psychology*, *7*(3), 141-164.

Cooper, J. O., Heron, T. E., & Heward, W. L. (2007): *Applied behavior analysis.*

Cooper, M., Shiflett, S., Korotkin, A. L., & Fleishman, E. A. (1984): *Command and control teams: Techniques for assessing team performance* (Report No. AFHRL-TP-84-3). Wright-Patterson AFB, OH: Logistics and Human Factors Division, Air Force Human Resources Laboratory.

Daft, R. L., & Marcic, D. (2015): *Understanding management USA: Cengange Learning*.

Davis, K. (1968): Success of chain-of-command oral communication in a manufacturing management group. *Academy of Management Journal*, *11*(4), 379-387.

Day, D. V., Gronn, P., & Salas, E. (2004): Leadership capacity in teams. *The Leadership Quarterly*, *15*(6), 857–880.

Dickinson, T. L. (1969): *The effects of work interaction and its interplay with task organization on team and member performance* (Doctoral dissertation, The Ohio State University, 1968): *Dissertation Abstracts International, 30,* 1937.

Dickinson, T. L., & McIntyre, R. M. (1997) A conceptual framework for team measurement: In M. T. Brannick, E. Salas, & C. Prince (Eds.), *Team performance assessment and measurement: Theory, methods, and applications* (19-43). Mahwah, NJ: Lawrence Erlbaum Associates.

Dickinson, T. L., McIntyre, R. M., Ruggeberg, B. J., Yanushefski, A. M., Elamill, L. S., & Vick, A. L. (1992). *A conceptual framework for developing team process measures of decision-making performance* (final report). Orlando, FL: Naval Training Systems Center.

Dieterly, D. L. (1988): Team performance requirements. In S. Gael (Ed.), *The job analysis handbook for business, industry, and government* (1, 486-492). New York: John Wiley.

Fransen, J., Kirschner, P. A., & Erkens, G. (2011): Mediating team effectiveness in the context of collaborative learning: The importance of team and task awareness: *Computers in human Behavior, 27*(3), 1103-1113.

Hackman, J. R. (1983): *A normative model of work team effectiveness* (Report No.2). New Haven, CT: Yale University.

Hackman, J. R. (1990): *Groups that work (and those that don't): Creating conditions for effective teamwork. San Francisco: Jossey-Bass.*

Hackman, J. R., & Morris, C. G. (1975): Group tasks, group interaction processes, and group performance effectiveness: A review and proposed integration. In L. Berkowitz (Ed.): *Advances in experimental social psychology* (8, 45-99). New York: Academic Press.

Hall, D.G. (2011): The Mouse Game and its Effects on Team Interdependence, Page 201-*Development in Business Simulation and Experiential Learning, volume 38, 2011* https://absel-ojs-ttu.tdl.org/absel/index.php/absel/article/view/240

Hill, C. W., Jones, G. R., & Schilling, M. A. (2014): *Strategic management: Theory &cases: An integrated approach*. Cengage Learning.

Hill, Charles W. L. and Jones, Gareth R. and Schilling, Melissa A. (2015) *Strategic Management: An Integrated Approach*. Cengage Learning.

Hunt, D. F., Michel, H., Dickinson, T. A., Shabanowitz, J., Cox, A. L., Sakaguchi, K., & Sette, A. (1992): *Peptides presented to the immune system by the murine class II major histocompatibility complex molecule* I-Ad. *Science, 256*(5065), 1817-1820.

Ilgen, D. R. (1999): Teams embedded in organizations: Some implications: *American Psychologist, 54* (2), 129.

Kemoni, H. N. (2004). Melvin DeFleur's information communication model: Its application to archives administration. *African Journal of Library, Archives and Information Science, 14*(2), 167-175.

Kiggundu, M. N. (1981). Task interdependence and the theory of job design*: Academy of Management Review,* 6(3), 499-508.

Kiggundu, M. N. (1983). Task interdependence and job design: Test of a theory: *Organizational Behavior and Human Performance, 31*, 145-172.

Klein, C., Diaz Granados, D., Salas, E., Le, H., Burke, C. S., Lyons, R., & Goodwin, G. F. (2009): Does team building work? : *Small group research, 40*(2), 181-222.

Krugman, P. R. (1994). *The age of diminished expectations*: *U.S. Economic Policy in the 1990s:* MIT Press.

Larson, C. E., & LaFasto, F. M. J. (1989): *Teamwork: What must go right/what can go wrong.* Sage Publications, Inc.

Larson. C. E, Lafesto. F. M. J, 1989, Teamwork, Sage, Thousand Oaks:(2015) Manzoor. S. R, Hafizullah, Hussain. M, Ahmad. Z. M, (2011), Effect of teamwork on employee performance. *International Journal of leaning and development, 2*, No1, 110126.

Liu, Y., 2006, *Teamwork in Chinese Organizations: New Concept and Framework*, Old Dominion University, ODU Digital Commons.

Lombardo, M. M., & Eichinger, R. W. (2000): *High potentials as high learners: Human Resource Management, 39(4),* 321-329.

Manzoor, S. R., Ullah, H., Huaasin, M. and Ahmad, Z. M., 2011, Effect of Teamwork on Employee Performance, *International Journal of Learning and Development, 1*(1), 110-126.

Mathieu, J., Maynard, M. T., Rapp, T., & Gilson, L. (2008): Team effectiveness 1997-2007: A review of recent advancements and a glimpse into the future: *Journal of management, 34*(3), 410-476.

McGrath, J. E. (1984). *Groups: Interaction and performance* (14). Englewood Cliffs, NJ: Prentice-Hall.

McIntyre, R. M., Morgan Jr, B. B., Salas, E., & Glickman, A. S. (1988, November): Teamwork from team training: New evidence for the development of teamwork skills during operational training: In *Proceedings of the 10th Annual Inter-service/Industry Training Systems Conference* (21-27). Hackman, L., & Warnow-

Blewett, J. (1987): The documentation strategy process: a model and a case study. *The American Archivist*, *50*(1), 12-47.

McIntyre, R., & Salas, E. (1995): Measuring and managing for team performance Emerging principles from complex environments. In R. Guzzo & E. Salas (Eds.), *Team effectiveness and decision making in organizations,* (9-45). San Francisco, CA: Jossey-Bass.

Morgan B. B, & Lassiter, D. L. (1992): Team composition and staffing. In R. W. Swezey & E. Salas (Eds.), *Teams: Their training and performance* (75-100). Norwood, NJ: Ablex.

Morgan, B. B., Jr., Glickman, A. S., Woodard, E. A., Blaiwes, A., & Salas, E. (1986): *Measurement of team behaviors in a Navy environment* (NTSC Report, No. 86-014). Orlando, FL: Naval Training Systems Center.

Naylor, J. C., & Dickinson, T. L. (1969): Task structure, work structure, and team performance. *Journal of Applied Psychology*, 53, 167-177.

Newstrom, J. W., & Davis, K. (1986): *Human behavior at work. New York, NY, 12*, 1-8.

Odini, C. (1999): Training and development of skills in a changing information environment: *Library management*.

Ojomo, O. W. (2004). Communication: theory and practice: *Language, communication and study skills*, 77-95.

Ojiambo, J. (1993). Interpersonal Communication skills for reference specialists: in Ocholla. D and Ojiambo, J. (eds). Issues in Library and Information studies, Nairobi: Jomo Kenyatta Foundation, 67 – 70.

Oser, R., McCallum, G. A., Salas, E., & Morgan, B. B., Jr. (1989): Toward a definition of teamwork: *An analysis of critical team behaviors* (NTSC Report No. 89-004). Orlando, FI: Naval Training Systems Center.

Peron, R. M. (1993): Improving team performance by identifying and targeting back-up behaviors: *A training strategy: (Doctoral dissertation*, Old Dominion University, 1993): *Dissertation Abstracts International*, 54, 6489.

Pritchard, R. D. (Ed.). (1995). *Productivity measurement and improvement: Organizational case studies.* New York: Praeger.

Pritchard, R. D., Jones, S. D., Roth, P. L., Stuebing, K. K., & Ekeberg, S. E. (1988): The effects of feedback, goal setting, and incentives on organizational productivity. *Journal of Applied Psychology Monograph Series, 73(2)*, 337-358.

Rothwell, L. (2001). Intercultural competence: Theories into practice. *Relative points of view: Linguistic representations of culture*, *5*, 161.

Saavedra, R., Earley, P. C., & Van Dyne, L. (1993): Complex interdependence in task performing groups. *Journal of Applied Psychology*, 78, 61-72.

Salas, E., Dickinson, T. L., Converse, S. A., & Tannenbaum, S. I. (1992): Toward an understanding of team performance and training. In R. W. Swezey & E. Salas (Eds.), Teams: *Their training and performance (3*-29). Norwood, NJ: Ablex.

Salman, W. A. and Hassan, Z., 2016, Impact of Teamwork on Employee Performance, *International Journal of Accounting and Business Management, 4*(1), 76-85.

Shea, G. P., & Guzzo, R. A. (1987): Groups as human resources. In G. R., Ferris, & K. M. Rowland (Eds.), *Research in personnel and human resources management* (232-356), Greenwich, CT: JAI Press.

Shiflett, S. C., Eisner, E. J., Price, S. J., & Schemmer, F. M. (1982): The definition and measurement of team functions (Final Report). Bethesda, MD: Advanced Research Resource Organization.

Sozen & Guven (2019): *The Effect of Online Assessments on Students' Attitudes towards Undergraduate-Level Geography Courses*.

Stephen Robbins &Timothy Judge (2017): *Essentials of Organizational Behavior*

Tuckman, Bruce W (1965). Developmental sequence in small groups: Psychological Bulletin. 63 (6): 384–399.doi:10.1037/h0022100.PMID 14314073.

Thompson, J. D. (1967): *Organizations in action. New York: McGraw-Hill*.

Van de Ven, A. H., & Ferry, D. L. (1980): *Measuring and assessing organizations.* NewYork: Wiley.

APPENDIX A

YANGON UNIVERSITY OF ECONOMICS

DEPARTMENT OF MANAGEMENT STUDIES

MBA PROGRAMME

Survey Questionnaire for Effect of Team Communication and team Coordination on Team Performance at Irrigation and Water Utilization Management Department, Ministry of Agriculture, Livestock and Irrigation

Dear Respondents,

I am a MBA student studying at Yangon University of Economic. As part of the academic requirements for the Master of Business Administration (MBA) degree, students need to complete MBA thesis. The purpose of my thesis paper is to analyze the effect of team communication and team coordination on performance at Irrigation and Water Utilization Management Department, Ministry of Agriculture, Livestock and Irrigation. I would appreciate your help in completing my MBA thesis of filling out the following questionnaires in all honesty. Your answers are greatly appreciated and these answers would be handled strictly confidential and exclusively be used just only for the purpose of this research. Your name and personal data will not be mentioned anywhere on the document and so I would like to thankfully request to answer the questions according to the experience you have been passing and facing, and aiming forward as your team's goals, objectives, mission, vision with the best of your understanding.

Thank you so much for your team spirit with strong cooperation,

Sincerely,

Tun Aung

Roll No. EMBA II-02

MBA 18th Batch (Nay Pyi Taw)

Effect of Team Communication and Team Coordination on Team Performance at Irrigation and Water Utilization Management Department, Ministry of Agriculture, Livestock and Irrigation

SECTION 1: Team Performance 1 (Team Achievement)

Please select the response that best indicates the extent to which you agree with each of the following statements.

1-Strongly Disagree, 2-Disagree, 3-Neutral, 4-Agree, 5-Strongly Agree

Sr. No.	Items	1	2	3	4	5
1	Team members always complete their duties specified in their job descriptions					
2	Team members fulfill all responsibilities required by their job					
3	Team members never neglect aspects of the job that they are obligated to perform					
4	Team members meet all the formal performance requirements of the job					
5	Team members have common understanding regarding the role and tasks of each other					

Team Performance 2 (Task Accomplishment)

Please choose the scale to rate how often your team achieves these outcomes.

1-Almost Never, 2-Not Often, 3-Sometimes, 4-Often, 5-Almost Always

Sr. No.	Items	1	2	3	4	5
1	Accomplish team goals					
2	Meet or exceed expectations of the team					
3	Meet performance goals in a timely manner					
4	Produce team output that meets standards of the organization					
5	Meet team objectives in an efficient manner					

Team Performance 3 (Team and Task Quality)

Please select the following choice that most closely matches the overall rating about your team.

1-Consistently Below Requirements, 2-Below Requirements, 3- Average, 4-Exceeds Requirements, 5- Consistently Exceeds Requirements

Sr. No.	Items	1	2	3	4	5
1	Knowledge of tasks					
2	Quality of work					
3	Initiative behaviors					
4	Interpersonal skills					
5	Overall performance of the team					

SECTION 2: Teamwork Components Rating

Task Interdependence scales

The questions in this section of the survey are about the interdependence of your task with that of your teammates. Please choose the response that best indicates the extent to which you agree with each statement.

1-Strongly Disagree, 2-Disagree, 3-Neutral, 4-Agree, 5-Strongly Agree

Sr. No.	Items	1	2	3	4	5
1	I work closely with others of the team in doing my work					
2	I frequently must coordinate my efforts with others in the team					
3	My own performance is dependent on receiving accurate information from other team members					
4	The way I perform my job has a significant impact on other team members					
5	My work requires me to consult with other team members fairly frequently					

Team Leadership

1-Almost Never, 2-Not Often, 3-Sometimes, 4-Often, 5-Almost Always

How often do your team members?

Sr. No.	Items	1	2	3	4	5
1	Work with other members to develop communication methods and areas of responsibility					
2	Ask other members to follow standard procedures					
3	Stress the importance of meeting deadlines					
4	Provide encouragement when other members attempt to meet new challenges					
5	Are willing to listen to problems/complaints of other members					

Team Orientation

1-Almost Never, 2-Not Often, 3-Sometimes, 4-Often, 5-Almost Always

How often do your team members?

Sr. No.	Items	1	2	3	4	5
1	Participate in all relevant aspects of the team willingly					
2	Cooperate fully with one another					
3	Enjoy working with other team members					
4	Feel proud of personal contributions to team output					
5	Regard other team members in a positive way					
6	Feel that accomplishment of team goals is important					

Communication

1-Almost Never, 2-Not Often, 3-Sometimes, 4-Often, 5-Almost Always

How often do your team members?

Sr. No.	Items	1	2	3	4	5
1	Clarify procedures in advance of assignments					
2	Acknowledge and repeat messages to ensure understanding					
3	Communicate with proper terminology and procedures					
4	Verify information prior to making a report					
5	Discuss task-related problems with others					

Monitoring

1-Almost Never, 2-Not Often, 3-Sometimes, 4-Often, 5-Almost Always

How often do your team members?

Sr. No.	Items	1	2	3	4	5
1	Make sure other team members are performing appropriately					
2	Recognize when a team member makes a mistake					
3	Recognize when a team member performs correctly					
4	Discover errors in the performance of another team member					
5	Watch other team members to ensure that they are performing according to guidelines					
6	Notice which members are performing their tasks especially well					

Feedback

1-Almost Never, 2-Not Often, 3-Sometimes, 4-Often, 5-Almost Always

How often do your team members?

Sr. No.	Items	1	2	3	4	5
1	Respond to other members' requests for performance information					
2	Ask the supervisor for input regarding their performance and what needs to be worked on					
3	Use information provided by other members to improve behavior					
4	Ask for advice on proper procedures					
5	Provide helpful suggestions to other members					

Backup

1-Almost Never, 2-Not Often, 3-Sometimes, 4-Often, 5-Almost Always

How often do your team members?

Sr. No.	Items	1	2	3	4	5
1	Take the place of another member who is unable to perform a task					
2	Seek opportunities to aid other team members					
3	Help another member to correct a mistake					
4	Provide assistance to those who need it when specifically asked					
5	Ask for help when needed					
6	Maintain their own duties in the process of helping others					

Coordination

1-Almost Never, 2-Not Often, 3-Sometimes, 4-Often, 5-Almost Always

How often do your team members?

Sr. No.	Items	1	2	3	4	5
1	Complete individual tasks without error in a timely manner					
2	Are familiar with the relevant parts of other members' jobs					
3	Carry out individual tasks in synchrony					
4	Avoid distractions during critical assignments					
5	Work together with other members to accomplish team goals					

SECTION 3: Demographic Questionnaire

Now I would like to know a few things about you. We will use this information only to classify the results.

1. Are you Male or Female? Male__; Female__
2. What is your age? __
3. Married or Unmarried? Married___; Unmarried___
4. How long have you worked for this organization? ___
5. Please check the types of team you work for ((Please check only one).

Your section is ___.

___Supervision

___Administration

___Finance and Statistics

___Maintenance

___Operation and Management

___Technology

___Other (Please specify) ___

Thank you for your time.

APPENDIX B

STATISTICAL OUTPUTS

(1) Analysis on Effect of Task Interdependence, Team Leadership and Team Orientation on Team Communication

Model Summary[b]					
Model	R	R Square	Adjusted R Square	Std. Error of the Estimate	Durbin-Watson
1	0.846	0.716	0.703	0.20811	1.859
a: Predictors: (Constant), TOR, TI, TL					
b: Dependent Variable: C					

ANOVA[a]						
Model		Sum of Squares	df	Mean Square	F	Sig
1	Regression	7.199	3	2.400	55.406	0.000[b]
	Residual	2.859	66	0.043		
	Total	10.058	69			
a. Dependent Variable: C						
b. Predictors: (Constant), TOR, TI, TL						

Coefficients[a]								
Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.	Collinearity Statistics	
		B	Std. Errors	Beta			Tolerance	VIF
1	Constant	0.839	0.324		2.590	0.012		
	TOR	0.442	0.083	0.540	5.361	0.000	0.424	2.357
	TI	0.147	0.120	0.137	1.221	0.227	0.342	2.928
	TL	0.250	0.140	0.245	1.788	0.078	0.229	4.367
a. Dependent Variable: C								

(2) Analysis on Effect of Team Communication on Monitoring and Feedback and Backup

Analysis on Effect of Team Communication on Monitoring

Model Summary[b]					
Model	R	R Square	Adjusted R Square	Std. Error of the Estimate	Durbin-Watson
1	0.886	0.784	0.781	0.19057	1.356
a: Predictors: (Constant), C					
b: Dependent Variable: M					

ANOVA[a]						
Model		Sum of Squares	df	Mean Square	F	Sig
1	Regression	8.971	1	8.971	247.005	0.000[b]
	Residual	2.470	68	0.036		
	Total	11.44	69			
a. Dependent Variable: M						
b. Predictors: (Constant), C						

Coefficients[a]								
Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.	Collinearity Statistics	
		B	Std. Errors	Beta			Tolerance	VIF
1	Constant	0.239	0.273		0.875	0.385		
	C	0.944	0.060	0.886	15.716	0.000	1	1
a. Dependent Variable: M								

Analysis on Effect of Team Communication on Feedback

Model Summary[b]					
Model	R	R Square	Adjusted R Square	Std. Error of the Estimate	Durbin-Watson
1	0.879	0.772	0.769	0.18645	2.086
a: Predictors: (Constant), C					
b: Dependent Variable: F					

ANOVA[a]						
Model		Sum of Squares	df	Mean Square	F	Sig
1	Regression	8.014	1	8.014	230.509	0.000[b]
	Residual	2.364	68	0.035		
	Total	10.378	69			
a. Dependent Variable: F						
b. Predictors: (Constant), C						

Coefficients[a]								
Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.	Collinearity Statistics	
		B	Std. Errors	Beta			Tolerance	VIF
1	Constant	0.487	0.268		1.820	0.073		
	C	0.893	0.059	0.897	15.183	0.000	1	1
a. Dependent Variable: F								

Analysis on Effect of Team Communication on Backup

Model Summary[b]					
Model	R	R Square	Adjusted R Square	Std. Error of the Estimate	Durbin-Watson
1	0.813	0.661	0.656	0.2565	1.970
a: Predictors: (Constant), C					
b: Dependent Variable: BC					

ANOVA[a]						
Model		Sum of Squares	df	Mean Square	F	Sig
1	Regression	8.733	1	8.733	132.733	0.000[b]
	Residual	4.474	68	0.066		
	Total	13.207	69			
a. Dependent Variable: BC						
b. Predictors: (Constant), C						

Coefficients[a]								
Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.	Collinearity Statistics	
		B	Std. Errors	Beta			Tolerance	VIF
1	Constant	0.196	0.368		0.533	0.595		
	C	0.932	0.081	0.813	11.521	0.000	1	1
a. Dependent Variable: BC								

(3) Analysis on Effect of Monitoring, Feedback and Backup on Team Coordination

Model Summary[b]					
Model	R	R Square	Adjusted R Square	Std. Error of the Estimate	Durbin-Watson
1	0.908	0.824	0.816	0.19628	1.544
a: Predictors: (Constant), F,M,BC					
b: Dependent Variable: Co					

ANOVA[a]						
Model		Sum of Squares	df	Mean Square	F	Sig
1	Regression	11.928	3	3.976	103.209	0.000[b]
	Residual	2.543	66	0.039		
	Total	14.471	69			
a. Dependent Variable: Co						
b. Predictors: (Constant), F,M,BC						

Coefficients[a]								
Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.	Collinearity Statistics	
		B	Std. Errors	Beta			Tolerance	VIF
1	Constant	-0.266	0.290		-0.918	0.362		
	BC	0.569	0.093	0.544	6.103	0.000	0.335	2.984
	M	0.034	0.089	0.030	0.382	0.704	0.423	2.362
	F	0.455	0.130	0.385	3.513	0.001	0.221	4.522
a. Dependent Variable: Co								

(4) Analysis on Effect of Team Coordination on Team Performance

Analysis on Effect of Team Coordination on Team Achievement

Model Summary[b]					
Model	R	R Square	Adjusted R Square	Std. Error of the Estimate	Durbin-Watson
2	0.510	0.261	0.250	0.3251	1.970
a: Predictors: (Constant), Co					
b: Dependent Variable: TA					

ANOVA[a]						
Model		Sum of Squares	df	Mean Square	F	Sig
2	Regression	2.533	1	2.533	23.962	0.000[b]
	Residual	7.181	68	0.106		
	Total	9.719	69			
a. Dependent Variable: TA						
b. Predictors: (Constant), Co						

Coefficients[a]								
Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.	Collinearity Statistics	
		B	Std. Errors	Beta			Tolerance	VIF
2	Constant	0.2528	0.384		6.585	0.000		
	C	0.418	0.085	0.510	4.895	0.000	1	1
a. Dependent Variable: TA								

Analysis on Effect of Team Coordination on Task Accomplishment

Model Summary[b]					
Model	R	R Square	Adjusted R Square	Std. Error of the Estimate	Durbin-Watson
2	0.609	0.371	0.362	0.29886	1.854
a: Predictors: (Constant), Co					
b: Dependent Variable: TAc					

ANOVA[a]						
Model		Sum of Squares	df	Mean Square	F	Sig
2	Regression	3.581	1	3.581	40.095	0.000[b]
	Residual	6.074	68	0.089		
	Total	9.655	69			
a. Dependent Variable: TAc						
b. Predictors: (Constant), Co						

Coefficients[a]								
Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.	Collinearity Statistics	
		B	Std. Errors	Beta			Tolerance	VIF
2	Constant	2.286	0.535		6.477	0.000		
	C	0.497	0.079	0.609	6.332	0.000	1	1
a. Dependent Variable: TAc								

Analysis on Effect of Team Coordination on Team and Task Quality

Model Summary[b]					
Model	R	R Square	Adjusted R Square	Std. Error of the Estimate	Durbin-Watson
2	0.505	0.255	0.244	0.54279	1.682
a: Predictors: (Constant), Co					
b: Dependent Variable: TQ					

ANOVA[a]						
Model		Sum of Squares	df	Mean Square	F	Sig
2	Regression	6.869	1	6.869	23.316	0.000[b]
	Residual	20.034	68	0.295		
	Total	26.903	69			
a. Dependent Variable: TQ						
b. Predictors: (Constant), Co						

Coefficients[a]								
Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.	Collinearity Statistics	
		B	Std. Errors	Beta			Tolerance	VIF
2	Constant	1.044	0.641		1.629	0.108		
	C	0.689	0.143	0.505	4.829	0.000	1	1
a. Dependent Variable: TQ								