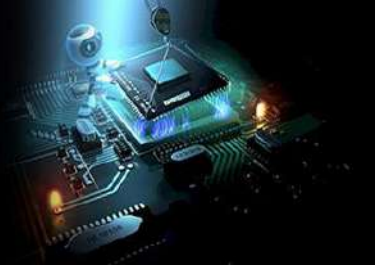


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The role of material coding and classification of stores management case study of standard mineral water Ghana

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Abstract

This study is concerned with the role of material coding and classification in the store management with particular reference to Standard Mineral Water. Our research study, points out the problems and development of coding and classification in the study. The introduction part gives brief accounts of the meaning of coding and classification in the organization. Also the general overview of the problem, objectives of the study, significance of the Study, research questions, scope of the study. Chapter two review of related literature and how important they are in the organization. Chapter 3 is devoted in methodology, and chapter four shows the discussion on findings associated with the research work. The discussion on findings were made with the view in highlighting a sound basic for some possible solution. Chapter 5 witnessed the climax of our research, which rounded up by summarizing and concluding all the findings during the investigations. We finalized by giving some recommendations, which is in our mind, if adhered to will help improve the material coding and classification of Standard Mineral Water. It also helped us to appreciate the need of coding and classification of items in private organization. To the company, it helps highlight that manager and other managers in different organization both private and public will benefit by knowing that some materials that are stored in the store or warehouse will be easy to be identified or located because of the coding and the classification system. It will provide employment opportunity for many people and faster it will enhance communication between the store staff and the workers.

Keywords: development of coding, witnessed the climax

1. Introduction

1.1 Background of the Study

In the information age, it is necessary to establish the information system for organizations to improve their own competitiveness in the increasingly fierce market. Establishing a unified material code of rules is the bottom for organizations to perform information management. The unreasonable material coding will lead to confusion in the management of the organization. Depending on the rational material coding we can optimize material management in order to improve the efficiency of management and to reduce the material inventory cost.

It is not, however, an easy work. The study of information classification and coding started in early 1945, in the United States, and the national material coding system was put forward in 1958. Since the 1960s, countries like Romania and Japan put a large amount of manpower and resources into studying material coding. Recently many scholars have carried many researches on how to encode material. Yi *et al.* (2006) and Wang and Wang (2008) introduced coding technology based on the ontology for information integration.

According to Lei *et al.* (2008) discussed code principle structures and characteristics of material classification with group technology. Jiang (2007), Wang and Wang (2008) and Zhao *et al.* (2010) studied the flexible structure and the multi-segment code for the Product Data Management (PDM) system and proposed the information coding model. Material coding management is applied in different industries (Li and Xu, 2012; Xiong *et al.*, 2010), and Xiong *et al.* (2012) suggested that new technologies such as Radio Frequency Identification (RFI) can be applied in material coding management. The basic objective is to develop an unambiguous classification and coding system that facilitates clear internal

communication ideally.

This system should be designed so that all the departments in the organization can use it effectively. The purchasing and store department are critical areas where the system must provide consistent and unambiguous identification and coding of materials. If the stock items are given a scientific identification codes, a complete catalogue can be assembled so that when a part is required it is possible to determine very quickly if is in stock. The stock records will then indicate the exact stores location. We recognized the British standard institute which has done a great deal of work in establishing standards for materials and product, and when a standard specification number is quoted both customer and supplier will know exactly what is being referred to. Even where it is not possible to develop a sophisticated coding system, or arranged in logical lines will be of great benefit to a business in avoiding errors in orderings, issuing and pricing, etc. The store's manager of Standard Mineral Water through his grouping of materials has arranged these materials on logical line for easy identification thereby avoiding errors in locating, ordering, issuing etc. items of stock in the organization. The code appears on all document relating to the movement and the use of materials and is marked against appropriate lines and racks.

1.2 Problem Statement

Although material coding and classification is considered as a clues or yardstick for easy identification in Standard Mineral Water. The organization having chosen all of the above coding system which has resulted to giving every item different code numbers. This leads to the increase in the volume of the store vocabulary. Standard Mineral Water is faced with the problem of inconsistency in classification of materials in the stores section. For instance, there is a section of spinning materials which is normally under the spinning store but recently it has been transferred to the administrative stores. There is also, lack of a section who takes adequate care of the organization store vocabulary. The organization is also faced with the problem of inappropriate classification of materials.

1.3 Objectives of the Study

The main objective of the study is to examine challenges inhabiting coding and classification of store management at Standard Mineral Water Cape Coast, whiles the specific objectives are;

1. To find out the method of coding and classification of store management used by standard mineral water.
2. To find out the benefits attributed to efficient coding system and classification in store management.
3. To investigate the challenges involved in coding and classification of store management.

1.4 Research Question

In order to carry out a complete investigation on the subject matter, the study will provide answers to the following questions.

1. What are the methods of coding and classification of store management?
2. What are the benefit attributed to efficient coding system and classification of store management at standard mineral water?
3. What are the challenges involved in coding and classification of store management in standard mineral

water?

1.5 Significance of the Study

We believe that the study will succeed in throwing more light on the subject matter. It will also go a long way in pricking that conscience of all who have or assumed responsibility of material coding and classification of purchased in manufacturing industry with particular reference to Standard Mineral Water. The significance of the study derives the research work aims at finding out the procedure or steps and methods used in coding and classification of materials in Standard Mineral Water. It is also, the aim of the study to identify the limitations to material coding and classification with the view of looking for solution to them. The study will also enumerate the need for the use of effective and efficient coding system. Lastly, to offer useful suggestions to management towards the application of the various method and techniques of coding and classification of materials.

1.6 The Scope of Study

Material coding and classification is a wide area of study, and the scope of this study was restricted to the stores management of Standard Mineral Water, in this respect; emphasis will be placed on examining the present system of the coding, classification and identification of items. We also cover a range of study on the assessment of the need of coding item in the private firm and other organization based on other writer in the area coding and classification of items.

2. Literature Review

2.1 Introduction

This chapter covers a review of literature on the topic under the study. The review focuses on the overview of material coding and specifically on stores management in Standard Mineral Water. Various of relevant literature on the topic "the role of material coding and classification of stores management" and the impact of material coding and classification in stores management in Standard Mineral Water especially with sustainable challenges in codification and material management in stores. All these are presented in order to establish and provide answers to the research questions of the study.

This chapter provides the reader with important facts, theories and models in order to increase the understanding of the area under investigation

2.2 Theoretical Review

2.2.1 History of Stores

Stores' roots back to the creation of granaries to store food, which was historically available for purchase during times of famine. According to (**Genesis 41:50-57**) and I quote" Joseph immediately went about the work to which Pharaoh had appointed him. His primary responsibility was getting food stored and preserved. He was able to efficiently stored and issued appropriately due to proper arrangement now termed as coding and classification. As European explorers began to create shipping-trade routes with other nations, stores became important for the storage of products and commodities from afar. Ports were the major location for stores and warehouses as railroads began to expand travel and transportation, the creation of rail depots for the storage of materials became necessary. In 1891 the American Warehousemen's Association was organized to challenge

the railroad companies' control over freight depots. World War II impacted storage in several ways, including the need to increase the size of stores and the need for more mechanized methods of storing and retrieving the products and materials. As mass production grew throughout manufacturing, the needs of efficient and effective storage capabilities grew with it. The earlier type of arrangement is based on the concept that stores along with other functions of materials management can be integrated into the material organization.

This will stream line all material management functions effectively. The other arrangement is leaning on the fact that production function is very closely linked to stores and a common command can reduce cost and increase effectiveness and also keep material accounting outside the scope of procurement function.

2.2.2 Various Stores of the Organization Standard Mineral Water

Standard Mineral Water stores operate continuous review daily to avoid redundancy and rigidity. The stores operations undergo continuous review in the form of PDCA to provide the benefit experience of implementation in operation of stores.

The Plan-Do-Check-Act (PDCA) Cycle is a four-step problem-solving iterative technique used to improve business processes. Originally developed by American Physicist Walter A. Shewhart during the 1920s, the cycle draws its inspiration from the continuous evaluation of management practices and management's willingness to adopt and disregard unsupported ideas.

3. Research Methodology

3.1 Introduction

The purpose of this chapter is to present the philosophical assumptions underpinning this research, as well as to introduce the research strategy and the empirical techniques applied. The chapter defines the scope and limitations of the research design, and situates the research amongst existing research traditions in information systems. This chapter is divided into three sections. In the first, the interpretive stance in the field of information systems is examined. The next section is about the research strategy. It describes the research approach followed in the case study research. Finally, section three deals with the research design and covers the reasons for selecting organizations, data sources, research analysis sub-units, data collection and analysis, and a brief summary of the expectations from the theoretical framework adopted.

3.2 Research design

For the purpose of this research work, we designed the research in order to suit the objective of the research. We scheduled and adapted the research design that would best answer the research question that governs the study. We then conducted both assessment and evaluation, since the research needs to find all fact pertaining to the study that exist at a point in time and also make judgment about the effectiveness, relevance efficiency or desirability of the study.

According to Peregrine Schwartz-Shea, Dvora Yanow Routledge, (2013) Research design is fundamental to all scientific endeavors, at all levels and in all institutional settings. In many social science disciplines, however,

scholars working in an interpretive-qualitative tradition get little guidance on this aspect of research from the positivist-centered training they receive. This book is an authoritative examination of the concepts and processes underlying the design of an interpretive research project. Such an approach to design starts with the recognition that researchers are inevitably embedded in inter subjective social processes of the worlds they study.

The philosophical assumptions underlying this research come from the interpretive tradition. This implies a subjective epistemology and the ontological belief that reality is socially constructed. The research strategy adopted was to conduct multiple case studies in two organizations and in a community. The fieldwork was conducted at the sites during the period from August 2021 to September 2021 and a steady correspondence has been maintained with the different informants at the sites. The main data collection techniques used in this research study were semi-structured interviews, participant observation, group discussion, documentation analysis and questionnaires.

3.3 Population of the study

Population as defined by Kinton (2016) is the entire pool from which a statistical sample is drawn. A population may also refer to the entire group of people, objective, event, and visit to standard mineral water or measurement. A population can thus be said to be an aggregate observation of subject grouped together by a common feature. Population parameter are typically numbers, such as the proportion of consumers who are loyal to a particular brand. The population of the study is the workers of standard mineral water and is made up of the top management, middle management and the lower management (junior staff)

3.4 Sample size and sampling techniques

According to Neetij Rai, Bikash Thapa Kathmandu: Kathmandu School of Law, (2015) ^[5] Purposive sampling research is a scientific process of investigation and experimentation that involves the systematic collection, analysis and interpretation of data to answer a certain question or solve problem.

Purposive sampling was a sampling technique which was used in selecting appropriate sample to meet the objectives of the research of the study. Purposive sampling was used in selecting sample size of twenty (20) of which ten (10) emanated from the procurement and stores department, five (5) from the finance and five (5) from the store department. In all, a sample of twenty (20) respondent were selected for the study. This technique was used because it is a procedure which would help in reaching the target related to the research.

We as well focused much on the use of purposive sampling to help us select the appropriate sample for the research. The sole objective of the use of purposive sampling is to focus on particular characteristic of the target population that were of interest and best motivated and enabled in the answering of the research questions. Purposive sampling provide us with several justification to make necessary generalization for the sample that was studied. But despite its merit, the use of purposive sampling was prone to researcher's bias.

In this study, all the research questionnaire were presented to standard mineral water. A total of twenty (20), thus ten (10) to the procurement and stores department, five (5) to

the information technology department, three (3) to the human resource department and two (2) to the planning and investment department. These questionnaires in some case were used as interview guide for the staff and assisted us the researchers extract vital information needed to aid the research.

3.5 Data sources / collection method

Data collection was done through both secondary and primary sources. Primary data sources included key informants for each case study. Secondary data sources mainly covered government publications, technical document, and annual reports of the company. Valuable insight was also gained from the analysis of research studies conducted by the researchers in the country. Secondary data covered different sources and provided an essential preparation for the interviews. Secondary data helped to cross-check official information, learn about major events, technical details, historical decisions and main organizational players and roles. They also supported the exploring of particular responses during interviews. For this study it was possible to conduct the data collection and analysis in an iterative manner.

3.5.1. Data collection and analysis

According to Roger Sapsford, Victor Jupp Sage, (2013) in simple and nontechnical terms Data Collection and Analysis explains and illustrates the range of techniques and approaches used in social research projects. This comprehensive textbook covers both quantitative and qualitative approaches to data collection and analysis in social research, considering the structure and logic of research projects and the ethics of research. The main data techniques used in this research study were semi-structured interviews, participant observation, group discussion, secondary source analysis and questionnaires. Personal interviews constituted one of the most important and valuable sources of information.

The social nature of information systems has led us the researchers to adopt research approaches that focus primarily on human interpretations and meaning. Interpretive studies advocate a relativistic understanding of the phenomena being studied (standard mineral water). Researchers see the pursuit of meaning and understanding as subjective and knowledge as a social construction (standard mineral water). We examine the social reality and subjective meanings held by people by eliciting and observing what is significant and important to them. They are not reporting facts, but their interpretations of other people's interpretations. There is no rigid separation between data collection and analysis, and the process is an iterative cycle of data collection and analysis, with the intention that the results of the analysis will help guide the subsequent collection of data. The interviewees were chosen for their relevance to the conceptual questions rather than their representativeness. It was deemed essential not to limit interviewees to staff.

The study method necessitates the collection of a large amount of rich, 'thick' qualitative information from a number of sources in order to address the complexity of the organizational processes and of the context studied.

During the fieldwork, the cross-checking mechanisms for the data pertaining to the case study were of an evolutionary nature, i.e., the questions were clarified and also refined

during the process of gathering data. The key informants have checked the results of the analysis by reviewing transcriptions of the interviews, and meetings were also held with some key participants in order to give us a chance to reflect on the case study i.e. the role of material coding and classification of store management in Standard Mineral Water.

A presentable formal documentation of the field material for the study was created, which consists of all the data or pieces of evidence, data collection instruments, interviews transcriptions and field notes. This will enable other investigators to review the evidence directly and not limited to the written reports. The analysis of data was done by following the trends in the patterns that emerged in the course of the research that explain past data.

The analysis of data firstly dealt with the description of the study based on the data collected via different instruments. Secondly, an analysis was done in similar and different patterns in the case study. Finally, considering that this research study is composed of three different methods of collecting data, it was necessary to search for patterns in the case study. This enabled us to develop a strong body of evidence from the study.

3.5.2 Questionnaires

To enable the researcher obtain information on the topic, "Role of Coding and Classification of store management", questionnaire were designed to Standard Mineral Water distributed to selected number of employees in the firm. According to Saunders *et al.* (2009) questionnaire is a written list of question, the answer to which are recorded by respondent. In the questionnaire, respondent read the questions, interpret what is expected and write down the answer where appropriate.

The aim of the questionnaire designing is to enable researchers to obtain response from the various respondents. The selection of respondent was done through a number of targeted people. According to Anthony J Onwuegbuzie, Nancy L Leech International journal of social research methodology 8 (5), 375-387, (2015) ^[2] the last 100 years have witnessed a fervent debate in the USA about quantitative and qualitative research paradigms. Unfortunately, this has led to a great division between quantitative and qualitative researchers, who often view themselves as in competition with each other. Clearly, this polarization has promoted purists, namely, researchers who restrict themselves exclusively either to quantitative or to qualitative research methods. Mono- method research is the biggest threat to the advancement of the social sciences. Indeed, as long as we stay polarized in research, how can we expect stakeholders who rely on our research findings to take our work seriously? Thus, the purpose of this paper is to explore how the debate between quantitative and qualitative is divisive hence, counterproductive for advancing the social and behavioral science field. In so doing, students will develop into what we term as pragmatic researchers.

We used a structured questions to gather specific data for mainly quantitative research, and on certain instances qualitative analysis. The structured questions are closed-ended in nature, which would prompt the respondent to give specific answers and not deviate too much on the query. The scope of giving generalized answers to the structured question is very little. In the case of structured questions, the

questionnaire has close-ended questions. The replies on this kind of questions are well utilized to construct the frame of the qualitative study with the theoretical analysis of a particular situation or event. To obtain valid response, the researcher combined both the open ended questions and the close ended question.

Respondent may be reluctant to answer the questions and takes a lot of time in gathering responses.

According to Alan Bryman Qualitative and Quantitative research 6 (1), 97-113, (2006) this article seeks to move beyond typologies of the ways in which quantitative and qualitative research are integrated to an examination of the ways that they are combined in practice. An examination of the research methods and research designs employed suggests that on the quantitative side structured interview and questionnaire research within a cross-sectional design tends to predominate, while on the qualitative side the semi-structured interview within a cross-sectional design tends to predominate.

3.6 Pilot studies

According to Edwin R Van Teijlingen, Vanora Hundley Department of Sociology, University of Surrey, (2010) [4] The term 'pilot studies' refers to mini versions of a full-scale study (also called 'feasibility' studies), as well as the specific pre-testing of a particular research instrument such as a questionnaire or interview schedule. Pilot studies are a crucial element of a good study design. Conducting a pilot study does not guarantee success in the main study, but it does increase the likelihood. Pilot studies fulfil a range of important functions and can provide valuable insights for other researchers. There is a need for more discussion amongst researchers of both the process and outcomes of pilot studies.

A pilot study was conducted on ten (10) employees at the procurement and stores, finance and the stores department;

that is five (5) at the procurement department, three (3) at the finance department and two (2) at the stores department. This was done to ensure efficient and effective use of the data collection method.

Questions were asked in the form of questionnaire for which respondent were given the pace to air their views and perceptions about the work by responding to questions provided in the questionnaire. The questionnaire, were also used in the form of an interview guide, especially to the staff who felt reluctant to answer the question which was given in the writing.

4. Presentation of findings, analysis and discussions

4.1 Introduction

This chapter deals with the analysis and interpretations of data. The data obtained was critically examined to know the views of procurement and stores department, information technology department, Human resource department, and the planning and investment department in relation to the effect of the role of material coding and classification in stores management in the organization (Standard Mineral Water). The data collected was analysed to really find out what is pertained on the ground.

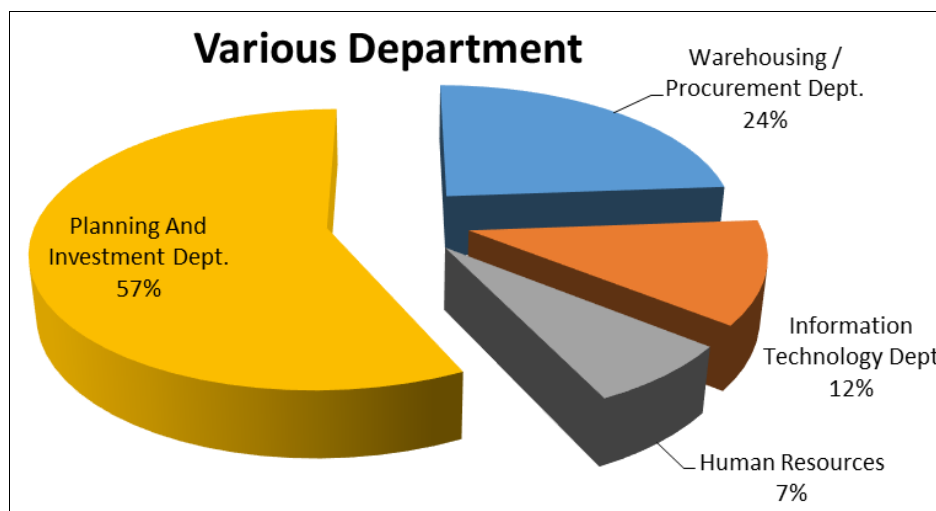
4.2 Presentation of Findings

The analysis has been presented in a tabular and graphically represented where necessary.

Table 1: Various Department

Department	Number Issued
Warehousing (Procurement) Department	10
Information Technology Department	5
Human Resource Department	3
Planning and Investment Department	2

Source: Field survey (2021)



Source: Field Survey (2021)

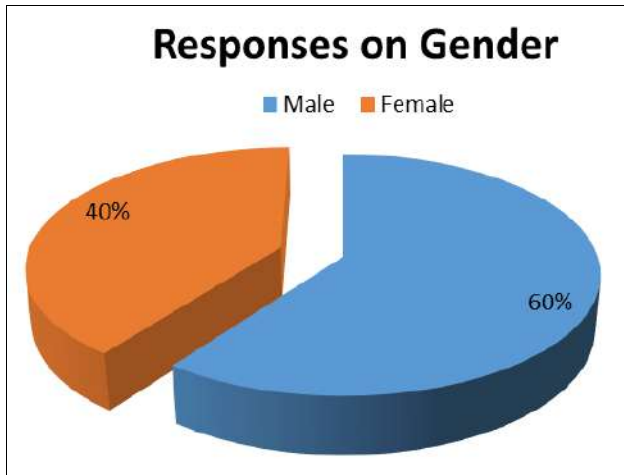
Fig1: Various Department

Table 2: Responses on Gender

Gender Responses	Frequency	Percentage (%)
Male	15	75
Female	5	25
Total	20	100

Source: Field survey, (2021)

Table 2 shows responses of gender indifference in the organization, the data collected from respondents show that, 85% were males and 15% were females, representing 15 and 5 respondents respectively.



Source: Field Survey (2021)

Fig 2: Response on Gender

Age Group

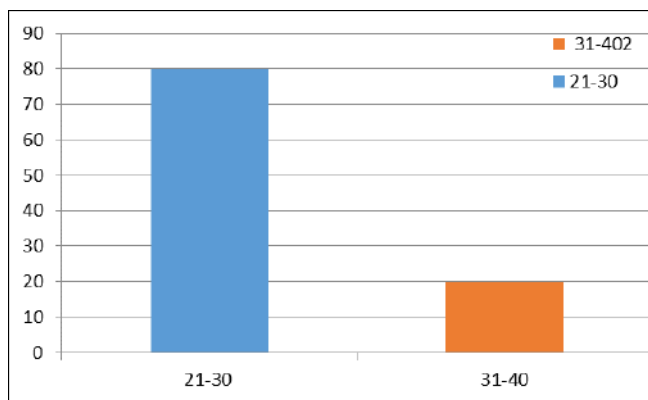


Fig 3: A Bar chart showing age group responses

Figure 1 shows collected data on the ages of the respondents. Out of the total of twenty respondents, sixteen were within the age range of twenty-one to thirty years, 4 were within the age of thirty-one to forty years, and none represented the ages below twenty years and above forty-one years, representing 80% and 20% respectively of the entire sample population.

4.2 Relationship between codification and stores management efficiency

From the information gathered, 10 of the respondent strongly agreed that organization has a relationship between codification and stores management which represent 50% of the entire respondents whereas 5 of the respondent agreed to the question of whether the organization has a relationship between codification and stores management which also represent 25% whereas 5 respondent chose neutral of the entire sample size representing 25%. This indicates that the organization has a relationship between codification stores management efficiency.

4.3 Whether the Purchasing Department undertake all Procurement of Items

Information on whether it is the responsibility of the purchasing department to undertake the procurement of items in the organization was gathered and it was established that it was the purchasing department which is solely responsible for all purchases in the organization. This

is because 18 of the entire respondent representing 90% of the sample size said that it is the purchasing department which is responsible for all purchases in the company whiles 2 of the respondent representing 10% of the sample size chose neutral as to whether the purchasing department undertake all procurement of items.

4.4 Whether Purchasing is Strategic Competence in the Organization

It was established through the data collected that purchasing is a strategic competence in the organization as 15 of the respondent representing 75% of the sample size strongly agreed to that assertion whereas 5 of the respondent represents 25% of the population sample chose neutral as to whether purchasing is seen as a strategic competence in the organization.

5. Discussion, Conclusion and Recommendations

5.1 Introduction

5.2 Discussion of the study findings

5.1.2 Codification activities

The study found that there is a positive significant influence of codification on warehousing and store management efficiency. In order to achieve effectiveness that is subject to warehousing and store management efficiency, there is a need for codification for easy identification of items in an organization. It was observed that, well material identification is necessary if warehousing and store management efficiency is to be realized.

5.1.3 Factors affecting stores management efficiency

Table five revealed a number of factors affecting warehousing efficiency. This included technology which looks at providing immediate response and high quality solutions to their customer’s demands, this is consistent with the findings of (Wang 2016) who noted that adapting new technology will greatly affect stores. This study also revealed that space utilization is one of the other factors that affect warehousing and store management efficiency, this is in line with (Van den Berg 2001).

5.1.4 Relationship between codification and store management efficiency

The findings revealed that codification helps the entity to control its inventory; this is because it reduces the amount of stock at hand by increasing the inventory turnover ratio, and this is consistent with (Martin Murray).

The study also revealed that codification enables the organization in requesting items or the operational department in placing of orders by purchase department. The findings agree with the findings of (Wasi Rahman) who emphasize that codification also helps in receiving and expediting the items on receipt from supplier.

5.3 Conclusion

Codification of materials is a step in maintaining stores in a systematic way; materials are classified in such a way that storing, issuing and identifying of products become easy generally. The study aimed to find out effects of codification on warehousing and store management efficiency.

In addition, the study investigated factors affecting material coding and classification of store management efficiency and finally the relationship between codification and store

management efficiency. This study provided that codification has a positive effect on store management efficiency. This implies that an increase in adapting codification leads to increase in store management efficiency. As a result, the study concludes that codification activities implanted were carried out positively. A positive increase in implementation of codification activities adapted leads to increased store management efficiency in terms of product identification among others as explained earlier. Materials identification and classification of items were found to have greater impact on store management efficiency. This is in agreement with some of the existing literature. This study provides substantive support for previous finding on effects of codification on store management efficiency and fresh insight about codification. In overall, codification was found to be collectively having an increase in store management efficiency. Subsequently, the study has a basis to conclude that collectively, codification positively influence standard mineral water.

5.4 Recommendations.

Based on the study findings the following recommendations are made. Technology, storage space costs, were some of the issues in line with codification that came out as respectively having the strongest influence on store management efficiency.

1. The organization should employ professional workers to undertake codification and facilitate their continuous training to ensure they are well equipped with necessary technical skills, this will ensure effectiveness of store management.
2. Adoption and implement of new existing technology to ease work greatly for example CCTV cameras to track inventory in store to prevent theft.

6. References

1. Alan Bryman Qualitative, and Quantitative research. 2006;6(1):97-113.
2. Anthony J Onwuegbuzie, Nancy L Leech. International journal of social research methodology. 2015;8(5):375-387.
3. Corporations (Conversion to Companies) Act 461 of 1993 as amended by LI, 1648.
4. Edwin R Van Teijlingen. Vanora Hundley Department of Sociology, University of Surrey, 2010.
5. Neetij Rai, Bikash Thapa Kathmandu. Kathmandu School of Law, 2015.