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Influence of Communication Structure on Employee Performance in Selected Large Manufacturing Businesses in Eritrea

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Abstract

Purpose: This research is intended to determine the influence of communication structure on employee performance in selected large manufacturing businesses in Eritrea. Manufacturing organizations, particularly the manufacturing businesses in Eritrea, face challenges in terms of increasing productivity. Having suitable communication structure can play a role and supports employees to achieve the required level of performance in the manufacturing businesses.

Methodology: The study used a quantitative research design to obtain a quantitative data. The target population for this study was employees of the selected large manufacturing businesses in Eritrea with a population size of 4175 employees. The sample size considered in this study was 365 employees, which was statistically determined using Taro Yamane formula. They were selected from each selected large manufacturing businesses using proportionately stratified random sampling technique. Data was then collected using questionnaire and analyzed using both the descriptive analysis (percentage) and inferential statistical analysis (correlation, regression and ANOVA) methods. SPSS as a tool was used to conduct the descriptive and inferential statistical analysis. The analyzed data was then presented in tabular form and interpreted statistically.

Findings: The study finding indicate that there was a significant positive relationship between communication structure and employee performance. The study concluded that communication structure did have influence on employee performance in the selected large manufacturing businesses in Eritrea.

Unique Contribution to Theory, Practice and Policy: Organizational communication as a field is gaining interests in the scientific/academic community because it is very essential in all dimensions of organization's performance. So, as this study shown that communication structure has a direct influence on employee performance in selected large manufacturing businesses in Eritrea, it has a contribution to the theoretical concepts on the field of communication and can be used as a base for further study/research. Also, the study noted that since communication structure determines the flow of information in an organization, effective communication structure is a prerequisite for improved employee performance. Thus, this study revealed that it is important to have a relevant communication policy that address to have effective communication structure through which effective information flows achieved and thus ensures improved employee performance in manufacturing sectors.

Keywords: *Communication, Communication Structure, Vertical Communication, Upward Communication, Downward Communication, Horizontal Communication, Diagonal Communication, Employee Performance, Manufacturing Businesses.*

INTRODUCTION

In any organization, there is a communication structure used to flow information, resources, and policies. It includes activities of sending and receiving information or message through various layers of authority and discussing various topics of interest (Shonubi & Akintaro, 2016). However, manufacturing businesses need to develop effective communication structure for employees to communicate effectively throughout the organization. This way, an organization improves the flow of information within and among the entire departmental areas for smooth and better functioning of the business and for better employee's performance. This indicates that communication structure has its own importance in organizational communication and hence can play a role on employee's performance.

According to Driskill & Goldstein (as cited in Ergen, 2010), organizational communication is tied with the organizational structure that is the vehicle for accessing and communicating information and it defines the nature of communication within the organization. This indicates that manufacturing organizations adopt their own organizational structure that defines the communication structure within the organization. However, the communication structure generally constitutes three important communication directions in which communication among employees takes place. These are vertical communication (downward and upward communication), horizontal, and diagonal communication (Spaho, 2012).

The communication structure that consists of vertical, horizontal, and diagonal communication interconnects employees and thus affects employee performance in an organization (Kovacic & Luzar, 2011). Thus, the communication structure of an organization can have an impact on employee performance because it determines the flow of information within the organization. However, manufacturing organizations, particularly the manufacturing businesses in Eritrea, face challenges in terms of increasing productivity. Hence, it is important to determine the influence of communication structure on employee performance in the selected large manufacturing business in Eritrea.

Indeed, scholars Nwata et al. (2016), Owusu-Boateng and Jeduah (2014), Atambo and Momanyi (2016), Bhatia and Balani (2015), and Hikmah (2015) had done similar studies but they did not show the direct relationship of communication structure on employee performance in the manufacturing sectors. Therefore, there was a need of empirical research studies that systematically examines the direct influence of communication structure on employee performance in manufacturing sectors. It was therefore important to conduct a research study to determine the direct influence of communication structure on employee performance in selected large manufacturing businesses in Eritrea.

Research Objective

To determine the influence of communication structure on employee performance in the selected large manufacturing business in Eritrea.

Research Hypothesis

There is no significant influence of communication structure on employee's performance in the selected large manufacturing businesses in Eritrea.

Theoretical Framework

This study is about the influence of organization's communication structure on employee performance in manufacturing businesses. Therefore, the study was guided by the relevant communication theories. The theories that are identified and applicable to this study are the social network theory and the theory of performance.

Social Network Theory (SNT)

According to Halgin (2012, p.3), "a network consists of a set of nodes (actors) linked with a set of ties of specified type that link them. The nodes are individuals or collectives of individuals that are interconnected through a pattern of ties or shared endpoints. These patterns of ties that link nodes in a network create a particular structure. The nodes occupy positions within the structure." Therefore, a network can simply be defined as a structure of the interconnections of nodes along with the specific ties that connect them.

According to Larsen and Eargle (2015), the social network theory refers to the social structure of relationships around a person, group, or organizations. It views the relationships in terms of nodes and ties. Nodes are the individual actors within the networks, and ties are the relationships between the actors. The power of the social network theory stems from the assumption that the attributes of individuals are less important than their relationships and ties with other actors within the network. This is a different view from traditional sociological studies (Larsen & Eargle, 2015). This means that the ability of individuals to succeed rests much within the structure of their network.

Another alternative view of the social network theory, according to Haythornthwaite (1996), is that regular patterns of information exchange can be considered as social networks, in which actors as nodes and information exchange relationships as ties. In such a network, the flow of information among the actors is structured by the information exchange relationship. Haythornthwaite (1996) explained that information exchange relationships indicate that the kinds of information being exchanged, with whom, and to what extent. This implies that individuals as actors will be exposed to particular kinds of information in the network. The patterns of exchange of information in networks indicate the flow of information around an environment and how actors position themselves to facilitate and control the information flow.

In relation to organizational communication structure, the SNT deals with the communication network of an organization. It considers the communication structure as a tie within an organization. These communication networks, as Haythornthwaite (1996) noted, can be used to explain several organizational phenomena. For instance, the place employees have in the communication network (as described by their tie) influences their exposure to and control over information. This means that, according to the theory, communication takes place within these

communication network among employees in an organization. Therefore, communication network here refers to interconnected individuals who are linked by communication structure within which information flows.

Moreover, Tayo and Olamigoke (as cited in Nwata et al., 2016) described that "human societies are characterized by a network of interactions." This implies that there is no interaction between individuals without any form of communication network. This further implies that the performance of employees cannot be enhanced without communication or interactions with one another because employees in an organization are linked through communication structure (Nwata et al., 2016). Employees in an organization would be isolated and will have nothing to do with one another if there is no communication structure that link or tie them. Indeed, employees do relate or interact with one another. It is this communication structure that facilitates the exchange of information among employees that eventually influence positively their performance. In other words, "organizational communication networks are possible remedies to actualize employees' performance" (Nwata et al., 2016, p.90).

Haythornthwaite (1996, p.336) pointed out that "strong, close connections between network members promote free exchange of information among network members." Therefore, the SNT theory is relevant to this study of organizational communication structure and employee performance because it demands strong relationship or tie among employees for the free flow of information in the manufacturing businesses.

Theory of Performance

The origin of the theory of performance is most associated with the work of Richard Schechner in 1970-1976 (Sidnell, 1991). According to Schechner (2003), performance is an inclusive term that includes performance in everyday life such as greetings, display of emotions, professional roles, sports, theaters, dances, ceremonies, and performance of great magnitude. However, the theory of performance in relation to performance in an organization is related or referred to the perceived relationship between different performance dimensions that include performance results and organizational performance, which is outcomes (Krausert, 2009). According to Krausert (2009), performance results or outputs are immediate and tangible consequences of behaviors whereas outcome is organizationally relevant consequences related to employee performance that can be influenced by other factors including competitiveness in markets.

The theory of performance explains that to perform is to produce valuable results through a complex series of actions that ingrate knowledge and skills (Elger, 2007). A performer is an individual or a group of people working in collaboration to produce the results (Elger, 2007). This implies that an individual employee performance in an organization is important because the employee is the performer. It can therefore be noted that employee performance refers to an individual's work achievement after applying the required knowledge and efforts on the job (Pradhan & Jena, 2017). Thus, the performance of an individual employee is related to their work related actions that results to outputs and outcomes (Krausert, 2009; Bose, 2018).

Performance is a multi-dimensional concept that includes task performance and contextual performance (Sonnentag & Frese, 2002). Borman and Motwidlo (as cited in Sonnentag & Frese, 2002) explained that task performance refers to an individual's proficiency in performing activities that contribute to the organization's technical core whereas contextual performance is related to activities that contribute to the organizational goals. According to Borman and Motwidlo, task performances are direct results in case of production workers and indirect in case of management and personnel workers but contextual performance relates to being cooperative, being reliable member, providing suggestions on how to improve work procedures, and so on. However, according to Campbell et al. (as cited in Sonnentag & Frese, 2002), behaviors or actions that can be scaled or measured are considered to constitute performance.

It can therefore be noted that the theory of performance is relevant to employee performance in the manufacturing sectors because employee performance produces a direct result (task performance) that can be measured in terms of productivity, that is, quantity and quality of products (Hikmah, 2015). Hence, this theory of performance is applicable in this study as the study considered employee performance as a dependent variable. Therefore, it is relevant to apply and be guided by the theory of performance in this study.

LITERATURE REVIEW

According to Shonubi & Akintaro (2016), organizations have a communication structure used to flow information, resources, and policies. It includes activities of sending and receiving information or message through various layers of authority and discussing various topics of interest. Driskill & Goldstein (as cited in Ergen, 2010) pointed out that the organization's communication structure is tied with the organizational structure (management structure), which is the vehicle for accessing and communicating information, and thus defines the nature of communication within the organization. According to Kovacic & Luzar (2011), the communication structure has its own structure of ties that interconnects employees and represents the patterned communication flows. The structure that interconnects employees determines the flow of information and thus affects performance and viability (Kovacic & Luzar, 2011).

Although organizations adopt their own organizational structure that defines the communication structure within the organization, there are four important communication structures or directions in which communication among employees takes place. These are downward, upward, horizontal, and diagonal communication (Spaho, 2012). However, the widely adopted communication structures are downward, upward, and horizontal communication (Atambo & Momanyi, 2016). The downward and upward communications in organizations are also called vertical communication. The other is diagonal communication. Despite its importance, diagonal communication is not widely used in organizations (Wilson, 1992).

Widhiastuti (2012) defined vertical communication as the exchanges of information through certain organizational hierarchies and influences the organization's members because there are involvements between employees, managers and employees in a formal organization. For instance, Widhiastuti (2012) explained that managers provide important information to employees through

the communication structure of the organization. This flow of communication is usually referred as the downward communication. Similarly, employees communicate about their work related issues such as work problems, things to be done, how to be done, and work report to the managers. This flow of communication can also be referred to as upward communication.

Nebo et al. (2015) noted that downward communication provides information from higher levels to lower levels. Thus, information flows down the chain of authority from to-to-down (Chan Chun Ming, 2010). It is designed to provide job rationale or directives to produce understanding of the task and its relation to other organizational tasks, to communicate about organizational procedures and practices, for feedback to the subordinate about performance, and to communicate to foster inculcation of organizational goals. Thus, this communication structure is a structure in which formal communication takes place between the various levels of management and lower level employees (Nebo et al., 2015). As Larkin & Larkin (as cited in Verma, 2013) noted, downward communication is most effective if managers communicate directly with immediate supervisors and immediate supervisors communicated with their staff. Increasing the power of immediate supervisors leads to increased performance by employees. However, such flow of information from the top to lower employee might take time and may affect the performance of the lower level employees if they fail to receive information on time. Information has value only when it is received on time. Therefore, this indicates that downward communication can have an influence on employee performance.

On the other hand, upward communication is the communication between the lower level employees to top levels following hierarchal structure of authority. Housel & Davis (as cited in Ergen, 2010) defined it as the transmission of information from the lower levels to the top levels of an organization. Similarly, Zalabak (as cited in Chan Chun Ming, 2010) stated that upward communication is where information flows through vertical lines of authority but in an upward direction and thus the message is directed at the higher management levels. However, according to Ergen (2010, p.6), "upward communication is a process, where employees' ideas, responses, critiques or plans are shared with their superiors and it involves listening." In line with this, Jablin (as cited in Chan Chun Ming, 2010) indicated that lower level employees engage in upward communication through the formal structure when they report about their work to their immediate supervisors. This means that upward communication involves lower level employees in organizational communication. It promotes employees to provide information related to their task to upper levels with the expectation of responses that would help them to execute their given tasks in a better way. Therefore, involvement of employees through the sharing of information creates a strong potential to prompt different aspects of their performance (Ergen, 2010).

It is therefore noted that communication between management and employees in downward and upward communications involves task requirements of a formal structure, where the initiation of communication usually arises from the need to handle certain tasks (Chan Chun Ming, 2010). For instance, upward communication may be related to problems and exceptions to routine work in order to make the supervisors aware of difficulties, suggestions for improving task-related procedures, periodic reports of performance, or grievances (Verma, 2013). Goris et al. (as cited in

Ergen, 2010) stated that vertical communications can affect employee performance. Therefore, communication between management levels and employees has an influence on employee performance.

Another important communication structure in an organization is the horizontal (lateral) communication. This communication is a communication between different functional units, divisions or departments within an organization. According to Nebo et al. (2015), horizontal (lateral) communication aims at linking related tasks, work units and divisions in the organization. The importance of horizontal communication increases with task specialization and diversity in organizational structure. Verma (2013) noted that horizontal communication flow exists to enhance coordination so that work can be done properly. It permits a lateral flow of messages. It also enables employees of one unit to work with other units without having to follow rigidly vertical channels. Basically, the information that employees communicate is informational in order to tie activities within or across units and departments. Such a communication direction is important because several task accomplishments relates with issues in other departments. This indicates that horizontal communication is not only for coordination but also for the execution of tasks because the needed information is with other employee in another functional unit or department. Employees should get information from colleagues in another functional units or departments in order to execute tasks in hand. Thus, sharing relevant and pertinent information through horizontal communication leads to a successful execution of tasks. In addition, Richmond et al. (2005) pointed out that in an organization, there is more horizontal communication on a daily basis than vertical communication because there are more employees than managers and employees feel more comfortable talking with employees at the same level than with employees at different hierarchical levels. This implies that it is easier to get the required information from colleagues than from upper level authorities. Therefore, horizontal communication enables employees to increase their understanding and knowledge, as well as their communication and socialization skills. This is where employees can establish the required relationships among themselves that can likely assist them to become better employees in the organization. This shows that horizontal communication can have a profound influence on employee performance in an organization.

Diagonal communication is also another communication structure in an organization. It refers to communication between managers and workers or among workers that are located in different functional divisions (Wilson 1992). It takes place between employees that are in different organizational levels and are not in direct relationship in organizational hierarchy. However, it is rarely used in organizations (Spaho, 2012). Although, vertical and horizontal communication continues to be dominant in organizational communication, there could be communication forms that require diagonal communication (Wilson 1992). Therefore, diagonal communication can have an influence on employee performance.

Therefore, the communication structure that consists of vertical (downward and upward), horizontal, and diagonal communication interconnects employees and thus affects employee performance in an organization (Kovacic & Luzar, 2011). Therefore, communication structures of

an organization can influence employee performance because they determine the flow of information within the organization. Hence, it is important to examine the communication structure as an independent variable to the dependent variable, which is employee performance in this study.

In relation to employee performance, employees are the main assets of an organization because they do play a great role in organizational performance. Organizational performance can't be achieved without ensuring the individual employee performance. According to Hikmah (2015), the performance of an organization is the accumulation of the performance of all organization units and thus it is the summation of every employee performance. This indicated that employee performance is crucial for an organization to achieve the intended outputs.

Actually, performance means work achievement achieved by someone (Abdussamad, 2015). Similarly, Beirut (as cited in Nebo et al., 2015) described that performance is about doing the work and about the results achieved. However, Prabu (as cited in Hikmah, 2015) stated that performance is the result of the quality and quantity of work achieved by an employee in carrying out their duties in accordance with the responsibilities assigned. This implies that performance is measurable. According to Nebo et al. (2015), measurement of performance is the process of quantifying the efficiency and effectiveness of an organization. Thus, it is the degree of efficiency and effectiveness (Hikmah, 2015). However, Low (as cited in Bartusevicienė & Sakalyte, 2013) stated that employee performance can be measured in terms of the quantity and quality of products that characterize the efficiency and effectiveness of the work respectively. Employee performance, however, can't be achieved without effective communication among employees in the organization. Nwata et al. (2016) stated that effective communication is important to employee performance. But, effective communication is also dependent on suitable communication structure of an organization as it determines the flow of information.

Indeed, scholars Nwata et al. (2016), Owusu-Boateng and Jeduah (2014), Atambo and Momanyi (2016), Bhatia and Balani (2015), and Hikmah (2015) had done similar studies but conducted in non-manufacturing businesses and had not considered the important aspects or directions of communication structure. Thus, the reviewed empirical studies did not show the direct effect or impact or influence of communication structure on employee performance in the manufacturing sectors. Therefore, there was a need of empirical research studies to fill this gap by systematically examine the influence of communication structure on employee performance in manufacturing sectors. It was therefore important to conduct a research study to determine the direct influence of communication structure on employee performance in selected large manufacturing businesses in Eritrea. Hence, the research hypothesis is that "there is no significant relationship between communication structure and employee performance in selected large manufacturing businesses in Eritrea".

METHODOLOGY

The study used a quantitative research design to obtain a quantitative data. Data was collected from a sample of employees of the selected large manufacturing businesses in Eritrea using a

questionnaire. The collected data was then organized and analyzed using both the descriptive (percentage) and inferential statistical analysis (correlation, regression and ANOVA) techniques. SPSS as a tool was used to conduct the descriptive and inferential statistical analysis.

Target Population

The target population for this study was employees of the selected large manufacturing businesses in Eritrea. From the list of the manufacturing establishment of the Ministry of Trade and Industry, 14 large manufacturing businesses that were based in the central region of Eritrea were considered. These 14 large manufacturing businesses constituted a total population size of 4175 employees.

Sample Size and Sampling Techniques

Considering the total population size of 4175 employees and 5% of sampling error, the sample size of this study was 365 employees. This sample size was statistically determined using Taro Yamane (1973) formula: $n = N / [1+N(e)^2]$ where n = sample size N = population size and e = sampling error.

Once the total sample size of the 365 was determined, the sample sizes of employees for each of the selected large manufacturing businesses were determined proportionately using the following formula: $n_i = [N_i / N] \times n$ where n_i = sample size in the i^{th} stratum N_i = population size of the i^{th} stratum N = total population size of the study n = total sample size of the study

Hence, the sample sizes for each selected large manufacturing businesses were determined proportionately as indicated in Table 1.

Table 1: Sample Sizes of Employees for Each Manufacturing Business

Se. No.	Name of Manufacturing Business	No. of Employees N_i	Proportion N_i / N	Sample size $n_i = [N_i / N] \times n$
1	Sembel Metal & Wood Works	977	0.23	85
2	Baroco Eritrea	756	0.18	66
3	Asmara Brewery Corporation	464	0.11	41
4	Red Sea Bottlers	261	0.06	23
5	Eritrea Textile	243	0.06	21
6	Dahlak Shoe	219	0.05	19
7	Sabur Printing Services	217	0.05	19
8	Asmara Meat & Diary Products	216	0.05	19
9	Keih Bahri Food Products	196	0.05	17
10	Margran PLC	180	0.04	16
11	Wina House Hold Utensils	126	0.03	11
12	Space 2001 Eritrea	111	0.03	10
13	Arag Wood & metal Work	105	0.03	9
14	Hawashait Garment	104	0.02	9
Total		**4175**		**365.00**

Table 2: Sample Sizes of Employees for Each Strata (Department)

Se. No.	Manufacturing Business	Departments	No. of Employees	Sample size
1	Sembel Metal & Wood Works	Metal work	400	35
		Wood work	322	28
		Hangars	255	22
	Total		**977**	**85**
2	Baroco Eritrea	----	**756**	**66**
3	Asmara Brewery Corporation	Liquor production	210	18
		Brewery production	264	23
	Total		**464**	**41**
4	Red Sea Bottlers	----	**261**	**23**
5	Eritrea Textile	Yarn production	57	5
		Fabric production	69	6
		Garment production	117	10
	Total		**243**	**21**
6	Dahlak Shoe	Leather shoes production	92	8
		Canvas shoes production	57	5
		Plastic shoes production	70	6
	Total		**219**	**19**
7	Sabur Printing Services	Printing department	92	8
		Binding department	125	11
	Total		**217**	**19**
8	Asmara Meat & Diary Products	Meat production	114	10
		Dairy production	102	9
	Total		**216**	**19**
9	Keih Bahri Food Products	Flour production	126	11
		Wheat germ production	70	6
	Total		**196**	**17**
10	Margran PLC	Granite production	80	7
		Marble production	100	9
	Total		**180**	**16**
11	Wina House Hold Utensils	Aluminum department	80	7
		Plastic department	46	4
	Total		**126**	**11**
12	Space 2001 Eritrea	Earth blocks production	69	6
		Tiles production	42	4
	Total		**111**	**10**
13	Arag Wood & metal Work	Wood work	46	4
		Metal work	59	5
	Total		**105**	**9**
14	Hawashait Garment	----	**104**	**9**
	Overall Total		**4175**	**365**

The sampling technique used for this study was the probability sampling technique, which is the proportionate stratified random sampling technique. In proportionate stratified random sampling, sets of strata were identified and their proportion of population corresponding to each stratum was

determined. Then a sample was drawn randomly from each stratum so that proportions in the sample matched exactly the proportions in overall population (Brase & Brase, 2009). Thus, the proportionate stratified random sampling technique was applied because samples of employees from each stratum of the selected large manufacturing businesses were drawn proportionately and randomly. Therefore, since the departments of the respective manufacturing businesses were the strata of this study from which employees were randomly selected, the sample sizes for each department of the selected manufacturing businesses were determined proportionately as indicated in Table 2. However, Table 2 does not show the list of departments for Baroco Eritrea, Red Sea Bottlers, and Hawashait Garments. This is because Baroco Eritrea and Red Sea Bottlers were not cooperative whereas Hawashait Garments was not functioning during the data collection period.

Data Collection Instrument

Since the study applied a quantitative research design, a questionnaire was used as a data collection instrument in order to obtain quantitative data. The questionnaire was basically focused on the independent and dependent variables of this study. The questionnaire was designed carefully so as to yield valid information using questions that were close-ended. The questionnaire was prepared in a Likert Scale format (strongly agree, agree, neutral, disagree, and strongly disagree). The questionnaire was also prepared in both English language and Tigrinya language (Eritrea national language) because some of the employees could experience difficulties in understanding English. The questionnaire was designed on anonymous data collection procedure, i.e., name of the respondent was not asked.

In addition, the required attention was given in designing the questionnaire in order to ensure its validity. According to Bolarinwa (2018), validity refers to the degree to which the questionnaire, as an instrument of measurement, measures what it is supposed to measure. Therefore, to ensure validity, the questionnaire was designed in a way that individual questions were relevant, appropriate, intelligible, precise, and unbiased. Simple and plain language was also used. The arrangement of the questions in terms of the conceptual flows and the layout of the questionnaire in terms of formatting were also considered.

The questionnaires were then distributed to the candidates. Since the questionnaire was prepared in both English and Tigrinya languages, the respondents completed the questionnaire using the language convenient to them. The completed questionnaires were then collected immediately. Through this strategy, the survey was conducted successfully

Data Analysis and Presentation

The data collected using the questionnaire was first checked for accuracy, consistency and completeness to ensure that the data collected was as originally intended. Then, the data was organized, coded and entered into SPSS for analysis. Once the data entered into SPSS was checked for accuracy and completeness, the data was analyzed using descriptive and inferential statistical analysis techniques. For the purpose of descriptive analysis, percentage was used and correlation, regression, and ANOVA were used for the inferential analysis. For the correlation analysis between the independent variables (communication structure) and dependent variable (employee

performance), Pearson correlation coefficient (r) was used. In respect to the regression analysis, regression coefficients and model were used to further determine the influence of the independent variables on the dependent variable. The analyzed data or the statistical output was then presented in tabular form and interpreted statistically.

FINDINGS AND DISCUSSION

Response Rate

As shown in Table 3, 14 large manufacturing businesses in Eritrea were initially selected for the study purposes with a total population size of 4175 employees and sample size of 365 employees. However, two manufacturing businesses (Baraco Eritrea and Red Sea Bottlers) were not cooperative and the researcher was not given permission to collect data from their manufacturing businesses. In addition, one manufacturing business (Hawashait Garment), despite its willingness to cooperate, was not functioning at the time of data collection period. Therefore, data was collected only from the 11 manufacturing businesses with a total of 267 respondents. According to Baruch (1999), the reasonable acceptable response rate that can contribute to the validity of the study is 60% +/-20. This implies that 80% and above is considered high response rate and below 40% is poor response rate. 60% and above is acceptable response rate. Therefore, as Table 3 shows, 267 questionnaires were sufficiently completed as the response rate. Thus, considering that the sample size was 365 employees, the response rate was 73.15%, which is a good response rate to addresses the research objectives.

Table 3: Response Rate of the Respondents

Manufacturing Business	Population Size	Sample Size	Response Rate	Percentage (%)
Sembel Metal & Wood Works	977	85	85	23.29
Baroco Eritrea	756	66	-	-
Asmara Brewery Corporation	464	41	41	11.23
Red Sea Bottlers	261	23	-	-
Eritrea Textile	243	21	21	5.75
Dahlak Shoe	219	19	19	5.21
Sabur Printing Services	217	19	19	5.21
Asmara Meat & Diary Products	216	19	19	5.21
Keih Bahri Food Products	196	17	17	4.66
Margran PLC	180	16	16	4.38
Wina House Hold Utensils	126	11	11	3.01
Space 2001 Eritrea	111	10	10	2.74
Arag Wood & metal Work	105	9	9	2.47
Hawashait Garment	104	9	-	-
Total	**4175**	**365**	**267**	**73.15**

Descriptive Analysis for Communication Structure

The objective of the study to be investigated was the influence of communication structures on employee performance in the selected large manufacturing businesses in Eritrea. Therefore, it was important first to conduct the descriptive analysis for communication structure in terms of vertical (upward and downward), horizontal and diagonal communication. It was also important to determine the effectiveness of these specific communication structures from the descriptive statistical analysis perspectives.

Vertical Communication (Downward and Upward Communication)

It was important to begin with the descriptive analysis on determining whether employees of the manufacturing businesses communicate vertically and whether vertical communication (two-way communication) was encouraged. According to Table 4, a majority of employees of the selected large manufacturing businesses confirmed that they do communicate vertically. Table 4 indicates

that a total of 50.2% of the employees strongly agree and agree, 15% neutral (neither agree nor disagree), and a total of 34.8% of the employees disagree & strongly disagree.

In addition, Table 4 shows that 40.4% of employees of the selected large manufacturing businesses confirmed that two-way communication was encouraged. Thus, a total of 40.4% of the employees strongly agree and agree, 26.6% neutral (neither agree nor disagree), and a total of 33% of the employees disagree and strongly disagree. This is consistent with Wrench et al. (as cited in Atambo & Momanyi, 2016) and Ali (2016) that it is important to encourage two-way communication (downward and upward) for improved employee performance.

Table 4: Vertical Communication

	Communicating vertically		**Encouraging vertical communication**	
	Frequency	**Percentage (%)**	**Frequency**	**Percentage (%)**
Strongly Agree	61	22.8	45	16.9
Agree	73	27.4	63	23.5
Neutral	40	15.0	71	26.6
Disagree	56	20.9	55	20.6
Strongly Disagree	37	13.9	33	12.4
Total	**267**	**100**	**267**	**100**

Effectiveness of Vertical Communication

The findings in section 7.2.1 confirmed that employees of the selected large manufacturing businesses communicate vertically. However, it was important to determine the effectiveness of the downward and upward communication in the selected large manufacturing businesses. In relation to downward communication, the findings in Table 5 indicate that a majority of employees of the selected large manufacturing businesses confirmed that downward communication was effective to them. Thus, a total of 48.3% of the employees strongly agree and agree, 23.2% neutral (neither agree nor disagree), and a total of 28.5% of the employees disagree and strongly disagree.

Table 5: Effectiveness of Downward and Upward Communication

	Downward communication		Upward communication	
	Frequency	**Percentage (%)**	**Frequency**	**Percentage (%)**
Strongly Agree	47	17.6	41	15.4
Agree	82	30.7	65	24.3
Neutral	62	23.2	71	26.6
Disagree	55	20.6	67	25.1
Strongly Disagree	21	7.9	23	8.6
Total	**267**	**100**	**267**	**100**

In relation to upward communication, Table 5 indicates that 39.7% of employees of the selected large manufacturing businesses confirmed that upward communication was effective to them. Thus, Table 5. a total of 39.7% of the employees strongly agree and agree, 26.6% neutral (neither agree nor disagree), and a total of 33.7% of the employees disagree and strongly disagree. However, the findings show that the level of agreement is 39.7% and level of disagreement is 33.7% which is the margin of difference is 6%. This indicates that the upward communication may not be effective for employees of the selected large manufacturing businesses in Eritrea.

Vertical Communication and Employee Performance

Once the effectiveness of vertical communication was determined in section 7.2.2, it was important to determine whether vertical communication enabled employees to produce the required quantity and quality of products. In relation to downward communication, the findings in Table 6 indicate that a majority of the employees confirmed that downward communication enabled them to produce the required quantity and quality of products with total representation of 70.4% and 68.5% respectively. Thus, for quantity of products, Table 6 indicates that a total of 70.4% of the employees strongly agree and agree, 15% neutral (neither agree nor disagree), and a total of 14.6% of the employees disagree and strongly disagree. Similarly, for quality of products, Table 6 indicates that a total of 68.5% of the employees strongly agree and agree, 15.4% neutral (neither agree nor disagree), and a total of 16.1% of the employees disagree and strongly disagree.

Table 6: Downward Communication and Employee Performance

	Quantity of products		Quality of products	
	Frequency	**Percentage (%)**	**Frequency**	**Percentage (%)**
Strongly Agree	74	27.7	66	24.7
Agree	114	42.7	117	43.8
Neutral	40	15.0	41	15.4
Disagree	31	11.6	31	11.6
Strongly Disagree	8	3.0	12	4.5
Total	**267**	**100.0**	**267**	**100.0**

In relation to upward communication, the findings in Table 6 indicate that a majority of the employees confirmed that upward communication enabled them to produce the required quantity and quality of products with total representations of 64.4% and 60.6% respectively. Thus, for quantity of products, Table 7 indicates that a total of 64.4% of the employees strongly agree and agree, 19.5% neutral (neither agree nor disagree), and a total of 16.1% of the employees disagree and strongly disagree. Similarly, for quality of products, Table 7 indicates that a total of 60.6% of the employees strongly agree and agree, 22.1% neutral (neither agree nor disagree), and a total of 17.3% of the employees disagree and strongly disagree.

Table 7: Upward Communication and Employee Performance

	Quantity of products		Quality of products	
	Frequency	**Percentage (%)**	**Frequency**	**Percentage (%)**
Strongly Agree	62	23.2	68	25.4
Agree	110	41.2	94	35.2
Neutral	52	19.5	59	22.1
Disagree	30	11.2	33	12.4
Strongly Disagree	13	4.9	13	4.9
Total	**268**	**100.0**	**268**	**100.0**

The above findings are consistent with the findings of Atambo and Momanyi (2016) that both downward and upward communication had influence on employee performance. The findings are also consistent with the findings of Ali (2016) that effective communication channels influence employee performance positively and ineffective or weak channels will not have any positive effect on employee performance. Therefore, it can be concluded that vertical communication has influence on employee performance in the selected large manufacturing businesses in Eritrea.

Horizontal Communication

Horizontal communication is a communication between different departments or units within the organization. It exists to enhance information flow and coordination so that work can be done

properly (Verma, 2013). Therefore, the researcher was interested to determine whether horizontal communication is supported and whether employees communicate horizontally in the selected large manufacturing businesses in Eritrea.

The findings in Table 7 indicate that a majority of employees of the selected large manufacturing businesses confirmed that the manufacturing businesses were supporting horizontal communication with 50.2%, and employees communicated horizontally with 58.8%. In relation to supporting horizontal communication, Table 7 shows that a total of 50.2% of the employees strongly agree and agree, 24% neutral (neither agree nor disagree), and a total of 25.8% of the employees disagree and strongly disagree. In relation to communicating horizontally, Table 7 shows that a total of 58.8% of the employees strongly agree and agree, 16.5% neutral (neither agree nor disagree), and a total of 24.7% of the employees disagree and strongly disagree.

Table 7: Supporting and Communicating Horizontally

	Supporting horizontal communication		Communicating horizontally	
	Frequency	**Percentage (%)**	**Frequency**	**Percentage (%)**
Strongly Agree	41	15.4	43	16.1
Agree	93	34.8	114	42.7
Neutral	64	24.0	44	16.5
Disagree	47	17.6	44	16.5
Strongly Disagree	22	8.2	22	8.2
Total	**267**	**100**	**267**	**100**

Effectiveness of Horizontal Communication

In relation to the effectiveness of horizontal communication, although 39.3% of employees of the selected large manufacturing businesses confirmed that horizontal communication was effective, it is only higher with the margin of 1.8% compared to the level of disagreement, 37.5% on its effectiveness. Thus, Table 8 shows that a total of 39.3% of the employees strongly agree and agree, 23.2% neutral (neither agree nor disagree), and a total of 37.5% of the employees disagree and strongly disagree.

Table 8: Effectiveness of Horizontal Communication

	Frequency	Percentage (%)
Strongly Agree	38	14.2
Agree	67	25.1
Neutral	62	23.2
Disagree	66	24.8
Strongly Disagree	34	12.7
Total	**267**	**100**

Horizontal Communication and Employee Performance

Once the effectiveness of horizontal communication was determined, it was important to further determine whether horizontal communication enabled employees to produce the required quantity and quality of products. The findings in Table 9 indicate that a majority of the employees confirmed that horizontal communication enabled them to produce the required quantity and quality of products with total representations of 67.4% and 67% respectively.

For quantity of products, Table 9 shows that a total of 67.4% of the employees strongly agree and agree, 17.6% neutral (neither agree nor disagree), and a total of 15% of the employees disagree and strongly disagree. Similarly, for quality of products, Table 9 shows that a total of 67% of the employees strongly agree and agree, 18.8% neutral (neither agree nor disagree), and a total of 14.2% of the employees disagree & strongly disagree. These findings are consistent with the findings of Atambo & Momanyi (2016) that horizontal communication was vital for employee performance. Therefore, horizontal communication has influence on employee's performance in the selected large manufacturing businesses in Eritrea.

Table 9: Horizontal Communication and Employee Performance

	Quantity of products		Quality of products	
	Frequency	Percentage (%)	Frequency	Percentage (%)
Strongly Agree	54	20.2	54	20.2
Agree	126	47.2	125	46.8
Neutral	47	17.6	50	18.8
Disagree	34	12.8	31	11.6
Strongly Disagree	6	2.2	7	2.6
Total	**267**	**100.0**	**267**	**100.0**

Diagonal Communication

Diagonal communication is a communication between employees or departments that do not have a direct relationship in the management structure of an organization. It was therefore important to

confirm whether employees of the selected large manufacturing businesses in Eritrea communicate diagonally. According to the findings in Table 10, a majority of employees with a total representation of 55.1% confirmed that they did not communicate diagonally. Thus, a total of 23.2% of the employees strongly agree and agree, 21.7% neutral (neither agree nor disagree), and a total of 55.1% of the employees disagree and strongly disagree. These findings agreed with what Wilson (1992) theoretically stated that diagonal communication is another communication structure in an organization that is not widely used.

Table 10: Communicating Diagonally

	Frequency	Percentage (%)
Strongly Agree	14	5.2
Agree	48	18.0
Neutral	58	21.7
Disagree	100	37.5
Strongly Disagree	47	17.6
Total	**267**	**100**

Effectiveness of Diagonal Communication

Although diagonal communication was not used widely in the selected manufacturing businesses in Eritrea as confirmed by the findings in Table 10, the researcher had interested to determine the effectiveness of diagonal communication. The findings indicate that a majority of employees of the selected large manufacturing businesses with a total representation of 64.2% confirmed that diagonal communication was not effective. Thus, Table 11 shows that a total of 15.7% of the employees strongly agree and agree, 20.1% neutral (neither agree nor disagree), and a total of 64.2% of the employees disagree and strongly disagree.

Table 11: Effectiveness of Diagonal Communication

	Frequency	Percentage (%)
Strongly Agree	10	3.7
Agree	32	12.0
Neutral	54	20.3
Disagree	117	43.8
Strongly Disagree	54	20.2
Total	**267**	**100**

Diagonal Communication and Employee Performance

Although the findings in sections 6.1.7 and 6.1.8 respectively confirmed that diagonal communication was rarely used and was not effective, the researcher also examined whether diagonal communication enabled employees to perform as required in terms of producing the

required quantity and quality of products. The findings in Table 12 indicate that a majority of the employees confirmed that diagonal communication did not enable them to produce the required quantity and quality of products. Thus, for quantity of products, Table 12 indicates that a total of 28.5% of the employees strongly agree and agree, 22.5% neutral (neither agree nor disagree), and a total of 49% of the employees disagree and strongly disagree.

Similarly, for quality of products, Table 12 indicates that a total of 27% of the employees strongly agree and agree, 22.4% neutral (neither agree nor disagree), and a total of 50.6% of the employees disagree & strongly disagree. This is due to the fact that diagonal communication is not widely used in the selected manufacturing businesses in Eritrea.

Table 12: Diagonal Communication and Employee Performance

	Quantity of products		Quality of products	
	Frequency	**Percentage (%)**	**Frequency**	**Percentage (%)**
Strongly Agree	23	8.6	18	6.7
Agree	53	19.9	54	20.3
Neutral	60	22.5	60	22.4
Disagree	89	33.3	101	37.9
Strongly Disagree	42	15.7	34	12.7
Total	**267**	**100.0**	**267**	**100.0**

Regularly Used Communication Structure

In relation to the communication structure, the researcher was interested to determine which communication structure was used regularly in the selected large manufacturing businesses in relation to the production of the required quantity and quality of products. According to the findings in Table 13, employees with a representation of 31.5 % confirmed that they use all types of communication structures, 29.6% downward, 25.5% upward, 11.9% horizontal, 1.5% diagonal communication. Therefore, employees of the selected large manufacturing businesses in Eritrea used all types of the communication structure regularly. However, diagonal communication was not used widely in the selected large manufacturing businesses. These findings imply that employees of the selected large manufacturing businesses in Eritrea use vertical and horizontal communication structures regularly.

Table 13: Regularly Used Communication Structure

	Frequency	Percentage (%)
Downward	79	29.6
Upward	68	25.5
Horizontal	32	11.9
Diagonal	4	1.5
All	84	31.5
Total	**267**	**100**

Inferential Analysis for Communication Structure and Employee Performance

Once the descriptive analysis was done to describe the findings, it is important to conduct the inferential analysis to determine whether there is a relationship between communication structure and employee performance; whether the relationship is strong or not, to determine the regression model and determine the model is a fitted model or not. Thus, the inferential analysis in this section includes the correlation, regression and ANOVA analysis.

Correlation Analysis

A correlation analysis was conducted to determine whether there is a relationship between communication structure and employee performance. As Table 14 shows, the Pearson correlation coefficient (r) is 0.492 with p-value of 0.000 (r=0.492, p=0.000). Therefore, there is a statistically significant relationship between communication structure and employee's performance because p<0.05. Thus, there is a positive relationship but the relationship is not strong since r=0.492 does not approaches to r=1 at which a relationship is strong.

Table 14: Correlation Analysis

		Communication Structure	Employee Performance
Communication structure	Pearson Correlation	1	.492**
	Sig. (2-tailed)		.000
	N	267	267
Employee performance	Pearson Correlation	.492**	1
	Sig. (2-tailed)	.000	
	N	267	267

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

Regression Analysis

A linear regression analysis was used to test whether the communication structure significantly predicts employee performance. The findings of the regression anlysis in Table 15 indicates that

there is a relationship between communication structure and employee performance in which the adjusted R^2 is 0.24. This means that only 24% of the employees performance can be explained by the communication structure. The remaining 76% of the employees performance are due to other factors which are not included in this model.

Table 15: Regression Analysis Model Summary

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.492[a]	.243	.240	.47380

a. Predictors: (Constant), Communication Structure

Further, Table 16 illustrates that the test of beta coefficient reveals that communication structure significantly predicted employees performance since P=0.000<0.05. Thus, the model is statistically significant. Therefore, the model can be defined as Y=0.282+0.523X, where Y=Employee performance and X=Communication structure. This indicates that an increase in the effectiveness of the communication structure leads to an increase the performance of employees by 0.523.

Table 16: Regression Analysis Coefficients for Communication Structure

Model		Unstandardized Coefficients		Standardized Coefficients		
		B	Std. Error	Beta	t	Sig.
1	(Constant)	.282	.100		2.827	.005
	Communication Structure	.523	.057	.492	9.211	.000

a. Dependent Variable: Employee Performance

ANOVA Analysis

An analysis of variance (ANOVA) was conducted in order to determine the influence of communication structure on employee performance. According to the findings in Table 17, there is statistically significant relationship between communication structure and employee performance since $F_{1,265;0.05}$=3.88<84.846 with p=0.000<0.05. Thus, the regression model is significantly fit or adequate to predict employee performance. Hence, it can be concluded that communication structure has influence on employee performance in the selected large manufacturing businesses in Eritrea.

Table 17: ANOVA Analysis for Communication Structure

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	19.047	1	19.047	84.846	.000[b]
	Residual	59.490	265	.224		
	Total	78.537	266			

a. Dependent Variable: Employee Performance

b. Predictors: (Constant), Communication Structure

The above inferential analysis (correlation, regression and ANOVA) confirmed that there was a relationship between communication structure and employee performance. Thus, it was confirmed that communication structure has influence on employee performance in the selected large manufacturing businesses. These findings agreed with the findings of Nwata et al. (2016), Atambo and Momanyi (2016), and Hikmah (2015) that there is a significant association between communication structure and employee performance.

Conclusions

Based on the findings of the descriptive analysis in this study, it can be concluded that employees of the selected large manufacturing businesses communicate vertically (downward and upward) and horizontally but rarely communicate diagonally. In addition, downward communication was effective, but upward wasn't, and horizontal communication was effective too but diagonal wasn't effective in the selected large manufacturing businesses in Eritrea. Further, based on the descriptive analysis, this study concluded that communication structure influences employee performance in the selected large manufacturing businesses in Eritrea.

The inferential findings also strengthened this findings of the descriptive analysis in a sense that communication structure influences employee performance. Thus, based on the correlation, regression and ANOVA analysis, the study concluded that there is a statistically significant positive relationship between communication structure and employee performance in the selected large manufacturing businesses in Eritrea although the relationship is not strong. It is therefore, the study concluded that communication structure influences employee performance in the selected large manufacturing businesses in Eritrea.

Recommendations

This research study offers the following recommendations to the policy makers, to the practice and manufacturing businesses as well as to researchers and academic communities.

Contribution to the Policy Makers

Effective communication is important for effective information or knowledge exchange that enables to carryout daily activities. However, to have effective communication requires a communication policy. Thus, a relevant organizational communication policy is a prerequisite for effective organizational communication. It is therefore that this study reveals that organizations should have effective communication structure that enable employees of the manufacturing

businesses to communicate effectively because communication structure influences employee performance. Hence, policy makers require to develop organizational communication policy that ensures to have effective communication structure.

Contribution to the Practice and the Manufacturing Businesses

Although employees of the selected large manufacturing businesses in Eritrea communicate vertically (upward and downward communication), the findings showed that upward communication was not effective. However, effective upward communication enables the bottom level employees to generate new ideas to upper management that can help to improve their performance. Therefore, the manufacturing businesses need to ensure that vertical communication is encouraged and be effective

In addition, the communication structure of the selected large manufacturing businesses in Eritrea is their respective management structure. Consequently, diagonal communication was not widely used and had no role in employee performance in the selected manufacturing businesses. Therefore, manufacturing businesses should develop a separate communication structure that ensures effective communication. For instance, organizations can have a networked type of communication structure that connects employees from different directions or levels where employees get relevant information to generate new knowledge, execute tasks and improves productivity.

Contribution to the Research and Academic Community

The field of organizational communication is gaining interests from the scientific/academic community since it is very essential in all dimensions of organization's performance (Abugre, 2011). This study meant to fill the gap in the scientific research in a sense that organizational communication structure has a direct influence on employee performance in the manufacturing businesses. Therefore, considering the limitations of this study, the scientific communities can use the findings of this study as a base or reference to academic and for further research to fill existing gaps in the field of communication in general and organizational communication in particular.

Suggestion for Further Research

This study was conducted based on a quantitative research method that generated a quantitative data. Therefore, it is important to conduct a research of this topic based on a qualitative research method.

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