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The nature of outsourcing and challenges encountered by mining firms in Ghana during the COVID-19 pandemic

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ABSTRACT

The global covid-19 pandemic has affected significant industries across the globe. Whereas this is known, little is known about the impact of the Covid-19 on outsourcing amongst the mining industry in a developing country where mining activities pre-dominates.

The study sought to explore the nature of outsourcing and challenges encountered by firms in the mining industry in Ghana during the COVID-19 pandemic. The researcher examined four interrelated goals to achieve this aim: reasons for outsourcing, outsourced functions, methods used in outsourcing, and challenges of the global covid-19 pandemic on outsourcing.

The study made use of an exploratory multiple-case study design. Primary data was obtained from three case companies in the mining industry in Ghana through semi-structured interviews. Cases were selected through theoretical replication logic in which three cases were selected to explore contrasting results to achieve the research objectives. The data were analyzed and coded using inductive coding approaches. Data presentation and report followed a thematic approach, and findings were supported with a quotation from participants.

Mining companies outsourced for several reasons: limited in-house technical skills, the financial cost of production/services, support service risk avoidance, and competition. Whereas core functions were rarely outsourced, non-core activities which were process-specific and operational-specific functions were outsourced. The outsourcing procedure was mainly through competitive bidden/Open tender. The covid-19 pandemic had a significant threat to outsourcing through reduced logistic inflows, lost man-hours, time constraints, reduced work speed, limited staff, increased expenditure, increased transportation cost, Covid-19 personal protective equipment costs, and limited suppliers.

The constraints posed by the global outbreak of covid-19 affected mining industries to increase outsourcing services in Ghana. Such effects can further affect the income of mining companies through increased expenditure on the cost of non-core functions. The mining industry, therefore, requires responsive models of engagements to mitigate the impact of the Covid-19 pandemic on mining firms in Ghana

List of Abbreviations

SOS- Sustainable Outsourcing Strategy

GCM-Ghana Chamber of Mines

PMMC-Precious Minerals Marketing Company

GMC-Ghana Manganese Company

BOG-Bank of Ghana

CC-Core Competencies

RBV-Resource-Based View

TCT-Transaction Cost Theory

TCE-Transaction Cost Economics

IT-Information Technology

KPIs-Key Performance Indicators

FIFO-Flying in and flying out

PPEs- Personal Protective Equipment

DRC-Democratic Republic of Congo

SSCM-Strategic Supply Chain Management

SCM-Supply Chain Management

SCRM-Supply Chain Risk Management

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CHAPTER 1

INTRODUCTION

1.1 Chapter Introduction

The chapter in context summarizes the thesis subject and reveals a research gap in outsourcing and challenges encountered by firms in the mining industry in Ghana during the COVID-19 pandemic, with a clear research objective and questions to find answers at the end of the research.

1.2 Background for the thesis

Supply chains and global sourcing has become more complex and fragmented. (Xiaoxiao & Zikui, 2019). Due to its specialization and complexity has impacted overall performance, quality of service, efficiency, and effectiveness in the supply chain, an effect of a pandemic such as COVID 19 (Xu et al., 2020, Pujawan & Bah, 2021). Streamlining outsourcing procedures and processes and aiming to provide sustainable supply chain solutions to challenges in outsourcing is the new development of focus for management in the supply chain discipline. Disruptions in the supply chains always affect outsourcing, which involves productivity, operational waste due to inefficiencies, delays, and loss of revenue. (Supply Chain Quarterly Staff, 2020).

Even though logistics outsourcing is a management strategy that shifts the organizational structure of companies and business transformation processes, this presents excellent opportunities for improved performance. It can also create problems, managerial issues, and failure if poorly pursued (Kenyon & Meixell, 2011). Outsourcing arguably plays a significant role in organizational performance. Its role of maximizing place utility and waiting time convenience, shorter lead times, and better after-sales support or service to customers determines, to a large extent, customer satisfaction which invariably leads to a better performance by the organization in terms of a larger base of satisfied customers and other benefits (Carton, 2014). However, the main problem is the procedure or approach used in outsourcing, the current outsourcing situations, and the typical activities outsourced as the COVID-19 pandemic is concerned. (Victoria B,2020). This could account for the reasons why some organizations still find no motivation to adopt the outsourcing strategy. However, this study seeks to uncover how it is essential to outsource in the mining industry, why do

managers in the mining industry outsource, what activities that are necessary to outsource, how this outsourcing is done, and the effect outsourcing has on the company's operational efficiency during the COVID-19 pandemic.

1.3 Research Objectives and Questions

The study's main objective is to explore the nature of outsourcing and challenges in the mining industry in Ghana during the COVID-19 pandemic. The research seeks to explore extensive literature in combination with a multiple case study research design. In quest of this research, it uncovers and examines a clear focus and understanding into the strategies, techniques, tools, and tactics to manage and specific determinant of critical factors for successful outsourcing in the mining industry and to handle disruptions in the supply chain which has become a strategic management problem. Identifying how outsourced functions are managed between parties and examining the challenging functions outsourced and evaluating how outsourcing reduces cost, achieves value, and sustainability in the mining industry in Ghana. The research findings will exhibit how firms in the mining industry in Ghana are handling outsourcing activities and uncover the various challenges encountered during the COVID-19 pandemic. Also, there will be much knowledge acquired from the experts in the supply chain department of the case companies used in the research to understand the mitigation measures implemented by those firms in ensuring the continuous flow of outsourcing activities during the COVID-19 pandemic without massive disruptions of their supply chains.

1.3.1 Questions

Outsourcing is a widely studied topic in logistics academically and in practice. Still, not many studies have been conducted regarding the nature of outsourcing and challenges in the mining industry in Ghana, to be specific, during the pandemic. Exploring the main research problem requires a set of relevant and concrete research questions that seek to find answers to the primary research problems. The research questions developed contribute toward gaining a broader view and understanding of the immediate research problems.

Exiting literature has proposed various models of the outsourcing process. (Van Weele 2005, The focus has always been the initial planning process and what activities to outsource.

(Hätönen & Erikkson 2009). Which usually does not include mitigation and risk measures in outsourcing during unforeseen pandemics such as COVID-19. Current outsourcing literature focuses on the strategic level of outsourcing with very little insight into how outsourcing can impact operational performance during disruptions in the supply chain. Research reviews for future research can include multiple questions from existing outsourcing research papers.
(Hätönen & Erikkson 2009).

Why do managers in the mining industry in Ghana outsource business functions?

This is the first and most relevant because deciding to make or buy in house or outsource is very strategic. It is therefore critical to identify the importance and understand the reasoning behind outsourcing decisions towards operational performance.
Most companies no longer agree that managing all organizational activities internally can reduce the company's cost but rather increase the overall cost of production. It becomes, therefore, essential to understand the main critical reasons involved in outsourcing some business functions. The reason why this question is interesting in the research is to know whether case companies in the mining industry in Ghana practice in accordance with the recommendations by theories if they do not act in accordance to that, then it becomes curious to know what they practice on the field and which difference it makes from what theories are recommending.

What functions are outsourced in the mining industry in Ghana?

The second research question aims to provide information on the various functions within the organization considering the core and non-core functions of the company and seek to investigate from previous research literature the various functions in the mining industry, organizational functions that are regarded as most important, and why these functions are usually outsourced. Firms outsource different functions in the mining industry and differ from firm to firm according to organizational priorities. What they consider as core and non-core, their business focus and cost drivers, therefore having a clear understanding of the various functions/activities in the mining industries that are outsourced, recommendations and compare with what is already established in the literature.

What are the current methods used in outsourcing in the mining industry?

Firms who practice outsourcing today have various strategies, procedures, and methods of outsourcing functions of the organization for long term or short-term purposes through a network of stable contract agreements between the outsourcers and contractors, and vendors; it is, therefore, crucial to know and understand the approach used in outsourcing the various business functions in the mining industry to achieve higher productivity.

What are the challenges of managing outsourcing during the COVID-19 pandemic?

Outsourcing enhances the production cost and uses skills and intellectuals that cannot be sourced in-house, but it is not risk-free. COVID-19 posed a shock to industries by the disruption of various supply chain networks globally. As a result, it has become crucial to comprehend the risk factors in managing outsourced activities in the mining industry and seek mitigation measures in managing supply chain risk during this Coronavirus pandemic.

1.4 Chapter summary

This chapter involves the context of the significant subject for the thesis. It presents the research gap in outsourcing and challenges in the mining industry in Ghana during the COVID-19 pandemic. Moreover, the chapter included the primary research objective and relevant research questions that seek answers to in the research process.

The organization of the thesis for the other chapters are as follows: Chapter 2 contains the examining of existing literature, i.e., Overview of Outsourcing, Forms of Outsourcing, Drivers of Outsourcing, outsourcing life Cycle, application of outsourcing in the mining industry, COVID-19, and Global mining industry as well as theoretical frameworks. Chapter 3: Research methodology with justifications for all methodological choices and data collection approach used in the study to ensure the research's validity and reliability for all three cases. Chapter 4: Findings and analysis from the three case companies, Furthermore Chapter 5: Discussion about the findings and extent to which they fit with the theories. Finally, Chapter 6: Conclusion, limitation of the research, and areas of further investigation.

Chapter 2

LITERATURE REVIEW

2.1 Chapter Introduction

This chapter explores the "background of outsourcing." The literature will examine relevant literature on outsourcing, benefits, and challenges in relation to the mining industry and the effects of the COVId-19 pandemic. Secondly, the "Theoretical framework" SCM element and theories to establish the relationship between outsourcing and COVID-19 will make the reader assess and make their judgment or application in outsourcing. Also, explore how existing researchers define outsourcing and processes and procedures used in outsourcing and risk involved in their theories and definitions.

2.2 Overview of Outsourcing

2.2.1 Definition

The concept of outsourcing was derived from two words, "outside and resourcing," which means obtaining resources externally, where independent professionals, specialists, and trainers are sourced. Economically outsourcing benefits companies, makes them more competitive, and improves efficiency by focusing on core functions and growing their business. (Troaca and Bodislav, 2012).

According to Gilley and Rasheed (2000), Outsourcing is defined as the fundamental decision by management to reject the internalization of an activity within an organization. Pointing out the confusion in management literature that there is no clear definition for all, further on proposed that outsourcing can occur in two ways, through substitution and secondly abstention. Substitution occurs when internal activities are replaced through outsourcing, while abstention occurs when business functions are never performed in-house and outsourced.

Outsourcing generates an image of multiples of projects outsourced worldwide. However, vendors of outsourced contracts may be in the same country, the town of business operations, or international. Outsourcing is not a new phenomenon. It has gained more big consideration since the 1990s. (Walker et al., 2006, p.45). There is more focus on outsourcing in manufacturing and mining by firms, and professional services are growingly outsourced. The outsourced functions or activities are IT, security, health, transportation, hospitality

management, exploration, and mine maintenance. While outsourcing from an auditing point of view is defined as the utilization of external providers towards the satisfaction of capital requirements of any company, thus labour material and plant such definition encompasses resource acquisition decision. (Franceschini, F et al. 2003) agued on the meaning of outsourcing, it is a strategic management decision whereby an organization delegates a function onto specialized service providers' core mining and mineral industry worldwide. The importance of outsourcing has seen an increase dramatically over the last decades.

Outsourcing involves transferring activities involved in the production process, goods, and services carried out internally to an external provider. (Mulama 2012). According to USAID, outsourcing is “engaging third-party providers to perform services to the host organization previously performed in-house.” Outsourcing can also be defined as an organization transferring full or partial ownership of a service or function of the business done in-house to a third party. (O’Riodan & Sweeney (2007). Among all definitions of outsourcing by various academic scholars, I would prefer to use the definition by (Mulama 2012) because not all outsourcing activities can be performed internally or outsourced externally or to a third party.

2.2.2 Forms of Outsourcing

According to (Brown and Wilson, 2005), Outsourcing can be divided into three types, namely tactical, strategic, and transformational outsourcing.

2.2.2.1 Tactical outsourcing

Most organizations use this type of outsourcing to get better service and value for money on less investment within a shorter lead time from an outsourced service provider, inadequate financial resources for capital investment, lack of managerial competencies in-house, and the desire of management to downsize. In tactical outsourcing, its bases are mainly cost comparison and the decision to make or buy. The effect of tactical outsourcing is cost savings and reducing the need to invest vast sums of money in the future—constructing the formal contract agreements and ensuring that vendors and contractors abide by the contract terms. Tactical outsourcing is employed to ensure the immediate reduction of cost. Most companies are running their business with longer payment terms for all goods and services procured from vendors. Tactical outsourcing is one of the means of addressing such problems.

Tactical outsourcing involves the following activities: Routine maintenance planning activities, which are mainly preventive routine, predictive and corrective maintenance activities, and shut down the processing plant maintenance.

2.2.2.2 Strategic Outsourcing

Outsourcing strategically has become an improvement initiative rather than just outsourcing from a potential vendor. Critical issues have to be considered to achieve a more significant result; making the strategic decision concerning what to outsource and what not to outsource. Unlike tactical or operational level outsourcing which is more featured with the problem-solving approach at the managerial level, strategic outsourcing, on the other hand, takes into consideration the overall structure and performance of the organization by seeking solutions to how relevant outsourcing is to an organization considering the goals and objectives of the company also gaining current and future competitive advantage in the business environment. Outsourcing specific functions of an organization to focus on the core functions requires good vendor and company relationship between two parties in the form of partnerships and part of the business with mutual benefits for both parties rather than a normal outsourcing relationship between buyer and supplier, which often ends after the supply of goods and services. The overall business improvement is the core of strategic outsourcing rather than cost management; therefore, attaining goals can be achieved by focusing on core activities towards organizational success. (Mahamoodzadeh et al. 2009).

2.2.2.3 Transformational outsourcing

Transformational outsourcing is a partnership agreement form of outsourcing between a client and an owner company to achieve a rapid, substantial, and more sustainable improvement in the overall business process. (Mohr, J. J. et al., 2011). This form of outsourcing is not just saving costs and adding value to the business. Transformational outsourcing is a strategic and innovative approach for competitive and improved sustainability in exploiting opportunities in a business environment. It is essential to involve organizational and operational structure changes, trust worthiness, and operational collaboration between clients and service providers. Both client and services providers have their own goals and objectives for entering into an agreement. The client's organizations always want to gain access to lower production while maintaining their greater advantage in the design and implementation and customer knowledge. On the other hand, service

providers also spread risk across clients and increase profit. In transformational outsourcing, good governance, continuous improvement of business process knowledge, and good drafting and monitoring of Service level agreements (SLAs) are essential. The level of risk is exceptionally high. Risk mitigation such as very high-security levels, project management skills, and continuous business improvement plans to ensure outsourcing transformational becomes a success. Making a strategic decision whether a specific business function should be outsourced or managed by the company requires assessing assets, competencies, and capabilities to perform the function in-house. The resource available will ensure the determining of proper governance.

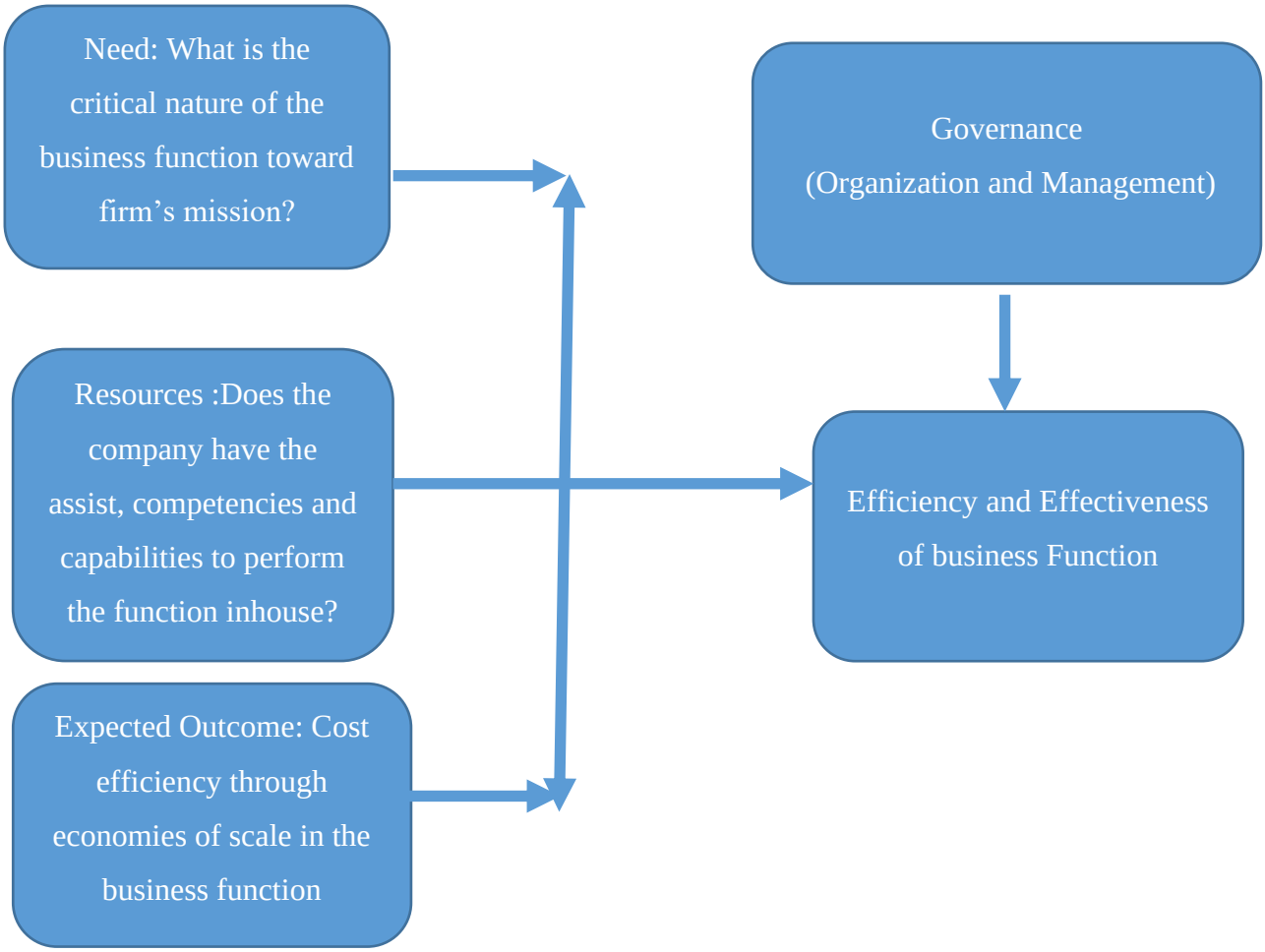


Figure 1: Outsourcing Governance and underlying conditions of business functions)

Source: Researcher

Outsourcing business functions to services gives economies of scale by combining the functional requirement with their great advantage over many clients. Hence the expected outcome of a firm's contemplating to outsource is obtaining cost efficiencies, and whether these cost efficiencies can be realized is an essential determinant of governance.

2.2.3 Drivers of outsourcing

Competitiveness in today's business environment is determined by the firm's ability to meet the constant changes in customers' demand. The market dynamics do not make it feasible for firms to build competitiveness and sustain it in all the processes o the value chain. (Ramachandran and Voleti, 2004). Drivers of outsourcing can be grouped as internal or external. Outsourcing today has become a sustainable reason than just cost savings.

Traditionally outsourcing strategies are measured by financial, business, and economic indicators such as overall cost of production, lead times, quality of product and services, and benefits. Sustainability has become the norm whereby society and the environment call for sustainability development in all aspects of businesses, which seeks to balance the profit of firms and the price paid for sustainability: environmental impact, moral principles, and labour protection.

Sustainable outsourcing strategy (SOS) can be achieved by compromising between organizational gains and sustainable development goals. (Zheng, Y. (2017). The most critical driver of outsourcing includes financial reasons such as cost reduction and profit maximization. (Bhattacharya et al. 2003). Technically, outsourcing decisions are access to new technology, expertise and skills, and quality of service. Strategically outsourcing enhances the use of innovative ideas into the business and improvement of core competencies. (Brown and Wilson, 2005). According to Birmrao Ghodeswar and Janardan Vaidyanathan, outsourcing drivers can be classified into four categories: organizational, improvement, financial, and cost and revenue drivers. In addition to the following sub-sections, the different outsourcing drivers are summarized in table 1 of the research.

2.2.3.1 Organizational drivers

The main objective of outsourcing by firms is to focus on the core business and increase flexibilities in changing business environment. The current demand for goods and services is changing through modern technologies to improve operations efficiency and achieve high stakeholder values. Tactically outsourcing other managerial components of business function enhances attention to strategic issues such as new product development improvement and market positioning. The transformation of resources towards non-core activities to provide more excellent service to customers. Business function of this nature is usually identified and outsourced to specialist or technically inclined vendors. Through

outsourcing, organizations can proactively identify some core business functions that are of low importance due to changes in market demand, which provides the labour force with career development and improved commitment and working culture towards non-core areas of the organization.

2.2.3.2 Improvement drivers

Significantly the objective of this initiative is the improvement of operational performances. Obtaining skilled expertise, improved management and control, management of risk, and acquisition of innovative ideas by outsourcing to service providers. Improvement measures such as productivity, quality of operations, operational lead times, utilization are the target. When a company realizes that the required skills and technical knowledge required are inadequately sufficient for a business function in house due to changes surrounding the working environment, it will then outsource such function to a specialized and experienced service provider or contractor with high potential is the administration and experience workforce with track records of best performance with standards and safety in the industry. Outsourcing gives opportunities for companies to adapt to dynamics in the market, more flexibility, and exploitations of changes in options.

2.2.3.3 Financial and Cost drivers

Organization's main aim is to reduce the overall cost of production and investment and reinvest savings or resources in other aspects of the business and also improve cash flow by transfer of assets to service providers, Organization when outsourcing some business functions, tend to reduce the investment expenditure of the firms, it improves financial measurement by elimination of the need to show equity returns on capital investment of non-core functions of the organization. Outsourcing becomes a substitute for building capacity in the quest to expand operations in new sites or geographical locations. Controlling and operations costs are reduced through outsourcing; going in for third-party suppliers with lower operational costs is one of the benefits of outsourcing in the short run. Service providers outsourced can handle varying operations more efficiently due to automation, economies of scale, process maturity, and investment in modern technology.

2.2.3.4 Revenue Drivers

The main objective of outsourcing is to increase profit on the market and take advantage of the state-of-the-art technology, systems, processes, and capacity of service providers. Usually, the need for outsourcing arises when firms identify limited capacity and capabilities. Expansion of capacities is a considerable investment that will take several years; therefore, a substitute to continue production and position in the market is to take advantage of service providers. Companies who engage in outsourcing can achieve high revenues through transformational outsourcing where assets of the Organization is transferred to the service provider, i.e., Facilities, equipment, vehicles on-site, permits, and licenses which is of great value and sold to the service provider as part of the agreement which results in an infusion of cash.

Table 1: Summary of Major Drivers of Outsourcing

Source :(Jon Beale,2016)

Major Drivers for outsourcing

Organizational Drivers	To achieve a greater focus on core business To increase flexibility to deal with ever-changing business conditions Assign operational issues to an outside expert To have greater trust in the market position and to develop new products To redirect available resources from non-core activities to greater focus on customer satisfaction
Improvement Drivers	To improve operating results, quality, timeliness, and productivity To obtain expertise, skills, and innovative ideas To obtain modern technologies which are not available in house

	To improve management and monitoring of operational processes, including risk management To enhance credibility and image by associating with superior providers
Finance and Cost Drivers	To reduce investment in assets To reduce the investment capital funds in non-core business functions To expand business in new geographical areas To access lower cost structure of outsourced providers To achieve cost reduction with enhanced performance To manage varying demands more efficiently due to economies of scale
Revenue Drivers	To achieve aggressive growth goals by gaining increased market access To leverage on the service provider's best processes, capabilities, and systems To expand the ability to design, test, and build new products and services To stretch its limits in handling the increased volume of business To manage demand efficiently through outsider automation, process maturity, and latest technologies To focus on the facilitators of business growth and strategies to fulfill them

2.2.4 Outsourcing Life Cycle

Outsourcing is driven by an approach that provides a systematic overview of the entire outsourcing arrangement, whether the nature of the outsourcing project is small or large, onshore or offshore, based on competency and capabilities. It is important to follow a step-by-step method to ensure success and sustainability in outsourcing relationships with service providers, vendors, and contractors. It is necessary to ensure effectiveness and efficiency in outsourcing; through practical experience over time, the organization is going through the outsourcing cycle should not be a problem

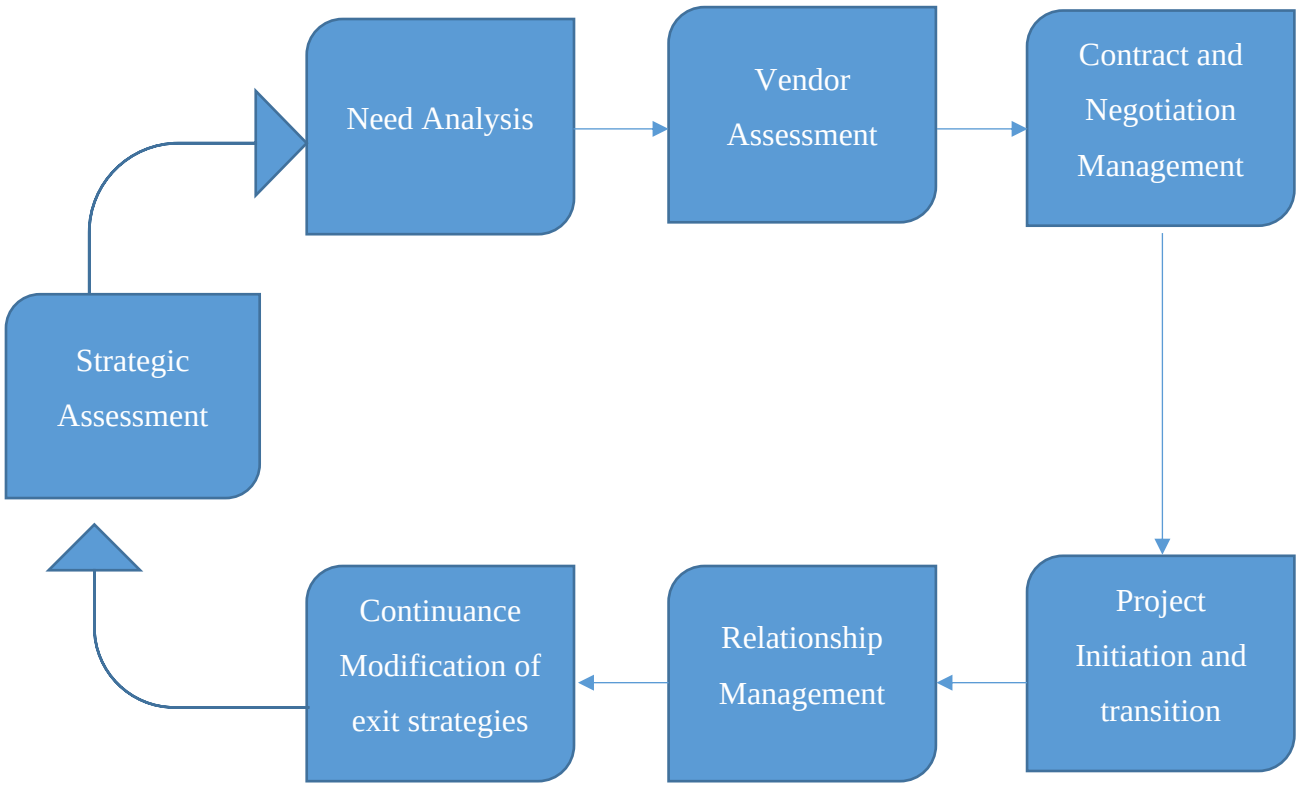


Figure 2: The outsourcing life cycle, a step-by-step approach in ensuring strategic outsourcing. (adapted from Power Mark 2006)

Figure 2 above is a step-by-step approach to ensuring effective and strategic outsourcing processes to achieve optimum results. Strategically outsourcing is influential tool organizations employ to increase their competitiveness, performance, and efficiency in operations. Assessment of the strategic need is a focal point where an organization identifies the importance and benefits of applying outsourcing strategies. Analyzing the core competencies and functions required to be outsourced, a team can conduct operational, financial, quality, and risk assessment through assessment by professional and managerial skills. After completing a strategic assessment, it is essential to prioritize the need and define the outsourcing project at the operational level to be outsourced and focused on. Conducting a need analysis becomes the next step of the outsourcing cycle, where a proposal is made known of the need to outsource to potential vendors. Thirdly, after identifying the need to outsource, sourcing, selection, and evaluation of potential vendors for the outsourcing need, a structured framework, a guide is employed in the critical selection, evaluation, and contracting of vendors, choosing the right vendor for the job is almost like choosing a

potential partner for long term projects, choosing poor performance vendors could jeopardize the expected result of an outsourced project.

As soon as a vendor is chosen for the project, it follows the engaging vendor in the negotiation and renegotiation process until both parties agree on a deal. A legally binding contract document that defines the scope of the outsourced project and all necessary specifications is approved and signed by both parties. It is essential to secure an agreement that is documented, not verbal, which is the best for both parties involved in the outsourcing relationships. Once the contract is signed, then the project initiation and transition phase must begin. This stage is where the project has already started. The client (organization outsourcing) exerts some monitoring and evaluation of the entire project or function outsourced through on-site inspections and other forms of assessment to ensure the conformance of standards, procedures, and terms of the contract are followed as per the agreement. It is a stage that assesses whether there is room for a continued relationship. It is, therefore, essential to understand the nature of the job and come up with problems until things get worse. Building a strong relationship with vendors and service providers is important in outsourcing through routine management of day-to-day operations and management meetings to ensure a strong and long-lasting buyer-supplier relationship. The main objective of an outsourcing relationship is to give opportunities for future projects. In executing an outsourced function or project, an event such as evaluating strategic alliance, changes in vendor business process, or innovations is employed regularly. An organization needs to evaluate outsourcing contract whether it fits the interest of the client organization or modification to be made to maintain the focus of the outsourced project and a good relationship with vendors.

2.5.6 Ghana Mining Industry

The mining industry in Ghana has been recognized as one of the top world producers and the largest in Africa in 2018 after South Africa. The industry is a major driving force of the Ghanaian economy and the most significant contributor of revenues and taxes to the government and export. Mining in Ghana contributes to about 37% of the total export,38,3% of the country's corporate tax earnings, total revenue of 27.6% of revenues to the government, and 6% of total GDP in the year 2011. Gold mining as a commodity alone contributes up to 90% of mineral export in Ghana. (Ghana Mining Industry Review 2020).

There are about 23 mining companies in Ghana. The mining sector employs about 28,000 human labour in the large mining companies, while 1,000,000 people are also engaged in the small-scale gold mining, diamond, and quarry business. The country has a wide variety of minerals, as one of Africa's largest producers of Gold and the key producer of diamond, manganese, and Bauxite.

Ghana has a large mineral deposit such as natural gas, salt, silver, and petroleum, discovered recently. Minerals exploration and mining activities are mostly carried out but require foreign investors. The government of Ghana owns some percentage of some of the companies. Private individuals can also invest in the mining industry in Ghana. An investment in the mining industry recently has boosted production and improved efficiency in gold production and Manganese. The government has implemented strict regulations to tackle irregularities, long-term issues of illegality locally called "galamsey," and environmental damage to the natural environment. (Ghana Mining Journal,2020).

The Ghana Chamber of Mines (GCM), founded in 1928, operates as a voluntary private-sector association representing companies engaged in the mining and mineral industry. Growth of the sector increased as a rise in the amount of gold assayed by the government's marketing firm Precious Minerals Marketing Company (PMMC), Which usually offsets its fall in the export of diamonds. The GCMs membership maintained its production record of 4.8oounces of gold in the year 2017-2018. The Ghana Manganese Company (GMC) improved its output by half to 4. 5million tonnes in the year 2017 and 2million in 2016 (Ghana Mining Industry Review Report 2020), `The industry was boosted with international demand and reasonable prices for gold and natural minerals as well as improvement in the supply by the recent capital investment by miners based in Ghana.

The export volume of gold increased around 20% to 4.6million ounces in 2017 and up from 3.8million ounces in 2016, according to the Bank of Ghana (BoG) data provided by the Ghana Chamber of Mines (GCM).

Ghanaian-based, large-scale producers increased their production output supporting the export of gold by licensed companies. Manganese as one of the precious minerals increased from 2million tonnes to 3million tonnes from 2016 to 2017, and the export o bauxite increased from 1.14milliomn tonnes to 1.47million tonnes which was an increase of 50% and 29%, respectively. Moreover, diamond export through PMMC saw a decline of 39% in 2017.

Table 2: Output of Producing Mining Firms from the year 2016 to 2018

Output of Producing Member Companies			
Company	2016	2017	2018
Gold Produced (US$)			
Gold Fields Ghana- Tarkwa	708,864,563	710,828,770	666,903,612
Newmont Golden Ridge Limited- Akyem	586,878,575	593,501,515	525,562,745
Newmont Ghana Gold Limited- Ahafo	434,741,967	437,410,929	552,814,514
AngloGold Ashanti Iduapriem Limited	268,261,229	285,592,063	322,611,642
Chirano Gold Mines	258,452,610	317,626,290	285,981,659
Perseus Mining (Ghana) Limited	165,324,528	252,542,488	276,642,909
Asanko Gold Mines	195,388,905	256,203,177	285,008,422
Abosso Goldfields Limited- Damang	183,390,746	180,268,662	228,953,694
Golden Star Wassa Limited	129,284,717	172,864,696	190,015,785
Golden Star Bogoso Prestea Limited	111,970,441	164,261,555	95,837,297
Adamus Resources Limited	107,150,748	147,685,310	131,032,157
AngloGold Ashanti Limited- Obuasi	3,268,846	3,460,288	-
Total	**3,257,646,310**	**3,522,245,743**	**3,561,364,435**
Gold Assayed (US$)			
Precious Minerals Marketing Company (Local sources)	1,999,943,636	2,234,545,039	
Precious Minerals Marketing Company (Transshipment)	n.a.	20,506,676	
Total	**1,999,943,636**	**2,255,051,716**	
Export of Diamond (US$)			
Purchase of Diamond	4,931,157	2,859,056	
Shipments of Manganese (US$)			
Ghana Manganese Company	104,807,091	165,198,565	297,006,754

Source: Ghana Chamber of Mines (2019)

2.5.7 Application of Outsourcing in the Mining Industry

Outsourcing has improved in the mining and metal industry worldwide, and many organizations have seen the importance and benefits of outsourcing in general. The value chain in the mining industry is made up of various processes from exploration, extraction, and production to final product or service, from all these processes and make it finally available to the market (Hanlin & Hanlin, 2012). The coordination of this value chain is determined by its governance. A suggestion has been made by (Stacey et al. 1999) that there are only two "core competencies in the mining industry, finance, and management. Apart from these two functions, all other functions could be outsourced to a third party. For instance, exploration, mining, processing, transportation, security services, and other mine supporting activities could be outsourced. In the mine, the core functional managers are

general manager, finance manager, and Safety manager are key anything else can be outsourced externally.

Sub-contracting some non-core functions such as facility management, security services, transportation. Subcontracting of functions takes place both in surface and underground mining operations. Development and construction of the mine site are all outsourced. Certain projects, such as the underground sinking of shafts, drilling, blasting, and other electrical projects, are outsourced. (Kenny & Bezuidenhout, 1999). Usually, mining companies in Ghana are in rural areas isolated from the urban areas. It sometimes becomes a problem due to the geographical location of the mine when sourcing for vendors, service providers with the unavailability of major suppliers to execute outsourced projects, according to the research by Kenny and Bezuidenhout (1999) on the nature of subcontracting in the South African Mine and an article by Hanlin & Hanlin's (2012). Their research work was on the local vendors and the South African Mining Industry. According to their research, many benefits can be derived through outsourcing in the mining industry. Through outsourcing, quality improvement is achieved, reduction of overheard costs, sustainability, and long-term partnership relationship with vendors, service providers, and contractors.

Baptista (2013) also seconded the research by looking into customer-supplier relationship development of capital equipment in Portugal's mining industry. The study organizational relationship in the mining industry was characterized under three variables, task characteristics, context, and the interactive process.

Firstly, understanding the nature of the relationship between suppliers and customers and identifying issues of specific involvement in a particular relationship. The mine life cycle was one of the variables which give insight into the context of the relationship.

2.5.8 Theories underpinning Outsourcing

This section explains the theoretical frameworks and concepts underpinning the nature of outsourcing and challenges encountered by firms in the mining industry in Ghana during the COVID-19 pandemic in detail.

2.5.8.1 Strategic Outsourcing

Outsourcing process or decisions become more strategic when it is in line with the long-term objectives. The operational and tactical level of outsourcing is more featured with a

problem-solving approach at the managerial level, on the other hand, strategic outsourcing takes into consideration the overall structure and performance of an organization by seeking an answer to how relevant outsourcing is to an organization, looking at its goals and objectives also how to gain current and future competitive advantage in the business. (Greaver 1999).

According to Ansoff (1965), the most important question to a firm's organizational strategy is what to produce in-house and outsource from external providers or third parties.

Earlier scholars adopting the strategic perspective argued that all core activities should be produced in-house, while the non-core activities should be outsourced to preserve core competencies. (Prahalad and Hamel, 1990). Therefore, a firm's decision to make or buy is surrounded by these thoughts. Quinn and Hilmer (1994) claimed that outsourcing processes have changed from traditional to more strategic outsourcing. Outsourcing can be traditional when firm the business function outsourced is not critical to the organization. The business function that does not require specific competencies such as transport services, cleaning, and canteen services can be outsourced. In turn, strategic outsourcing expects that the business function requires some special technical know-how with a unique competitive advantage (Quinn & Hilmer, 1994).

The term strategic outsourcing was used to identify the company's strategic core activities, which is crucial towards the strategic goals of firms (Kakabadse &Kakabadse 2000). Strategic outsourcing considers the overall business improvement of the company rather than cost management; therefore, a company can attain its strategic goals by focusing on the core activities towards organizational success. (Mahmoodzadeh et al. 2009) Unlike strategic outsourcing, tactical outsourcing focuses on short-term objectives geared at minimizing operational costs and saving costs. Outsourcing is not just a simple purchasing decision. Instead, it contains the fundamentals to choose to accept or reject the internalization of a business function; due to this, it becomes a highly strategic decision.

Distinctively strategic outsourcing and strategic purchasing are not the same. Strategic purchasing is a process that involves sourcing, negotiations, contracting, and finally, delivery of goods and services from suppliers (Chen & Paulraj, 2004). Organizations engage in the procurement of goods and services frequently from suppliers on a usual basis for their production needs. For instance, production inputs such as raw materials, MRO, equipment, and PPEs are required in the mining industry. Strategic outsourcing involves relationships with suppliers and partners that provide specialized capabilities and resources that cannot be

achieved internally. (Holcomb & Hitt 2007). Strategic outsourcing reflects the primary viewpoint and cannot be the same as the purchase of goods and services.

2.5.8.2 Core Competencies (CC)

The Core competence concept was derived from RBV, sometimes referred to as organizational competencies, distinctive capabilities, and dynamic capabilities, widely studied by researchers (Andrews, 1971, Barney,1986, Dierickx and Cool, 1989). Resource-Based view is a strategic formulation of theories, such as strategic resources (Barney 1986, Dierckx and Cool 1989), "core competencies" (Prahalad and Hamel 1990), "distinctive competencies" (Selznick 1957, Snow and Hrenibiniak,1980), "dynamic capabilities" (Teesce Pisano, and Shuen, 1997) are used interchangeably by scholars that have contributed to the related literature. All the researchers described and explained resources and competency theories very close and in line with their opinions. As much as they explained in different words and ways, they all have similarities and tried to explain why some competitors with equal resources become more successful.

In consistency with resource-based view (RBV) and Transaction cost theory (TCT), the theory of core competencies focuses much on strategic decision-making approach (Dekkers 2011). Regarding this theory which focuses on the core competencies, an issue of which business function to focus on to decide to outsource or produce in-house. (Gilley & Rasheed, 2000). According to Dekkers 2011, outsourcing decision made by firms is mainly driven by core competencies approaches. The study of manufacturing companies and their outsourcing decisions has revealed how operationally had been barely accounted for in the decision-making process.

In literature, there is a lot of ambiguities in what is meant by core competencies. For instance, many scholars use core activities as core competencies, which are known to be what firms usually focus on, whereas other activities are more intermitted and are outsourced. (Quinn & Hilmer 1994). Others also define core competencies as the business functions within an organization with a long-term competitive advantage, which must be produced in-house. (Prahalad & Hamel 1990). Capability differences also play a significant role in making or buying decisions, concluding that production capabilities can play an important role in determining vertical scope. The focus of this study is more comparative advantage than the competitive advantage of firms.

Capabilities are the integration of resources, whereas the integration of capabilities forms core competencies. A firm's core competencies are developed with time and not subject to

sudden change. They are identified with the result of greatest value to customers and uniqueness in resources. This becomes the first step unless they are performed repeatedly to create value; competitive advances, among others, will be challenging to achieve. The most important is integrating unique resources and capabilities effectively to enhance the development of an organization's core competencies. (Özbağ, G. K. (2013)

2.5.8.3 Transaction Cost Theory (TCT)

Transaction cost theory (TCT), also known as Transaction Cost Economics (TCE), Williamson single-handedly developed the theory. His works have made a lot of publication-based assumptions of bounded rationality and opportunistic behavior. (Douma &Schreuder, 2017). According to the theory which Oliver Williamson originated, a transaction cost is modes of organizational transactions, i.e., government structures such as markets, hybrids, bureaus, and firms that minimize overall transaction cost (Williamson 1979). It further explained that an organizational structure could attain the optimum level when it achieves efficiency by reducing the cost of information. (Williamson 1979, 1986). Each type of transaction taken into consideration produces coordination of cost of monitoring, controlling, and managing transactions. Williamson further defined transaction cost as the cost of managing the economic systems of firms. Transaction costs are divided into two; ex-ante and ex-post (Buvik 2002). Ex-ante cost is the representation of direct opportunity cost. (Malone. 1987; Masten, Meehan & Snyder, 1991). Furthermore, the ex-post transaction cost is the cost associated with the problem of hidden action in a relationship (Bergen. Dutta. & Walker, 1992) (Buvik, 2002). Also associated with ex-post are transaction cost problems; *Performance control (e.g., the verification of production cost, performance verification costs (e.g., product quality assessment), adjustment cost (e.g., change orders difficulties), and bargaining costs (e.g., price negotiations).* The various problems of ex-post transaction cost are characterized as lack of effective integration of production resources in specific buyer-supplier relationships, cost involved in coordinating business relationships with relative business outcomes of resulting transactions, time and resources needed to control the supplier's products and production processes, product verification with quality and cost of production associated with the supplier. (Buvik 2002). Ex-ante and ex-post transaction costs have been studied throughout the literature of Transaction cost theory. The theory of transaction cost has been well established in operations, procurement, and supply chain management in analyzing the transaction of exchange of cost for goods and services. Transaction cost and outsourcing have relevance. Outsourcing is essential in inter-

organization business transactions. A formal governance mechanism of transactions is a valid contract agreement between organizations. The contract provides the foundations for complete business transactions and control over buyer-supplier interaction regarding responsibilities. (Jiang et al, 2008, Yao et al. 2010). TCT has been a theoretical framework and determinant of institutional structures, i.e., markets vs. hierarchies, and its associated governance mechanism in supply chain transactions. (Grover and Malhotra 2003, Viket et al. 2008, Williamson 2008). Primarily transaction cost Theory explains why institutional arrangement operates in different degrees of efficiency. Transaction cost proposes that the alignment of transactional attributes (asset specificity, uncertainty, frequency of transaction, performance assessment, and institutional structures) leads to higher transaction efficiency. All these transaction cost attributes are transaction characteristics; asset specificity, uncertainty, and frequency of transactions are often used to predict the outsourcing decision. (Yang et al., 2012). Transaction cost has an impact on outsourcing activities. According to (Vasiliauskiene and Snieska, 2009), the structures of transaction cost factors influencing outsourcing activities are;

- *Information gathering - If there is no established relationship of a potential supplier of goods and services, it becomes necessary to acquire suppliers to satisfy the needs*

- *Supplier Search cost - At this stage, all transaction cost associated with the cost of supplier search and building trust between buyer-supplier*

- *Negotiation cost- Negotiation is taken place, and price and delivery terms and conditions are known. Contract agreements establish. The transaction cost of this phase is included in the outsourcing contract*

- *Fulfillment cost - All costs related to the preparation, delivery and shipment, contract execution, and payment for products and services*

- *Cost of maintenance and disposal - The cost of performance of goods and services and other accompanying service support evaluated*

- *Cost of order renewal - Cost of evaluation on whether to maintain supplier or consider an alternative supplier*

The development of information technology has reduced transaction and coordination costs and facilitated market transactions between organizations. Transaction costs can reduce when the market exchange is fostered information technology rather than physical transactions. The fixed cost of outsourcing training and development will be much lower using video conferencing technologies than physical presentations. Outsourcing comes with transaction costs discussed above, and firms must consider transaction costs in outsourcing to improve operation and enhance profitability. Transaction cost is a determinant of the governance structure of a supply chain. (Bremen et al., 2010). Therefore, in outsourcing, suppliers' transaction costs must be taken into consideration.

2.5.8.4 Resource-Based View (RBV)

Resource-based views theory emphasizes that a firm considers all assets and resources employed in more distinctive approaches to create a competitive advantage. RBV, in this context, is when a company utilizes the means of outsourcing to acquire resources that are not internally available in the company. A firm's utilization of resources outside the company and integrating it into its production process will yield a profit in the end (Holcomb &Hitt 2007). The management of a firm's capabilities efficiently is the pivot of the company's competitive advantage. (Handley & Benton 2012). The RBV theory explains the approach regarding the firm's set of resources and capabilities that are seen as the organization's strength, must be supported, and be the strategy guide of the firm. Operational efficiency determines the effectiveness of resources employed both internally and outsourced resources from vendors (Logan 2000). Compared to the transaction cost theory, the resource-based view can better describe a more complex reality (Dyer & Singh 1998). Resource-based views focus on core competencies, while the transaction cost theory organizes the decision process of a non-core function of the firm that should be outsourced and produced in-house. Five categories of resources have been identified as financial, physical, technological, and reputation. (Fernández and Suárez 1996). Grant (1991). Financial and physical resources are classified as the tangible resources of a firm that are much easier to access and identify while technological and reputational are intangible resources that can enhance the firm's achieving competitive advantage. Outsourcing can influence the type of resources required in a particular business function and the level of a firm's specialization activities, mostly corporate strategies. (Quélin and Duhamel 2003). Core competencies are one of the most important reasons why firms turn to outsource. (Gilley and Rasheed 2000). The approach suggests that firms invest in functions/activities

that constitute core competencies and outsource the other activities. (Prahalad and Hamel 1990; Quinn 1999). Since the other activities are the ones providing the organizations growth and sense of direction.

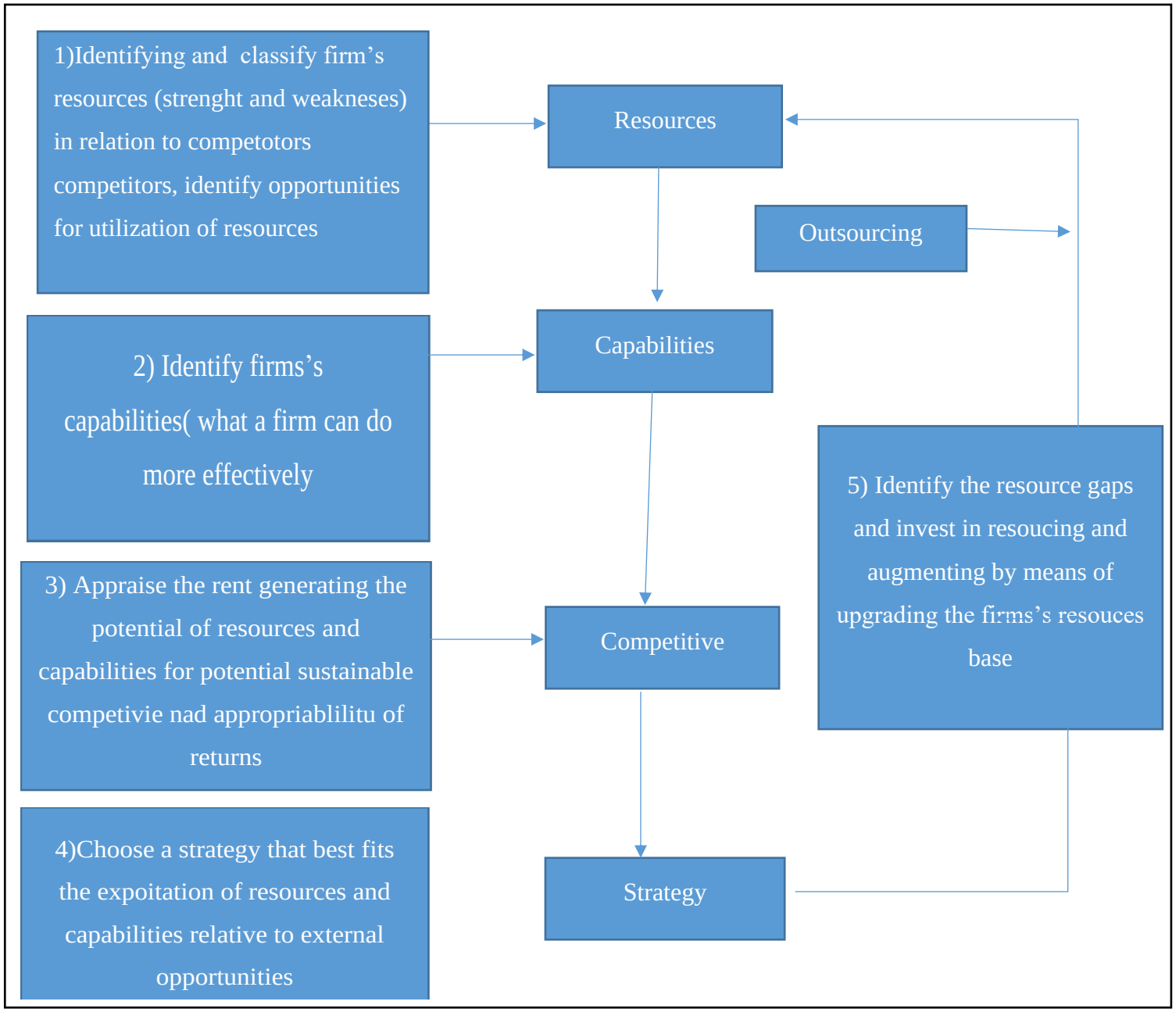


Figure 3:A resource-based approach to outsourcing strategy, how firms can improve their strategy through outsourcing resources and capabilities to create competitive advantage Adopted from (Grant, 1991)

Considering the firm's value chain and support operations and ensure efficient competitions, companies must develop and focus on activities at which they are most efficient, which can improve the knowledge and essential skills the firm can build and maintain the most, which becomes the platform for future innovations. (Quinn and Hilmer 1994).

An important distinction of the RBV theory is that a resource provides the organization with a very sustained competitive advantage. In quest of that, there are different attributes of resources that need to be fulfilled. Various resource attributes affirm the attribute of competitive advantage. (Hedman& Kalling 2002). Scholars like (Barney 1991), (Cheon et a, 1995), and (Hedman & Kalling 2002) identified four attributes of resource-based theory as valuable, rare, costly imitated, and efficiently organized as it was described in the VRIO framework proposed by Barney 1994.

The figure above, resource-based approach to outsourcing strategy established by Grant (1991), explains outsourcing from the perspective of resources and capabilities. A firm's resources and capabilities are the main consideration of establishing outsourcing strategies. According to Grant (1991) has, five stages in his model of strategic formulation, which was established, i.e., in which he associates strategy, competitive advantage, resources, and capabilities, in the model the last of these five stages is identifying the resource gaps which needs to be filled and invest in the replenishing and upgrading a firm's resource base where there is the need for outsourcing. The approach to creating resources has been based on a lack of the firm's resources and capabilities, A firm's decision to develop resources internally or acquire externally. In order to exploit the combination of resources and capabilities already existing in a firm and develop a strategy that can lead to competitiveness; hence it may require a firm to acquire complementary resources externally. Therefore, firms must not be limited by exploiting their resources and capabilities. (Teng et al. 1995). Through strategic alliance and partnership, any lack of resources can be acquired through outsourcing to complement a firm's resources and capabilities to improve the firm's strategies and objectives.

2.5.8.5 Relationship between RBV and TCT in Outsourcing Decision

The need for an organization to achieve optimum efficiencies and minimize cost has pushed most firms to focus on some key business areas, leading to outsourcing activities. Outsourcing has changed from traditionally outsourcing activities in organizations such as cleaning, security, facilities management, and IT services and moved to a more critical business area such as marketing, human resource, plant maintenance, and logistics activities. Outsourcing is considered a critical aspect of many organizations' businesses (Holcomb and

Hitt, 2007). The most influential theories of outsourcing in research are Transaction Cost Theory (TCT) and Resource-Based View. Both theories contribute to the understanding of the relevance of outsourcing. TCT examines the conditions under which a firm manages the economic exchanges both internally and externally. (Williamson, 1985). The theory argues that firms should consider the level of transaction-specific investment in the economic exchange as the primary determinant of whether the economic exchange is managed internally. RBV, in response to TCT in outsourcing decisions by firms, views firms as the number of assets and resources, if used more distinctly, can create a competitive advantage for firms. (Barney 1991).

Scholars have treated TCT and RBV as different approaches to outsourcing. Moreover, a growing body of literature affirms that RBV and TCT are complementary based on the notion that each theoretical perspective cannot fully explain the outsourcing decision. (Ellram et al.,2008, Vivek et al., 2008; Holcomb and Hitt 2007, Madhok, 2002, Winter,2005, Arnolde (2000). According to Arnold 2000 creating value within the company with the focus on outside perspective is most strategic perspective on external resources with focus on RBV theory firm's understand a unique of available resources and and knowledge which might help firms's to survice competition in their respective opetating environment and beyong.There are some instances from the theoretical point of view which make it complementary. For instance, where a firm has the resources required to develop a capability that is difficult to imitate and potential for opportunism is very high, then that activity needs to be internalized to affirm the complementary nature of theoretical standpoint is based on the point that specific assets and capabilities share similar traits, they are challenging to imitate. The role of transaction cost theory focuses on efficient governance through analysis of the transaction in explaining a firm's economic activity, while the resource-based view focuses on how a firm uses competitive advantage through the analysis of resources. In summary, TCT focuses on governance skills while RBV focuses on production skills. Both capabilities are influencing outsourcing decisions

2.5.9 Benefits of Outsourcing

Outsourcing has become one of the most extensive and profitable areas in the world today. In terms of crises, most companies apply outsourcing strategies to improve the quality of service but not necessarily reduce cost or budget (Dina Ana-Maria 2015). The decision to outsource by most firms relies on various reasons, and it is strategically important. Some frequently outsourced functions or activities are information technology (IT), human

resources services, logistics, distribution and transportation service, and procurement services. The reason for outsourcing human resources is to enhance services delivery and assess the value and qualities, according to Beulen, Ribber, and Roos (2012).

On the other hand, Beulen et al. (2012) also argued that reasons to outsource HR services focus on achieving customer satisfaction through key performance indicators (KPIs) and service levels. Also, According to Brown and Wilson (2012), in the USA, it focuses on concentrating on the core activities, attaining experience on suppliers, risk sharing, flexibility, also the reduction of cost in a competitive bidding process. The outsourcing strategy is very technical in connecting parties to reduce cost, use best standards and practices, and provide innovative IT services. (Brown & Wilson 2012). The overall benefits of outsourcing include the following**.**

2.5.9.1 Focus on Core functions

Organizations focus on core functions due to their great competitive advantage. Understanding the nature of business is the same as focusing on core activities in the organization. All core functions of the company of great value and importance should be in source. All other non-core activities that stand as peripherals to the organization's core business functions must be outsourced. Non-core activities are said to be the various activities o function in the organization which contributes to the competitive advantage of their operations (Quin and Himler,1994). According to K &K (2000), Alexander and Young's general characteristics are associated with core activities in clarifying core activities.

- Core Activities are performed in-house,
- Core activities are of value to business performance
- Increase and improve competitive advantage and
- Improves the need for innovative ideas

Competencies combine modern technology, management skills, and collective learning. Their core competencies are the main product designs in Nike, but the shoe manufacturing company outsources almost everything else (Leavy, 2005).

2.5.9.2 Access to technically skilled resources

Outsourcing gives rise to taking advantage of knowledge, skills, and experience from professionals. Companies outsource some activities or functions to absorb the knowledge

and expertise from service providers. For example, IT services are outsourced due to the level of knowledge required to support the operations or core function. Companies outsource skilled resources through various procurement evaluation procedures by fulfilling all standards and requirements related to the activity to be outsourced.

2.5.9.3 Risk Sharing

Outsourcing poses a significant risk, according to Gilley & Rasheed (2000). Through outsourcing, companies diversify their activities than possessing all the activities which are termed as portfolio effects, Also when firm do not outsource and take care of their entire operations, it begins to handle all the risk surrounding both the non-core and core functions, but as soon as some peripheral function of the company is outsourced risk in term of finances, operations becomes a balance and management of operations through coordination and continues improvement of the relationship between service providers to achieve more excellent results. Many scholars agree that through outsourcing, a benefit of reduction in overall cost is achieved. (Althinkemer et al.(1994), Gilley & Rasheed (2000). By sharing technological investment, availability of expertise, and fixed-term contract, business efficiency and cost can be reduced.

2.5.9.4 Operational Cost

Most firms outsource intending to save cost, which is a benefit to them, Outsourcing aids in cutting down costs than essential maintenance of a function in-house. (Malhotra (1995). Confirms that factors that affect the overall decision to outsource some function are to minimize operational cost. Fixed cost in the company can be converted to a variable cost, which could be an essential factor. Through this outsourcing, an organization can avoid significant expenditure and increase market share by the favorable position of the business in the mind of investors.

2.5.9.5 Improved Performance

One of the benefits of outsourcing is the considerable achievement of improved performance due to economies of scale. On a large-scale provider, a variety of functions and opportunities helps keep the best available employee, who would not want to work in a less stimulating consumer environment. Also, the level of performance expected from the service provider is so high due to the greater concentration of tasks assigned compared to the internal operations. (Allen et al. 2003).

2.5.10 COVID-19 and Global Mining Industry

COVID-19 is possibly one of the most shocking and disruptive global epidemics since the Ebola virus outbreak. (WHO, 2020a., Sohrabi et al., 2020). Although it is a health pandemic, it has grown into unprecedented social, environmental, and economic world crises. Unleashing multiple shocks of the local economy on the demand and supply, immediate and strict lockdown measures disrupted the global supply chain due to the closure of industries and temporal suspension of air, maritime, and land transportation of goods and services. (Bachman, 2020; Sarkis et al. 2020). Mining is an economic activity that generates a lot of revenues in rich countries; even in developed and developing nations like Ghana is benefiting from mining by its role in reducing poverty through social-economic developmental projects in the catchment communities. Economically the mining industry has not been spared from the negative consequences of the corona virus pandemic. Strict working conditions at the mine sites pose a high risk of workers' health and safety and some employees being quarantined due to the risk of investing the whole mine. (Isabelle R, 2020). Even though COVID-19 caused much disruption in the mining industries globally, shutting down the mining operations could have negatively affected countries' economies that heavily depended on mining. International and domestic travel restrictions and bands also impacted the ability of the mines to continue operations with most of the managers and expats that work on flying in and flying out roster (FIFO) in some countries. Australia. (Herbert Freehills, 2020). A potential shortage of personnel means the mine might not be able to sustain its operations in the short run, especially with the mining lead time required to move the mining operation from production to care and maintenance. The lead time is very important and allows the efficient reopening and prevention of environmental issues during the cessation of mining operations. Mining in countries like Canada, Australia, the USA, and Africa employ many indigenous employees, maybe faced to reduce or close with the risk of infection passing onto the very remote communities of operations with limited access to medical infrastructure. (United Nation for Indigenous People, 2020) This infrastructure-led Red Dog mines in Alaska, USA, to institute their travel restriction to stop the COVID-19 virus from spreading. (DeMarban, 2020).

Logistical challenges concerning the transportation of supplies and raw materials required for mining operations. It is very unclear whether there have been a significant disruption or impact on mining supplies such as fuel, explosive for blasting, or even personal protective

equipment (PPEs) needed to perform operations. However, the shipment of ores and mineral concentrate will be highly affected by the pandemic. For instance, a country like the Democratic Republic of Congo (DRC), with limited mining operations, generally ships the ore to China for further processing through South Africa's port of Durban. (Luk,2020). Significant challenges facing the mining industry as a result of the COVID-19 pandemic is not government closure of operations in order to mitigate the spread of the virus instead, the supply chain challenges of supplying and supporting operations with the essential workforce, and transportation of mineral products is more difficult on the production aspect of mining which implies that mining and metal supply may not directly be affected by COVID-19 pandemic rather indirect impacts are possible. (Vivoda, V (2020).

2.5.11 Supply Chain and COVID-19 Pandemic

Supply Chain management results from cooperation and coordination with organizations where different actors in the chain achieve mutual benefit, building relationships to achieve efficiency and effectiveness (Wankmüller, C., Reiner, G, 2020). Good quality and quantity flow is expected to optimize processes, resulting in cost reduction and increased profits in a resilient supply chain. COVID-19 has negatively affected the supply chain, with a massive influence on local and global supply chain activities. (Meyer W et al.). In the very beginning, when COVID-19 was found in China, it was seen as a local issue affecting only china. However, the supply chain impact was already on the global scale, with industries having reduced demand for goods and services and some even shutting down operations. Organizations that had global operations in and relied on a global supply chain from China with a shipment of products from China and the rest of the world experienced interruptions in the flow of goods and services. (Haren, P., & Simchi-Levi, D.2020).

The supply chain is a key facilitator in the continuous improvement process, profit maximization based on trust and mutualism. In a global supply chain scenario, procurement of capital and human resources, raw materials for production, component processing, and international end-to-end shipping products are managed by different supply chain actors. (Zhang et al., 2020). The procurement of goods and services plays a very critical role, especially in pandemic periods. (Tátrai-Vörösmarty, 2020). Companies maximizing profits and efficiency in operations green supply chain is very important because of social, environmental, and sustainability in the supply chain. Modern SCM focuses on the interdependence of organizations collaboratively working together to improve the efficiency of global logistics channels. (Fonseca, L. M., & Azevedo, A. L. (2020). Supply chains

consist of all parties involved, directly or indirectly, in fulfilling a customer request. (Salomon, V (2018),. Outsourcing and procurement of goods works and services to ensure the best value for money through vendors should be based on fairness, integrity, transparency, and product cost considering the organization's quality, delivery lead times, and interest. (United Nations Procurement Manual,2020)

Strategic supply chain management (SSCM) is regarded as making an optimum effort to ensure a long-term strategic plan to create a capable and reliable supplier base and leverage the benefits of supply chain management. The COVID-19 pandemic has made a revelation of how fragile the global supply chain. McGillivray, G. (2021). The pandemic originated a shock of both supply and demand sides of the supply chain, which made it more challenging and mind-blowing to respond to an adequate flow of the supply chains. (Richard B & Beatrice W,2020). Supply shock was significant and escalated on-demand with new government policies and regulations implemented to contain the situation, imposing social distancing policies on the mass population, increasing hospital capacities, planning, and increasing medical supplies, test kits, and equipment, e.g. Ventilators for critical conditions. (Prakash Mirchandani, 2020). The selection process for qualified potential vendors to make up for the task was not easy, especially when dealing with long supply chains that have proven to be the most vulnerable. As the actors in the supply chain become more and more, the overall probability of disruption increases (Harvard Business Review,2020).

Regarding the COVID-19 pandemic, stakeholders in supply chain management need to build more robust, effective, and resilient supply chain systems with artificial intelligence and smart technologies. (Das D et al., 2021). Consumers often consider the management of upstream SCM activities in making decisions. (Terry L.S. 2021). The pandemic negatively affected Amazon and Tyson Foods due to poor working conditions and their processing and distribution centers. Also, the consumer response to product delivery and services needed to be investigated whether consumers might be inclined to switch suppliers due to the attention of SCM work conditions in these pandemic times.

COVID-19 pandemic affected supply chains in the world. It also affected the mining industry globally. Uncertainties of supply chains involving commodities of prices is a major concern in the mining industry. Production and export of minerals were still ongoing during the pandemic times, and businesses were faced with shipment and transportation delays-(road and air freight) in import and export to other countries, delays with major shipping ports, and travel restrictions impacted on the supply chains causing global supply chains to

bottleneck. (Matthew J et al., 2020). Industries practice optimization of supply chains to improve efficiency. The era of this pandemic has reduced the ability to cope with the global shocks and the delays due to the COVID-19 pandemic. (Deloitte, 2020). It became very necessary to consider key supply chain risks associated with sole suppliers and supplier base, inconsistencies in supplies and develop contingency plans to manage risk related to such disruptions such as sourcing for the required component needed from a variety of markets, considering domestic suppliers or adapting to the insourcing of component required for operations, also reviewing of contracts and even renegotiating on terms and conditions, i.e., prices, quantities supplied, payment terms and if necessary termination of some contracts. (Matthew J et al.,2020).

2.5.12 The effect of COVID 19 on global economies and Supply Chain

COVID-19 has proved to be a very significant challenge to global economies, including the mining, automotive, and food supply chain industries, the prevention of the spread of the virus, which affected was very critical even in the history of outbreaks due to social and economic aspects, it was very crucial to implement risk mitigations to prevent further damages. (Haldon et al., 2020). The effects of the COVID-19 pandemic could be seen from country-to-country level, industry by industry setting, and organization. The effects range from the impact of COVID-19 on employment in the mining industry and the health and safety of mining operations, the impact on local, global suppliers and community economic activities, reductions of purchasing intention and demand by customers, shortage of material supplies and supply chain disruptions, shutting down of production by some manufacturing firms, as a result of this effects of COVID-19 different level of capacities and labour diminishing is experienced. (Kraus et al., 2020). The aftermath of the pandemic can be situated to a disaster like volcanic eruption or earthquakes, which can influence the entire processes of a supply chain. Demand and supply fluctuations of goods and services both in the short and long run can cause an immense problem. (Ivanov, 2020). Preparation for a pandemic like Ebola and coronavirus is likely impossible. However, proactive responds measures and strategies of constant changes in an uncertain environment may be beneficial. (Kannan et al., 2020). The recovery of economies worldwide will be a great challenge due to the level of damage caused by the pandemic. In some countries, support of resources will be required to avoid further losses, the rate of unemployment due to the pandemic, and the weakening of the economic sector. According to experts, economies' estimated recovery will be from nine to twelve months with support and implementation of strict safety measures.

(Mani et al. 2020). Uncertainty in the duration of the COVID-19 reveals many vulnerabilities in the supply chain. Value-adding services of the supply chain are more critical, and it is evident that the supply chain connects to economies at the local and global levels. The importance of a good supply chain can be realized when it works properly and can overcome unexpected circumstances that are difficult to ascertain its effectiveness. Flexible supply chain strategies can make it possible to react to changes and enable the approach of demand fluctuations, supply, and quality issues. (Kırılmaz, O., & Erol, S. 2017).

Table 3:List of Relevant SCM and COVID-19 literature

Author	Title
Azadegan, A., Mellat Parast, M., Lucianetti, L., Nishant, R., Blackhurst, J. (2020)	Supply chain disruptions and business continuity: an empirical assessment.
Bachman, D. (2020).	COVID-19 could affect the global economy in three main ways, Deloitte.
Chopra, Sunil, and ManMohan S. Sodhi. (2004)	Managing risk to avoid supply-chain breakdown: By understanding the variety and interconnectedness of supply-chain risks, managers can tailor balanced, effective risk-reduction strategies for their companies.
Das, D., Datta, A., Kumar, P., Kazancoglu, Y., & Ram, M. (2021).	Building supply chain resilience in the era of COVID-19: An AHP-DEMATEL approach. Operations Management Research
Deloitte. (2020).	COVID-19-Managing Supply Chain risk and disruption
Fonseca, L. M., & Azevedo, A. L. (2020)	COVID- 19: Outcomes for global supply chains. Management & Marketing. Challenges for the Knowledge Society
Harvard Business Review (September 2020)	Global supply chain in a post-pandemic world

Haren, P., & Simchi-Levi, D. (2020)	How coronavirus could impact the global supply chain.
Herbert Smith Freehills. (2020)	Covid-19: The Global impact on the mining industry.
McGillivray, G. (2021).	The COVID-19 pandemic has revealed that global supply chains are a huge house of cards. The Conversation.
Meyer, A., Walter, W., & Seuring, S. (2021)	The impact of the coronavirus pandemic on supply chains and their sustainability: A text mining approach. Frontiers in Sustainability,1-15
Pujawan, I. N., & Bah, A. U. (2021)	Supply chains under COVID-19 disruptions: Literature review and research agenda. Supply Chain Forum: An International Journal
Sarkis, J., Cohen, M.J., Dewick, P., Schröder, P., (2020)	A brave new world: lessons from the COVID-19 pandemic for transitioning to sustainable supply and production
Terry L. Esper (2021)	Supply Chain Management Amid the Coronavirus Pandemic. 40(1), 101-102
Xu, Z., Elomri, A., Kerbache, L., & El Omri, A. (2020).	Impacts of COVID-19 on global supply chains: Facts and perspectives. IEEE Engineering Management Review, 48(3), 153-166.
Vivoda, V. (2020)	Implications of COVID-19 on the global mining sector. Aspects in Mining & Mineral Science, 4(5)

2.5.13 Supply Chain Risk

SCRM is an academic research area that has gained much attention over the years. (Rao and Goldsby, 2009) International trade improves to global supply chain, and risk is involved in supply chain management. (SCM). Globalization of trade has increased or exposed the vulnerability in SCM and increased the risk factors. (Dey et al., 2011). Risk management is the implementation of strategies and mitigation measures to manage a network of supply chains through the risk assessment protocols and to reduce vulnerability in ensuring a very resilient supply chain network. Risk level may differ from an industry perspective, specifically in the business area, the risk may vary. (Jemison 1987).

Supply chain risk management (SCRM) is a systemic and management approach used in recognizing, evaluating, monitoring, and mitigating a disruption in the supply chain network. (Aqlan and Lam 2016). SCRM is a very critical area of management due to the effect caused in the supply chain networks. (Cigolini and Rossi, 2010). COVID-19 is a typical example of an effect in global supply chains. The pandemic resulted in disruption in supply chains and the economies of developed and developing countries irrespective of countries' economic stability. Supply chain management is becoming more complex as a result of uncertainties occurring in the business environment. The global supply chain has a lot of uncertainties and greater challenges and risks. (Blackhurst et al., 2005 and Chopra and Sodhi, 2004).

According to some academic scholars, supply chain risk (SCR) can be categorized as operational and disruption risks. (Handfield and McCormack, 2008, Fahimnia et al., 2018; Ivanov, 2018; Xu et al.,2020). Operational risk is the ordinary misfunctioning in the SC operations such as operational lead times, demand fluctuations. On the other hand, disruption risks are concerned with a very low frequency but have a high impact. (Hosseini et al., 2019). Pandemics such as COVID-19 constitute a special supply chain risk due to their unknown duration (long term) and high level of uncertainty and ripple effect propagation. (Ivanov,2020). SC disruptions caused by pandemics can threaten the resilience and robustness of SCs. Risk mitigation and control measures are appropriate through contingency plans to manage after the unfolding of the event. (Azadegan et al., 2020).

The efficiency and effectiveness of SC depend on the collaboration of partners in the supply chain and the recognition and implementation of SCRM practices relevant to firms. (Fan and Stevenson,2018)

In summary, the literature reviewed existing relevant research in relation to SCM and COVID-19, i.e., the Overview of outsourcing studied by various scholars, the various forms of outsourcing being practices according to theories, strategic, transformational, and tactical outsourcing, the various drivers of outsourcing by firms which includes organizational, Improvement purposes, financial and cost drivers and revenue drivers. Also, the literature examined the outsourcing life cycle the systematic approach of overall outsourcing engagements based on competencies and capabilities to ensure sustainability, the Ghana mining industry, and output of producing firms from 2016 to 2018. Moreover, how outsourcing has been applied in the mining industry and various theories underpinning outsourcing, i.e., resource-based view and transaction cost theories, benefits industries derive from outsourcing, how RBV and TCT coordinate to achieve greater outsourcing decisions and results, the effect of COVID-19 on supply chains, mining industry, and global economy.

CHAPTER THREE

RESEARCH METHODOLOGY

3.1 Introduction

This chapter presents the research methodologies employed; this constitutes all methodological decisions taken at all stages of the research process (Aspelund & Helland, 2019). The research methods adopted include a comprehensive and systematic analysis of strategies and principles within a field, hence functioning as an overall system where we employ approaches and questions regarding several research approaches and composition of the research as stated by Aspelund and Helland (2019). This chapter looks at the research philosophies, methods, data collection strategies, and analytical procedures used in conducting the study. The section solely embraces the research onion concept presented by Saunders and colleagues (2019). The decision to adopt this research concept was influenced by the postulation of Saunders et al. (2019).

As stated by them, the research onion concept presents a carefully thought through and coherent set of assumptions. These well-thought-out and consistent assumptions enable researchers to design a reliable research project in which all elements of research are interconnected. (Saunders et al., 2019). The scientific research onion concept systematically illustrates all stages of research one must scientifically go through and cover when developing a research strategy. When seen from the outside, the layers of the concept (onion) describe a more elaborate stage of the research process that any researcher must undertake (Saunders et al., 2019). The research onion provides adequate progress through which a research method can be developed. Its usefulness lies in its adaptability for any research method and can be used in various contexts (Bryman, 2012).

3.2 Research Philosophy

Research philosophy is a belief in the way data about a phenomenon must be collected, analyzed, and used. The word ontology (the nature of reality) encompasses various philosophies of research approach (Satyam, 2011). Researchers must relate these research philosophies to specific research methodological choices (Holden & Lynch, 2004). This directs and indicates the position of the researcher in the phenomenon being investigated. Irrespective of the underpinning philosophy and the methodological decisions made, there is inherent weakness and strength in every approach adopted by the researcher (Žukauskas, Vveinhardt, & Andriukaitienė, 2018). The two primary research philosophies identified

throughout the literature are the positivist approach (research outcomes or phenomena can be understood objectively) and the interpretive approach (research outcomes or phenomena are perceived to have a subjective connotation

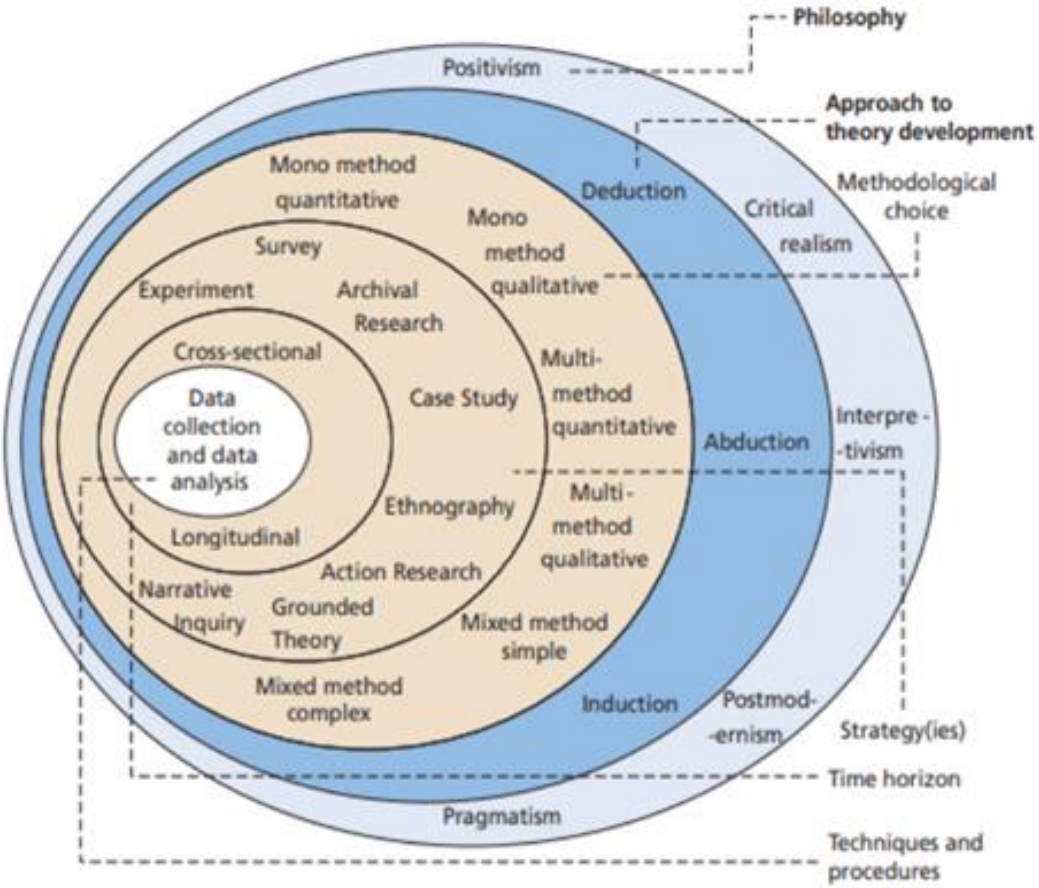


Figure 3: The research onion adapted from Sanders et al., 2009

3.2. 1 Positivism

Positivists believe reality is stable, can be observed, and described objectively (Parsons, 2017), thus without interfering with the subjective meanings ascribed to the investigated phenomena. The proponents of this philosophy argue that phenomena should be isolated from the subjective means of individuals and that observations must be repeated and measured in a more objective and standardized manner. Frequently this involves manipulating reality with variations in only one dependent variable to identify regularities caused by a single and multiple independent variables and form relationships among some of the social world (Satyam, 2011). In a positivist research approach, forecasts are mostly

conducted based on the previously observed and explained realities and their relationships. Positivism has a long and rich historical research tradition. It is so embedded in our society that knowledge claims not grounded in positivist thought are dismissed as scientific and therefore invalid (Binu, 2015). Positivism has also had an incredibly successful connection to the physical and natural sciences.

3.2. 2 Interpretivism

Interpretivism argues that only through the subjective interpretation of and intervention can the social world or reality be fully understood by researchers ("Chapter 12 Interpretive Research | Research Methods for the Social Sciences," 2021). Studying a research phenomenon in its natural environment is key to interpretive philosophy, acknowledging that scientists cannot avoid affecting them (Saunders et al., 2019). They admitted that there might be many explanations that can be attributed to the social occurrence of a specific reality but maintain that these interpretations are in themselves a part of the scientific knowledge they are pursuing (Saunders et al., 2019). Interpretivism has a tradition that exists no less glorious than that of positivism, nor is it shorter.

Given the different interpretations we attribute to our social environment and experiences, researchers must account for the specific epistemological underpinning that clearly explains a reality (Kivunja & Kuyini, 2017). To be considered scientific, this study states clearly and aligns research strategies to the interpretivist epistemological approach. On this ground, the study adopted an interpretive approach to describe a social occurrence to discuss outsourcing and challenges encountered by firms in the mining industry of Ghana during the COVID-19 pandemic. The choice of the research philosophy is partly rooted in the varied roles played by social actors and the subjective interpretation of their experiences in connection with the COVID-19 pandemic. As a result, research conducted to clearly understand outsourcing and the COVID-19 pandemic ought to adopt the researcher's approach to explore this phenomenon and its implications on outsourcing extensively. With interpretivism, the researcher is presented with a rare opportunity to make sense of the world around us (phenomenology) and the continual process of interpreting the social world around us (symbolic interactionism). These understandings are critical to this study because we interpret the actions of others with whom we interact, and this explanation leads to the adjustment of our meanings and actions.

3.3 Research Approach

Under this section of the study, the researcher used the inductive approach to conducting the study since it aligned with the interpretivism philosophy. Saunders et al. (2019) noted that the interpretive philosophy most likely informs the inductive approach. The inductive approach was pre-selected due to the study's philosophical underpinnings (interpretivism) (Bryman, 2012). The inductive approach was appropriate for this study because it permitted the researcher to understand better the nature of the problem. This allowed the researcher to make sense of the collected interview data through the content analysis performed in the study (Denzin and Lincoln, 2018). Also, this approach used in the study critically considered the context in which the problem took place. A smaller sample was deemed to be appropriate under this research approach. Overall, the inductive approach is preferred for this study because of its connection to humanities and its emphasis on subjective interpretations (Soiferman, 2010).

3.4 Research Design

Qualitative research was used to reach the study's goals. Denzin and Lincoln (2018) conveyed the ever-evolving nature of qualitative inquiry from social construction, interpretivism, and social justice around the world. According to Denzin and Lincoln (2018), qualitative research is a suited activity that locates the observer in the social world. Qualitative research entails a set of interpretive, material practices that make the world visible. Such practices transform the world. At this level, qualitative research is an interpretive, natural approach to the social world (Creswell, 2014). This refers to the fact that qualitative researchers study social phenomena or occurrences in their natural settings. They attempt to make sense of the phenomenon to add meaning to the context of the event. This approach vividly describes a phenomenon regarding people's meaning (Denzin & Lincoln, 2018). This design links the various key tenets in the research to the current happenings in the global social and business environment. Knowing the challenges posed by the COVID-19 pandemic, the present study stipulates that different companies at different organizational levels will respond in diverse ways. To this effect, it became imperative to use this research design to inquire about mining companies' realities in the COVID-19 era in Ghana.

The qualitative design employed in the study was aligned to the key thematic areas in Creswell’s (2013) definition of qualitative research. Creswell (2013) extensively elaborates the qualitative research approach. According to him, qualitative begins with assumption and

interpretivism or theoretical frameworks that highlight the study of research problems considering the meaning of individuals or groups attributed to a social or human problem in COVID-19 pandemic and outsourcing. The research used an emerging qualitative approach to study this problem, collecting data in a natural setting, given the damages and challenges related to the pandemic. The study used the transformative approach of the interpretive frameworks. The reason for this choice was that the transformative framework views knowledge and experience as not being It is impartial and represents the power and social interactions within society. Thus, knowledge construction aims to aid people to improve society (Creswell, 2013) since many mining companies during the COVID-19 era continually faced challenges concerning outsourcing.

3.5 Research Strategy

Various research strategies can be utilized within a research area depending on research objectives and queries. Some of the research strategies that can be used include experimental Survey, case study, action research, grounded theory, ethnography, archival research, grounding theory, and narrative inquiry (Saunders, Lewis & Thornhill, 2019). In this research, a multiple case study strategy was used due to the nature of the research conducted and the quest to answer the research question and the study's objective.

Case Study

Case studies involve an attempt to describe relationships that exist in the reality of the social world, very often in a single organization (Saunders, Lewis & Thornhill, 2019). Case studies may align with the positivist and interpretivism philosophies, depending on the researcher's approach, the data collected, and the analytical techniques employed (Mills, Durepos & Wiebe, 2012). An observer-researcher can capture reality in greater detail, analyzing more variables than is typically possible in experimental and survey research. Case studies can be considered weak since they are usually restricted to a single organization. It is difficult to generalize findings since it is difficult to find similar cases with similar data analysis. Moreover, different researchers may interpret the same data differently, thereby adding research bias to the equation.

Regarding the research strategy, the researcher adopted a case study research strategy as it allows for an in-depth investigation of a phenomena in its natural environment (Yin, 2018). With the havoc caused by the COVID-19 pandemic in major industries, particularly among those in low- and middle-income countries, it became imperative for the researcher to adopt

this strategy. Case study research sets out to understand the dynamics of the topic being studied within its setting or context. Yin (2018) stated that a case study strategy could generate insights from intensive and in-depth research into studying a phenomenon in its real-life context, leading to detailed, empirical descriptions and the development of theory. On this assertion, this study adopted a multiple case study strategy based on the rationale postulated by Yin (2018). To choose multiple cases, this study conceptualizes different companies in the mining industry that will employ different outsourcing approaches and techniques given the problems related to the COVID-19 pandemic. Saunders et al. (2019) affirm the need for a smaller sample size for studies that adopt multiple case study strategies. They proposed a multiple case study strategy that may combine a small number of cases chosen to predict literal replication and a small number chosen to predict theoretical replication. Also, to ensure that the data collected contained enough information power, the researcher interviewed 3 cases from different mining companies.

3.6 Case Selection

In addition to the adequacy of methodology and instrumentation, the sampling strategy adopted may also determine the quality of research. Sampling recognizes the populations the study will focus on, and factors like accessibility, time, and expanse often restrict the sample size (Cohen, Manion, & Morrison, 2007). Case selection is the rational choice of one or more cases of a phenomenon as the research subject. The underlying reasons for selecting a case or cases vary from the interest in the case to theoretical considerations. The importance of the case or cases for the research objective is the essential criterion for selection (Mills, Durepos & Wiebe, 2010). Choosing cases is a critical part of the case study design. If suitable cases are not selected, the study will not be credible and reliable since the findings will not be coordinated with the study objectives. Selecting cases is a challenging task due to the intensive data collection methods in case study research. The number of research units may be minimal (Mills, Durepos & Wiebe, 2010). Single-case designs examine one unit of a social phenomenon, whereas multiple-case designs compare two or more cases. This limited amount of research units places a focus on the researchers' rationale for choosing cases.

There are two main sampling strategies of sampling, random and purposive. The difference between them is that a random sample strategy involves randomly chosen cases within the population, with the idea that randomness hinders preconception in the selection process. In contrast, the researcher actively selects which cases to be chosen from the population

(Cohen, Manion, & Morrison, 2007). In random sampling, every member of a case has an equal probability of being selected. In contrast, some members will be excluded in probability sampling, and some will be included in the sample (Cohen, Manion, & Morrison, 2007).

Random sampling is considered a viable strategy in case study design when examining a few variables in many cases. Still, when doing a comparative case study with a dwindling number of cases, randomized sampling produces unrepresentative population results (Seawright & Gerring, 2008). In this thesis, purposive sampling is used in the selection of cases. Purposive sampling is featured in qualitative research where researchers handpick the samples with a basis of the judgment of their typicality, possession of knowledge regarding a specific field or process. By selecting these samples, the researcher can build a sample that fits that research. (Cohen, Manion, & Morrison, 2007). The primary nature of purposive sampling used in this thesis is to collect specific data that can deepen and clarify the understanding of the research.

3.7 Use of key informants

Key informants used in the data collection are skilled and knowledgeable people in the mining industry who, regarding this research, contributed a perspective that the researcher lacks. They are not research participants (they are not the subject of the study). Instead, they provided information about the subject of the research. Their contribution expands the researcher's knowledge and precisely insight reduction of inconsistency in the understanding of research. Key informants are ideal means of purposeful entry into a cultural group to identify its characteristics when interviewing in qualitative research (Skinner, 2012). Informant chosen for the data collection from the 3 cases companies was used due to insider knowledge, position, experience in mining supply chain for many years, and information about the phenomenon, concept, situation, or subject and willing to share with the researcher (Bernard, 2018). Semi-structured interviews were used to compare among informants from the 3 case companies to understand the knowledge and information from data collected. There are many advantages why key informants were used in this thesis to expand the researcher’s understanding and highlight unusual assumptions before the data collection and analysis in the research. The principal advantage of using informants relates to the quality of data obtained in the short time frame. Instead of using large data collection approaches, key informant facilitates the achievement of research goals much easier. (Pauwels and Hardyns, 2009). Incorporating informants in this research reduced the tension and

misconceptions between literature (abstractions) and in practice (reality) which implies different experiences and theoretical knowledge that may not be universal or centered.

3.8 Research Context

3.8.1 General Definition of Mining and Metal Industry

Mining operations are a very competitive, highly profitable, recognized business internationally.
The industry is the source of many raw materials for many equipment and tools we use in our daily lives today, from aluminum to electrical chips used in phones and computers. Due to its high demand, metals have progressively increased over the years with the occasional rush for minerals like silver, gold, manganese, etc.) due to its high demand.

Access to mining comes with a great responsibility of first obtaining the license, developing, and producing the ore and metal sold at the market. (Jain et al. 2016). Mining is among the activities with the most social and environmental impact; therefore, many mining companies have revised their processes and procedures, effects, and challenges in the future. Mineral production requires enormous capital and labor investment, and corporate companies establish and produce minerals.
Successful mining operations require adequate modern technology and reserves of minerals to process. (Finnish national minerals Strategy, (2010).

Mining can be defined as removing valuable raw materials by extraction and refining processes to get the mineral. There are two types of mining techniques: surface mining, open-pit mining, and underground mining. In open-pit mining (surface mining), all the vegetations, plants, and possibly layers of bedrock are removed to access buried ore deposits. The refinery and enrichment process may vary from mine to mine after the ore in the raw state has been mined through drilling, blasting, excavation, and load and hauling. Specialized knowledge and skills are required to process the ore to a refined state. The processing of minerals today has seen improvement with technology focusing on energy efficiency and environmental compliance. (Finnish national mineral strategy 2010).

Table 4: The Mining life Cycle

Major Phases	Activities involved
1. Exploration & Feasibility Studies	Exploration • Surveying, location of mineral • Discovery and sampling Feasibility • Decision on the economic feasibility of the mining process
2. Planning and Construction	Planning • Mine planning • Environmental and social planning • End of life of mine planning considerations Construction • Clearing the land, stripping, drilling, and blasting • Infrastructure
3. Operations	• Ore extraction • Crushing, grinding, and concentration at the plant • Tailings and waste management • Water management
4. Shut Down or Closure	• Sites clean up, reclamation, and rehabilitation • Maintenance, environmental monitoring, and assessment

Adapted from Environmental Code of Practice for Metal Mines

The open-pit or surface mining technique involves recovering raw material from land or ground and quarrying from an open pit. On the other hand, underground mining also involves digging underground tunnels or portals or shafts beneath the earth to reach buried mineral Deposal of waste are brought from underground through the portal, likewise the offloading of the ore to the processing plant. (Hakapaa & Lappalainen 2011:24). Mining is considered a primary industry. The earthmoving and excavation, transportation of materials,

and ore extraction are done with very massive equipment, and operations are controlled by modern technology.

Explosives are used for blasting the rocks into smaller pieces for extraction and processing. Underground mining today is labour intensive and requires machinery for operations, making it highly mechanical. (Hakapaa & Lappalainen, 2011;13-25)

The mining life cycle has different phases, from exploration and feasibility studies to planning and construction. After that, the development and operation finally end up with the closure or rehabilitation stage. At the exploration and feasibility stage, the locations of the mineral, discovery, and sampling of the core to ascertain the state of the mineral is done, it is proven that indeed there is a mineral. The planning and construction have to begin with mine planning, environmental and social planning, obtaining a permit from authorities, clearing, stripping, drilling and blasting, and infrastructures. The scope of the work involved depends on many factors and may vary from different projects, In spite that there are some common elements applied in the construction phase of all mines. At this stage, procurement of services, labor, and contractors is needed to succeed. Operations have to begin with crushing the ore at the plant, grinding, concentrating, and managing the tailings and waste from extraction and progressive reclamation. After the ore has finally been extracted, the mine has to come to closure by cleaning up, reafforestation and rehabilitation, and environmental monitoring and assessment to ensure soil goes back to its natural state

3.9 Case Description.

This section of the thesis presents three cases selected for this research project, the names of all case companies and informants have been altered to ensure anonymity. The table below provides the case overview of all the cases with more details of the companies.

Table 5: Case Overview

Case	**Industry**	**Product type**	**Informant(s)**
Tarkwa Mine	Mining	Gold	Senior Supply Chain Supervisor
Akwaaba Mine	Underground Mining	Gold	Logistics and Procurement Officer
Sankofa Mine	Mining	Gold	Procurement Officer

Tarkwa Mine

Tarkwa mine is a family member, a multinational gold producer with its head office located in South Africa. The company has nine operating mines in Australia, Peru, South Africa, and West Africa (Ghana). The company was incorporated in Ghana in 1993, currently operates the highest gold producing mine in Ghana and the highest producer in the Tarkwa mining Family globally. The mine has access to the national electricity grid, water road, and rail infrastructure; mining consumables are trucked from the nearest seaport, which is 140 kilometers by road to the regional capital in Takoradi, or from the Tema port in the Capital city, which is also 300 kilometers by road. The gold mine is in the southwestern part of Ghana, about 300kms by road to Accra, the national capital at latitude 2.00'W. It is 4kms away from the Tarkwa township. Tarkwa mine is primarily involved in underground and surface mining-related activities, including exploration, extraction, processing, and smelting. The government of Ghana owns a 10% share of the mine and 71.1% owned by Tarkwa Mine; also North American exploration and development company owns 18.9%. Tarkwa mine has two mining operations, Tarkwa and Damang, and a JV with Asanko Gold in the Ashanti region of Ghana. The company's global vision is to be the leading diversified metal producer through responsible, sustainable, and innovative quality assets over time. There has been a modification in its processing plant, discovered new pit mining areas, and processing rates for ore production. New pit discoveries and development have led to the need to resettle people living in such communities. The company is committed to ensuring that the resettlement of all people living within the affected sites maintains less or no negative socioeconomic and environment on the livelihood of those affected. Goldfields Tarkwa mine is fully transitioned to contracting to mine and well-positioned to deliver sustained value.

Sankofa Mine

Sankofa mining is a rapidly growing West African gold producer, developer, and explorer. The company operates three gold mines in the West of Africa. Its operation in Ghana is the first mine located at Ayanfuri in the Western Region of Ghana with 1.8 million ounces of gold since gold was poured in September quarter 2011. Based on the current ore reserves, the company will recover extra 1.2 million ounces of gold from their operations in Ghana over currently the estimated five years and more years of mine life remaining. It has become a multi mine and gold producer in the year January 2018 with the opening of its second operation in Sissingué Gold Mine in Côte d'Ivoire and the recent completion of its Yaouré

Gold Mine, which is also located in Côte d'Ivoire in December 2020. Edikan, as Ghana's operation, sources gold ore from several open pits and is processed through open pits and processed through the centralized process with up to 8.0 million tons of ore production per annum. Perseus currently has plans of building an underground mine that is intended to increase the gold production capacity.

Akwaaba Mine

Akwaaba Mine, a subsidiary with headquarters in Australia. The company has provided unmatched mechanized underground mining services to all its clients in Africa. By combining knowledge gained in underground mining operations from Australia, has their operations in Africa for over 15 years, underground mining expertise of Australia, The subsidiary company in Ghana is a 50/50 Joint venture formed in 2007. The JV combines both companies' knowledge into a single entity, from highly productive underground mining services to clients. Currently, in Ghana, the company is operating on total underground production for two of Ghana's most prominent clients with over a thousand employees in various departments of the mine, i.e., HR department, Mining Engineering, Production and Drilling services, logistics, and Supply Chain and Haulage Services. In 2018 the company was awarded a contract worth $375 million underground mining in one of West Africa's oldest mines in Obuasi Ghana. Since commencing in Ghana in 2007 has trained over 1200 Ghanaians through apprenticeship programs in mining and engineering. Currently, in Africa, the company has operations in Mali and Burkina Faso and are still exploring other mining opportunities in Africa

3.8 Time Horizon of Research

Due to the number of contacts between the researcher and the respondents. Kumar (2011) briefly described a cross-sectional design best suited for studies designed to find out the prevalence of a phenomenon, situation, problem, attitude, or question, by taking a cross-section of the population (Kumar, 2011). Cross-sectional studies help obtain an overall 'picture' as it stands at the time of the study. They are 'designed to study some phenomenon through taking a cross-section of it at one time' (Kumar, 2011). With a cross-sectional study, the researcher decides what he/she wants to know about, identifies the study population, chooses a sample (if you need to), and contact the respondents to find out the required information.

3.9 Data collection

Data collection is a series of activities that begins with gathering and measuring information on variables of interest in an established systematic manner that enables one to answer stated research questions, test hypotheses, and evaluate outcomes (Kabir, 2016). The data collection of this research is common in all fields of study, including physical and social sciences, humanities, business, etc. Kabir (2016) indicated the diversity of data collection per the field of study and philosophical approaches adopted. He stated that the data collection methods vary by discipline, emphasizing maintaining an accurate and honest collection. The goal for data collection is to capture quality evidence that ensures richness in the data analysis, which ensures the compelling and credible answer to questions that have been asked (Kabir, 2016, Yin, 2018; Saunders, Lewis & Thornhill, 2019 Accurate data is essential in every subject of research in maintaining the integrity of research as it is a constituent an integral part of the researcher's objectives. The selection of relevant data collection tools (existing, modified, or newly developed) and delineated guidelines for their proper use reduces the likelihood of errors occurring.

In conclusion, the data collection method employed in the study was an interview. This method was used due to the study approach and the philosophies that underpinned the study and to get in-depth knowledge on the subject to open the conversation for a much deeper explanation and understanding. A detailed section on this data collection approach will be discussed in the subsequent section.

3.9.1 Interviews

An interview is a data-collection method in which an interviewer (the researcher) asks the interviewee questions (the participants). Interviews that are done face-to-face are called in-person interviews; interviews conducted over the telephone are called telephone interviews. Probes is a significant strength of interviews as it allows the researcher to prompt for an additional response for clarity. An interview is considered an interpersonal encounter, and as a result, the research must establish a rapport with the study participant. Interviews are primarily conducted in a friendly environment, and the researcher must be impartial to whatever the interviewee says.

An interview guide was used for this study. An interview is an interpersonal interaction between the researcher and the respondent. An interview can be both structured and unstructured. The interview aims at identifying participants' emotions, feelings, and

opinions regarding a particular research subject. The main advantage is that they involve personal and direct contact between interviewers and interviewees and reduce non-response rates, but interviewers must have acquired the requisite skills to do so. Carry an interview (Yin, 2018) successfully. The study also adopted a semi-structured interview guide. This offers flexibility in terms of the interview flow. As a result, conclusions not originally intended to be drawn about a research topic can be generated.

Stages in Designing and Using an Interview Guide

As with other research tools, there are several stages to developing and efficiently using interview guides. Following is an adopted conceptualized framework from Wilkinson and Birmingham (2003)

Draft the interview Guide.

The interview development and the process started by indicating the questions I sought answers to in the research and looking for other articles mentioned for further studies concerning the COVID-19 pandemic. In comparison to other research instruments such as surveys, interviews are generally less structured. However, this research used semi-structured interviews to give the informant enough time ahead, provide reliable and comparable qualitative data, allow a two-way interview between the researcher and the informant(s).

Pilot questions

No scientific study instrument is perfect. The researcher began to identify and correct deficiencies (before it is too late) by designing pilot questions with my supervisor to establish clarity. The interview questions were carefully crafted on the key topic of the research – The nature of outsourcing and challenges encountered by firms in the mining industry in Ghana during the COVID-19 pandemic. Piloting is crucial. It helps eliminate ambiguous questions and generate helpful feedback on the structure and flow of the intended interview. As with other research methods, the interview questions were designed to make them easy to understand.

Selection of sample interviewees.

Because it takes longer to prepare, conduct, and analyze interviews than other research instruments, additional care was taken when selecting the sample group of respondents.

Even the most competent and hard-working researchers cannot expect to interview anyone associated with or involved in the subject under scrutiny. Each hour-long interview will take at least twice as long to transcribe; it will take a long time to set up, and it will almost always need the researcher to visit the participant. Interviewees on their 'locations' to conduct the interview. For these reasons, the sample of respondents was representative – if you are to generalize from the data they provide – and reasonable. The central research question or questions should help you decide how many interviewees you will require and whom to interview. The interview was conducted with more than one interviewee from different mining companies in Ghana. It is widely agreed that things should start from the beginning. 'top-down,' i.e., Interview informants were heads of departments and Senior Supervisors with employees who report to them daily and many years of experience in the mining supply chain.

The interview guide was divided into seven modules. The modules were developed based on the socio-demographic characters of respondents and the specific objectives of the study. Module "1" focused on the *introduction and socio-demographic characteristics of participants*, Module "2" dealt with *core and non-core functions of the organization*, Module "3" was on *outsourcing engagement*, "4" centered on *outsourcing and outsourcing processes*, the "5" part focused on *supplier selection and processes*, the 6th section of the guide solicited for data on *outsourcing, and COVID-19 pandemic* and the part of the guide collected data on *the general question and the informant's contribution*.

The research technique used primary data by conducting interviews with three case companies in the mining industry in Ghana to explore the nature of outsourcing and challenges encountered by firms in the mining industry in Ghana during the COVID-19 pandemic. All three interviews were conducted through "Voice over Internet Protocol," which I used WhatsApp calls in my case. (Iacono, V et al., 2016) This helped to conduct the interviews considering the challenges of internet connectivity in Ghana and the elimination of geographical barriers due to CoVID-19 and international restrictions, traveling and expense cost, and enabling a schedule for the interviews. The difficulties encountered while conducting the interview was unstable internet connectivity, where at a point in time, I had to use direct calls to ensure that the interviews came to a successful end. Unfortunately, only one informant out of the three agreed to have a face-to-face interview, but due to poor internet connectivity, we later adapted to audio calls which later was successful.

All interviews were conducted in between the period of 18th and 21st April 2021. The interview duration lasted between 35 minutes up to 60 minutes, and all informants were

assured of anonymity and confidentiality of the interviews. It was a semi-structured interview with open-ended questions. This enhanced the data collection whereby the interviewer and interviewee had the flexibility and more open conversation and follow-ups on all responses from the interviewees, which were exciting and more emphasizing. (Alshenqeeti 2014). The same interview guide was used in the collection of data for all three case companies. The interview guide can be found in Appendix A: interview guide.

All participants were informed two weeks earlier and given an interview guide to understand and understand the answers to be expected during the interview. This made the interviews richer and understanding throughout the entire process.

Table 6: Interview schedule: a summary of all the scheduled times and duration for the interviews.

Case	Date	Interview Object/Years of experience	Interview Duration
Tarkwa Mine	April 18th	Senior Supply Chain (13 years) Supervisor	35 minutes
Sankofa Mine	April 21st	Procurement Officer (9 years)	45 minutes
Akwaaba Mine	April 21st	Logistics and Supply (11 years) Chain Officer	60 minutes

All the interviews were audio-recorded and later transcribed. Recording the interviews was very convenient because it reduced the stress of taking notes and focused on the interviewees' responses. Later all recorded interviews were transcribed and analyzed for Chapter 4, findings, and analysis.

3.10 Data Analysis

For data collected to be helpful and answer the research question, content analysis needs to be done, primary data collection through a semi-structured interview as qualitative data was collected for the research. Qualitative data are primarily textual and descriptive or nominal, meaning the data collected are in words and sentences (Kumar, 2011). Often (not always), such data capture the participants' feelings, emotions, or subjective perceptions. Qualitative research approaches aim to fully address the ‘how’ and ‘why’ of research and fully use unstructured data collection methods to explore the topic (Creswell, 2013). Before analyzing the data collected, all audio recorded interviews data collected were transcribed, and transcript checked for errors and was reviewed by the interview object.

Data was collected, transcribed, and analyzed from three cases. A thematic content analysis was employed to analyze the data. The categorization was based on research questions iteratively to compare and contrast the codes using three methods used in manual qualitative data coding. This followed Lacey and Luff's (2007) five-stage technique: transcription, organization of data, familiarization, coding, and theme generation. The coding methods followed a three-stage process. First, coding each participant's responses that relate to the research objectives with a word or an extended-phrase that identifies what unit of data is about/or what it means. For instance, "*we do not have the requisite human resource with a specialized skill for the service or the product we want in house*" was coded "*limited human resource*." Secondly, the use of "In-vivo" terms to represent participants meaning were used as codes. For instance, "*most of our employees were not coming to work because of covid-19, so we lost man-hours*" was coded "*lost man-hours*." Lastly, process coding is also labeled as "action coding," Human action, which can be strategic, routine, or random, occurs sequences to reach a particular goal or handle a problem (Saldaña 2013). For instance, the coding of *periodic giving out of the transport, cattery, cleaning, and security services* to other companies was coded as *outsourcing non-core activities*.

The research questions and objectives were the main categorizations. These major categorizations are why mining companies outsource, the essential functions, outsourcing procedures, and the challenges encountered during covid-19. Below are the results of the data analysis. After the transcription, I adopted the cyclical analytic coding and categorized the interview transcripts (Saldaña, 2013). The iterative activities were structured scientifically in a manner where the researcher compared data to data, data to code, code to code, code to the category, category to category, category back to data (Saldaña, 2013. These activities were to ensure coherency and consistency of approaches adopted in coding and categorizing data for analysis. The data coding approach used by the researcher was in vivo coding several names, including literal verbatim coding called the approach. In vivo translate to mean "*in that which is alive,*" and as a code, this represents a word or short phrase from the transcripts or words found in the qualitative data record, which are the terms used by the study participants themselves. The coding approach was selected because the impact of COVID-19 has been extensive and interrupted many business processes. Therefore, the researcher wanted the analysis to reflect the emotions, organizational cultures, and worldview of the mining industries

3.11 Validity

Shenton (2004) indicates that validity in the qualitative term "appropriateness" refers to the instruments, techniques, and data used in the research. Whether the research question is appropriate for the desired outcome, whether the technique chosen is appropriate for answering the research question, whether the design is appropriate for the methodology, and whether the approach is appropriate for the design. The sampling and data analysis is appropriate, and finally, the results and conclusions are valid for the sample and context. In evaluating the validity of qualitative research, the challenge may begin with the ontology and epistemology of the subject being examined. For sampling, procedures and methods must be appropriate for the research paradigm and be distinctive between systematic, purposeful, or theoretical (adaptive) sampling where the systematic sampling has no a priori theory, purposeful sampling often has a specific aim or framework, and theoretical sampling is molded by the ongoing process of data collection and theory in evolution (Wilkinson and Birmingham, 2003). According to Yin (2009), there are three measures to increase validity in case of study research, using multiple sources of evidence, which emerges during the data collections stage of the research. In the case of this research, multiple sources of evidence were considered through interviews of three case companies and information obtained from their websites. Another form of tactics is establishing a chain of evidence in the study whereby the research follows logical patterns, which allows the reader to gain insights into how the research was conducted. (Ellram 1996).and efficient citations and cross-checks of sources of evidence (Riege 2003). In the data collection stage, according to Yin (2009), the last tactics are reviewing the transcript of the case study report by key informants, data analysis of the findings, and making necessary changes possible.

3.14 Reliability

Reliability concerning the quality of research design can be defined as *"whether it will be able to demonstrate other researchers and similar yield results can repeat the procedures and operations implemented in the research design." (Riege 2003).* Alternatively, to (Riege) 2003, Guba and Lincoln (1989) also defined it as the "*consistency, stability, accuracy and dependability of terms of the phenomenon in question and research instrument applied*." To ensure quality in research reliability, dependability should be considered, whereby reliability is concerned with little or no variances in the result of the study. Dependability, on the other hand, seeks to find traceability for variances in the result. The reason for dependability is

that the variance in the results of a replicated study does not arise inconsistencies in the research design, which might be due to changes in reality or increased insights (Guba and Lincoln 1989).

In ensuring the reliability of the research and making a concrete judgment on decisions regarding the research design and analysis of the study, all theories used in the study was explained and ensured that data collected through case interviews are accurate, all interviews were recorded and captured in a live voice recording, stored, which was later transcribed and used for the Chapter 4 of the study (finding and analysis).

Moreover, a semi-structured interview guide with slight adjustments made by my supervisor was used for all three case interviews to ensure consistency. All methodological approaches were carefully examined to ensure appropriateness.

3.15 Credibility

Credibility is focused on establishing a match between the constructed realities of respondents and those realities represented by the researcher(s) (Sinkovics, Penz, & Ghauri, 2008). It has been defined as the naturalistic parallel to internal validity (Halldorsson & Aastrup, 2003; Riege, 2003). The term credibility concerns the interpretation of the observations, whether the data support the interference that the researcher(s) makes, and sensible to earlier research (Silverman, 2013). To achieve this, Erlandson et al. (1993) suggest six techniques: prolonged engagement, persistent observation, triangulation, referential adequacy materials, peer debriefing, and member checks.

Out of the six techniques listed, the first technique utilized was triangulation. Triangulated data were obtained from interviews conducted on three case companies within the same industries and with employees in strategic positions within their respective companies and information on their company websites. This gave different approaches to procurement, giving us a rich understanding of the procurement process and how different companies and employees face and tackle complexity in procurement. The second technique was member checks, where all the informants retained the possibility of revising all information provided by them throughout the research period. However, this did not include drafts of findings and analysis done during the research (Silverman, 2013). All informants also offered to be available for further questions during the study if they need clarification, follow-up questions, or additional information should arise.

The last technique utilized is referential adequacy materials. Since this is a case study, I have taken the context of the study into account because it influences the data collection and the

interpretation of the interviews (Sinkovics, Penz, & Ghauri, 2008). In qualitative research, the context of the study is essential, which is reflected throughout the making of the questioner where the initial questions are generic and by using a semi-structured interview, each informant was given a chance to go deeper into subjects regarding challenges specific to their environment. Throughout the findings, an analysis of a holistic view of the data has been done to preserve the context of their collection (Grossoehme, 2014).

3.16 Transferability

Transferability addresses the question of whether the results of the qualitative research can be transferred to other contexts or settings. According to (Silverman, 2013) this is dealt with through a thorough case selection with adequate details about the case itself and the setting. This means that the conditions for and the possibility for generalizability are determined at the design stage (Patton, 2015). A case has a problem: it tends to be highly localized, and researchers must be cautious when generalizing from case studies and demonstrate how the selected cases are like those of its type (Denscombe, 2010). This research follows an indictive logic and tries to generate theories from the cases investigated to ensure the highest possible transferability. Denscombe (2010) and Patton (2015) present several principles and arguments that rebuke eventual claims lacking generalizability.

3.17 Confirmability

Traditional interpretive researcher seeks to establish objectivity through a methodology that is explicated, replicable, and where the observations are insulated from the biases of the researchers. However, the naturalistic researcher does not attempt to ensure that the researchers' observations are free from contamination but instead relies on the confirmability of the data themselves (Erlandson, Harris, Skipper, & Allen, 1993). “This means that the data is traceable to back to their sources and that the logic used to assemble the interpretations into structurally coherent and corroborating wholes is both explicit and implicit” (Erlandson, Harris, Skipper, & Allen, 1993). Patton (2015) describes confirmability as establishing the fact that the researchers do not make up the data and interpretations of an inquiry, and as confirming this, linking assertions, findings, interpretations, and so on to the data themselves in readily discernible ways is needed.

To best ensure the confirmability of this research, there must establish a chain of evidence, which refers to having a robust and straightforwardly research design making the reader able to follow the case study data and analysis from the initial formulation of the research

questions to the conclusion (Ellram, 1996). To ensure this, the same research questions were used for data collection in the same environment (mining industry) for all three cases considering theoretical positions. Through the data collection findings and analysis, research questions and objective of the study reflected on the findings and analysis of the study, which increased the overall quality of the research by gathering feedback and advice and adjusting the structure and approach accordingly, ensuring that the research has reached a satisfactory level.

The anonymization of the informants was necessary to gather information to perform this case study, as some of the questions could provoke answers reflection discontent of the

3.18 Generalizability

Most qualitative studies are designed to research a specific issue or phenomenon in a particular population or ethnic group of a focused locality in a particular context. Hence the generalizability of qualitative research findings is usually not an expected attribute (Korstjens & Moser, 2018). However, the rising trend of knowledge synthesis from qualitative research via meta-synthesis, meta-narrative or meta-ethnography, evaluation of generalizability becomes pertinent. A pragmatic approach to assessing generalizability for qualitative studies is to adopt the same criteria for validity: Using systematic sampling, triangulation and constant comparison, proper audit and documentation, and multi-dimensional theory (Grossoehme, 2014). Given the complexity of generalizability of qualitative research finding identified by other research, the context of this study appears outside this limitation. This is partly because the phenomenon being studied is global, not specific to a group of individuals. The study explored the nature of outsourcing and challenges encountered by firms in the mining industry in Ghana during the COVID-19 pandemic and focused specifically on the mining industry in Ghana and research questions seek to find answers as such, moreover comparison by case to case concerning the subject matter in the mining industry show patterns. As a result, the findings from this study can be extended to conclude similar mining organizations within this situation. Also, given that a scientific and systematic approach was followed to ensure the validity and reliability of this study, a case in point can be advanced for the potential generalization of the findings of this study.

3.19 Ethical Considerations

The current study was subjected to specific ethical issues (consent, confidentiality, and anonymity of the case companies and informants' identity regarding maintaining the quality and integrity of the data for the research). All participants indicated their acceptance regarding their participation in the research and signed an informed consent form. The informed consent form aimed to reassure participants of their participation in the research. They could decide when not interested in the research at any point and for any reason. The study's goal was presented to the respondents. They were assured that all information they would provide would be used only for academic purposes and treated on a high confidentiality level. The anonymity of respondents was assured; because of this, the altered researcher names of the participants and the companies they work with were used. (Josselson, R. 2007)

3.20 Analytical Approach

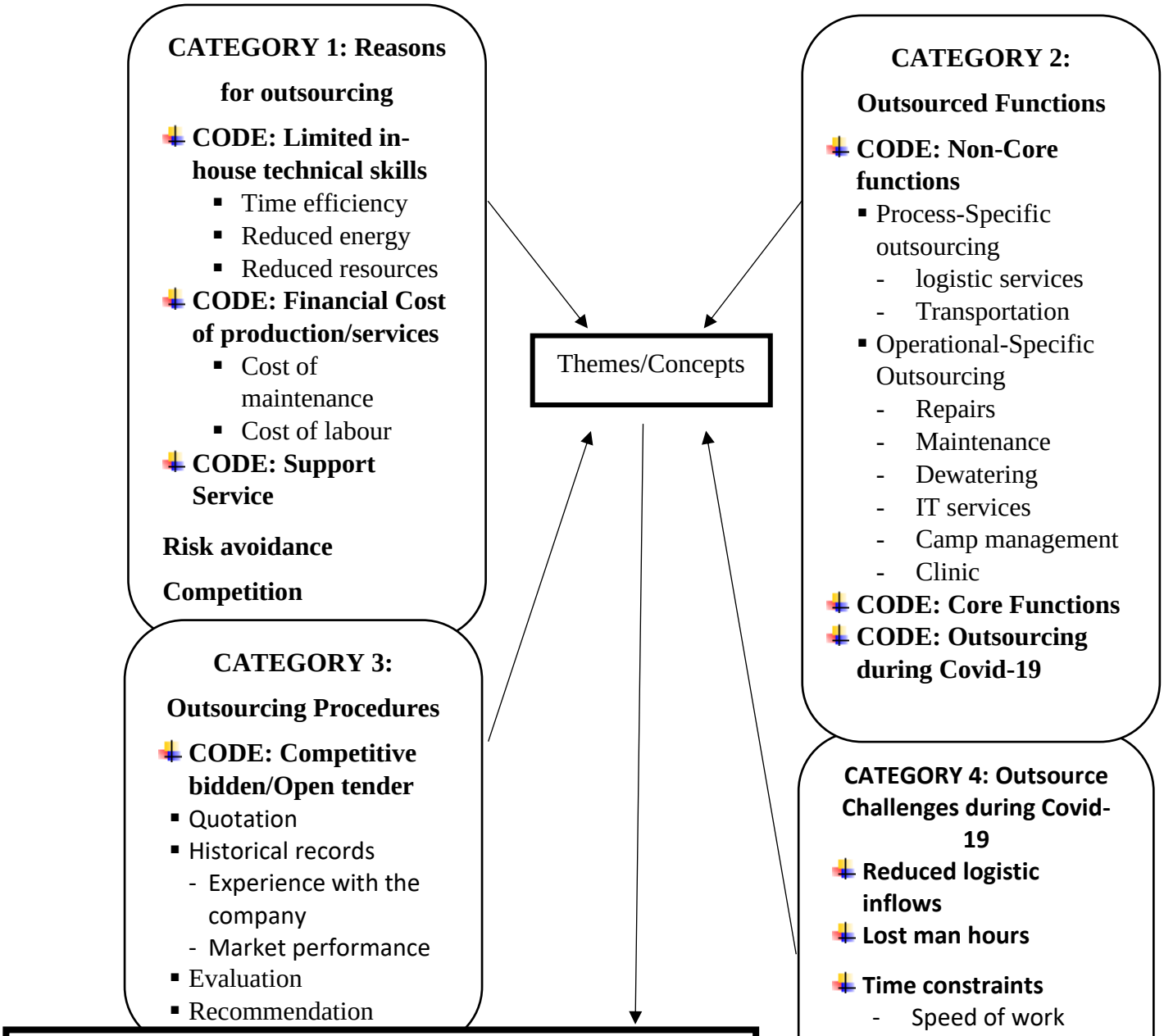
Data was collected, transcribed, and analyzed from three cases. A thematic content analysis was employed to analyze the data. The categorization was based on research questions iteratively to compare the codes by using three methods that are used in manual qualitative Data coding. This followed Lacey and Luff's (2007) five-stage analytical techniques: transcription, organization of data, familiarization, coding, and theme generation. The coding methods followed a three-stage process. First, coding each participant's responses that relate to the research objectives with a word or an extended-phrase that identifies what unit of data is about/or what it means. For instance, "*we do not have the requisite human resource with a specialized skill for the service or the product we want in house*" was coded "*limited human resource*." Secondly, the use of "In-vivo" terms to represent participants meaning were used as codes. For instance, "*most of our caterers were not coming to work because of covid-19, so we lost man-hours*" was coded "*lost man-hours*." Lastly, process coding is also labeled as "action coding," Human action, which can be strategic, routine, or random, occurs in particular sequences to reach a particular goal or handle a problem (Saldaña 2013). For instance, the coding of *periodic giving out of the transport, cattery, cleaning, and security services* to other companies was coded as *outsourcing non-core activities*. The research questions and objectives were the main categorizations. These major categorizations are why mining companies outsource, the key functions, outsourcing procedures, and the challenges encountered during covid-19. Below are the results of the data analysis.

CHAPTER FOUR

FINDINGS

RESULTS OF THE STUDY

Figure 4: Coding and Thematic Framework



OBJECTIVES: The study sought to explore the nature of outsourcing and challenges encountered by firms in the mining industry in Ghana during the COVID-19 pandemic. The research explored several interrelated categories which are: Category 1) Whether managers in the mining industry in Ghana outsource business functions. Category 2) Functions that are outsourced in the mining industry in Ghana. Category 3) Current methods used in outsourcing in the mining industry, and Category 4) Challenges of managing outsourcing during COVID-19 pandemic

4.1.1 Why do managers in the mining industry in Ghana outsource business functions?

The decision to produce in-house or outsource any product or service in the mining industry is a very strategic endeavor. As such, mining industries outsource for several reasons. In the various case studies studied, the mining companies outsource due to limited in-house technical skills, increased cost of in-house production, company functions that were considered non-core, risk avoidance, and meeting the competition in the mining industry.

Limited in-house technical skills/specialization

The most typical theme expressed by the mining companies concerned inadequate skilled human resources needed to perform technical activities. These activities include operational refurbishment and the operation of specialized or complex machines. For instance, a logistic and supply chain officer shared that:

> *We outsource because we do not have the requisite human resource with specialized skills for the service or the product we want in-house.*

The lack of technical skills was also confirmed by all participants, including a Senior Supply Chain supervisor who stated that:

> *The outsourced companies have the technical know-how and the skills that we need.*

On refurbishment, several examples, for instance, were cited.

> *We do not have the requisite human resource with the specialized skill for refurbishment. Refurbishment is a different thing altogether, from the day-to-day maintenance and the maintenance of the mines. So we outsource to OEMs like Sandvik, Mantrac. (* Logistics and SupplyChain officer, Akwaaba Mine*)*
>
> *There are expert consortiums; even though we also possess key skills in-house, these consortiums' are the field experts. E.g., is the OEM. (*Procurement Officer, Sankofa Mine)

When the machine is employed requires expert services, mining companies outsource such maintenance to the companies with the requisite skills and abilities. For instance, a procurement officer reported that:

> *We have to fall on the outsourced people because they know much about the machines than we do.*

The procurement officer also mentioned that these consortiums are engaged because of the warranty and security of work. He reported that:

> *Because of the warranty and security of the work, we outsource to experts in the field.*

Participants shared the need to employ the services of experts in the mining industry. The sub-theme concerns the need to save time, save energy and limit scarce in-house resources. This was summarized when a procurement and supply chain officer reported that:

> *It takes us more time, energy, and resources to carry out a task because we do not have the skills. These specialized people can give us the best quality and cost-effectively provide their services.*

Support Service

Another key reason mining companies outsource a function or activity is the focus of the company. At the mining sites, several core and non-core activities take place. The mining companies reported that their primary function concerns the extraction and processing of ore. Any activity that falls outside this focus is considered secondary and therefore needs less attention. Participants described that a *core* (Logistics and Supply Chain Officer, Akwaaba Mine). Participants also defined non-core functions as *support activities related to managing the mining activity, spanning from finance to operations and other related services*. They cited non-core functions such as the *finance department, the Human Resource department, logistics, cleaning, transport, and security (Senior Supply Chain Supervisor,*

Tarkwa Mine). The non-core functions are not directly related to the exploration of mining but serve as a support to ensure that the day-to-day running of the mine is smooth. Due to its nature, *limited resources, including skilled human resources, are accorded to it in-house* (Senior Supply Chain Supervisor, Tarkwa Mine). Participants reported that they outsource non-score functions:

> *We outsource non-core functions so that we can get the time and focus on our core activities. Using a scale of preference, we arrange our needs and wants and scale them and do the important ones first.* (Procurement Officer, Sankofa Mine)
>
> *The reason for outsourcing is that some of the activities are not our core business* (Senior Supply Chain Supervisor, Tarkwa Mine)

One company cited cleaning as an example. Although cleaning activities are not currently outsourced, it is more likely to be outsourced in the near future as it is non-core activity.

> *Cleaning is not outsourced today but would be suitable for outsourcing because it is not a core business, and when outsourced, it can be done well at a low cost* (Senior Supply Chain Supervisor, Tarkwa Mine).

Financial Cost of production/services

Mining companies also engage other companies to perform some functions due to the increased cost of in-house producing the exact product/service. Participants expressed that:

> Gold is produced at a specific value. You realize that you have the core competencies but doing it yourself means you will incur extra costs (Senior Supply Chain Supervisor, Tarkwa Mine).

Two major sub-themes emerged from the financial cost. These themes are the financial cost of maintenance and the cost of employing permanent staff.

Cost of maintenance

On the cost of maintenance, it was evident that managing mining fleets can be costly, and therefore rational to outsource such fleet responsibilities to a third party.

> *Again, we also look at the fleets that we are using for the job. If you look at the cost of maintaining the fleets, if it is more, you may desire to hire a third party to do it for you* (Senior Supply Chain Supervisor, Tarkwa Mine).

Cost of employment/labour

A sub-theme on financial cost is also labour cost, particularly the cost of permanent employment. Participants shared that employing a permanent person will incur an additional cost since the mining industry is labour intensive. On labour, participants shared that

> *Labour controls almost 80% of our company's expenditure, but you can also get the same service from a service provider at a cheaper cost, so (Tarkwa mine) take advantage of the available market opportunity at a cheaper cost* (Senior Supply Chain Supervisor, Tarkwa Mine).

This was also confirmed by a Procurement officer when he mentioned that:

> *Getting permanent staff is costly, we have to pay their Social Security (SSNIT), their Provident Fund, etc., but these become the outsourced company's responsibility. In the case of individuals, they come as and when we need them and then pay them off.*

To avoid such responsibilities, other reasons for outsourcing are to shift risks involved in the mining operations to the outsourcing company. For instance, risk avoidance was expressed in this way:

> *When we outsource, any risk that will come is pushed onto the outsourced company (Logistics and Supply Chain Officer, Akwaaba Mine).*

Competition in the mining company also encourages mining companies to outsource some functions to other companies.

Competition

In the quest to be competitive, we look at our internal and external capabilities and objects also available in the external environment to inform our outsource decisions (Senior Supply Chain Supervisor, Tarkwa Mine)

4.1.2. What functions are outsourced in the mining industry in Ghana?

As mentioned earlier, several functions are performed in the mining industry. These are generally classified into core and non-core functions. It was evident that non-core functions or activities were the most common outsourced in the mining industry. These non-core functions are usually not the utmost priority for mining companies. By extension, non-core functions comparatively generate little revenue to mining companies than the core functions (mining of the ore). Generally, the mining companies outsource less of core activities and more of non-core activities. This is based on mining companies' focal directions, competition available in the market, the quest to gain other knowledge for competitiveness, and response to governments' requirements/regulations (Senior Supply Chain Supervisor, Tarkwa Mine).

Non-Core functions

All the companies reported that they outsource non-core functions to other companies or individuals. The non-core activities are not the focus of the companies. Due to the multitude of non-core activities, sub-themes were further generated from the data. These sub-themes are process-specific outsourcing and operational-specific outsourcing. On non-core function outsourcing, the participants shared that:

Our focus is to ensure that we are hitting our target in terms of exploration of the ore, so anything that does not have a direct relationship with the ore, we usually do not focus on it but rather outsource it for people who can do it better for us (Logistics and Supply Chain Officer, Akwaaba Mine).

We outsource supporting activities like transportation, logistic, catering, and hospital services because these activities do not add any significant value to our business. Except it is expensive trying to keep these so you give these to other people who have key competencies in these areas so that you can concentrate on your activities' (Senior Supply Chain Supervisor, Tarkwa Mine).

Process-Specific outsourcing

Participants defined process-specific outsourcing as all the supply chain activities that seek to bring goods or services outside the camp to the camp environment. These were primarily concerned with transportation services and mainly were done by supply chain officers and warehouse officers.

*Many activities occur when importing goods to our mining sites, and we do not necessarily handle all the activities within the supply chain. We do not own a vessel, so we outsource a vessel from the sea to the ports, and we also do not build the trucks, so we outsource with truck owners to move the things from the port to our final sites (*Logistics officer and Supply Chain Officer, Akwaaba Mine).

*When importing them through the supply chain, transportation of our consignment from the port, or even right from the origin. We assign freight forwarders such as Supply direct, and they have other partners which mobilize our logistics with their resources. When it gets to Ghana, because we do not have people at the port, we outsource it to a company that knows clearance to engage the transport company to clear the products to our site (*Procurement Officer,Sankofa Mine).

Operational-Specific Outsourcing

In the camp environment, several activities are also outsourced. These activities are usually mining operations maintenance, fleet maintenance, refurbishment, and dewatering services. On dewatering, for instance, a company shared the reasons why it engaged third parties when they stated that:

> *Water gets accumulated in our pits, and it is sometimes so many that our resources cannot siphon all the water, so we rely on people who are specialized in that area to make sure that they pump the water out of the pit to make allow easy movement of our people and machines (* Logistics and Supply Chain Officer, Akwaaba Mine).

Also, on maintenance and repair, participants shared that

> *It is not the entire maintenance function that we outsource, and the outsourced ones are the maintenance, repairs, and refurbishment work. The outsourcing company ensures that all the machines' weak parts are replaced by servicing them and putting them better* (Logistics and Supply Chain Officer, Akwaaba Mine).
>
> *Also, mining support services like minor repairs like the sowing of vent bags are outsourced because they can be done at a low cost and can be done perfectly without technical or formal knowledge required* (Senior Supply Chain Supervisor, Tarkwa Mine).
>
> *There are times that final drives and equipment are sent to Sandvik or Mantrac to refurbish them (* Logistics and Supply Chain Officer, Akwaaba Mine).

Information Communication and technology was another operational area that was outsourced.

> *We engage professional service experts such as IT persons to design our web, and also when it comes to our payroll. For example, our payroll software is not something that is in-house built. It is a consultant that built the software and managed the software for us at a cost. Another accounting consultancy, such as*

account auditing is also outsourced (Logistics and Supply Chain Officer,Akwaaba Mine).

Other services such as cleaning, camp management, and health/safety issues are also outsourced. For instance, participants shared that:

> *When it comes to getting labour (security services, cleaning, camp management), we outsource these to the local assembly members and chiefs. We do these also to create jobs for the local people since it is their land. We want them to feel engaged, and we want them to have a feel of working in the mines to gather meaningful experiences* (Logistics and Supply Chain Officer, Akwaaba Mine).

This was also confirmed when a procurement officer mentioned that they employ local people every three months and recruit another batch to take over some menial jobs in the mining sites until their contracts expire.

> *Our mining department employs local people every three months, their contract expires, and we pick another group and do their work for three months and on* (Procurement Officer, Sankofa Mine).

At some mining sites, health issues are outsourced to health professionals to provide some primary care services. For instance, a mining company shared that:

> *Currently, we have SOS international clinic, which is outsourced. We face several hazards, and accidents do happen. Therefore, the site clinic provides first aid before being sent to the hospital* (Logistics and Supply Chain Officer, Akwaaba Mine).

Core Functions

As mentioned earlier, outsourcing a core function is rare. Among the cases studied, only a company reported that it outsourced a core function. The company has a mining department that oversees the work done by mining contractors, mainly Rock sure Ghana Limited. The company shared that:

In the case of the mining operations, we have outsourced it to ROCKSURE. For the maintenance of the machine, mill, and the equipment we use in our day-to-day activities, we usually call them SHUTDOWN (Procurement Officer, Sankofa,Mine).

The procurement officer further shared that:

We have those people who do the blasting for us. MAXAM offers explosive services, and they do this in consultation with the exploration team. The survey team will also tell them where we have the high grade and the low-grade ore. We show them, but they do the blasting, mining, drilling, and the transport of ore (Procurement Officer with six years' work experience and 13 years work experience in other mining companies).

Outsourcing during Covid-19

The global covid-19 pandemic has shipwrecked economic systems and has led to the collapse of establishments. Efforts were made to explore outsourcing mechanisms during this global pandemic. It was evident that most mining companies did not outsource a service or product largely due to the covid-19 pandemic. A company, for instance, expressed its intentions not to outsource any key function due to the uncertainties with the covid-19 pandemic, particularly with the time it will be fully controlled. Also, an instance was when a participant stated that:

With a pandemic, you cannot pre-determine when the pandemic ends, so it is not a favorable opportunity to go into a significant contract with a company because it may come with many risks (Senior Supply Chain Officer, Tarkwa Mine).

Exploring the ore is one of our core functions that the company could not compromise by engaging a third party, albeit a covid-19 pandemic. Our specialized exploration team is still handling that aspect (Logistics and Supply Chain Officer, Akwaaba Mine).

Some companies reported the need to outsource health experts to handle education and adherence to covid-19 protocols in the mining sites.

> *We had to outsource the safety issues to a third party to effectively manage the pandemic for us so that we would be able to avoid any covid-19 case* (Logistics and Supply Chain Officer, Akwaaba Mine).

4.1.3 What are the current methods used in outsourcing in the mining industry?

The third objective of the study sought to explore the current methods used in outsourcing. All the cases indicated that the main method of outsourcing is through competitive bidden, and successful applicants and the mining companies agree on the Service Level Agreement (SLA). The selection of the company to outsource to is influenced by several factors. In this study, the methods include quotations, historical records, experience with the company, evaluation, technical skills, and recommendations. These themes are further reported.

Quotation

Quotation involves the vendor's pricing, timeliness, and ethical conduct. Mining companies then carry out its assessment to ensure that the right vendors are chosen based on the company's indicators, such as price, the timeline, and other considerations. It was evident from the study that pricing is an essential component of outsourcing in the mining industry. It was realized that the lowest bidder among the competitive teams is more likely to win outsourcing contracts. For instance, the cases show that:

> *Vendors are selected based on their cost of production or service* (Logistics and Supply Chain Officer, Akwaaba Mine).
>
> *We call for proposals for the highest bidders, and when they come in, we look for the lowest bidder* (Procurement Officer, Sankofa, Mine).

The procurement officer provided key highlights to the bidden and cost.

If possible, we will go in for the highest bidder based on the services he will provide and based on what we also want, including meeting deadlines, legal standing, and trustworthiness. But normally, the lowest bidder wins, and sometimes, the highest bidder also wins, looking at the facilities and services they can render.

Some companies reported that quotations in the mining industry are the most important as the supplier brings to the table what he/she can provide and how that will also meet the mining company's needs. Quotation, therefore, goes beyond pricing to include other essential demands. A Procurement and Logistics Officer stated that:

The quotation, evaluation, and process are the most important because the supplier gives you the offer of the time he will deliver, the offer of cost, and other terms and conditions that may come into play.

The procurement officer went further to explain the legalities in quotations.

A quotation is such a legal form where a purchasing order is exchanged. They are legally binding documents with terms and conditions. Vendors can therefore be held responsible.

Historical records

Mining companies engage in outsourcing with companies they have prior knowledge and experience with. Such experiences are in the form of the company's personal experience and market performance. Usually, mining companies outsource to other companies that they have had positive work experience with. Participants stated that:

I may have an existing supplier who has done delivery over time, is consistent, their services are cost-effective and time-efficient. These become an assessment tool for selecting such suppliers (Logistics and Supply Chain Officer, Akwaaba Mine).

For the eight years I have been here, another company came, and they knocked them off. So that is how we make the selection (Procurement Officer, Sankofa Mine).

Participants also expressed that, while historical records are essential, they can be misleading mainly through past glories. For instance, a Logistics and Supply Chain Officer expressed that:

Such companies can also fail to perform. Past glory can be in history and may not be relevant in contemporary outsourcing (Logistics and Supply Chain Officer, Akwaaba Mine).

Evaluation

Evaluation is one critical method employed in outsourcing practices. After the quotation, the outsourcing company evaluates the vendor's request by assessing the vendors' product/service quality and timelines. On quality and timeliness, a Procurement Officer, for instance, mentioned that:

The most important criteria to us are the quality of the product/service and the ability to provide all requisite items within the stipulated time.

Recommendation

Some participants also mentioned that they consider when selecting vendors through recommendations from fellow mining companies. The recommendation is made when the outsourcing company reaches out to a second company to recommend vendors. For instance,

*We have other mining sisters and brothers who provide recommendations for us when we contact them (*Logistics and Supply Chain Officer, Akwaaba Mine).

We also take advice from other mining companies. When we need them, we seek the view from other mines, and based on what they give us, we consider them in our selection criteria (Logistics and Supply Chain Officer, Akwaaba Mine)

4.1.4. What are the challenges of managing outsourcing during the COVID-19 pandemic?

Outsourcing enhances the production cost and uses skills and intellectuals that cannot be sourced in-house, but it is not risk-free. COVID-19 posed a shock to industries in 2019 by the disruption of various supply chain networks globally. As a result, it's critical to comprehend the risk factors in managing outsourced activities in the mining industry and seek mitigation measures in managing supply chain risk during this Coronavirus pandemic. Seven sub-themes emerged from the case studies: responsive models, reduced logistic inflows, lost man-hours, time constraints, limited staff, increased expenditure/cost, and limited suppliers.

Responsive models

Whereas it was expected that the global covid-19 would have a devastating effect on industries, it was realized that different companies responded differently to the impact of covid-19. Companies that had responsive models were less likely to be impacted adversely by the covid-19 pandemic. However, out of the cases studied, only one company reported a smooth process. The company reported that:

We have our risk management profile and are always prepared. At every time, we look at what is available and activate our risk management profile. During this pandemic, things have been smooth for us (Senior Supply Chain Supervisor, Tarkwa Mine).

Lost man hours

Covid-19 impacted the productivity of the mining industries by reducing the man-hours needed to complete a given task/work. Participants shared that:

> *Due to the physical distancing, we could not keep many workers in a particular working area as we used to* (Logistics and Supply Chain Officer, Akwaaba Mine).
>
> *Outsourced works require our supervision, but such supervision was reduced due to physical distancing* (Procurement Officer, Sankofa Mine).

Some participants shared their experience on lost man-hours by citing security and cattery services:

> *The security section adopted a zoning system where people worked for three months, and upon return, self-quarantine for two weeks, and then work for three months, and then another will come* (Procurement Officer, Sankofa Mine).

Time constraints

It was found that working in the mines during covid-19 affected the pace of work. For instance, a procurement officer stated that:

> *Time was one of the factors that impacted the performance delivery of our company because what happened was that all compliances to the protocols and other control ground rules had to be enforced, so then we were not doing things in the usual way* (Logistics and Supply Chain Officer, Akwaaba Mine)
>
> *Due to covid-19, the number of employees we work with has been downsized, and some equipment is packed up. This situation impedes the pace of service delivery, which also affects timelines, and eventually reduces our production* (Logistics and Supply Chain Officer, Akwaaba Mine).

It was also found that adherence to covid-19 protocols such as wearing a nose mask reduced the pace of delivery.

The wearing of a nose mask affected the pace of delivery. We had to acclimatize ourselves by wearing nose-mask and consistently sanitizing hands that were new to our workers. These things impeded the flow and the timeline of their services and products to our company (Logistics and Supply Chain Officer, Akwaaba Mine).

Downsizing of workers contributed to limited mining staff.

Limited staff

The working staff is very important in the mining industry. As stated by a participant, mining work is labour intensive.The covid-19 pandemic was discovered to have contributed to a reduction in the number of workers in the mining companies. Such limited staff also affected outsourcing by putting pressure on the outsourced companies. For instance, a Procurement and Logistics Officer stated that

We gave an outsourced company two weeks to refurbish a particular machine. Lots of pressure was put on the outsourcing company, but they could not finish within the time because the number of workers working on that machine had been reduced to 5 (Logistics and Supply Chain Officer, Akwaaba)

Like err, the cattery services, there was a general shut down, so many companies and other businesses were going to town. Most of the caterers were not coming (Procurement Officer, Sankofa Mine)

Increased expenditure/cost

The covid-19 pandemic increased the expenditure of mining companies in various ways. In this study, two sub-themes emerged: increased cost of transportation and covid-19 personal protective equipment.

- Increased in transportation cost

Transportation is very common in the mining industry. In most instances, workers are transported to and from work. It was evident that to ensure physical distancing in the buses, the number of buses needed to be increased to avoid overcrowding and observe some physical distancing. A participant, for instance, stated that:

> *We have one man one seat policy for the passing system, with each person having a seat number. As such we had to increase the number of buses, which came at a cost to us. We used to have two buses, but now we have four buses to meet our needs* (Procurement Officer, Sankofa Mine).

- PPE's

As mentioned, observation of the covid-19 protocols came at a cost to the mining companies. The companies buy nose-masks, hand sanitizers, face shields, thermometer guns, and veronica buckets as a means to avoid contracting the covid-19 pandemic. A procurement officer mentioned that:

> *The PPE's that we had to bring in, the shortages of the PPEs, and the need to still get them in were all factored in our finances in terms of cost* (Logistics and Supply Chain Officer, Akwaaba Mine).

Reduced logistic inflows

During this pandemic, the flow of logistics from across the world and parts of the country was also affected. This was also because not all outsourcing companies manage their inflows since they may be produced outside the country.

> *The locked-down that happened and people were not moving up and down all impacted the flow of goods. There is a huge gap between what we could produce now and the times before covid-19* (Logistics and Supply Chain Officer, Akwaaba Mine).

Limited suppliers

Due to the covid-19 and its related restrictions and business closure, suppliers of goods and services were also limited.

> Suppliers were had to find particularly during the COVID-19 locked down. This is because of border closures and locking up of goods at the airports (Logistics and Supply Chain Officer, Akwaaba Mine)
>
> Many suppliers could not meet their capabilities due to the COVID-19, which led many banks to close and limit their services (Senior Supply Chain Supervisor)

CHAPTER FIVE
DISCUSSION

5.1 Chapter Introduction

This chapter presents information on the discussion of the study results compared to other studies done on outsourcing within the mining sector. The study's main objective was to explore the nature of outsourcing and challenges encountered in the mining industry in Ghana during the COVID-19 pandemic. The reasons for outsourcing, functions that are outsourced, methods used in outsourcing, and the challenges faced in managing outsourcing during the COVID-19 were the specific objectives used to achieve the main objective. Extensive literature was explored, and the use of multiple case studies and the application of theoretical framework relating to outsourcing in this study.

5.2 Why do managers in the mining industry in Ghana outsource business functions?

Throughout the research conducted within the mining industry in all three cases, there is always a reason why some functions are outsourced. These causes differ from one industry to the next. Firm to firm and at a different level. Thus both core and non-core activities are outsourced at different levels. From the study, outsourcing business functions within the mining industry are due to limited in-house technical skills and the financial cost of production/services.

The limited in-house technical skills are related to time efficiency, reduced energy, and reduced resources, as found in this study. It was found in the study that having individuals with technical know-how is very important, and as such, it is very important for mining companies to outsource some of their operations that require technical expertise that the company lacks. By outsourcing these technical skills, there is a tendency to improve production. The respondents saw outsourcing of expertise as critical in production, and despite the various mining firms having experts in-house, they still have to outsource to help

improve efficiency and effectiveness. It is believed that people with expertise help reduce production time wasted. Lin et al. (2016) confirm this assertion by indicating that companies outsource to allow them access to skills or competencies they are lacking. Acquiring a new set of knowledge and skills brings in innovations and technology and helps improve productivity. Kirk (2010) contends that outsourcing for individuals with technical know-how can help prevent the high cost of investing in individuals when there is a shortage in skills within a firm because attraction and retention in the mining industry is an operational challenge. Deloitte Management Consulting (2012) affirms this assertion by stating that in the mining sector as a commodity-based industry, outsourcing is done to overcome the challenge of retaining skilled personnel and acquiring this skilled personnel.

The study also found non-core activities to be the most outsourced activities. The conventional ideology of outsourcing within the mining companies indicates that outsourcing should be focused on non-core activities (Quelin and Dhamel, 2003 as cited in Steenkamp and van der Lingen, 2014) as indicated in this study. These non-core activities in this study are support services such as cleaning. Security services, transportation, and others not directly involved in the extraction of and processing of ore. These non-core activities are not directly related to the main mandate of the mining companies but indirectly help in the day-to-day operations of the mining industry. In this study, non-core activities are outsourced because much attention and concentration are needed for the core activities. These activities identified in this study are cleaning, security, catering, and finance department.

Another factor identified as a driver of outsourcing within the mining sector was the financial cost of production or the cost involved in rendering service. Due to the cost of production, mining companies engage the services of other companies in the production phase of the work despite them having the core competencies. As found in the study, the

financial cost involved the cost of maintenance and labour, equipment, and other infrastructures used in the mining sector are outsourced to other companies, and as such, the cost of maintaining that equipment is not borne by the parent company. Also, since the cost of production can be outsourced, the company involved comes with their labour, and as a result, the cost of labour is not the mining company that gave the contract out. The study found costs such as safety of the employees and the cost involved in contributing to their Social Security (SSNIT), Provident Fund, medical insurance for employees and their dependents, and others are not the parent company's responsibility but that of the outsourced company. As found in this study, the issue of cost conforms with the Deloitte Outsourcing report in 2008, which found cost reduction as a reason contributing to about two-thirds of outsourcing initiatives (Deloitte Consulting, 2008). Similar observations were found in the study by Ferruzzi et al. (2011), which found reduction and operating cost control as a reason why firms outsource their activities, and Freytag et al. (2012) indicated that outsourcing helps covert fixed–cost of production to variable cost of production.

On the contrary, Slack et al. (2008) found cost reduction as not why firms outsource their activities but rather sustainable alignment. Their study looked at how the firm's operations strategy fits with the market requirement so that the firm can exist over time. Choudhuri et al. (2009) believed that future outsourcing decisions would not be based on cost reduction but on value addition to a firm and sustainability of firms.

The competitiveness of the mining company is also a reason why mining companies outsource some of their operations. This is done by analyzing their internal and external capabilities instead of their competitive firm to know their strength. Mining firms then outsource the area they lack competencies or weaknesses to other companies with the required skills to help boost their production and growth and maintain them in the business. Mclvor (2009) identified that outsourcing activities make firms or businesses more flexible

and react to the changing market and compete with other firms. Freytag et al. (2012) affirm this assertion by indicating that outsourcing non-core activities brings a balance to the firm and helps it focus, rendering the best service and sharpening its competitive advantage over other firms.

5.3 What functions are outsourced in the mining industry in Ghana?

From the study, different functions of the mining industry are outsourced. These include both core and non-core functions. The non-core function, as indicated early does not directly impact the extraction and processing of ore, whiles the core functions are the main mandate of the mining companies, thus, activities that directly involve the extraction and processing of ore. The non-core activities are either process-specific or operational-specific. From the study, the process-specific activities are those activities that seek to ensure that all equipment that is not at the company's disposal is acquired from other companies and how this equipment gets to the mining company's site. It was found that these process-specific activities include transportation, either by land, sea, or air. All these transportation routes are outsourced to third-party companies to deliver the acquired equipment to the mining company. Some process-specific activities are outsourced at different stages of the procurement process. This includes outsourcing the mode of transportation if the equipment was bought outside the country. The transportation of the goods is outsourced to a freight forwarder to transport goods by vessels or plane to the destination's port. At the port, clearance of the goods is further outsourced to a clearing agency skilled in port operations and other transports of the goods to the mining site. These different levels of the outsourcing of transportation of the goods, as indicated, helps in ensuring safe delivery of the goods, and the outsourced company bears the risk associated with it. These activities, as indicated by Baatarogtokh et al.'s (2018) study, are full logistics. The logistical activities from their global study on outsourcing were one of the outsourced activities within the mining sector.

For operation-specific activities, a number of them are outsourced. From the study, operation activities such as mining operations maintenance, fleet maintenance, refurbishment, and dewatering services are the functions that are outsourced within the mining companies. Baatarogtokh et al. (2018) found similar observations in their study. They further indicated that these activities are outsourced because the mining companies do not have the internal capacity to perform them. Specialization is key in the mining industry, and as such, each unit needs individuals specialized in that field. Due to the high volumes of water found within underground mining pits, it is necessary to get rid of the excess water to help in easy movement, and as such specialized companies are outsourced to work on the dewatering. Maintaining machines to put them in good shape is very important in the mining industry, and this function is also outsourced to help in regular and periodic maintenance, repair, and refurbishing the machines found within the mining sites. From the study, another operational-specific activity that is outsourced is information communication and technology. Design and management of mining company's website and payroll software design are outsourced to an information communication and technology firm. Other non-specialized operation-specific functions within the mining sector, such as cleaning and security services, are outsourced to local authorities (chiefs and leaders of the local community).

Most of the outsourcing within the mining sector is for non-core activities. Outsourcing a core activity within the mining sector is not common. Among the companies studied, only one company outsourced drilling and blasting, which was a core activity to them with the reason being that outsourcing of such function is to take advantage of the technical skills, expertise, and knowledge as such in order to focus on the processing of the ore and extraction of the final product. Core activities such as blasting, drilling, and transporting ore are outsourced to other companies. Baatarogtokh et al. (2018) confirmed this finding in their

study. Their study found that mining operational activities such as blasting and drilling were mainly outsourced than mineral processing activities. Obeng et al. (2015) also confirm this in their study. They found core activity such as exploration as one of the functions been outsourced. This finding contradicts the conservative theory of outsourcing, which stipulates that outsourcing should focus on non-core competencies rather than the core ones such as blasting and drilling (Quelin and Dhamel, 2003 as cited in Steenkamp van der Lingen, 2014).

Procurement officers indicated that during the COVID-19 pandemic, health care services were outsourced to strengthen the health care sector within the mining company. Other core functions were not outsourced because of the pandemic. The pandemic did not influence what to outsource and what not to outsource. Obeng et al. (2015) confirmed this finding in their study where the majority (91%) of their cases indicated that they outsource the health function of the mining company to other health institutions.

5.4 What are the current methods used in outsourcing in the mining industry?

From the study, all outsourced activities go through a competitive bidden. Tenders are opened through advertisements on its website, newspapers, and different companies bid for them. The successful company and the mining company agree on a Service Legal Agreement (SLA). As found in the study, the bidding process within the mining companies is influenced by several factors. These factors include quotation, historical records, company experience, evaluation, technical skills, and recommendations.

The quotation was one of the most important factors outsourcing companies consider when outsourcing their activities. As indicated in this study, Quotation is the comparative study of the pricing, timeliness, and ethical conduct of outsourced companies' proposed bids. The mining companies compare the pricing of each bidder, and the lowest bidder is mainly selected. Aside from the pricing, the time to complete the work and how to work is done

ethically. It was indicated that the highest bidder sometimes wins the contract, but this is not a common practice.

The historical record of an outsourced company and the experience an outsourcing company has with the outsourced company influence the direction of the bidden tender. Companies with prior experience or history with the outsourced company are more likely to win the bidden tender. If a company has an existing supplier who has been consistent in its service delivery over a period, its service is cost-effective and time-efficient, it becomes the preferred candidate to win the tender because of this experience, and this past experience forms the basis for assessment. Another view was raised that past records or experience with another company during the outsourcing process can be misleading because some companies fail to perform when given the contract. Moruri (2015), in his Kenyan study on factors influencing the outsourcing process, confirms that the buyer-supplier relationship influences the outsourcing process. Their study focused on outsourcing of technical and specialized activities within public secondary schools but not within the mining sector as this study sought to achieve. The experience and the skills possessed by the vendor in relation to the function to be outsourced as a critical factor in successfully outsourcing that function to that vendor (Obeng et al., 2015)

The information gathered also found evaluation and recommendation as a factor used by mining companies to outsource their activities to the appropriate and qualified companies. Evaluation, as found in the study, involves assessing the services/product of the vendor and its quality and the ability of the vendor to complete the work within the stipulated time. Evaluation is a key component in deciding on a vendor for an outsourced activity. In this regard, Alexandrovna (2015) affirms that evaluating the human capital and the knowledge of the vendor organization and their expertise on the related task is key in choosing a vendor for an outsourced project. On recommendation, since most service provided within the

mining companies is the same, they tend to consult other mining companies for help when outsourcing some of their activities. Outsourced companies are recommended to other mining companies by another mining company based on their performance on a similar project within their company

5.5 What are the challenges of managing outsourcing during the COVID-19 pandemic?

The COVID-19 pandemic had a great impact on the procurement process. It posed a challenge to outsourcing activities to other companies and procuring equipment from different companies due to its impact on the global economy. One of the challenges identified in the study was the loss of man-hours leading to low productivity. The study found out a reduction in the number of people to complete a specific task because social distance has been observed, which affected output. Also, some of the outsourced activities which needed strict supervision were not effectively done because the number of supervisors was reduced to help ensure social distancing, and as a result, quality of service was affected. Gray et al. (2009) made a similar observation in their study conducted within the manufacturing sector. They found lower quality of manufacturing as a problem associated with outsourcing of activities.

The COVID -19 pandemic, as indicated earlier, affected the global economy, and as a result, production was low, which led to workers being laid off. The mining companies are mainly labour-intensive, and due to COVID-19, the number of workers was reduced, which affected the time to perform a task effectively and efficiently. It was found that the limited number of workers affected the work of outsourced companies to complete a task within the stipulated time as stated in their contract. This placed a lot of pressure on outsourced companies to perform their task. The refurbishment sector was affected as well as the catering activities which were outsourced. Some of these activities were shut down. Dunn

et al. (2009) confirm that the loss of workers further escalates to social costs. The laid-off workers can lead to loss of core knowledge (Obeng et al., 2015; Shi, 2007; Kremic et al., 2006). Thus, some workers are laid off not because they do not possess the needed skills but because of other economic reasons such as ensuring sustainability.

It was also realized that there was an increase in expenditure by mining companies. These additional expenditures were incurred from the cost of transport and purchasing of personal protective equipment (PPEs). Transportation is very important in the mining sector because workers of the mining companies are transported to and from work daily. In order to ensure social distance, the capacity of each bus had to be reduced to half of it, which led to acquiring additional buses to convey the workers to work. Also, the purchasing of COVID-19 PPEs such as nose masks, hand sanitizers, thermometer guns, and buckets led to an increase in the expenditure of the mining companies, which initially were to be budgeted for during contract negotiations. A study by Shy and Stenbacks (2005) found increased cost as a challenge in outsourcing. Their study found the cost to be from monitoring because the vendor firms must be monitored to know whether they are performing their part of the contract effectively and efficiently or not but not as found in this study.

Reduced logistics inflows and limited supply are some of the procurement challenges faced during the pandemic. This may be due to the shutdown of international borders during the pandemic's peak, and the local lockdown also affected the local supply of logistics to the mining companies by outsourced companies. It was found out that outsourced companies that could get their supplies did not get the quantities required. This can also be related to the rise in the number in lead time in the procurement process, which delays logistics supply, as confirmed in the study by Wu and Park (2009).

Despite almost all the cases having challenges in outsourcing their activities, one company had responsive measures to control the challenges that may arise during major

crises/pandemics. The firm indicated that they have their risk management profile and are always prepared. They tend to look at what is available to them and then activate their risk management profile during the pandemic. Among all the three cases analyzed to form the results of the study, it was identified that companies in the mining industry in Ghana outsource for many reasons, which includes limited in-house technical skills/specialization, the financial cost of production/service, support services, also the various procedures engaged in outsourcing are Quotation and evaluation, Historical records, experience, market performance, evaluation, and recommendations. Challenges faced in outsourcing activities in the mining industry during the COVID-19 pandemic were Lost man-hours, Time constraints, limited labour/staff, increased expenditure, reduced logistics inflows, limited suppliers. In effect, to limit the effect of the disruption of outsourcing activities and supply chain in general, a company has responsive risk management measures in place to handle the disruption, which enables the operation of the company to flow normally without any problems because companies outsource most of their mining suppliers and labour expertise including expat employees, first of all, they ensured strict adherence to all COVID-19 infection measures which include education on symptoms, effect, cause as well as reducing all non-essential working arrangement and focused on IT systems to support the work operations. Concerning vendor/supplier management, the company focused on collaboration with vendors, suppliers, distributors, and retailers, which helps through electronic data management interchange between the members of the supply chain to understand the disruptions in the upstream and downstream during crises like COVID-19, which improves efficiency in the chain, availability of locally skilled and trained staff to execute most of their activities, by activating to multiple sources of suppliers, Focus on tier 1 suppliers, strong collaboration and flexible contract, is very important risk management profile with domestic suppliers to build resilience and robust supply chain in disruptions through

resource sharing information and technology to limit the impact and recover from the COVID-19 disruption to remain competitive.

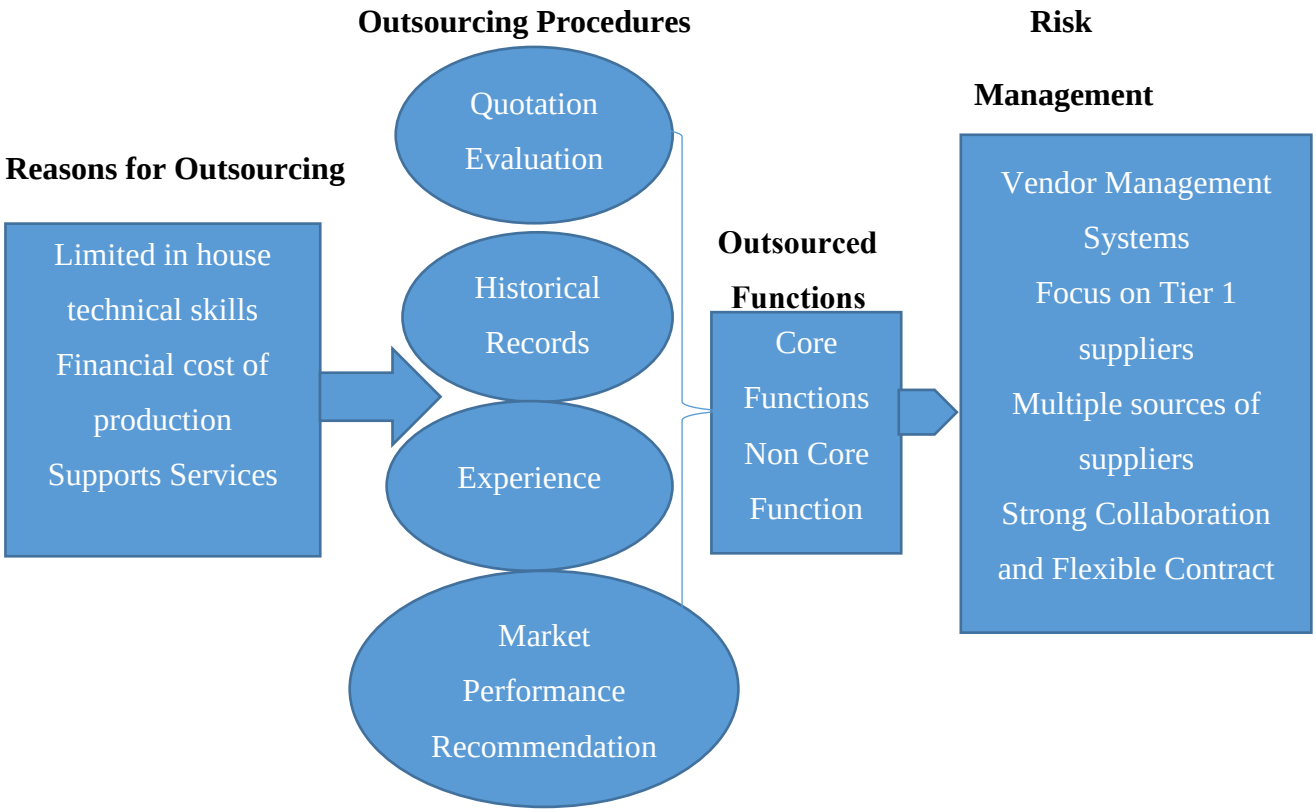


Figure 6: Guide for outsourcing during a major crisis

Source: Researcher

Chapter 6

IMPLICATIONS AND CONCLUSIONS

6.1 Chapter Introduction

This chapter summarizes the research, the implication of the findings, and the conclusions regarding the nature of outsourcing and challenges in the mining industry in Ghana during the COVID-19 pandemic. This chapter also contains the limitation of the study and suggest various avenues for further research

6.2 Research summary

The main objective of the study was to explore the nature of outsourcing and challenges in the mining industry in Ghana during the COVID-19 pandemic. This study contributes to closing a research gap within outsourcing in the mining industry. The research findings span across different theoretical and empirical issues. The study was underpinned by four primary research questions, which were to explore the reasons why managers in the mining industry in Ghana outsource business functions, the functions that are outsourced in the mining industry in Ghana, current methods used in outsourcing in the mining industry, and the challenges of managing outsourcing during COVID-19 pandemic. These were critical questions needed to understand the nature of outsourcing in the mining industry during the global covid-19 pandemic in Ghana.

6.3 Reasons why managers in the mining industry in Ghana outsource business functions

The mining industry outsourced due to four major reasons: limited in-house technical skills, the financial cost of production/services, support service, and risk avoidance competition. Limited in-house technical skills concerned the limited skills in operational refurbishment and operation of technical or complex machines. The financial cost of production was due to the increased cost of producing the same product/service in-house, maintenance and labor

costs, and the quest to be competitive. Mining industries have core functions they strived to maintain. They, therefore, outsourced support services other than the extraction and processing of ore.

Functions that are outsourced in the mining industry in Ghana

Core functions were rarely outsourced. Non-core functions that were outsourced were process-specific, including logistic service and transportation, and operational-specific outsourcing such as repairs, maintenance, dewatering, IT services, camp management, and clinic services. During the current Covid-19 pandemic, an outsourced area concerned the extension of human resources to health experts to handle education and adherence to covid-19 protocols in the mining sites.

Current methods used in outsourcing in the mining industry

The outsourcing procedure was mainly through Competitive bidden/Open tender. Several factors considered on the table were price vendor price quotation and evaluation, historical records, prior experiences with the company, market performance, evaluation, and recommendations from partner industries.

6.4 Challenges of managing outsourcing in the mining sector during the COVID-19 pandemic

Several drawbacks influenced outsourcing in the mining industry during the Covid-19 pandemic: reduced logistic inflows, lost man-hours, time constraints, speed of work, limited staff, increased expenditure, limited transportation cost, and cost incurred through personal protective equipment, and limited suppliers. However, companies that had responsive models were less impacted.

6.5 Theoretical contribution and implications

Two theories underpinned this study - the transactional cost and resource-based view theories. As noted, not all functions were outsourced, and the methods of outsourcing included competitive bidden and recommendations from partner companies. The transaction cost theory has been well established in bidden processes via analyzing cost for goods and services. Mining companies considered the cost of transaction through price quotations and evaluation before awarding contracts. From the transactional cost theory, this constitutes the first construct which is *information gathering*. It must be noted that information gathering preceded *search for suppliers* as in most cases, the mining companies had suppliers in mind and resorted to information gathering, particularly their price quotation and their ability to deliver quality services. It was clear that the services of companies that had lower price quotations but could deliver on the service level agreement were employed. From the transactional theory perspective, this is referred to as *negotiating cost.* Other costs such as fulfillment cost, cost of maintenance and cost, and other renewal were key factors that ensured repeated service use among mining companies and their vendors. Thus, this study contributes extensively to the transactional cost theory and the role of relationships between mining companies and their vendors, and how such relationships can distort the transaction processes.

Resource-based View (RBV) in this context is considered the trade-off between core and non-core functions. As found, mining companies rarely outsourced core functions. The means of outsourcing was to acquire resources that are not internally available in the company. In short, mining companies outsourced resources concerned with increased in-house production but less profit to other firms specializing in such productions and enjoyed larger economies of scale. A firm's utilization of resources outside the company and integrating it into its production process will yield a profit in the end (Holcomb & Hitt 2007).

6.6 Conclusion

In conclusion, mining industries engaged in outsourcing during the global covid-19 outbreak. The decision to outsource was informed by several factors: limited in-house technical skills, the financial cost of production/services, support service risk avoidance, and competition. Whereas core functions were rarely outsourced, non-core activities which were process-specific and operational-specific functions were outsourced. The outsourcing procedure was mainly through competitive bidden/Open tender. The covid-19 epidemic was a major concern. Outsourcing through reduced logistic inflows, lost man-hours, time constraints, reduced work speed, limited staff, increased expenditure, increased transportation cost, Covid-19 personal protective equipment costs, and limited suppliers. Therefore, the mining industry requires responsive models of engagements to mitigate the impact of the Covid-19 on mining firms in Ghana.

6.7 Limitations and suggestions for further research

The study faced some methodological constraints. The difficulties encountered while conducting the interview were unstable internet connectivity, and therefore the need to resort to direct calls. Second, the world is still grappling with the covid-19 pandemic. It is still unclear to ascertain the actual impact of the covid-19 pandemic on mining companies in Ghana. Third, the study is qualitative and therefore limited in terms of the number of cases interviewed. This implies that the generalization of the findings is improbable.

To provide other researchers and readers the chance to evaluate this thesis's quality and future use, this section presents areas that provide opportunities for further research. First, there are opportunities for future researchers to increase the literal replication by increasing the number of cases. Therefore, we suggest that future researchers expand the case study cope, for example, by increasing the cases to five different industries with five companies in each industry to ensure that the results are significant. This may also include reviewing

historical records to ascertain the impact of the covid-19 on organizational outsourcing, processes, and income

Second, the study is based only on buying firms and thus lacks the perspective of supplier firms. By focusing on mining companies, we get a group's view of outsourcing during the covid-19. Suppliers and sub-suppliers could provide important information to aid a holistic understanding of the subject matter. Future research may consider involving both mining companies and service suppliers to get a more holistic understanding of outsourcing during the current global pandemic.

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APPENDIX A: INTERVIEW GUIDE

1) Opening/Preliminary Information

i. Introduction of researcher, purpose of the study, assurance of confidentiality of information.
ii. Demographic Data Collection: Participant's position, background of the organization and experience in the industry.

2) Distinguish between Core and Non-Core Functions/Activities

i. Identify Core and Non-Core Function/Activities in your organization/firm?
ii. What function do you consider to be core and Non-Core and Why?
    - Management
    - Mining Operation
    - Exploration
    - Mine Maintenance
    - Transportation
    - Security Services
    - Cleaning

3) General Questions regarding Outsourcing engagements in the Mining Industry.

i. Why does your organization engage in outsourcing activities?
ii. What forms of outsourcing engagement is practiced in your organization?
iii. How has outsourcing impacted efficiency in your organization?

4) Outsourcing and Outsourcing processes

i. In practice what does your firm outsource and why?
ii. What functions are outsourced and why?

iii. What other functions are not outsourced today, but would be suitable for outsourcing and why?

5) Supplier Selection and Processes

i. How are vendors selected,
ii. What criteria are the most important?
iii. Are there any problems with supplier availability during COVID-19 pandemic?
    - Capacity
    - Capability
    - Knowledge

6) **Outsourcing and COVID-19 Pandemic**

i. Does your company engage in outsourcing during this COVID-19 pandemic?
ii. What functions/activities are outsourced now, have there been any Changes in outsourced activities, why?
iii. What functions/activities would you never outsource during COVID-19 pandemic and why?
iv. What are the challenges faced and how does your company manage outsourcing activities during COVID-19 pandemic?
v. What mitigation and control measures are implemented to ensure efficient outsourcing during COVID-19 pandemic?

7) General Question

i. Base on your experience how has COVID-19 impacted on outsourcing activities in the mining industry.
ii. Is there anything you would like to it ?