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Strategies to Manage Hydroelectricity Interruptions in Zambian Manufacturing Businesses

Mpafya Mutapa
Walden University

Walden University

College of Management and Technology

This is to certify that the doctoral study by

Mpafya Mutapa

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Review Committee
Dr. Christopher Beehner, Committee Chairperson, Doctor of Business Administration Faculty

Dr. Beverly Muhammad, Committee Member, Doctor of Business Administration Faculty

Dr. Irene Williams, University Reviewer, Doctor of Business Administration Faculty

Chief Academic Officer and Provost
Sue Subocz, Ph.D.

Walden University
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Abstract

Doctor of Business Administration

by

Mpafya Mutapa

MS, Ulyanovsk State University, 2014

BS, Athlone Institute of Technology, 2007

Chartered Management Accountant (CIMA), 2007

Doctoral Study Submitted in Partial Fulfillment

of the Requirements for the Degree of

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Abstract

Interruptions of hydroelectric energy damage equipment and reduce worker productivity. Manufacturing leaders in Zambia who lack strategies to manage hydroelectricity interruptions risk financial losses. Grounded in contingency theory, the purpose of this qualitative multiple case study was to explore strategies that some manufacturing leaders use to manage hydroelectricity interruptions. The participants were six managers from different manufacturing industries based in Lusaka, Zambia, who implemented strategies to manage hydropower interruptions. Data collection involved semistructured interviews and review of company documents, company websites, and publications from the Zambia Association of Manufacturers related to managing hydroelectricity power interruptions. Thematic analysis was used to analyze the data. Four themes emerged: managing stock gaps, use of generators (turn-time), managing cost of labor input, and investment in stabilizers and storage facilities. Key recommendations include investment in alternative power generating equipment and upgrading of plant transformers. The implication for positive social change includes the potential to create jobs and improve the local economy and subsequent tax base.

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Dedication

I dedicate this doctoral study to my dearest and loving family. To my remarkable wife, Chilufya Chabala Mutapa – thank you dear for your support, understanding and sacrifice. Your belief and encouragement throughout the DBA journey was exceptional. To my beautiful parents, Sebastian Chisanga Mutapa and Agnes Chanda Nkole Mutapa, for your inspiration to work hard and encouragement to keep pushing! To my amazing kids, Mpafya David Mutapa, Hadassah Kasuba Mutapa, Hannah Lutanda Mutapa, and Lanita Kabalika Mutapa, thank you for being my motivation and understanding when I could not be with you because of my studies. Being your dad/mentor has been a wonderful gift to me from our Lord Jesus Christ and I aim to set the foundation that you shall continue to build on generations to come – To God be all the Glory and honor.

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Section 1: Foundation of the Study

Hydropower consumption has positive and significant effects on the growth of the manufacturing industry. Nearly all manufacturing businesses in Southern Africa are challenged with power supply deficits (Urban et al., 2015), and this may cause negative effects on the economies. In addition, the problem of hydroelectricity interruption is critically impacting the value chain on small medium enterprises (SME's) and multinational business profits (Gaimon et al., 2017). Hydropower consumption affects processes that transform manufacturing operations and ultimately diffuse into the economy.

The growing power supply shortages have caused significant consequences on manufacturing businesses with regard to competition and profitability (Kumar et al., 2018). These consequences are more pronounced in the struggling industrial sector for countries in southern part of Africa and commonly reported as a significant infrastructure constraint to enterprises in several firm level surveys, and negatively impacting on the volume of production, increased production downtime, and downward movement of profitability of most industries (Oseni & Pollitt, 2016). The manufacturing industry is no exception to the negative impact caused by hydropower interruptions.

According to *Programme for Infrastructure Development in Africa* (2019), the increase of energy demand is projected to increase significantly from 590 TWh to 3,100 TWh whereas the installed capacity is expected to grow from 120 GW to 700 GW. Implying that significant investment in both hydro and additional renewable energy supply initiatives are required to meet future demand. The investments may address the

issues of low production in the manufacturing industry and increase profitability (Gaimon et al., 2017). Therefore, changing the current practice of manufacturing leadership strategies and management of technological changes in line with hydropower innovations may contribute to improved efficiency.

Background of the Problem

Business leaders in the manufacturing industry are concerned about the increasing hydropower interruptions because of the high costs associated with alternative energy sources and loss of production time resulting in loss of revenue (Ahmed et al., 2019; Mwila et al., 2017; Phiri, 2017). Unstable hydropower supply brings value-adding activities to a fundamental halt in economic sectors; conversely, electricity deficit is considerably more in the energy-intensive manufacturing sector (Ahmed et al., 2019; Mwila et al., 2017; Phiri, 2017). Because electricity plays an essential role in a nation's economic development, hydropower interruption causes concerns for household and commercial consumers in general, mainly in the manufacturing industry; it is of a vital concern.

The manufacturing industry is managing hydropower interruptions mostly by running on alternative but expensive energy sources such as diesel-powered generators, which increase the cost of production (Phiri, 2017). This has resulted in negatively impacted margins of manufacturing businesses because product prices cannot be increased as customers may not afford high prices (Ahmed et al., 2019). Therefore, to maintain a competitive advantage, manufacturing leaders need to engage strategies to manage the increasing load shedding hours in Zambia. In this study, I explored strategies

manufacturing leaders use to manage hydroelectricity interruptions using the lens of contingency theory to collect data that other manufacturing leaders may employee to manage hydropower interruptions and remain competitive in the industry.

Problem Statement

Interruptions of hydroelectricity negatively impact business operations and cause financial losses for the manufacturing sector (NamPower, 2018). A study of 12,452 small scale enterprises in Zambia indicated that the average revenue loss per firm resulting from hydroelectric interruptions was K 19,251, with 22.8% of firms reporting cases of idle labor, 29.9% reporting equipment damage, and 7.6% reporting reduced working hours (Mwila et al., 2017). The general business problem was the interruptions of hydroelectric power supply causes operational interference and financial loss in the Zambian manufacturing sector. The specific business problem was that some manufacturing leaders lack strategies to manage hydroelectricity interruptions.

Purpose Statement

In this qualitative multiple case study, I explored strategies that some manufacturing leaders use to manage hydroelectric power interruptions. The targeted population consisted of six manufacturing leaders in Zambia who have used strategies to successfully manage hydroelectricity interruptions. The implications for positive social change include the potential of economic growth that can catalyze job creation among the unemployed and enhance the livelihoods of the people of Zambia.

Nature of Study

The three research methods are qualitative, quantitative, and mixed (Yin, 2018). I selected the qualitative method for this study. Qualitative researchers explore human experiences using documentations, interviews, and observations (Ivankova et al, 2006; Yin, 2018). Because I explored leaders 'strategies to manage hydroelectricity interruptions using observations, documentations, and interviews, the qualitative method was appropriate. Quantitative researchers test hypotheses and analyze independent and dependent variables 'relationships or differences using statistical methods (Bogue et al., 1994). The mixed method includes both qualitative and quantitative method to explore and explain phenomena (Klassen et al., 2012). Because I did not test hypotheses to analyze variables 'relationships neither the quantitative nor mixed methods were appropriate.

I considered three research designs: (a) case study (b) phenomenological, and (c) mini-ethnography. I used a multiple case study design. Researchers use a case study design to explore the *what*, *how,* and *who* query of a phenomenon over a period of time (Yin, 2018). A multiple case study was appropriate because I explored and compared multiple manufacturing organizations 'strategies to manage hydroelectricity interruptions. Researchers use the phenomenological design to explore individuals 'perceptions of their lived experiences in their perceived immediacy (Moustakas, 1994). Because I did not explore individuals 'lived experiences in developing and implementing strategies, the phenomenological design was not appropriate for the study. Researchers use the ethnographic design to understand the shared cultures and patterns of behavior for

distinctive cultural subsets giving an account of the way of life in a society (Sangaramoorthy & Kroeger, 2020). Because I did not observe the participants 'cultural norms the ethnographic design was not appropriate.

Research Question

What strategies do manufacturing leaders use to manage hydroelectricity interruptions?

Interview Questions

1. What strategies have you used to manage hydroelectricity interruption?
2. What strategies have been most effective to manage hydroelectricity interruption?
3. What strategies were least effective to manage hydroelectricity interruption?
4. What, if any, were the key barriers to implementing strategies to manage hydroelectricity interruptions and how were any key barriers addressed?
5. How, if at all, have you modified your most successful strategies to manage the hydroelectricity interruption?
6. What additional information, if any, can you share regarding your strategies to manage hydroelectricity interruption?

Conceptual Framework

Contingency theory (CT) was the conceptual framework for this study. Woodward (1981) developed the CT stating that there is no best way to lead, organize, and make decisions in a business. Fiedler (1964) built on the CT by elaborating on factors of leadership style and locational understanding. The fundamental propositions underlying the CT are: (a) there is no universal or one best way to manage a business, (b)

organizations systems should fit within the environment, (c) organizations should be concerned with accomplishing alignment and good fit with management practices, systems, and technologies, and (d) adequately designed systems meet the needs of an organization (Woodward, 1981). I used the contingency theory as a potential means to understand manufacturing leaders 'strategies to manage hydroelectricity interruptions because previous research has shown that the contingency theory of leadership clarifies the desired style of leadership and the environmental characteristics, which aid leaders in decision making fit the organizations 'business model (Heller, 2019).

Operational Definitions

Hydroelectricity interruptions: The inconsistency of electricity supply can fluctuate from time to time (Phiri, 2017).

Load shedding: The rationing of hydroelectricity supply by organizations generating and distributing electricity to consumers (Phiri, 2017).

Locational Understanding: A place of operation, considering the impact of costs and revenues to the business, in addition to its customers and supply chain system (Reggiani, 2019).

Managing a business (no universal way): A term in management that a business cannot be dependent on a single method of management to be successful, it must be tailored to its planning, organizing, leading, and controlling that is customized to its peculiar conditions (Luthans, 1973).

Organization subsystems: Effective organizations have the right fit in the environment that they operate and other support sectors (Pas et al., 2019).

The organizational system and the environment: Organizational needs are fulfilled when its design and management style is suitable for both the tasks to be performed and the teams assigned the work to be done (Komah et al., 2019).

Assumptions, Limitations, and Delimitations

Assumptions

Assumptions are facts accepted by society as accurate but have no empirical substantiation to support the belief and, as a result, cannot be verified (Kottler & Balkin, 2020). My first assumption was that manufacturing leaders are knowledgeable in strategies to address the challenges of hydroelectricity interruptions in their organizations. The assumption has limitations, because some leaders may not be expressive as expected due to fears of losing their competitive advantage. My second assumption was that successful manufacturing leaders are 100% involved in the decision-making process to implement strategies that reduce productivity or cause production downtime due to hydroelectricity interruptions. My third assumption was that manufacturing leaders have readily available systems to modify strategies to manage hydroelectricity interruptions. My fourth assumption was leaders in the manufacturing industry have business tools to address critical barriers when implementing strategies to manage hydroelectricity interruptions. All premises in the research were assumed to have inherent risks, and I treated them as such.

Limitations

Limitations are constraints or weaknesses that a researcher may encounter and limit the research (Hughes, 2019). I used a sample of multiple case studies and interviews

to minimize generalization and bias in my findings. However, my study sample may not have been an exact representation of the essential strategies used by manufacturing leaders, because I restricted the sample to a few manufacturing businesses based in Lusaka, Zambia. The second limitation was time constraints due to the busy schedule of the target sample that I interviewed. The last limitation was limited access to essential documentation to help me verify successful strategies to the specific business problem.

Delimitations

The reflections made by the researcher to help maintain a reasonable scope and depict limitations regarding the study were known as delimitations (Hughes, 2019). The study included the management team and individuals in charge of strategy and policy in manufacturing organizations. The first delimitation was the number of participants for the study. I choose six participants, i.e., one from each organization. Hennink et al. (2016) stated that data saturation could be attained with less than 10 interviews. Limitation of resources such as time made the number of participants' delimitation. The second delimitation was the number of manufacturing organizations. Because data saturation may be attained with less than 10 (Hennink et al., 2016), I did not set a minimum number of manufacturing organizations from which to sample participants. The third delimitation was manufacturers of fast-moving consumer goods (FMCG). I did not consider all manufacturing business sectors because the quality of response could come from manufacturers that are consumer-centric. The fourth delimitation was the geographical location of manufacturers operating in Lusaka, Zambia to which I had access. The fifth delimitation was the consideration of new entrants in the business. To ensure I captured

emerging trends in managing hydropower interruption from new entrants in the manufacturing sector who may provide awareness to the industries' advantage, I did not limit the study to manufacturers' years in the store.

Significance of the Study

Contribution to Business Practice

The study findings could be valuable to business leaders because the findings may contribute to the development of strategies needed to introduce effective mitigation practices to manage hydroelectricity interruptions. Hydroelectric power interruptions reduce operational hours and increases operational costs. Manufacturing leaders may use the research results to improve industries practices to reduce cost of production and manage unproductive working hours or production downtime, resulting in improved productivity and profitability.

Implications for Social Change

The study's findings may support social change through promotion and recognition of paramount leadership strategies within the manufacturing sector. The strategies may become evident in increased job opportunities, job satisfaction, job security, and organizational sustainability. These results could improve job creation and improve the livelihood of employees and their families, which may contribute to the economic stability of communities 'citizens.

A Review of the Professional and Academic Literature

My goal for this study was to address strategies manufacturing leaders use to manage hydroelectric power interruptions, through the lens of CT. In the CT of

leadership section, I provide an in-depth review of managing a business (no universal way), organizational subsystems, and organizational needs. Under emerging trends section, I considered the overall management and linked it to managing hydropower interruptions and how it impacts the manufacturer. I used the situational contingency theory to focus on topical foundations (i.e., organizational systems and its environment, and opportunities). Lastly, I used the decision-making theory to consider the type of leadership and change structure needed in the manufacturing industry. The contrasting theories section includes recommendations for action from literature as hypothetical arguments.

The literature review is organized into three essential elements: contingency theories of leadership, contingency theory of decision-making, leadership and team engagement, and locational understanding with five sub-sections. The five sections include: (a) contingency theory and hydropower leadership, (b) emerging trends in managing hydropower interruptions and influence on manufacturing sectors, (c) authenticity, innovation, and information technology in manufacturing industry; topical foundation (i.e., organizational systems and the environment, and opportunities), (d) energy constraints and manufacturing business decisions, and (e) contrasting theories.

When assembling material for review, I considered multiple search engines and academic literature; I considered keywords on the research topic with the goal of having an exhaustive search for previous studies related to the issues investigated in this study. I considered key search words as follows: *hydropower and leadership theories, contingency theory of leadership, hydropower interruptions and impact on*

manufacturing firms, hydropower and strategic leadership in the manufacturing sector, contingency theory of management, and *contingency theory in managing hydropower interruptions.*

I narrowed the research focus on modern literature and emerging business practices published in academic journals, educational, a few encyclopedia and business journals. I considered peer-reviewed sources to avoid biasness and provide credible arguments to make meaningful contribution to the knowledge library. Therefore, my search of peer-reviewed articles was limited to publications within 5 years of the predicted conclusion date of this study. The literature review included 96 peer-reviewed journal articles including three government report references, zero annual organizational reports, and 10 academically published books for references of which four were from encyclopedia. The makeup of the literature accounts for a minimum of 85% of sources with 88.99% accounting for publications within the last 5 years (see Table 1).

Table 1

Literature Review

S/N	Reference source	>5 years	< 5 years	% Total references	% < 5 years
1	Peer-reviewed journal articles	11	85	88.07%	77.98%
2	Books	1	9	9.17%	8.26%
3	Government reports	0	3	2.75%	2.75%
	Totals	12	97	100%	88.99%

The purpose of the research was to explore strategies that some manufacturing leaders use to manage hydroelectricity interruptions. The literature presented was a result of critical analysis and evaluation of the effects of strategic leadership in the manufacturing sector to manage the increasing hydropower interruptions in Zambia. The CT of leadership advocates that managing a business has no universal way of organizing, leading, or providing leadership, and complexity management (Fiedler, 1964; Toubiana et al., 2017), stating that some conditions may not be effective in others. The literature, I used focused on contingency leadership and management of businesses in line with hydropower interruptions and its effects to the consumer, management, leadership style, and organizational strategies. In addition, my research considered general issues in hydropower generation and distribution as an essential resource input in the manufacturing sector. I connected these resources to reveal topics linked to specific

business practices and leadership styles. I also considered strategies used by leaders in different industries to manage hydropower interruptions to elaborate on wider application of the developments.

Contingency Theories of Leadership

The conceptual framework for this study was the CT. Fiedler (1964) developed on the CT by elaborating on factors of leadership style and locational supportiveness. The main concepts of contingency theory are: (a) no universal or one best way to manage a business, (b) organizations systems should fit with the environment, (c) organizations should reasonably fit among its subsystems and (d) adequately designed systems met the needs of organization. CT has been an essential part of management writing for the past many years. CT developed in the 1960s, and acknowledgment of the theory flourished mainly due to criticisms that the conventional theories backed the theme of no one best way of managing and structuring a business (GÖK, 2020). The applicable organizational configuration and administration style are reliant on conventional contingency aspects, frequently aligned with ambiguity and variability of the environment (Csaszar & Ostler, 2020; GÖK, 2020). Leaders' effectiveness is contingent upon how their management style balances with the job or task. Successful leaders must find out what kind of leadership style and setting they succeed in (Csaszar & Ostler, 2020). A leader is efficient when their leadership style fits with the situation (Wilbur & Cameron, 2020). The leadership style is therefore scaled based on the situation or problem faced by the organization and those in leadership.

The theory approach to leadership suggests that organizations leaders must propose forethoughts based on the situational and circumstantial element impacting leadership choices (Fiedler, 1964; Omoluabi, 2016). Omoluabi, (2016), underscores that what business leaders do in practice varies with the challenges faced in a particular situation. Contingency leadership is like situational leadership and the two expressions are frequently used interchangeably (Omoluabi, 2016; Strydom, 1999). However, some researchers differentiate the two on the foundation that situational leadership styles simply indicate what leaders put their trust in when faced with a particular challenge, while contingency leadership styles suggest a functional interrelationship between the variables in a particular situation and the desired leadership style to achieve the optimum solution (Omoluabi, 2016; Park 2019). Therefore, under contingency theory, leaders may consider a business process and determine that a highly coordinated organization configuration may best fit and interrelate with the environment.

Falkenhausen et al., (2019), suggested that the CT attempts to convey studies using several variables, allowing researchers to analyze different situations and make an informed decision concerning variables that may influence the right decision to overcome a particular situation. Therefore, business leaders make decisions, aligned to a certain skill of leadership style to match the need for optimum results (Park, 2019). The process may be defined comprehensively as the ability to identify team members who may have attributes such as inspirational/charismatic or authoritative behavior to model the actions of the team members and direct the team activities so that the followers may work willingly, co-operatively, enthusiastically, or convincingly toward achieving the

organization objectives or the team assignment (Park, 2019). Consequently, leadership may be expressed systematically as the process in which a team-member of an organization endures, motivates, encourages the mindsets, performances, and activities of team members, and directs their activities so that the team members work voluntarily and fervently toward the completion of task assignments (Tifferet, 2020). Team members and team leaders are therefore concerned with the systematic and consistent process of identifying essential team members with attributes to achieve the objectives of the organization, and balance leaders 'attentiveness to the assignment.

The contingency theory of leadership distinguishes three contingency or situational scopes: (a) leader-member relations, (b) task structure, and (c) position power (Strydom, 1999). The leader-member relations are the level of assurance, belief, and reverence members have in their leader (Strydom, 1999). The task structure is the level to which team assignments are framed, whether structured or unstructured (Mozersky, 2019). Last in the trio is the position power, which is the level of influence a leader has in exercising power of variables such as hiring, firing, discipline, promotions, and salary increases (Mozersky, 2019; Strydom, 1999). The CT states that the task-oriented leadership style may be best for favorable and unfavorable situations (Gebremeskel et al., 2019). In favorable situations, when leader-team member(s) relations are good, and trust is not questioned, the task is structured, and position power is strong, the task-oriented leadership style may be useful (Gebremeskel et al., 2019; Mozersky, 2019; Park 2019). In unfavorable situations, when leader-team member relations are low, the task is unstructured and position power is weak, the task-oriented leadership style will be right

(Park, 2019). However, when the situation is moderate (moderately favorable or unfavorable), the team member relations–oriented leader will attain maximum results (Gebremeskel et al., 2019; Park, 2019). CT of task restructuring states that leadership behavior is fixed, and effectiveness may be improved by changing the level of influence exhibited by the leadership style over the organization (Fielder, 1964). Therefore, team members tasked with achieving desired results demand a balance from the leader in attending to their performance interest and in building socio-relationships during task implementation.

The primary leadership styles are delegative, participatory, transactional, and authoritarian (Park 2019). Organizational leadership styles are likely to be driven by their vision and mission. Fielder (1964) identified two types of leadership styles connected to behavior that proved to be effective in successful organizations: (a) consideration leader behavior and (b) initiating structure leader behaviors. The consideration leader strategies build a good rapport and interpersonal relationships and exhibit support and concern for subordinates and the entire organization workforce. The theory uses autocratic leadership, consultative leadership, and collaborative leadership. On the other hand, the second leadership behavior, which is the initiating structure of CT, and is essential to my study because of the need for adequate structures such as locational understanding, role/task assignment, scheduling the production lines, planning, task completion, and objectives attainment. Also essential to the study regarding the CT is contingency forecasting and planning (Tsolka, 2020). Forecasting and planning are essential skills for strategic

foresight and leadership because of the need for adequate facilities to achieve organizational objectives and understanding the operational environment.

CT may be used to predict the suitability of employees in serving different circumstances (Csaszar & Ostler, 2020). Having such knowledge would determine and position the employees in clusters that indicate how well rounded they are regarding assignments and be of value adding to the organizations reward systems for employees. Likewise, contingency system is expended to evaluate the efficiency of team members in line with specific organizational roles and tasks (Csaszar & Ostler, 2020). An all-inclusive contingency model for leadership states that effective management and team performance is dependent on the right match between the leader's style and the level to which the state or condition of the challenge can be skillfully managed by the leader (Gallistel, 2019; Wang, 2019). Therefore, it is essential to categorize the leadership style together with the organization systems (Gallistel, 2019; Wang, 2019). Fiedler (1964) stated that an individual's leadership style is fixed. This may be interpreted as: If a situation requires a task-oriented leader and the individual in the leadership position is relationship-oriented, then two options may emerge. The situation must be amended or the leader must be substituted.

The CT explains leadership results through a lens of external and internal practices (Negrão, 2019) to *contextualizing group atmosphere*. Internal practices relate to total productivity, continuous flow, and maintenance and process controls (Csaszar & Ostler, 2020; Negrão, 2019) within the organizations control. The external processes critically analyze the involvement of customers and suppliers' feedback (Csaszar &

Ostler, 2020), which is external to the organization. Contextualizing the external and internal business practices elaborates the complexity of the business markets. Bachrach and Mullins (2019), stated that complex markets use teams to capitalize on collective awareness and proficiency across the team members, calling it transactive memory system (TMS). However, for businesses to benefit from the transactive memory approach it is essential that organizations have an assessment of the leadership style and external environment that influence translation of transactive memory approach to improve team performance (Bachrach & Mullins, 2019). Therefore, the importance of formal control mechanisms such as TMS not only strengthens the approach to the market development but also increases the demand for management and leadership style. The results are services whose structure may be costly to the business and increase the cost of doing business.

The situational CT of evolutionary systems may be well adjusted to challenges where optimization is the fundamental standard. Hooi and Smyth (2014) elaborated on systems to promote hydroelectric power consumption, stating that systems may have everlasting positive effects on hydroelectric power utilization but may not be successful in addressing hydroelectric power interruption. The CT looks at organization initiatives using the lens of organizations subsystems. The ideas on the consumption and use of such efforts have permanent positive effects on hydroelectric power consumers in particular the manufacturing sector.

Because productivity systems increase in proportion to the firm's size, so does access to credit based on productivity (Cissokho, 2019). However, due to hydropower

interruptions, manufacturing firms may not have access to credit if conditions do not improve, as productivity would be lower than desired output. The loss of productivity due to hydropower interruptions may require actions through the lens of *situational leadership*. Fielder, (1964), stated that the situational leadership of CT suggests that leaders that are in control of the situation are confident that their followers will carry out suggestions made and achieve desired success. Adopting a leadership style that suits challenges manufacturing firms are facing due to load shedding may win the confidence of the team members and help develop skills for their members confidence while focusing on the task.

Contingency Theory of Decision-Making, Leadership and Team Engagement

The CT relate to decision making and result in the type of leadership that shape organization objectives and direction. A decision is useful if it addresses the purpose of challenges faced and the significance of the quality of the decisions (Csaszar & Ostler, 2020). To achieve the desired result(s) from effective decision process and outcome, the normative model support participation as an essential variable. General theory, rational decision-making takes after economic reasoning and links the decisions to the leader—members behavior regarding the optimization of their set goals (Robinson & Le Ber, 2019). Participatory leadership is essential for effective decision-making, while taking into consideration the economic reasoning and organization set objectives.

The rational theory is founded on systems methodology and decision makers want to yield the greatest productivity. However, contingency theorists suggest that the efficiency of decisions enforces the purpose of situational variables that incorporate

appropriate information, and the probability of other players may acknowledge the decisions (Csaszar & Ostler, 2020; Robinson & Le Ber, 2019). An all-inclusive and fit for purpose decision is certainty and not a result of uncertainty in setting and planning organizational goals or objectives (Csaszar & Ostler, 2020). The challenge with formulating CT of decision making is the political process aligned with what the leader controls concerning the decision(s) made. Therefore, navigating such control may necessitate a certain degree of influence, particularly when developing contingency rules that nature the decision(s) (Csaszar & Ostler, 2020; Heller, 2019; Robinson & Le Ber, 2019). Organizational cultural norms are essential to consider when applying CT of decision making to identify the perfect design (Heller, 2019). This is essential because contingency opinions rationalize the need for adaptiveness of business structures, team goals attainment, fit among organizational corporate social implementation, tactics, and configurations. A mixture of simulation for decision making have shown that explanatory power increases by operationalizing varied decision-making among personalities, even accounting for greater level of independence (Embrey, 2019). In addition, substantial evidence shows that individual decision-makers do not consistently request the same result benchmark after a period or across choice of circumstances (Embrey, 2019; Heller, 2019). Decisions are made in situations where one or more actors must decide on the available alternatives. Available alternatives include developments to be undertaken, purposes to possess, and costs to be incurred for them to actualize. The decision-making CT informs that of every outcome resulting from the choices made there are also other preferences with different outcomes (Embrey, 2019). Besides, organization policies

shapes the decisions and its direction through conversational, interactive, and substantial work using social relationships (Weick, 2020). Organizational, decision is based on a mixture of simulations with substantial evidence that individual decision-making yields different results and cannot be benchmarked.

A necessary concept underlying an integral part of decision theory is based on relationship(s). Fiedler, (1964) proposed that team performance has a relationship between the personality of the leader and the situation. Performance gains are obtainable by moving managers into tasks situations where their leader's personality avails them with a comparative advantage (Yetton, & Crouch, 1983). In situations were leader-member relations are good it is likely that performance will be good and were performance is good, but the leader-member relations are poor it is unlikely that the performance from management teams may not be long lasting (Yetton, & Crouch, 1983). Therefore, leadership decision may be affected by two situational individualities being leader position power and task structure.

Team functionality is affected by the leadership style and the relationship of the leader with the team members. The functioning of a team ordinarily varies with regard to the relationships of the members and their leaders (Delfgaauw et al., 2020; Yetton, & Crouch, 1983). The determination exercised by the team members and on the separation of tasks among them is essential and calls for prudent rather transparent leadership if tasks are to be achieved among high performing teams. Nonetheless, when leaders allocate responsibility to team members, performance may not only be the consideration because a leaders 'position power may have an influence on the relationships (Delfgaauw

et al., 2020). Leaders ’position power, preferentialism, employees' seniority, employees' inclinations over tasks, and fairness often play a role in managing team’s optimum functionality. Team encouragement has the potential to restrict the function of dynamics in support of performance (Yetton, & Crouch, 1983), in specific when the incentive plan includes both the leader and team members. Therefore, team effectiveness cannot be measured based on task performance without paying attention to the leaders ’position power which has an influence on team members and organization objectives.

Leadership styles toward team member efficiency may have an essential role with regard to regulating role assignment alienation. Competition among organizations largely depend on the degree of employee-leader engagement (Zhao & Sheng, 2019). To mobilize the eagerness of team members and recuperate the level of team members engagement is a practical challenge faced by business managers. Substantial literature has consistently concluded that higher task involvement result in positive influence on individual work and is positively associated with team members job performance and satisfaction (Delfgaauw et al., 2020; Kumar, 2020; Yetton, & Crouch, 1983; Zhao & Sheng, 2019). The CT of leadership and decision-making theory discusses two main styles of leadership. The first one is the authoritarian leadership style that accentuates the influence and power of the leader (Busse & Regenberg, 2018; Zhao & Sheng, 2019). The second is the charismatic leadership style that encourages team members attitude and behavior by defining inspirational foresight and enthusiastically meeting team members needs (Busse & Regenberg, 2018; Zhao & Sheng, 2019). Leadership is an imperative

situational variable in team members assignment and has a significant impact on the individual team member mindset, attitude, and performance.

Charismatic leadership influences team members dimensions, i.e., task recreation, task clarity, high expectation from the team members, confidence in the team members, and motivational behavior. Inspiration is one essential element in a charismatic leader to have followers and they identify with their team members to achieve the set goals and objectives (Zhao & Sheng, 2019). Besides, charismatic leaders 'are risk taking, sensitive to their environment, have strategic visions and goals, sensitive to the team members needs, and display unconventional behaviors (Kwadade-Cudjoe, 2020). The strategic vision and care for employees needs stimulate team members performance and members are fully committed to tasks (Henkel et al., 2019). Kalra (2020) stated that charismatic leadership is like transformational leadership, because it is positively linked to organizational commitment and team members extra effort. In addition, team members who notice that the organizational leadership is attractive, easily identify with their leaders 'values and exhibit great enthusiasm for the tasks assigned to them by their leaders and are willing to do the task (Zhao & Sheng, 2019). Applied to this study charismatic leaders in manufacturing industries are those who are good at observing opportunities in line with changes in the sector, forming attractive visions for the entire organization, and giving hope to employees when faced with challenges to enhance the motivational aspect of team members.

The authoritarian leadership style lowers subordinates and ignores their contributions and suggestions (Busse & Regenberg, 2018). Leaders who are authoritative

have strict requirements in terms of employee expectations and performance, giving speeches and direct control to team members that are not meeting performance expectations. Busse and Regenberg, (2018), state that authoritarian leadership style and decision-making negatively impact team members. The result is task performance is poor, and if team members achieve positive results under authoritative leadership chances are it will not last long (Busse & Regenberg, 2018). Zhao and Sheng (2019) stated that authoritarian leadership negatively impact on team member's commitment, because leaders show authoritarian style, high attentiveness of power, unenthusiastic to inspire team members, and command team members to conform categorically. Such leadership style may result in team members becoming rebellious and not having the motivation to perform tasks and not engage in organizational activities, because team members passively start believing that they are not suitable to carry out the assigned tasks by their leaders (Kwadade-Cudjoe, 2020). Authoritative leadership demand more from the team members who eventually end up losing faith in their leaders because the leader and follower relationship suggests that the team members are not suitable for the task.

The right leadership style enhances the success and quality of the desired output and there is no universal acceptable leadership style applicable to different situations. Fiedler (1964) leadership CT, states that there is no universally applicable leadership style. The helpfulness of leadership style is predictably moved by organizational context dynamics that include charismatic and authoritarian leadership (Kwadade-Cudjoe, 2020; Zhao & Sheng, 2019). Fiedler (1964) recommended the notion of organizational task structure and deliberated on its influence on the effectiveness of the leadership style. Task

structure is the determination of the task, the technique to complete the assignment, the clarity of the assignment, and implementation assessment standards (Kumar, 2020). A business with a high level of job arrangement has clear work goals and objectives that molder assignments into standard processes and may objectively and accurately evaluate team members performance (Kumar, 2020; Kwadade-Cudjoe, 2020). However, firms with low assignment structure do not have clear objectives, processes, fail to accurately evaluate team members performance, and do not have proper evaluation methods (Kumar, 2020). Assigning team members too many theoretical works or comprehensive tasks without explicit and definite methods, may result in low task structure (Shapira, 2019). In this regard charismatic leadership becomes ideal, and fully exercise the leaders 'own advantage(s) but at the same time expressing the vision of the team (Shapira, 2019; Zhao & Sheng, 2019). The involvement of all team members and the consultative approach of charismatic leaders make up for the inadequacies of low-task configuration consequences (Shapira, 2019). In the event of a low assignment structure, a charismatic leader may encourage the team members to be involved and take ownership of task (Shapira, 2019; Zhao & Sheng, 2019). Therefore, charismatic leaders may establish feasible goals and be in position to solving difficulties caused by environmental ambiguity such as hydropower interruptions.

When it comes to high task structures, chances are that the mission structure, and objectives are clear to all the team members. Also, the organizational systems seemingly improve gradually, and the advantages of the charismatic leader are crowded out (Saiti, & Stefou, 2020; Shapira, 2019). At this point the leaders need to consider ways

to show the advantages of consultative management. Because what the organization require is a system for the leader to find a way to realize its influence, rather than discovery of a new one. Business commands team members to complete their tasks according to known and established processes. Therefore, the desire of a charismatic leader is to put in place new objectives, defined processes, and goals, (Kumar, 2020; Saiti, & Stefou, 2020). However, the challenge is that team members and their work goals become confusing, contradictory, and lose direction of the assignment, resulting in reduction of team member engagement in the assignment and poor performance. In the case of a high task structure, authoritarian leadership is effectual and may increase team members engagement (Saiti, & Stefou, 2020). Charismatic leaders define team objectives but not clear enough and sometimes results into team members confusing the objectives of the task and loss of commitment. Therefore, high task structure is more defined regarding the set objectives and desired when the team assignment is complicated.

Locational Understanding

The CT of locational understanding considers the organization structure and the environment, which provides the essential framework for organizational design (Donaldson, 2008). The theory holds that effective organizational structures are those whose structure fits the likelihoods of the business environment (Fiedler, 1964). Successful organizations evaluate their external environment in line with the entities; conditions, events, and factors surrounding the organization (Donaldson, 2008; Ha & Pasch, 2019). Organizations relate with numerous environments regarding a peculiar setting in terms of uncertainty and the rate of change is in response to their markets and

technologies advancements in the industry regarding internal and external structures of the organization (Ha & Pasch, 2019). However, some scholars ignore factor like government influence, market dynamics, and human resources by characterizing them in terms of certainty and the nature of their complexity. The result is having environments clustered into two bands of either being standardized/mixed or unwavering/fluctuating (Ha & Pasch, 2019). Organizations interactions with its environment demands for a balance between set objectives and the setting of its internal and external structures.

A fundamental principle of locational understanding is that a specific environmental feature disturbs all businesses in a comparable mode of operations (Ha & Pasch, 2019). Leadership style that disregards the tactical choice element neglect essential factor to achieve the optimum results being sought after by the business. Therefore, emphasizing the importance of analyzing two factors in decision-making of internal and external environmental influence on the business operations. It is, therefore, critical to establish and understand the connection of the organization to the environment in detail and accurate ways. Because organization environment changes over a period and needs to adopt (Ayoko & Ashkanasy, 2019). The organizational environment influences how businesses are conducted and it is best to understand how the business maybe shaped and used to achieve optimum desired result(s).

The CT of locational understanding informs how leaders ’priorities the purpose of the organization and stay focused or on course. Essential to the theory is to understand factors that influences the location of the business in line with technology, political conditions, legal conditions, cultural, demographic, ecological, and economic standing

(Commendatore et al., 2020). Businesses that create stable environmental conditions optimize productivity and utilization of resources such as hydropower which is essential to minimize costs and maximize profits in the manufacturing industry. However, when faced with rigid structures and the organizational environment starts to change, it may necessitate the need to change, to adapt, to optimize activities, to minimize costs and to maximize profits.

The idea of locational understanding supports the organizational innovation and adaptation as an early CT of managing environmental factors (Harrison, 2020). The importance of perception to understand the environment provide information for decision-making (Donaldson, 2013). Donaldson, (2013), stated that business leaders are uncertain when they do not have the information, they need to make good organizational decisions, while certainty of information points to opportunities. Therefore, a system must embrace both the array of environmental segments with which a business network. From a systemic perspective a manufacturing business faced with the challenge of hydropower interruptions may consider specific elements in line with its internal and external environment that may include (a) opportunities, (b) role assignments, (c) suppliers of hydroelectric power, (d) task completion, (e) objective or target achievement, and (f) contingency forecasting.

Opportunities

Opportunities are presented to organizations that fit within the environment and benefit from higher performance (Burton & Obel, 2018). The results are evident in the generation of excess resources and organizational expansion, such as growth in size and

revenue, innovation, and diversification (Burton & Obel, 2018). Therefore, opportunities may also lead to misfit with the existing organizational structure. The misfit may lead to poor performance, and eventually poor organizational profit margins, which lead to adaptive structural change to fit into the emerging subsystems (Victer, 2020). Organizational fit and misfit are temporal positions that alternate with each other and the idea behind the alternation is that an organization that expands because of opportunities, the expansion will eventually lead into misfit, and provoke structural adaptation to fit into the new environment.

To maximize opportunities resulting from locational understanding, leadership decisions and practices must adapt to the demands of the environmental (Csaszar & Ostler, 2020). Therefore, maturity level of team members and their involvement in understanding the organizational environment becomes essential for the organizations desired work behaviors and performance improvement (Csaszar & Ostler, 2020). Also, opportunities unfold together with organizational adaptive marketing strategies, alongside external environmental factors, and adaptive adaptation of the strategy to locational factors to improve performance (Zeriti, 2014). Maximizing opportunities from the environment is critical but needs a balance with the level of experience from the team members and their understanding of the tasks to achieve the desired performance.

The business environment has an influence on the organization's performance and its success. However, aside opportunities environmental or locational pressures transform the performance of organizations (Yu et al., 2017) and environmental factors shape the organizational structure, but the market of the organization moderates it. The

manufacturing sector considers marketing as an integral function and with high marketing capability contributing to the desired margins. The challenge is that with increased costs because of mitigating hydropower interruptions may prove damaging to the sectors customers and suppliers. Moreover, complicated, and premeditated business judgments are not as fruitful if they are flexible.

Role Assignment

Examining and establishing a connection between the relationships of human resources, locational understanding, and how it affects performance in the manufacturing industry is essential. Adapting the structure of the workforce or human resources to liveliness and environmental uncertainty yields better performance (Raju, 2019). The business external environment moderates the effects of information failure regarding the workplace (i.e., division of teams in the organization; Raju, 2019). Therefore, instability and unpredictability caused by lack of hydropower interruptions to businesses is influenced by information failure of top management and result in poor organizational performance (Raju, 2019). Therefore, industry leaders quickly adapt their leadership style, human resources, task team, and team members to the internal and external environmental factors (Donaldson, 2008; Ha & Pasch 2019). Organizational performance is enhanced when the structure and systems of the workforce is well aligned to the internal and external environment with clear roles and responsibilities for the team assignment.

Identifying critical linear relationships in the operational environment of a business is essential for achieving the desired performance. Environmental factors

influence the standards of behavior for customer orientation and business performance (Wylot, 2019). The manufacturing sector has a strong association with suppliers of hydropower and this external relationship is essential for strategic leadership. External dynamics alter this relationship, and the best mitigation strategy is a structure that considers the environmental contingencies that are market-oriented coordination (Wylot, 2019). Therefore, the efficiency of the contemplated effects on the manufacturing business may improve if evident that the external conditions of the environment are in place such as constant supply of hydropower and good relations with suppliers of hydropower.

Suppliers of Hydroelectricity

Suppliers of electricity and policymakers need to have a common understanding with regard to the needs of the manufacturing industry. Policies are essential because they determine the cost of doing business and the social change impact that businesses may have in their communities. Flores and Waddams (2018) examined the characteristics of most consumers of electricity and the market approach of suppliers and how it affects business including small-scale consumers. Therefore, contemplating the characteristic of increasing strategy relevance and interference, while pioneering customer mindsets through marketing evokes new dynamics, and variables influencing customers conduct that may alarm business leaders and merit some consideration (Flores & Waddams, 2018). Policymakers need to consider a balance between suppliers of hydroelectric power and consumers to enable the market access to sustainable and consistent supply of hydropower.

Hydroelectric power utility providers need strategies that take into consideration the needs of their users both commercial and domestic. Đogić (2017) considered strategies that electricity utilities use to help provide better services and informed that there was a huge contrast between those operating in advanced economies and the ones in developing economies. Even though electricity is an indispensable element of everyday life and for economic growth, the degree of deregulation may affect business growth strategies. The issue of investment and outright purchase price has an impact on the future tariffs because suppliers of electricity may be looking at ways in which to recover their investment (Munoz et al., 2018). Therefore, if the cost of electricity supply is not managed well chances are that these costs will be met indirectly by the consumers and may lead to high priced products (Munoz et al., 2018). It is therefore, essential to consider all available options be it audited costs or bid price and their impact on the business community and the impact on social change in their communities.

Task Completion

Manufacturing organization may consider the locational understanding by looking at the employees' work styles and morale. Employees' morale and work style is inspired with the level of maturity or readiness to do the task (Fuller, 2019). Vidal et al., (2017), contributes by providing a perception of existing relationship between effective leadership and readiness or maturity level of teams in line with situational leadership style. The preparedness and aptitude of employee to take up tasks for directing their behavior are aligned to four standings (a) employees who willingly do not want to take up responsibility, (b) employees who are willing but are not skilled to take up the task at

hand, (c) employees who are skilled for the task but do not want to take up responsibility, and (d) employees who are willing and have the skill to take up the task at hand (Vidal et al., 2017; Zhao & Sheng, 2019). The level of skilled personnel willingness to perform a given task is critical to successful completion of the task assignment and essential to achieve the organizational objectives.

Objective or Target Achievement

The goals and objectives of most manufacturing organization is profit maximization through high performance. Wang and Bao (2017) analyzed strategies of operating high-performance alliance portfolios. Organizational relationship portfolios are relentlessly examined from a resource-based assessment. In the light of CT, it is essential to analyze the environment using environmental dynamism i.e., the rate of variation and volatility of the perceived change in the structure of the business to achieve the set objectives and goals (Fuller, 2019). Therefore, with the increase in environmental dynamics affecting the manufacturing sector, businesses may focus their resources on strategic management of their alliances (Miraz, 2020), by so doing maintaining relationships and strengthening trust. The business environment modifies the structure of the alliances in the supply value chain and by maintaining the existing supply chain size or reducing it may benefit the performance of the core businesses (Miraz, 2020). The supply chain is critical to manage resources and strategic management is key to ensure a balance by determining a reasonable supply chain for efficiency purposes.

Business strategies have an impact on the organizations' performance and this needs to be managed from two perspective i.e., mechanistic, and organic organizations.

Putri and Salamah (2018) respond to objective attainment by changing strategies through mechanistic (stable organizations) and organic (unstable organizations) approaches. Mechanistic organizations operate under stable environmental conditions while organic organizations operate under unstable environmental conditions. To gain compatibility and performance, manufacturing businesses may need to change the design of their organizational structure based on their locational understanding from mechanistic features to unstable (organistic trait; Putri & Salamah, 2018). Therefore, it is essential for manufacturing business to change structure to avoid loss of performance resulting from a mismatch to the environment. Critical is for management to understand that a new organizational form may not perform better than the previous structure (Putri, & Salamah 2018). In modern manufacturing business, locational understanding is essential to understand how the environment affects the business. In this regard, depending on the levels of the identified variables business leaders must choose the most appropriate leadership style in an environment that is fragile in terms of important resources such as constant and stable supply of hydropower. Chapman et al. (2016) introduce the idea of policymaking and its impact on the energy sector linked to the organization's objective attainment. Emphasizing the need for additional policy design stages that would include sustainability measures and evaluation process before decision-making and implementation, to remedy the identified shortcomings in achieving organization objectives. However, to ensure that such policies are implemented and complied with in a more efficiently manner, it is good to consider energy policies and standards that must be adopted and legally mandated (Rybkowski et al., 2017). Policy compliance demand a

balance from policymakers by attending not only to the needs of users of hydropower but also attentiveness in building stakeholder relations during policy implementation that may have effects on all stakeholders especially suppliers of hydropower.

Contingency Forecasting

The function of contingency and situational theory emphasizes the significance of investigating the existing location and variables that affect business structures so that leaders may be successful (Tsolka, 2020; Wilbur & Cameron, 2020). Regardless of the business model being referred to, it is fundamentally unimportant to analyze leadership varieties without identifying the importance of the business environment. For leadership to be effectual in an uncertain environment, leaders ought to embrace an all-inclusive attitude (Tsolka, 2020). Manufacturing businesses and processes are multifaceted organizations, mostly functioning with an open system that emerges to be unclear if the importance of the business environment is not considered.

Leaders avoid high ambiguity conditions by employing usual operative methods and making conventional organizational reactions in almost all situations (Huang & Lee, 2020; Tsolka, 2020). Huang and Lee, (2020), advocate that contingency forecasting and situational theory may provide business leaders the opportunity for a firm foundation in promoting and cultivating management leadership strategies and practices. CT is grounded on the supposition that no distinct/specific leadership style is right in all settings. The theory may mean that the leadership style is moderately uncompromising. Therefore, organizational efficiency hangs on harmonizing internal business characteristics with environmental circumstances (Huang & Lee, 2020). An essential tool

of the theory of contingency leadership is linked to contingency planning or forecasting (Huang & Lee, 2020; Tsolka, 2020) and the flexibility exerted when overseeing team members efficiency.

Contingency Theory and Hydropower Leadership

Hydroelectric power is an essential renewable energy source and represents 16%–17% of global electricity generation output (Killingtveit, 2019). Improving hydroelectric power access in low-income countries is challenging owing to the high infrastructure costs and services as well as lower consumption in some areas in particular the rural areas (Sievert & Steinbuks, 2020). Therefore, establishing power pools will institute state to state regional relationships through integration and pulling resources together to build the assets (Huasheng et al., 2016). Consequently, the creation of power pools will inevitably lead to a need for leadership, management, and strategic governance structures to manage hydroelectric power services, and these services are most likely to be outsourced to the private sector.

Trading today has made it more complicated and challenging for manufacturers causing several challenges, such as increasing demand for production with greater elasticity crafted in the shortest time. The ultimate challenge is that manufacturing leaders must devise strategies to deal with hydroelectric power interruptions, and comply with increasing demands to be sustainable, leading to the improvement of more resourceful practices, and structures (Guerra-Zubiaga et al., 2018). Hydropower demand is directly connected to the manufacturers production up and downtime (i.e., start-to-stop) known as the machining stage (Guerra-Zubiaga et al., 2018). Therefore, significant

volumes of non-cutting hydropower is needed and consumed compared with the tangible physical material removal of energy in manufacturing sectors such as end-milling, causing low-efficiency process (Guerra-Zubiaga et al., 2018). Guerra-Zubiaga et al. (2018) assessed how machining strategies by analyzing hydropower consumption. The level of activity and consumption of hydropower in the manufacturing sector is seen to be high and the industry may collapse if the level of load sheading is not addressed and continues to increase. The result would be a weakening industry both large and small enterprises that are important to support economic growth for any country, and this may result in a negative effect on small to medium manufacturers who may have no options but winding up their businesses.

Utilization of hydropower during peak hours varies from every service sector such as manufacturing sector, commercial sector and residential (Bharathi et al., 2017). Balancing hydropower consumption in the manufacturing sector may translate into reduction in other service sectors and this may be done in an efficient way or not. However, different industries have comparably lesser hydropower consuming device than the manufacturing sector whose hydroelectric power consumption is on the higher end (Bharathi et al., 2017). Hydropower utilization and demand varies from low hours to peak hours, hence, a balance to ration the supply among different sectors is vital.

Maximization of utilization of hydropower generation is critical since storage of generated hydropower is still a challenge and Ware (2018) stated that maximizing the long-term value of hydropower generation and supply to industries required management of uncertain resources. Ware (2018) considers saving the natural resources as an essential

subsystem of a business manufacturing sector through appropriate management leadership styles and that lack of such may deplete the natural resources and cause severe effects on business revenue generation. Therefore, investment in subsystems like Independent Power Projects (IPP) may be deemed to have a vibrant future, though may increase the cost of doing business.

Emerging Trends in Hydropower Interruptions and Influence on Manufacturing Sectors

Current measures being considered to address hydroelectric power interruptions are not independent but dependent on other drivers. An optimum solution may resolve the aspects considered above, i.e., environmental impact, and business needs of manufacturers. To administer the demands intensifying in the manufacturing industry, suitable rationing may be reallocated proportionately to all the occupied time windows grounded on the typical hydropower consumption (Bharathi et al., 2017). Therefore, such interferences may be done accommodatingly by influencing the loads using what Bharathi et al. (2017) identifies as demand side management (DSM) technique. The objective is for manufacturing leaders to minimize hydropower consumption throughout the hydroelectric power rush hour by commendably allocating the available hydropower when demand is low. Any maximization or minimization challenges may be addressed proficiently using a situational CT of evolutionary system. However, the challenge is that the manufacturing sector needs a solution before the industry collapses due to the shortfall and lack of constant and stable hydroelectric power supply. In 2015 and 2016 alone, Zambia's hydroelectric power generation and distribution company ZESCO

(Zambia Electricity and Supply Cooperation) introduced a countrywide load shedding for a duration of 8.00 hours a day (Ahmed et al., 2019). Consequently, this resulted in a drop-in manufacturing's share of hydropower consumption. Figure 1 below highlights the impact of load shedding, which resulted in a reduced share of manufacturing's hydropower consumption from 4.6% in 2015 to 4.1% in 2017.

Figure 1

National Electricity Consumption by Economic Sector, 2014–2017

Sectors	2014		2015		2016		2017	
	GWH	% SHARE	GWH	% SHARE	GWH	% SHARE	GWH	% SHARE
Mining	5,871	47.3%	6,246	54.5%	5,918	54.5%	6,202	50.9%
Domestic	3,251	26.2%	3,482	30.4%	3,383	31.2%	4,147	34.0%
Finance & property	487	3.9%	517	4.5%	499	4.6%	640	5.2%
Manufacturing	479	3.9%	531	4.6%	470	4.3%	503	4.1%
Agriculture	241	1.9%	260	2.3%	228	2.1%	262	2.1%
Others	99	0.8%	99	0.9%	80	0.7%	87	0.7%
Trade	107	0.9%	99	1.0%	80	0.9%	87	0.9%
Energy & water	73	0.6%	110	0.8%	97	0.8%	110	0.7%
Quarries	62	0.5%	89	0.6%	88	0.5%	81	1.0%
Transport	31	0.3%	68	0.3%	60	0.3%	118	0.3%
Construction	1,702	13.7%	33	0.1%	28	0.1%	32	0.1%
Total	12,403	100%	11,534	100%	10,931	100%	12,269	100%

Note. Ahmed, I., Baddeley, M., Coffman, D., Meikle, J., & Sianjase, G. (2019). The cost of power outages to Zambia’s manufacturing firms. F-41408-ZMB-1 Reprinted with permission.

In the same period, the sector's poor performance was attributed to the high cost of production due to hydropower interruptions (Ahmed et al., 2019). Machado and Bhagwat (2020) introduced a concept of cost-sharing using the insurance call option obligation (ICO). The ICO is a strategy to transfer risks associated with hydropower generation to consumers. The result is that it may drive significant wealth from manufacturers to hydropower generators impacting the margins of the manufacturing

sector negatively. Also, the willingness of manufacturers to pay for reduced load shedding corresponds to a tariff increase of 16% (Carlsson et al., 2020). Moreover, the willingness to pay for the average length of load shedding by 1.00 hour corresponds to an increase of 33% (Ahmed et al., 2019; Carlsson et al., 2020). This means that the cost to manufacturer would instantly increase by 33% i.e., before accounting for other variable costs of production. Besides, the manufacturing sector lost 15% of productivity due to hydropower interruptions in 2012, and small and medium manufacturing businesses lost, between 4.2% and 4.7% (Ahmed et al., 2019; Cissokho, 2019). To improve the margins, manufacturing leaders may consider the use of CT of task structure for clear directions and approach to task completion. Task structure may improve the productivity levels of the business sector through scheduling production lines with a focus of achieving the desired daily production and avoid unplanned downtimes due to load shedding.

Managing hydroelectric power supply due to challenges in generation and distribution affects business productivity. Bharathi et al. (2017) assessed businesses in line with their usage of hydroelectric power and it's bearing on productivity and the community. To strike equilibrium and satisfy both manufacturing sector and domestic demand, it is essential to consider the concept of evolutionary or situational contingency theory. Bharathi et al. (2017) recommend the notion of the evolutionary system to be amended to difficulties where optimization is the fundamental yardstick. To optimize and address, most of the challenges of load shedding, hydropower utility companies need to invest in technology to manage Load Redistribution (RL) to consumers (Bharathi et al. 2017; Ge, 2019). However, the investment in technology not only escalate the cost of

providing and dispensing hydropower, but also conveys the risks such as cyber-attacks and false data injection (Ge, 2019; Xiang et al., 2017). Addressing these challenges may provide indicators on how manufacturing leaders may add toward economic consumption and elimination of wastage may be managed in times of high load sheading experienced by the industry.

Increased load shedding may have a negative influence on the profit margins of the manufacturing sector. Wang et al. (2018) considered the influence of hydropower interruptions on manufacturing industries profit ratios using arithmetical simulations of hydroelectric power constraints, green scientific advancement, and production profit ratios. The result is that there is a non-linear correlation concerning energy restrictions and business profit ratios (Wang et al., 2018). However, for organizations that are highly computerized the connection is U-shaped; while those that are heavy on mechanical or less teach the connection is N-shaped (Wang et al., 2018). Therefore, if good hydropower policies are in place, it may improve the profits of the manufacturing sector and champion environmental initiatives that are eco-friendly. Although most African government hydropower strategies have not comprehended the important practical consequences, good hydropower strategies should be implemented fitting into the qualities of different areas and industries (Wang et al., 2018). These may result in contribution to good environmentally friendly business polices and support industry technological development such as those of the manufacturing sector to improve productivity. Besides, hydroelectric power tariffs differ by nature of consumer, i.e., domestic, commercial, and manufacturing connections and currently the cost to supply

hydroelectricity fluctuates minute by minute, (Akil, 2019). The differentiation of tariff by industry sector is essential and provides good policy guidelines in terms of client segmentation.

Authenticity, Innovation, and Information Technology in Manufacturing Industry

Innovation structures are evolving, placing much reliance on exploring various leadership styles or models to house and execute change in line with hydropower interruptions and the related growing costs. Displaying that innovation needs to be critically evaluated against its benefits and authenticity. Innovation and technology forester the authenticity of the business. To continue being relevant and authentic in every act organization or individual may need to ascertain their internal environment or inner-self and act in line with the demands of the internal arrangements (Bhattacharyya, 2020). Zhao and Sheng (2019) enlightened personalities of dependable leaders, who build trust and create an environment of a trust relationship with followers. It is therefore, essential to understand that in times of difficulty, only trustworthy leadership style may lead team members effectively.

There seems to be no uninformed view on manufacturing innovation design. The current concerns in the manufacturing sector regarding hydroelectric power interruptions are questions such as what change is to be worked on? Influences to be measured for success and are these influences in line with corporate policy? The use of Information management technology in manufacturing is basically to manage the cost of hydroelectric power interruptions. Every, business has a model for its operations based on a specific business model, however, other organizations do not have distinct model

(Micieta et al., 2020). Distinctive models help manage information and considers a balance between operations and strategic business models adopted by an organization for transformation purposes.

International megatrends are amongst universal features of today's business problems (Micieta et al., 2020). Changes in key technological aspects will influence the competitive environment of the future and emerging of pandemics like covid-19 may act as catalyst to embrace technology. The result may be new ways to perceive and value products, and improvements may become preconditions for product modernization to meet the needs, demands, and opportunities of clients (Micieta et al., 2020). Businesses today including manufacturing industries need vital information to make sound decisions for their models that may help manage costs and the scarcity of resources such as energy.

Energy Constraints and Manufacturing Business Decisions

Energy constraints such as hydroelectric power interruptions have an impact on the business decisions such as scheduling production times and workforce shifts. Wang et al. (2018) examine how energy constraints affect business decisions and stated that there is a general nonlinear relationship between energy constraints and business rations. Therefore, it is essential to appreciate that some entities can be related to each other concerning production down time due to power shortages. On the other hand, the cost of electricity is one significant input to product costing in the manufacturing sector (Hoare, 2017). However, the ever-increasing costs of hydropower may also be associated with many factors at both regional and national levels regarding government policies. Saadi et al. (2015) introduced the opportunity for comparison of regional cooperation's promoting

trade and renewable energy deployment. This would create favorable market conditions for solar and wind technologies, however, the question that is not addressed is the extra costs associated with such investments and its impact on the manufacturer if countries decide to deploy more fossil-based power generated solutions while using hydroelectric power resources to mainly meet domestic demand.

It is essential to analyze the effect of wind and hydropower on wholesale electricity prices because of high penetration of renewable energy, and the availability of data on water stored in dams. The aspects of consistency with regard to hydroelectric power plants behaving strategically and, giving zero marginal cost may be the future and address the concerns of the consumers (Pereira et al., 2017). Therefore, complementing other intermittent renewables, and not only operationally, but also on an economic level. Consideration of renewable energy as a solution to most business in southern Africa may be an alternative for manufacturing business. Eales et al. (2017) elaborate on business challenges with regard to limited resources and lack of local capacity to implement alternative renewable energy sources, highlighting the indirect cost of renewable energy that would need to be controlled by business ’before switching from hydropower. Alternative renewable energy may be an option for most companies as far as load shedding is of concern in southern Africa. It is therefore essential to consider indirect costs which cannot be overlooked and may need to be prioritized just as direct costs, primarily associated with enhancing the supply of hydroelectric power (Eales et al., 2017). Essential to alternative energy is the consideration of policy regarding the supply of hydroelectric power to the grid. Shu et al. (2017) demonstrates that essential tools are

critical for simulating the impact of public policy on the adoption of the smart grid technology for electric utilities to determine utility pricing and manage the costs to consumers. It is evident that investment in energy infrastructure comes at a high price and may need engaging different valuation models for both costing and pricing an essential consideration for the manufacturing industry.

Contrasting Theories

CT reflects on the elements of the organization's performance and structure. CT reacts to areas in organizational analysis to address challenges faced by the business and consider best options to optimize the opportunities. Bureaucratic organizational structures tend to be more appropriate for large organizations, especially if those organizations are correlated with rulemaking to administer repetitive processes (Otenyo, 2018). However, bureaucratic structures that are simplified are seen to be more centralized and associated with individualized decision-making management styles (Knowles, 2019; Otenyo, 2018). The cultural norm of an organization is in line with its bureaucratic approach and mushrooms the uniqueness of the operational environmental factors that result in changing the perceived outcomes of the organization. In addition, organizations operating in stable environments generate outputs that are differentiated compared to those in unpredictable and or vigorous environments (Otenyo, 2018). Bureaucratic structures seem to advocate for simplified processes and are associated with individual decision-making, hence, the uniqueness of the environmental operations become essential but not guaranteed.

Organizations are consequently molded by contingency to fit in the identified variables and escape or avoid challenges that may compromise ideal performance (Donaldson, 2013; Otenyo, 2018;). Donaldson (2013) used the Structural Adaptation to Regain Fit (SARFIT) model expounding that organizational fit affect organizational desired performance. In formulating this, organizations endure to eliminate issues aligned with misfit situations that emerge because of change in contingency (Donaldson, 2013). The result is a structural contingency that associates with the essential structure and characteristics of the business.

The theory of contingency has a broader application when considering areas of leadership and decision-making for virous organizational settings (Donaldson, 2013; Otenyo, 2018). To address the challenges faced by organizations, most business would have to make a consensus depending on their technical know-how of the problem by having a detailed definition of the challenges faced in a particular situation. The technical know-how is essential to fix challenges faced by manufacturing business, therefore the need for manufacturing leaders to have a consensus, and clarity of the challenges faced. The contingency framework draws together the dual dimensions to reinforce the environmental foundation of the philosophy (Otenyo, 2018). However, Scholars need to contend with questions regarding the meanings of contingency theories concepts such as environmental demands, organizational internal features, and acclimatization (Donaldson, 2013). Contingency theory concepts fundamentally rely on the organization environmental aspects but ignores some such as technical challenges that are constantly changing.

Contrary to the contingency theory are systems theory and the path gaol theory. Systems theory centers on internal dynamics of the organizations. The systems theories target at defining purposes and entities, whether they are material or human hypotheses to develop the phenomenon under study (Knowles, 2019). Therefore, introducing the essential aspects and exemplary methods of organizational applied systems to explain and analyze the processes and organizational units with a focus of unlocking, transforming, or forecasting organizational structure and their behavior (M. Al-Shaalan, 2019). System theory explains and analyzes the functioning units of an organization with the aim of removing bottlenecks in the whole system.

Systems theory considers the links of interrelations that are human made or natural and how to make the processes work together for the befit of the system (Kamuda & Kużel, 2020). Kamuda and Kużel (2020) identified, equipment, households, corporations, workstations, bodies, and environmental networks as examples of systems that may be taken in isolation from the environment. A business needs to distinctively separate its process from the environment (Dominici, 2017), whether it concerns manufacturing processes or any business unit process to analyze the performance of each process or unit and search for optimum solutions to improve performance. The analysis and search for optimum solutions is championed by unique identification and definition of the challenges faced by the business at the center of the argument or debate (Elhadj, 2019). Subsequently, structures are fundamentally different; they differ on the nature and size of the problem and occasionally on the leader-team members performance in conducting the analysis. However, some systems are supportive regarding content theory

compared to process theory systems (Rhee, 2019). Kamuda and Kużel (2020) stated that for a robotic business to improve real-time reactions, the essential focus would be on the designs of the mechanical structure because each model would differ in line with the purpose it is built for. Therefore, in-depth identification of systems is exclusively reliant on understanding the challenges that have been identified in order of their priority.

Innovative practices are emerging to manage business systems so that the business processes are nonlinear and resistant to manage the emergence of erratic occurrences (Dominici, 2017). In the same vein organizations cannot be seen as silo systems but need to be viewed within a broader global set-up. Therefore, it is essential to device a universal view that deliberates business techniques as multifaceted organizations. Taking such an approach entails that organizations are complex systems, and their components cannot be measured as independent and distinguishable entities. Systems theorist may attest that essential processes have mutual relationships among each other and their environment. Using the quality systems of an organization, Ehsani and Ghane (2019) stated that out of the quality processes, guidelines, and polices the same systems may have an interconnection with the environment in which they operate which is linked to stakeholders, customers, and suppliers. The structures define the elements that establishes the relationships within the systems called internal structures and the ones outside the system are known as external structures (Wanjari & Khadekar, 2019). However, concerning the external structures it must be distinct that the external elements have a direct relation to the elements within the internal structures (Kamuda & Kużel, 2020). Using the manufacturing system, which may entail having machinery

performing procedures and supported by the external environment with inbound activities such as materials and parts sourced from suppliers and through the outbound processes produces products and distributes to the intended customers. Therefore, isolating systems from their relationship with the environment i.e., the external structures may not define the purpose of the internal systems.

Organizational, structure consider properties of systems units, elements, relationships, and how they change over time (Elhadj, 2019). Organizational leaders seek to improve the performance of processes and understand how systems may still perform tasks to achieve the targeted outcome of the processes (Elhadj, 2019). On the other hand, static systems do not define the elements or their relationships and contrarily, when an organizations 'interests seem to be dynamic in nature, the state of elements and relationships may fluctuate over time. The benefits of exploring options may result or concentrate on the causes of the discrepancies and possibly how to manage the variations.

The path goal theory concerns with the individual rewards for team-members, through clarity of responsibilities, overseeing obstructions and prospects to own satisfaction of employees (Farhan, 2017). Like CT, the path goal theory considers leadership behavior as a critical source that influences team members and may change the manner, enthusiasm, and performance of individual subordinates (Farhan, 2017). Path goal leadership theory necessitates a culture of leaders, who are concerned in naturing a learning culture to embrace instructions, helpful, participative, and realization concerned behavior (Olowoselu, et al., 2019). A Leader, who is knowledgeable and willing to learn may accept certain behaviors to accomplish organizations set goal(s) of inspiring junior

team members knowledge and proficiencies. In addition, the assumption of applicable style is essential to respond speedily to team members 'expectancies, essentials, and needs (Olowoselu et al., 2019). Idriss Dokony et al. (2020) stated that the adoption of suitable leadership behavior relies on the ability to change in circumstances aligned to the culture of the organization, uncertainty of team assignments, and attitudes of subordinates. The actions taken by organizational leadership may offset for any deficiency that may be disclosed (Kwon et al., 2020). Therefore, advocating that leaders ' who are knowledgeable may use the path goal leadership styles to influence team-members to gratify the knowledge gap and improve their capacity.

The path goal theory advocates for leader behaviors in four essential areas which are directive, supportive, participative, and achievement oriented. Leadership that exhibits directive behavior, alignes with characteristics such as issuing instructions with regard to the duties and roles of the assignment that need to be completed, informing team members when the assignment needs to be completed, and formulating clear performance expectations to all team members (Bickle, 2017), like the authoritative leadership under CT of leadership styles. Leadership style that is concerned with exhibiting compassion and concern for team members or followers is known as supportive leadership. Supportive leaders aim at making the working environment more enjoyable and treat team members as they would prefer to be treated (Kwon et al., 2020). Participative leadership requests for dialogue from team members by inviting insightful contributions from team members concerning the assignment or task and using the suggestions of the team members to complete the tasks successfully (Sujana, 2020).

When leader behavior is centered on setting high-pitched achievement targets and inspires team members to attain the set goals consistently, then the leadership style is achievement oriented. The focus for achievement-oriented leaders is set on achieving the key objective and nothing else, employees are motivated to achieve these goals and are demanded to be consistent with performance. It is essential, to appreciate that the Path gaol theory supports the notion that a leader may display more than one leadership behavior depending on the nature and size of the task at hand when interreacting with team members.

Another essential aspect taken into consideration under the path goal theory is the characteristics of team members and assignment are equally important as those of the leadership style. The characteristics of the assignment include the organizational hierarchal structure, the design of the assignment work, and the team composition of the employees (Howard et al., 2017). It is critical for the leaders to adapt their leadership style (i.e., directive, supportive, participative, and achievement oriented) based on the identified team members and task characteristics that are needed to complete the assignment. Therefore, leaders engage directive style of leadership when team members need a structure that may manage a task that is complicated in nature (Skendzel et al., 2019). When faced with simple or difficult task and team members desire to be treated well the leadership style would need to be supportive and if team members need clear guidance to complete the task, then a participative style of leadership would be desired (Skendzel et al., 2019). However, achievement-oriented leadership style is desirable when team members desire to do better, and task is challenging (Skendzel et al., 2019).

Path-goal theory is the only leadership methodology that supports team leaders to characterize the importance to encourage team members correctly to get optimum task output and have task completed.

CT has significantly contributed to most leadership studies on organizations' settings, behavior, and management strategies, (Donaldson, 2013; see also Bachrach & Mullins, 2019; Csaszar & Ostler, 2020; Falkenhausen et al., 2019). However, critics of the contingency theory have identified several shortcomings of CT general appeal. One of the outstanding problem with CT is that it is not an integrated body but a body of viewpoints (Donaldson, 2013). Donaldson, (2013) stated that the key challenge associated with CT is the absence of clarity in its assertions. To be precise, the SARFIT model is the evolution of the structural contingency model and appears to disregard rational thinking, because it insinuates that when eventualities change, functionality of processes deteriorates, leading to inaccurate consideration of organizational structure to adjust and match to new or emerging contingencies (Donaldson, 2013). In addition, there are three important scopes that require some improvement: (a) effectiveness, (b) environment setting, and (c) compatibility.

Effectiveness

Schoonhoven, (1981) argued that CT interpret organizational efficiency as being too broad or narrow. Efficiency is generally regarded when it denotes how organizations adjust and survive challenges (Victer, 2020). This view of effectiveness is recommended by organizational systems or natural systems philosophers (Victer, 2020). Organizations that come to terms with their environment(s) survive and are effective.

However, organizations, may survive at different levels. Acclimatization, as a theory, does not express issues concerning an organizations' degree of efficiency (Smith et al., 2019). Besides, Adaptation yields the desired results over a while, and the time variable is hardly recognized in the CT of organizational adjustment (Smith et al., 2019). Therefore, if environmental ambiguity is complemented by effective adaptation, the organization may choose to promote organizational processes in uncertain environments because of the leadership style (Soares et al., 2019). Also, adaptation changes as the organization enter new environments and adopt new strategies and infrastructures.

Effectiveness can be interpreted too narrowly in organizations that only prioritize profitability (McAdam, 2019; Schoonhoven, 1981), such a view is too narrow because other performance conditions exist. The pre and post existing conditions may be more appropriate to the organization's success other than just profit maximization, for example, the organizations' market share, motivation, business growth, operational flexibility, efficiency, and quality of processes and outputs. Taking such a position may suggest that organizational effectiveness criteria must mirror total social values consistent with the prevailing economic viewpoint (Burgess, 2020). Therefore, if there are other dominant social referents, they must be incorporated into the criteria for effectiveness.

One of the biggest challenges with effectiveness is that it is a multidimensional notion. Given the contradictory standpoints and prominences, at least three dimensions, or outcomes, may be used to measure efficiency occurrences (Mozersky, 2019). The first states that efficiency mostly refers to how the organization's resources are arranged and the quantity or degree of utilizing the available resources to attain a unit of the desired

output (Mozersky, 2019). Second is commonly the preferred outcome of successful organizations or payback concerning the organization's members with regard to their compensation, job satisfaction, quality of work-life, or security and a third is the organizational socially responsible outcome (Mozersky, 2019). Therefore, some organization's give particular attention to other elements such as self-actualization of needs and the quality of work life or socio interactions, that may support overall performance.

Environment

The CT fundamentally supposition that a particular environmental characteristic affects all organizations in a similar fashion (Romero-Silva, 2018). Therefore, the relationship of the organization to the environment must be framed in more precise ways. A theory must include both the array of environmental segments with which an organization interacts and specific sectors (Kováts, 2018). Identifying specific sectors also allows for a theoretical consideration of different types and effects of environmental difficulty. Essential to reflect on are two cases: (a) Organizations face environments which may be strong, uncertain influences from; customers, government agencies, and society in general, and (b) Organization encounter environments in which there is slight difficulty from political, economic, government and few general social challenges (Kováts, 2018; Romero-Silva, 2018). Nevertheless, it produces several different products using different technologies for a varied set of changing customers. Besides, environments are multifaceted and diverse. Whether organizations develop similar

infrastructures, even if their strategies are similar, may still be subjected to debate and logical substantiation.

Compatibility

Profoundly rooted in the contingency literature is the concept of compatibility, or fit (Bagnoli, 2019). Improving compatibility between the environment and the organization theoretically leads to effectiveness (Jasmine, 2019; Sharma, 2019); fit or compatibility is the dominant theme in most contingency analyses. Although a construct of central importance, there are two significant problems with the compatibility or fit concept: (a) methodological and (b) theoretical (McDonough, 2018). However, concision in testing contingency theories rests on different statistical suppositions. Some studies have tested for compatibility or fit by distinguishing the degree of interaction between two variables, deliberated by the importance of correlation coefficients (McDonough, 2018). Fit or compatibility contingency theories assume relationships among two variables that are contingent upon some third variable.

Transition

The study of hydroelectric power interruptions in manufacturing industries domiciled in Zambia may be overwhelming due to country and industry characteristics. The interruptions have caused critical consequences for the manufacturing industry because of the high costs associated with alternative energy sources and its effects on the production time, causing poor performance for the sector (Ahmed et al., 2019; Mwila et al., 2017; Phiri, 2017). The manufacturing sector is no exception to the growing challenges caused by unstable hydroelectric power supply.

The multiple case study design aims at exploring the how, what and who strategies over a period of time to address challenges caused by hydroelectric power interruptions. The research study is intended to answer the key research question: What strategies do manufacture leaders use to manage hydroelectricity interruptions? The analysis is grounded on the CT, emphasizing the leadership style and locational understanding, linking dynamic elements of the theory to managing a business. The assumptions, limitations, and delimitations of the study were described. The literature review has in its content an elaboration on how the current practice is applied to address business challenges by evaluating hydroelectric power interruptions and the style of leadership, including the conceptual framework, and contrasting theories. I examine hypothetical matters as suggestions to managements 'consideration from the business literature's perspective.

The particulars of the study are enlightened in section two. Section two reaffirms the purpose statement and explains the roles of the researcher. In addition, a description of the participants is provided in detail, and the research methodology and design is discussed. The section elaborates on the sample choices used for the research, and the population selected, in line with the ethical considerations. Finally, the section concludes with the expected quality collection of data, transferability, reliability, and analysis.

Section 3 contains the study's findings supported with detailed explanations of the data analysis procedures and the responses combined with emerging themes from the study. Section 3 also includes the essential findings and the study's application to

professional business practice. I discussed the positive implications for social change in section 3 and concluded with the research key findings, reflections, recommendations for future research, a summary of the study, and a conclusion.

Section 2: The Project

I introduce the overview of the research methodology in this section and the purpose statement to furnish more clarity to the background of the study focus. The section discusses my role as the researcher and details of the research method, design, population, and sampling size. I consider ethical research practice in line with the ethical standards for protecting organizations and participants. I also discuss the data collection techniques, tools, organization, and analysis. Lastly, I conclude the section discussing the reliability and validity of the study and associated elements.

Purpose Statement

In this qualitative multiple case study, I explored strategies that some manufacturing leaders use to manage hydroelectric power interruptions. The targeted population consisted of six manufacturing leaders in Zambia who have used strategies to successfully manage hydroelectricity interruptions. The implications for positive social change include the potential of economic growth that can catalyze job creation among the unemployed and enhance the livelihoods of the people of Zambia.

Role of the Researcher

My central role as a researcher was to collect, interpret, transcribe, check, and examine the data. After obtaining approval from Walden University Institutional Review Board (IRB), I proceeded to collect data using semistructured interviews, took handwritten field notes, study the participants' responses equitably, and conducted data analysis. Qualitative investigations require researchers to value all data gathered and objectively report the information collected to elaborate on the shared occurrences

(Sutton & Austin, 2015; Yin, 2018). I asked appropriate questions, paraphrased for thorough understanding and accuracy, listened intently, and took notes.

I had neither prior nor existing relationships with the participants or their organizations. Having prior relationships with study participants affects the research findings; however, in data management, it is essential to know the industry being examined for research processes (Xu et al., 2019). I aimed to explore some manufacturing leaders' strategies to manage hydroelectric power interruptions.

Prior relationships were not of value to the study because my central research question focused on what strategies manufacturing leaders use to manage hydroelectricity interruptions. Despite not currently working in the manufacturing industry, I served 2 years in a fast-moving consumer goods (FMCG) manufacturing sector from 2008 to 2010. I have been trained in organizational balanced scorecard (BSC), a tool that assists clarifying, articulating, and communicating corporate strategy in four essential areas: customer perspective, internal business processes, financial perspective, and learning and growth.

It is essential for a researcher to exhibit respect regarding persons, beneficence, and justice (Department of Health and Human Services [DHHS], 1979). After securing approval from IRB, I conducted interviews by obtaining consent from participants to ensure confidentiality regarding their privacy and identity. I used the interview protocol (Appendix A) to structure and conduct interviews using the design approved by IRB. Yin,(2018), stated that to ensure standardization and avoid biasness during interviews researchers use interview protocols. Therefore, I used interview protocol to guided the

study process and streamline all interviews conducted regardless of the organization's participants' status. I followed the interview protocol (Appendix A) steps suggested by Galynker (2017), which included: (a) brief introduction and opening remarks, (b) interview questions, (c) investigative questions, (d) statement of appreciation and conclusion, (e) general discussion of emergent arguments, (f) corrective action of views in line with participant's feedback, and (g) inclusion of insightful minutes. Jayaratne and Jayatilleke, (2020), stated that to enable the research have meaningful data collected and avoid confusion of terms and assumptions, researchers use semistructured interviews. Using semistructured interviews permitted participants to respond in their own words, avoid biasness, enable share their diverse views of their experience, and providing the research with a more holistic view. Data were collected using semistructured interviews provides more variety than closed questions or survey questioners with yes or no responses (Jayaratne & Jayatilleke, 2020). I collected data using semistructured interviews and used the various options availed to me by using semistructured interviews such as diverse views of the participants' lived experiences.

Alleviation of bias in research is essential. I mitigated biasness by providing the identified participants a background of the research and the potential contribution to the industry. I considered only relevant field observations aligned with the study. Leonelli, (2019), data were analyzed and interpreted according to the design of the interview protocol and research findings. Qualitative research centers on the researcher's integrity, which creates different challenges (Yin, 2018). Avoiding bias was essential in conducting the qualitative research because the credibility, dependability, and transferability of the

study data are principal to the researcher (Smith, 1988; Yin, 2018). Yin, (2018), stated, qualitative studies demand a categorical description of how the researcher avoids bias and remains conscious of knowledge acquired to control biasness. Therefore, judging the validity of data concentrates mainly on interpreting the findings (Khan, 2014; Smith, 1988; Yin, 2018). To monitor and reduce biasness, I ensured that my understanding of literature review did not distort information provided by the participants and ensure correct interpretation of the study findings.

Participants

To be qualified for the study, participants had to be over the age of 21 years, employed by manufacturing organizations based in Lusaka, Zambia, and engaged in leadership strategies to manage hydroelectric power interruptions successfully. For research purposes, leaders are managers or senior managers assigned with the responsibility of strategic foresight of the organization, supervision, or staff oversight, and participate in the organization's decision-making processes (Martin, 2007). To capture emerging strategic business practices in managing hydropower interruptions and explore new theories in the manufacturing sector, I did not limit participants to their industry experience or organization size. Chief executive officers (CEOs), line production managers, and financial executive officers (FEOs) shape the organization's policies, culture, vision and mission, and act as change agents for business strategies implementation (Martin, 2007); therefore, they were appropriate participants for this study.

My strategy to gain access to the target participants was to use the Patents and Company's Registration Act of Zambia (PACRA). PACRA, lists all legal businesses and official operational physical and electronic addresses. I used emails and phone communication to inform potential participants of the study's nature and reasons. In addition, using market segmentation, I only sampled six participants from manufacturing organizations operating in Lusaka, Zambia. Johnson et al., (2019) and Oprit-Maftei, (2019), suggested email addresses, official telephone number, and physical address are suitable research communication tools. I used email addresses, corporate telephone numbers, and physical locations of the target participants. I sent invitation emails and shared consent forms with participants who consented to partake in the research. The email correspondence explained the content and intent of the study and included a sample of interview questions and the criteria for screening research questions. To achieve a professional interface with the target participants, I informed the participants of the possible maximum duration of the interview. Therefore, I scheduled the interviews for maximum period between 40 and 45 minutes.

Establishing a working relationship with the participants is principal to qualitative research (Yin, 2018). Upon receiving consent forms from the participants, I informed and engaged the interview protocol process (Appendix A) and shared the sample questions (Appendix C). In-person interviews enhance working relationships, conversation, and quickly establish a friendly environment (Johnson et al., 2019). A friendly environment helps build trust and avoids tension between the researcher and participant. Johnson et al., (2019), sated remote interviews are necessary and advantageous but may limit the

richness of communication and relationship produced by the interview. Because the COVID-19 pandemic presented challenges for face-to-face interviews, I communicated with participants using email and telephone calls prior to physically visiting business locations. The approach ensured that I reach the target of interviewing no fewer than six participants and reached data saturation. To ensure data saturation, I continued the interview process until no new themes emerged, I considered interviewing additional participants, but it was not necessary, and the study could be replicated.I shared my contact details for any follow-up questions and clarifications. A professional, respectful, and casual tone during interviews is essential to gain the participants trust, create a friendly but professional atmosphere (Johnson et al., 2019). I maintained a professional connection with participants to benefit from their honesty, divergent views, and gain a deeper understanding of industry terms and descriptions using their background assessments.

Research Method and Design

Ascertaining the appropriate method and design during my study was essential. Therefore, a researcher must understand different categorical approaches about research methodologies and designs (Stoecker & Avila, 2020; Yin 2018). Yin, (2018), stated that choosing the right method and design for the study enables the researcher to conduct the research rigorously and avoid generalizing the research conclusions. Because I explored leaders' strategies to understand the *how* or *why*, and did not have control over the behavioral events, I selected the qualitative method and case study design.

Research Method

The three research methods are qualitative, quantitative, and mixed methods. I chose the qualitative method because I intended to explore strategies that manufacturing leaders use to manage hydroelectric power interruptions. Qualitative researchers explore human experiences using documentation, interviews, observations to gain a thorough understanding of a phenomenon, and elaborate on diverse perspectives and insights of lived experiences (Ivankova et al.2006; Stoecker & Avila, 2020; 2006; Yin, 2018). I used the qualitative research method because it addressed the central research question. Molina-Azorin and Fetters (2019), and Moustakas (1994), stated that qualitative research enables the study to be done in diverse social settings that consent for direct observations of the target population being studied, communications, interactions with the participants, provides prospects for casual, and official interviews. Ahmed et al. (2019) used the qualitative method to investigate the outlay of hydroelectric power interruptions to the manufacturing organizations in Zambia and the cost of alternative energy sources. Researchers use qualitative studies to obtain in-depth understanding of the phenomenon under study from diverse views (Molina-Azorin, & Fetters, 2019; Yin, 2018;). I used the qualitative method to obtain understanding of the unknowable leadership strategies in manufacturing business practices. By establishing and integrating the study data from exploratory studies, interview records, notes, artwork, and individual participants (see Becker, 1993; Moustakas, 1994), I collected and organized documents into a structure that communicates each research participant's narration, feedback, and experiences. Qualitative research methods may provide awareness of costs associated with energy

restrictions, business profit ratios, and advantages of whether the business's strategies are automated or mechanical.

I did not use the quantitative method for this study. The quantitative method is used to test hypotheses and analyze independent and dependent variables' relationships or variations using statistical methods (Bogue et al., 1994; Yin, 2018). Researchers use quantitative analysis to describe, measure, and investigate relationships among variables (Bogue et al., 1994; Molina-Azorin, & Fetters, 2019; Yin, 2018). Because I was not testing hypotheses or analyzing dependent and independent variables the quantitative method was not the appropriate method.

The mixed method includes qualitative and quantitative methods to explore and explain phenomena over a time series (Klassen et al., 2012; Stoecker & Avila, 2020; Yin, 2018). The mixed method study incorporates intervention on one or more data measurements and compares and observes results before and after (Stoecker & Avila, 2020; Yin, 2018). The comparison and observations may be affected by significant challenges during the study because any change may affect the outcome, such as performance improvement in the second test because of the first test's proficiency (Hopkins, 2000; Klassen et al., 2012). Both the quantitative and mixed methods work with the sample of subjects and not the entire population (Hopkins, 2000; Yin, 2018). Because there was no quantitative component to my study, the mixed method was not an appropriate research method.

Research Design

Common qualitative designs include case study, narrative, phenomenological, and ethnography. I used a multiple case study design. Researchers use the case study to explore the *what* and *how* aspects of a case and how they relate to its extant circumstantial environment (Groenewald, 2004; Yin, 2018). Yin, (2018), stated that the research question justifies the design method by considering the form of the research question, controlling a researcher over the behavioral events, and emphasizing current as opposed to historical occurrences (Yin, 2018). Depending on the form of the reporting structures and the form of the research questions, case studies may be exploratory, explanatory, and descriptive (Groenewald, 2004; Yin, 2018). Molina-Azorin and Fetters (2019), and Yin, (2018), argued that exploratory case studies examine divergent phenomena depicted with or lacking comprehensive groundwork research, the limit the choice of methodology, and are small in scope. Yin, (2018), stated that explanatory case study centers on examining *how* and *why* it is what it has comes to be, and the results are not for clarification but depiction of the specifics of the phenomenon under study (Groenewald, 2004; Yin, 2018;). Descriptive case study centers on the propositions, and questions about a phenomenon are analyzed, communicated, and articulated from inception (Groenewald, 2004; Molina-Azorin, & Fetters, 2019; Yin, 2018). The descriptive case study's essential qualities are to analyze a sample in depth using real-world circumstances faced by either individuals or groups and how they addressed the challenges (Groenewald, 2004; Molina-Azorin, & Fetters, 2019; Yin, 2018). Therefore, the multiple case study was appropriate for my study because the central research

question centers on analyzing the *who*, *what*, and *how* manufacturing leaders are managing hydroelectric power interruptions.

It is essential to have no control over the industry's behavioral events, and that the study focus is contemporary and not entirely a historical occurrence (Groenewald, 2004; Molina-Azorin, & Fetters, 2019; Yin, 2018), therefore I had no control over the industry's behavioral events. A case study analysis may consider the in-depth strategies to manage hydroelectric power interruptions, by taking into account the features and scope of the research (Groenewald, 2004; Molina-Azorin, & Fetters, 2019). An all-encompassing methodology of customized logic of design, analysis, data collection techniques, and detailed approaches to data analysis lies at the center of a case study design (Groenewald, 2004; Molina-Azorin, & Fetters, 2019; Yin, 2018). Therefore, the choice of using case study to collect data are known to address the *how* or *what* questions and provide a balance in identifying *how* or *what* manufacturing strategies are used to manage hydroelectric power interruptions.

The narrative design is used to study individual lived experiences by collecting data using written and verbal communications as informed by their own words, giving scarcely focused and specified explanations of a phenomenon. Unfortunately, researchers using the narrative do not explore the *how*, *who*, and *why* of the facts happening within the context, (Groenewald, 2004; Marshall, 2016; Moustakas, 1994); which makes the narrative design not fit for the study. The phenomenological design is bound to the concept of intentionality (Groenewald, 2004; Moustakas, 1994). The phenomenological design is used to investigate individuals' views of their lived experiences in their seeming

familiarity (Groenewald, 2004; Moustakas, 1994). Researchers using the phenomenological design consider what is seen but do not deduce from the phenomena what can be distinguished and described and ignore daily understanding, judgment, and knowing's from the phenomena (Groenewald, 2004; Moustakas, 1994; Schmitt, 1967) to reexamine from zero with a broader perception. The phenomenological design was not chosen. Researchers use ethnographic design to generate a rich overview of the phenomena with regard to the individuals and group's shared cultures, and behavior patterns for distinctive cultural subsets over some time (Moustakas, 1994; Sangaramoorthy & Kroeger, 2020; Schmitt, 1967). The ethnographic design was not appropriate for the study because the central research question does not encompass investigating cultural groups and their respective setting.

Depending on the sample size, data saturation may be attained with a minimum of six interviews subject to the sample population's size; therefore, in a case study, data saturation may be reached between a minimum of six to 10 participants (Hennink et al, 2016; Morse, 2020; Venkatesh & Thirupathi, 2019). To ensure I attained data saturation, I conducted structured interview questions to reach out to multiple participants with the same interview questions. I used one participant from each identified manufacturing organization. However, to ensure data saturation, I continued the interview process until no new themes emerge and considered interviewing additional participants if necessary. Limiting the interviews to participants with technical information concerning the study may overshadow the data purposely or accidentally (Morse, 2020; Teng et al., 2020). I did not limit the interviews to participants with technical information. Finally, I

considered avoiding biasness by deducing the conduct and contemplations of the target participants, characterizing, and ensuring there were no new emerging data.

Population and Sampling

The targeted population consisted of six manufacturing leaders in Zambia who have used strategies to successfully manage hydroelectric power interruptions. My focus was on manufacturing firms producing fast-moving consumer goods (FMCG). I used selective sampling to select participants from PACRA's publication list of lawfully registered manufacturing organizations whose operations are based in Lusaka, Zambia. Researchers, use selective sampling in a qualitative study to connect and collect rich data, and for the most effective use of controlled resources such as geographical vicinity, accessibility, or availability of the target population (Jehiel & Steiner, 2019; Yin, 2018). Yin, (2018) stated that finalizing the interviews with essential stakeholders of the organization may offer a universal dataset. I interviewed leaders of manufacturing firms' who have the vision, knowledgeable communication strategy, and empower or delegate tasks relevant to the research question; therefore, selective sampling was appropriate.

When research does not attain data saturation, the study's quality is compromised and obstructs content validity (Fusch & Ness, 2015). Using the identified target population, I interviewed six participants to enable me to have a selected sample of six participants. A sample size ranging between six and 10 is enough to collect diverse themes to attain data saturation. A sample size exceeding 10 or more may not translate into richer or value-adding data to the study goals (Guest et al., 2006; Hennink et al., 2016). A researcher needs to consider data in terms of the dataset's quality and quantity

(Fusch & Ness, 2015; Hennink et al, 2016). Using selective sample I considered interviewing key stakeholders who provided me the best opportunity to reach data saturation, regarding the data layers, elaborateness, features, and nuanced. Using interviews, I did not quantify the sample but took what I could get from the participants and transcribed the data. The interview protocol (Appendix A) enabled me to ask several participants the same question. I emailed participants' responses for confirmation of accuracy and if there were misinterpretations, I made the appropriate changes, sent them back to the participants repeating the process and continued this process until no new information was obtained, and the study could be replicated.

Using purposeful sampling enabled me to identify the participants to be interviewed and using the PACRA list of registered manufacturing organizations to choose the manufacturing businesses. I contacted the participants via email (Appendix B) to request participation and the preferred method of interfacing. If those contacted agreed to participate, I searched the Zambia Association of Manufacturers (ZAM) for their business publication reports and press briefings to see additional information regarding the impact of hydropower interruptions on the manufacturer. The object of searching the ZAM website was to obtain a holistic view of challenges the manufacturing sector was facing and other factors emanating from the external environment such as the political, economic, technological, and social (PEST) setting. During the interview process, I inquired on the leadership style to identify the level of participation of manufacture leaders on national and local government policies concerning addressing challenges caused by hydropower interruptions. Engaging stakeholders involved in hydropower

interruption issues served as a layer of data, because participants had grounded knowledge and were better placed for contingency forecasting. In addition, it is essential to consider assessing the selective sample population in line with other cultural and power dimensions prior to the interviews (Gill, 2020; Jehiel & Steiner, 2019; Pitard, 2020). Using purposeful sampling was useful in the selection of the research population and improved my attentiveness with selection of meaningful cases aligned to the phenomenon.

To schedule appointments, I contacted the participants using email or telephone (see Appendix B) to agree on the date, time, and venue. I aimed to establish a rapport by having open, casual, and curious attitude to show why I was interested in the participants' view of a phenomenon. Agreeing on the date, time, and venue enabled my research to be undertaken in a conducive environment and provided the opportunity for open interaction. I considered semistructured interviews because of the possibility to create a rapport with the participants. Technology-supported interviews such as skype, zoom, google meets, and telephone have advantages and disadvantages, but if not managed well, may limit the research quality (Kaur, 2018). McGrath et al., (2018), stated that essential to any interview method used is to follow the interview protocol and ensure no distractions for both the interviewer and interviewee to capture accurate information, record conversations without echo or noise pollution. I informed participants of the importance of a noise free environment, no destruction and establishing a rapport was key to engage participants and build trust.

Ethical Research

Ethical research is essential to help the researcher manage research participants concerning the conduct, guides, and norms or standards to adhere to regarding respect of persons (Heider et al., 2020; LeCompte & Young, 2020; Sauceda et al., 2020). As a researcher and a professional, ethics is an essential aspect of my daily life, which requires that I protect, have self-respect for participants and protect information shared during the research. My approach to the study was conceptualized with the belief that no harm was caused to the persons' or participants' privacy, reverence to the participant's responsibilities to their communities, environmental health, and critical importance standards. I, therefore, ensured that confidentiality was paramount to the study. In addition, no disclosure of identified business information or personal identification to remain anonymous (Sauceda et al., 2020), and doing so protected the organizations' identities, the participants, business traits, employees, and other stakeholders such as customers and suppliers.

After IRB approval, I provided credible research participants with an invitation letter containing a summary of the research study, and a consent form. Participants who choose to participate in the study returned a signed consent form via email or physical copy. Researcher, description of how participants may withdraw from the research study at any time without any consequences is essential (Heider et al., 2020). I included the following in the consent form, study overview, a statement of voluntary participation, and that non-participation shall not attract or involve any charges or loss of benefits attributed to the participant. Heider et al. (2020), and LeCompte and Young, (2020), illustrated that

the consent form should include a description of procedures concerning the duration of participation, interview procedures to be followed, any risks or possible discomfort that the participant may experience. The consent form I used included these elements and I also described participants' confidentiality, details for privacy, identity protection, and informed participants that there were no incentives for participating in the study.

Participants had the right to withdraw by emailing me their desire to withdraw or could contact the appropriate Walden University personnel to withdraw from the study. The IRB final approval number included in the final study shows that the research was performed in compliance with Walden University's IRB process. I ensured that participants signed the consent form via email and return a copy or physically signed. The signed consent forms shall be maintained for 5 years. To protect data gathered and participants' identity, data collected are kept in encrypt computer-based files using external data drive or iCloud for safe storage (Sauceda et al., 2020). I kept all data files in encryption format on my computer password protected drive. Besides, I removed any personal identifiers from the documents and stored the any hard files in my lockable safe box. I ensured that the iCloud is password-protected. I will delete all data after 5 years, and hard files shredded using a shredding machine.

Data Collection Instruments

Yin, (2018) stated that in qualitative research, the primary data collection instrument is the researcher. I was the focal point person for data collection, using semistructured interviews. Jagger (1982), and Yin, (2018) stated that data collection in case study are accomplished by conducting semistructured interviews using a selective

sample, coupled with the interview protocol, and note-taking of study observations. Data collection instruments are key to the study and the use of semistructured interviews requires a researcher to be methodical to capture any emerging themes linked to the phenomenon.

Dearnley, (2005), stated that semistructured interviews provided a holistic view and enriched data through participants expressed observations and understanding of the phenomenon under study. I used the interview protocol (Appendix A) to guide the research. After obtaining the participant's consent, I recorded the interview using digital voice memos were permitted.

To maintain validity in a qualitative study, researchers commonly use the member checking process (Candela, 2019). Member checking was essential to ensure that the research was trustworthy. Understanding the participants, experience, importance, and impact of those experiences for the phenomenon under study is essential (Candela, 2019; Yin, 2018). To increase the study's validity, it is vital to engage multiple sources to validate the study (Yin, 2018). I conducted face-to-face semi- structured interviews to enhance accuracy and capture data correctly, and I used member checking to determine if what was initially discussed was a true reflection of the participants' perception. I captured the participant’s responses, transcribe them, and emailed them back for confirmation of accuracy, if there were any misinterpretations, I would make the changes, return them, and continue the member checking process until there was no new information.

Data Collection Technique

Semistructured interviews was the primary data collection technique to address what strategies manufacturing leaders use to manage hydroelectricity interruptions. Researchers use other available options for qualitative data collection such as direct interactions with participants, video and audio recording, and observations of photographs and artifacts (Castillo-Montoya, 2016; Yin, 2018). Semistructured interviews enable the researcher to elaborate to the participants a broader understanding of the phenomenon (Yin, 2018), and express their understanding in their own words with richer meaning, examples, and descriptions (Stofer, 2019; Yin, 2018). Using semistructured interviews provided each participant freedom to elaborate on strategy formulation to manage hydroelectric power interruptions.

Researchers may use a group setting but requires several groups and sufficient time to obtain an objective and unbiased view of the investigation (Perera, 2020). A researcher should also possess a range of skills such as group skills, facilitating, and moderating to avoid the potential competition of participants' views that may compromise the participants and give limited responses (Perera, 2020; Stofer, 2019; Yin, 2018). A disadvantage of individual face-to-face interviews is obtaining different versions and interpretations to the study questions and diverse feedback (Castillo-Montoya, 2016; Perera, 2020). Researchers use individual interviews because they provide the opportunity to be reasonably informal and enable the participants liberty to express their views (Yin, 2018). However, participants should be kept on track by the interviewer through probing and follow-up questions to foster quality of interviews (Castillo-

Montoya, 2016; Yin, 2018). Group setting maybe adequate to capture data, however, it needs more resources such as time. Time is a limitation in most research and may deprive the researcher from analyzing different versions of interpretations from participants.

After successful IRB approval, I contacted the participants using a standard email correspondence, to confirm, secure and schedule interviews (see Appendix B). To gain richer and detailed insight into a phenomenon, I contacted the participants before the interview to inform each participant of the interview's purpose and the estimated duration and importance of the consent form. An essential part of the semistructured interview was choosing neutral locations convenient for the participants and an environment free from noise and disruption for audio recording (Castillo-Montoya, 2016, Yin, 2018). I scheduled interviews to be conducted via face-to-face, Microsoft teams, zoom, or over the telephone with consent to record the sessions. Researchers avoid biasness, by ensuring that each interview process experience is the same for data collection methodology (Yin, 2018). Therefore, I adhered to the interview protocols described in Appendix A and there was no pilot study.

I requested each participant to respond to the interview research questions in line with the interview protocol (see Appendix A). Researchers, may use observation techniques to verify the information gathered during face-to-face encounters and obtain richer data (Castillo-Montoya, 2016; Stofer, 2019; Yin,2018). I used written descriptions of the participants' situation or environment, such as photographs and artifacts, to collect observable data of the study, including objects of significance if made available. It was

important to accurately capture diverse participants' perspectives to obtain a common understanding of the phenomenon under study during the data collection process.

To ensure data saturation, I continued interviewing participants from the target population sample until no additional information or emergent themes arose while interviewing or conducting member check procedures. The anchor of qualitative data collection are with the integrity of the results, and this is achieved using member checking to validate the results by exploring the credibility (Birt et al., 2016). I used MAXQDA to track and categorize the study data captured. I returned an interview summary to each participant for accuracy checking, and resonance concerning their experiences of the phenomenon with regard to emerging themes. Member checking allow participants to engage, make additions, validate, or clarify emerging themes and interpret data from their perception of the phenomenon and interview questions (Birt et al., 2016). I used member checking to verifying data and the process of interviewing participants to achieve data saturation was central in ensuring that no new or additional information emerged.

Data Organization Technique

I used the multiple case study as an essential element for organizing and easy access to referring file structures in a listing format. Researchers organizing the study data into digital formats for ease of reference from other digital files (Yin, 2018). I download digital audio files and stored them on my personal computer for back-up. All notes were saved in adobe.preview files for easy access and referencing. Tamboli and Bewoor (2019), stated that adobe preview files and folders arrangements are essential for

managing and maintaing a professionally organized electronic directory and drive structures. To distinguish the files and ease browsing I used the naming conversion in the the order of; participant number, interview date, and data type (i.e., Pax01_04302021_notes.pdf; Pax02_04302021_audio.mp3; Pax03_04302021_transcribed.docx). I consolidated the data into a password-protected flash disk and stored it in my safe box. I will keep the data for a minimum period of 5 years. After 5 years, I will format the flash disk.

Data Analysis

Alam (2020) and Yin (2018) stated that essential feature of qualitative data analysis is examining the text. Text in qualitative data analysis can be in the form of notes and artifacts reviewed by the researcher (Kanygin & Koretckaia, 2021; Yin, 2018). I analyzed data to understand participants' views of the phenomenon and comprehend the depth of the data using hermeneutic assessment of the text. Yin, (2018), stated that hermeneutic analyzes and interprets text that cannot be considered factual or deceptive. I therefore, constructed the study findings' reality through the lens of the central research question, the conceptual framework grounded on modified van Kaam, and the literature review of the research anchored on the CT.

Researchers, use methodological triangulation to compare interview responses with additional documentation, artifacts, and depth, to understanding a particular investigation (Yin, 2018). I supplemented interview responses with documents such as publicly available company agreements, reports, websites, and photographs, in addition, I considered the use of physical artifacts observation.

Data results are analyzed from the same study to enhance the validity and provide the research with a more in-depth conception of the research problem, and examine different ways of understanding the central research problem (Alam, 2020; Khan, 2014; Yin, 2018). I used methodological triangulation by: (a) evaluating the transcribed data and classifying arguments using a highlighter, (b) cutting and classifying, which involves retracing the data further and grouping information by words and expressions, and, (c) examining and engaging, the final step to scrutinizing the data, which necessitates a comprehensive review, any supplementary data, outlined in the contingency theory and the central research question to guarantee the connections drawn from the study. Researchers use the theoretical proposition to help organize the entire analysis by indicating the essential contextual conditions described and explanations to be evaluated (Kanygin & Koretckaia, 2021; Yin, 2018). I used two critical data sources, (i.e., interviewing officials of the targeted manufacturing businesses and their official documents), provided I was provided with company websites to access the available documents.

Coding helps the researcher to present the research findings and analyze the data (Kanygin & Koretckaia, 2021; Yin, 2018) coherently and meaningfully. Many factors influence the number of themes generated when collecting data, including the method used to manage data, *who* and *how* many participants are looking for the themes (Phillips et al., 2020; Yin, 2018). I used MAXQDA qualitative data software analysis for coding, sorting, processing, and analyzing the semistructured interviews. Researchers use qualitative data software tools such as MAXQDA to organize and scrutinize data by

transcribing the interviews and journal notes (Alam, 2020; Kanygin & Koretckaia, 2021; Musab & Bach, 2014). Coding is a model of the "uninterrupted reasonable procedure" of qualitative data analysis (Kanygin & Koretckaia, 2021). Using MAXQDA, I coded data using a diagnostic four-step technique: (a) correlating mechanisms of meaning throughout groups for inductive categorization, (b) cleaning groupings, (c) "demarcating the concept" by examining interfaces and recurrences throughout the groups, and (d) integrating data to transcribe a concept. Çelik (2020), Musab and Bach (2014), and Yin (2018), suggested several rigorously controlled qualitative data analysis, like synchronized interviews to diagnose and integrate data. The process of data coding was paramount to analyzing data collected and triangulation. The use of MAXQDA, helped provide a logical and sequential process for conducting data analysis.

I used the CT to answer the research question using the conceptual framework of modified Van Kaam. Moustakas (1994) popularized the Van Kaam data analysis plan to analyze data. I used the theoretical proposition of the contingency theory and followed nine steps:

1. Step 1 I removed any bias by treating all data equally through preliminary coding and grouping all quotes regarding the phenomenon under study.
2. Step 2 I reduced and eliminated anything that seemed unnecessary to the participant's lived experience or minimized it to its concealed meaning to detach the elements of the experience from futile and subordinate information.

3. Step 3 I thematized the unchanged components to investigate the implications, group themes according to their meanings, and formed themes expressing the participants' responses.
4. Step 4 I checked and analyzed the themes against the dataset to ensure that the emerging themes represented the participants' lived experiences.
5. Step 5 I considered citations and emerging themes from the participants.
6. Step 6 I observed and examined the relationships between the emotions, cultural and social connections of *what* and *how* participants expressed their views of their lived experience to interpret data.
7. Step 7 I combined the text descriptions of all emerging themes for all participants in a table format to identify the phenomenon's reoccurring and prominent themes.
8. Step 8 I depicted common elements of the participants' experience by examining the participants' cultural, social, and emotional connections. Step eight was to understand details that matter the most and inform participants' lived experiences.
9. Step 9 I merged or synthesized the data to provide a comprehensive understanding of the phenomenon from the participants' lived experience.

All files and data were stored on a password-protected flash disk and stored in my safe box for a minimum period of 5 years, after which they will be destroyed.

Reliability and Validity

Reliability

Sadik (2019) and Yin (2018), stated that a qualitative study's reliability ensures the research achieves consistency and reproduces case study's findings if repeated. The chain of evidence provides dependability of the study, and the stronger data collected are linked to the case finding, the more excellent reliability of the phenomenon under study (Yin, 2018). I used methodological triangulation fashion to overcome any research challenges linked to data collected for greater dependability of the study results. Methodological triangulation is when the researcher utilizes multiple sources of evidence, such as semistructured interviews, observation notes, and artifacts from selected participants' organizations for consistency and dependability (Yin, 2018). I used multiple semistructured interviews with interview protocol, journal notes, and member checking. Relying on multiple sources of evidence such as in-depth interview (IDI) and focus groups (FGs) may provide greater reliability of the research findings and better quality than using single sources of information (Carter et al., 2014; Yin, 2018). Because I used interview protocol process, additional sources of data collection such as observational notes, and member checking it provided the study and participants multiple opportunities to validate the reliability of the study findings.

Credibility

Establishing that the research findings are believable is highly dependent on the member checking process and feedback from participants (Ozcan & Koca, 2020; Sadik, 2019). The participant's perspective is essential because the purpose of the research is to

elaborate the study phenomena from the participants' view (Ozcan & Koca, 2020; Sadik, 2019, Yin, 2018). Because the participants are the only ones who may judge the credibility of the results without biasness, I used semistructured interviews to probe participants' perceptions and unlock the meaning of terms and jargon used in the industry. To mitigate credibility concerns, a researcher may use member checking process and feedback from participants for emerging themes (Ozcan & Koca, 2020; Yin, 2018). I used a formal approach to interview participants to probe, clarify questions, and identify emerging themes for member checking and enhanced credibility. Member checking provided the participants the opportunity to provide additional evaluation of the feedback provided and examine emerging themes (Ozcan & Koca, 2020; Sadik, 2019, Yin, 2018). I allowed participants to review a summary of their responses through member checking after the interviews were interpreted, and coding was completed. In addition, I informed the participants to seek additional clarification, authenticate of potential emerging themes identified during the study, and, in return, warrant the research findings' credibility.

Transferability

Transferability is the extent to which the researcher’s study findings may be generalized or transferred to another context or setting (Kanygin & Koretckaia, 2021; Ozcan & Koca, 2020). I used the interview protocol to present the probing question, sought clarifications during, and after concluding all interviews for future researchers to transfer to other contexts. A researcher may enhance transferability by providing assumptions that are essential to the central research question (Kanygin & Koretckaia, 2021; Yin, 2018). I was consistent with the interview protocol, data collection process

and analysis. In addition, I was thorough with the documentation to enhance credibility and reliability so as to achieve accurate presentation of the study findings. The use of standard procedures and ethical guidelines will allow future scholars to replicate the research findings using similar or alternative samples. Uniformity in the hypothesized interpretation of a phenomenon fosters the research's transferability (Aksu & Eser, 2020; Kanygin & Koretckaia, 2021; Slevin & Sines, 2000). I focused on the essential themes of the phenomenon understudy aligned to the literature review, new studies, and the conceptual framework.

Confirmability

Confirmability is the degree to which the research findings may be confirmed or substantiated by others (Swinburne, 1973; Yin, 2018). A researcher's objectivity and consistency is fundamental when analyzing case study and mitigating personal biasness when analyzing the research results (Slevin & Sines, 2000; Swinburne, 1973; Yin, 2018). To enhance confirmability, I documented the procedures for data collection and analysis throughout the study for the interview processes. In addition, I transcribed some interviews into digital audio files, combined with observational notes, and feedback. By following these steps I safeguarded the study results from any biasness, reproduced the participants' perspectives captured and presented in an independent investigation manner.

Transition and Summary

In section 2, I reinstated the study's purpose statement and elaborated on my role as the researcher. I detailed the participants' sample, and I presented the depth of the research method for the study using the multiple case study as the preferred research

design. I discussed the data collection processes and analysis with emphasis on the ethical process and IRB approvals. Data descriptions regarding the collection instruments, techniques, data organization techniques, and analysis were elaborated in section 2. I concluded section 2 discussing the reliability and validity of data through the lens of four necessary aspects; (a) reliability, (b) credibility, (c) transferability, and (d) confirmability.

In section 3, I present the study's findings supported with detailed explanations of data analysis procedures and the participants' responses combined with emerging themes from the study. Section 3 includes further discussion on the study findings. In addition, I elaborate on the application to professional business practice and positive implications for social change. Lastly, I concluded section 3 with key findings, reflections, recommendations for future research, a summary, and conclusion of the study findings.

Section 3: Application to Professional Practice and Implications for Change

Introduction

In this qualitative multiple case study, I explored strategies that some manufacturing leaders use to manage hydroelectric power interruptions. The specific business problem was that some manufacturing leaders lack strategies to manage hydroelectricity interruptions. The research question for the study was: What strategies do manufacturing leaders use to manage hydroelectricity interruptions? Data analysis included exploration and methodological triangulation of the multiple case study through the lens of the central research question, the conceptual framework grounded on modified van Kaam, and the literature review of the research anchored on the CT. I collected data using semistructured interviews with CEOs, line production managers, FEOs, and others who have successfully managed hydropower interruptions.

Four significant themes emerged from the interviews (see Table 2). Results showed that leaders in the manufacturing sector are knowledgeable of strategies to manage hydroelectric power interruptions. Effective strategies may include timely decision-making, awareness of their existing location, and variables affecting the business structure. Most participants reported that strategies to invest in other energy power sources such as generators and solar would help the manufacturing sector. In addition, participants conveyed that hydropower might only be used for production purposes, while alternative energy sources such as solar could be used for administrative office equipment and domestic consumption.

Presentation of the Findings

The qualitative multiple case study involved six senior managers in the manufacturing sector who have experience and were involved in shaping organization's policies, culture, vision, and mission, and successfully implemented strategies to manage hydropower interruptions. I used alphanumeric coding system i.e., Pax01 through to Pax06 to represent Participants 1 through 6. All participants were Zambians, with educational degrees in their respective disciplines. The research question that guided my study was: What strategies do manufacturing leaders use to manage hydroelectricity interruptions?

Table 2

Emergence of Themes and Number of Occurrences

Emerging themes	Number of Occurrence	Percentage of Occurrence
Managing Stock Gaps	11	83
Use of generators (turn -time)	11	83
Managing Cost of Input	9	100
Investment in Stabilizers and storage facilities to manage power fluctuations	13	67
Total		

Theme 1: Managing Stock Gaps

Theme 1 that emerged from the data analysis was managing stock gaps in the manufacturing sector. Eighty-three percent of target participants of leaders responded to:

What strategies have you used to manage hydroelectricity interruption? Participants reported that the primary and essential aspect was addressing the stock gaps in production as a strategy of managing hydropower interruptions. Pax01 stated, “The manufacturing industry must consider managing stock gaps to manage the effects of hydropower interruptions, and one quick option was to invest in generators.”

Pax02 further stated,

> Everything is based on production, and having a dormant plant is not beneficial to anybody since it must be operated; therefore, managing stock gaps is critical. We managed production in line with the peak periods and non-peak hours. Day production was subdivided because consumption was most during the peak periods. We opted to start off-peak production hours, i.e., during the night and activities that do not need hydropower during the day to stock up.

Pax03 stated, “Our changing over system during power interruption has been fully automated to eliminate delays or interruptions on production when faced with hydropower interruptions.” Pax04 mentioned, “increasing production time to overnight when power is available is a successful strategy to manage stock and have the labor force resting during daytime when there is no power to avoid loss of production time and man-hours.” Pax06 further stated,

> An off-grid system would have required batteries to store the power generated during the day for use even at night to manage production. Whereas an on-grid system would have fed the Power utility’s distributions lines with any excess

power the solar plan would have generated significantly reducing the initial cost of the project and cost of production.

Pax05 did not mention this theme but stated, “we invested in generators to power the plant, the only successful strategy. The company has not seen the need to modify its approach as it has good maintenance of the generators to have a powered plant.”

Correlation to the Literature and Conceptual Framework

The first theme aligns with the literature review on situational contingency theory of evolutionary systems adjusting to challenges where optimization focuses on contingency forecasting (Fielder, 1964). The situational contingency theory focuses on topical foundations (i.e., organizational systems and their environment and opportunities).

Productivity systems increase the proportion to the business's size (Cissokho, 2019). The loss of productivity because of power interruptions may require leadership to consider situational leadership style. The situational leadership style of contingency theory advocates that those leaders who focus on the challenges faced and control the situation. Leaders are confident that their team members will make suggestions and achieve desired success (Fielder, 1964). Manufacturing businesses consider initiatives by focusing on organizations' subsystems. This is indispensable because it expounds on the necessity for adaptiveness of business structures, team goals attainment, and fit among organizational corporate social implementation, tactics, and configurations.

The usefulness of leadership decisions is that they are used to address the purpose of circumstances the business faces and the quality of decisions (Csaszar & Ostler, 2020).

Decision-makers follow the most significant productivity decision and managing stock gaps in the manufacturing sector ensures production scheduling is aligned to the organization's demand. The efficiency of decisions enforces the purpose of challenges that incorporate appropriate information for the right decision (Csaszar & Ostler, 2020; Robinson & Le Ber, 2019).

Fit-for-purpose decisions are all-inclusive (Csaszar & Ostler, 2020), and certainty is critical because the manufacturing sector may not afford uncertainties in setting and planning production if the business is to achieve its goals and objectives. Manufacturers need to emphasize on investigating the location and variables affecting the business structures (Tsolka, 2020; Wilbur & Cameron, 2020). Stock gaps in production are critical because the sector is multidimensional and primarily operates in open systems. Therefore, leaders avoid high ambiguity conditions by engaging in operative models and making all-around convectional organizational forecasts (Huang & Lee, 2020; Tsolka, 2020). In summary contingency forecasting, decision-making and situational contingency theory provide manufacturing leaders the opportunity for a better foundation that may promote and cultivate leadership strategies and practices.

Theme 2: Use of Generators (Turn-Time)

The second theme that emerged from data analysis was the use of generators. Five out of the six target participants representing 83% of the target population when responding to: The interview question on what strategies have been most effective to manage hydroelectricity interruption? Agreed that investment in generators to manage

hydropower interruptions was a successful strategy for maintaining production. Pax01 stated,

> To manage stock gaps, you need to handle interruptions in the supply chain, and the easiest option is implementing generators. The reason is that if power is disrupted, it may cause a stoppage to the production line. Therefore, the use of generators is essential because of the turn- time if power is interrupted from the primary source, the generator's supply kicks in more immediately than any other power supply substitute.

Pax03 mentioned that, “the company invested in a 200kva diesel power generator to cushion the impact of downtime on production to manage the production line and stocks.” Pax04 stated “the organization purchased an industrial generator to be used during load shedding to manage production runs.” In comparison, Pax05 mentioned that “the business invested in generator units. We have used one strategy we thought was effective from inception and stuck to it by investing in generator units.” While Pax06 further stated “we employed electric generators to power the factory during load shading hours. Shuffled shifts around to ensure we had teams in place when power was scheduled to be on to ensure production of stock.”

Pax02 did not cite this theme but stated,

> The time of tap time was reduced from 1 hr 30 min to 1 hr 00 min due to oxygen optimization. Sheading the labour instead of 24 hr 00 min was reduced to 12 hr 00 min. At the same time 30% labour staff were permanent, and the rest were put on casual basis to avoid high unemployment.

Correlation to the Literature and Conceptual Framework

Theme 2 is relevant to the literature review of CT of emerging trends and influence on the manufacturing sector link in managing hydropower interruptions. Fielder, (1964), argued that the business environment affects how businesses are managed and is the best aspect to understand how the organization may be shaped and used to achieve optimum results. The theory relates to leaders decision-making, and the usefulness of a leader decision to address the purpose of circumstances and the significance of the quality of decisions (Csaszar & Ostler, 2020). Motivating team members' eagerness and reclaiming the team members' engagement level is a practical challenge faced by business managers, when faced with difficult choices (Park, 2019; Tifferet, 2020).

A nonfunctioning plant may not be helpful and could demotivate the workforce. Decisions to invest in generators are essential and involve higher task involvement results. Higher task results positively influence individual work and is aligned with job performance and satisfaction (Delfgaauw et al., 2020; Kumar, 2020; Yetton & Crouch, 1983; Zhao & Sheng, 2019). The suitability of employees in serving different circumstances is essential (Csaszar & Ostler, 2020). Therefore, employees' knowledge to operate generators and reduce idle man-hours may be necessary for an operational plant to continue production. Also, considering the challenges of hydropower effects on a business' external and internal practices to contextualize the operational atmosphere is critical for the organization's success (Negrão, 2019). Internal procedures align themselves to total productivity and aim to eliminate production downtime, practices

relate to continuous production flow, maintenance, and process controls within the business (Csaszar & Ostler, 2020; Negrão, 2019).

The external process analyzes the involvement of customers' and suppliers' feedback (Csaszar & Ostler, 2020). In summary, the complexity of running generators requires manufacturers to engage suppliers of services to maintain the generators and supply fuel needed for business operational efficiency. The organization must also supply manufactured goods to their customers. Managing hydropower interruptions by running on alternative power generating equipment like diesel-powered generators increases production costs (Phiri, 2017). In conclusion, investment and maintenance of generators ensure no break in operations, secure production line, and efficiency concerning other internal practices for archiving organizational goals. However, it may negatively impact the margins of the manufacturing businesses because product prices cannot increase since customers may not afford high prices reflecting the actual cost of the investment.

Theme 3: Managing Cost of Input

The third theme that emerged from the analyzed data were managing costs of input aligned to the cost of sales. All six leaders in the manufacturing sector, representing 100%, of the target population responded to: what strategies were least effective to manage hydroelectricity interruption? And how, if at all, have you modified your most successful strategies to manage hydroelectricity interruption? All participants agreed that managing the cost of input was a strategy they engaged in managing hydropower interruptions. Pax01 stated, "Cost of sales are functions derived from the cost of inputs. In addition, reduced labor would be an option, but this mainly advocates lowering the

cost of inputs and not much addressing the challenges of hydropower interruptions." Pax02 mentioned,

> Everything is based on the cost of production, and a dormant plant is not beneficial to anybody since it must be operated. We reduced it from 24 hours to 12 hours in the first phase and considered the tariff cost and what it could accommodate. The essential element was negotiating the price of inputs to have favorable prices. Other inputs such as oxygen plants and water plants were outsourced and sourced internally.

Pax03 further stated "the critical barriers for implementing this strategy were; The cost of procuring the 200kva generator, the cost of diesel for operation, and the cost of maintenance and servicing of the generator."

Pax04 further mentioned,

> Installation of additional solar-powered lighting was a once-off cost; however, we had to manage with the cost investment. Pax05 mentioned the key buriers where the high cost of procuring fuel for the generator set, and pax06 stated the solar plan would have generated stable power and significantly reduced the project's initial cost.

Correlation to the Literature and Conceptual Framework

Theme 3 aligns with the literature review on energy constraints and manufacturing business decisions. Energy constraints affect business decisions and directly influence the costs of operations (Wang et al., 2018). The cost of electricity is one significant input to product cost in the manufacturing sector (Hoare, 2017). The

aspects of consistency regarding hydropower plants behaving strategically and giving zero marginal cost may be the future and address the consumers' concerns (Pereira et al., 2017).

Decision-making that only forecast aspects of alternatives to manage hydropower interruptions are faced with the challenge of economic and organizational politics (Okta Rama & Harnani, 2021). It is, therefore, essential to consider indirect costs, which cannot be overlooked and may need to be prioritized just as direct expenses, primarily associated with enhancing the supply of electricity (Eales et al., 2017). Manufacturing businesses that secure conditions for operations may improve productivity and use input resources such as hydropower to minimize costs and maximize profits. In summary, when leadership is challenged with inflexible edifices and the organizational environment begins to change, it may require transformational adjustment to improve activities, reduce costs, negotiate tariff costs, fuel costs, and re-schedule production hours to maximize profits. Besides, reduction in the workforce could be an option when considering the cost of inputs and not necessarily addressing the challenges of hydropower interruptions.

Theme 4: Investment in Stabilizers and Storage Facilities to Manage Power Fluctuations

Theme 4 that emerged from the data analysis was investment in stabilizers and storage facilities to manage power fluctuations. Four participants out six representing 67% of the target population responded to; If any, key barriers to implementing strategies and how were any key barriers addressed? And what additional information, if any, can you share regarding your strategies to manage hydroelectricity interruption? Sixty seven

percent of the participants agreed that investment in stabilizers and storage facilities to manage hydropower interruptions was a strategy they used.

Pax01 stated

> To overcome most barriers, a need to invest in additional equipment to stabilize power fluctuations and protect plant and equipment is essential. Investments in capacitors to stabilize power or create false leverage when starting equipment not to cause harm or interrupt distribution of energy during production.

Pax02 mentioned that "part of product input is through the suppliers. It needs to consider the equipment designs that influenced investment in plant facilities to manage power interruptions and boost production."

Pax04 further stated,

> mastering the power availability timetable was not easy and working around it was ineffective. To this end, it was critical to invest in stabilizers and storage facilities. To maximize production, we store power on different power storage devices for use when we experience load shedding.

Pax06 mentioned

> Investment in a solar project was opted, but we shelved it due to the unavailability of funds. At the time, we faced challenges of getting the power utility to agree to sign us up for a 1MV on-grid solar plant that would have almost halved the cost of the projects due to the elimination of storage batteries.

Pax03 did not mention the theme but stated that,

we opted for a diesel generator due to its stable and reliable power output as compared to other power sources like solar power, which may not give a reliable power output due to factors like changes in the weather pattern.

Also, pax05, did not cite the theme but cited that "from inception we used only one strategy we thought was effective (diesel generator)."

Correlation to the Literature and Conceptual Framework

To continue being relevant and authentic in all business undertakings, organizations or individuals may need to understand and analyze their internal environment or inner-self and act according to the demands of the internal arrangements (Bhattacharyya, 2020). Internal practices relate to total productivity, continuous flow, maintenance, and process controls (Csaszar & Ostler, 2020; Negrão, 2019) within the organization's management.

Theme 4 aligns with the literature review on decision making, leadership, team management, authenticity, innovation, and information technology. When faced with no uniform view on the innovative design, leaders may be forced to prioritize change in terms of three crucial elements (Kwadade-Cudjoe, 2020; Zhao & Sheng, 2019): purposes of the innovation, the political environment for the sought innovation, and the processes. Initiating structure of CT advocates for locational understanding, role/task assignment, scheduling the production lines, planning, task completion, and objectives attainment leading to innovation (Fielder, 1964).

Innovation brings about transformation, and adaptation. For innovative ideas to be implemented, there must be visibly striking encouragement from leaders and proper use

of information management technology. Every manufacturer has a model for its operations based on a specific need of the model (Micieta et al., 2020). Modern-day manufacturers must be open to changes and consider locational understanding (fit for purpose) decisions (Csaszar & Ostler, 2020). When investing in storage facilities to manage power interruptions and safeguard equipment, understanding the cost of investment becomes essential (Hoare, 2017); therefore, leaders in the manufacturing sector may need to decide based on the returns on investment because the initial cost of investment eventually ends up in the final output. To summarize the manufacturing sector may overcome barriers by investing in equipment that stabilize power fluctuations and consider equipment designs influencing the investment in line with production demand and facilities.

Applications to Professional Practice

The application of the study to professional practice is beneficial for managers in the manufacturing industry in charge of strategy to manage hydropower interruptions. Additionally, the study may provide information to the business environment, address issues of managing production downtime, increase productivity through managing stock gaps, control costs, investment decision-making, job creation and satisfaction, and improve livelihoods of communities employed in the manufacturing sector. My study findings apply to the manufacturing industry's professional practice because it provides in-depth analysis and understanding that there is no universal or one best way to manage a business.

Organizations' systems should fit within the business environment. Businesses should be concerned with accomplishing goals and objectives by aligning their strategies, practices, techniques, technologies, and adequately designing systems to meet the current needs (Woodward, 1981). Thus, it is essential for managers in the manufacturing sector to carefully consider systems integration and immediate need for alternative power sources that operate using solar energy or generators. The strategies maybe aligned in response to market demands for products to address stock gaps, while focusing on quality and meeting customer requirements.

Information gathered from research participants and secondary data on how to manage hydropower interruptions in the manufacturing industry may apply to most manufacturers across the industry. In summary the use of generators has been key because of the turn-time when power is interrupted from the primary source of supply and generators kicks in immediately than any other power supply substitute. This information is integral to decision-making and a necessary concept underlying n key part of CT based on functional relationships. Fiedler (1964) proposed that team performance has a connection between the leader's personality and the situation faced. Therefore, the switch time difference in using generators and change of production lines is essential to the performance of a plant, the manager and his team, and the batch production which is continuous. Continuous production can be managed using generators due to the minimum switch time and help protect the equipment from hydropower interruptions.

CT rests on different statistical suppositions and compatibility. Therefore, researchers should distinguish the degree of interaction between two variables,

deliberated by the importance of correlation coefficients (McDonough, 2018). Leaders may have alternative strategies to secure jobs for their employees and offer a stable environment by not laying off some team members due to low production and idle person-hours. Fit or compatibility contingency theory assume relationships among two variables being contingent upon some third variable (Falkenhausen et al., 2019) and taking care of employees and communities may be critical to the success of manufacturing industries.

In summary everything is based on the cost of production when it comes to manufacturing sector and a dormant plant is not beneficial for business since it must be operated. In addition, its critical to manage costs by minimizing wastage caused by production downtime in manufacturing business. Wastage management may be reduced and managed using the Kaizen method (Criscione, 2020). This is in addition to other procedures such as reduced scheduling production hours, change in labour shifts, maintenance and servicing of generators, reliable fuel suppliers for generators, and investment in power stabilizers to protect equipment to maximize output and minimize cost.

Implications for Social Change

The qualitative multiple case study findings on strategies to manage hydroelectricity interruptions in Zambian manufacturing businesses contributes to social change by stimulating and appreciating essential leadership strategies within the manufacturing sector. Okta Rama and Harnani (2021) reviewed the connection concerning current arrangements of operational transformation in a country's economy

and poverty reduction. In the last two decades, some developing economies have become service-centered at the expense of subsectors, such as the manufacturing industry, which has ceased to drive structural transformation (Okta Rama & Harnani, 2021). In addition, the manufacturing sector's competence to generate employment and lead productivity growth has deteriorated in most developing countries, therefore a slowdown in poverty elevation and rapid increase in inequality. Economies' growth struggles if leadership styles do not conceptualize the need for subsectors such as manufacturing industries, and this increases unemployment because of low productivity making the fight against poverty and inequality in communities difficult (Okta Rama & Harnani, 2021).

Using CT strategies to capitalize on modern power stabilizers and storage facilities, generators to manage production stock gaps, input costs, and production during off-peak hours contributes to the economic stability of communities, citizens, and countries. Leaders who successfully implement these strategies improve employee job satisfaction, job security, employment, and organizational sustainability. The tangible improvements to individuals and communities are that it champions job creation, reduces poverty and inequality, and advocates for part-time employees who are not laid-off entirely and do not lose their income to maintain the employees' livelihoods and their families. Besides, the organizational culture is impacted positively by championing a fit-for-purpose environment that ensures the sustainability of the business.

In addition, making timely payments and managing the supply chains enables manufacturing businesses to negotiate production input costs (Snyder & Shen, 2020). Therefore, maximizing profits and empowering suppliers who directly have a positive

contribution to the communities and society. Successful emergent strategies from industry leaders indirectly enable them to employ companies that supply partly processed stock and resource inputs which helps manage the effects of hydropower interruptions during production.

Companies or suppliers who are directly involved in the supply chain of businesses may influence the communities they operate in (Snyder & Shen, 2020). Therefore, managing supply chain relationships may reduce youth unemployment levels and reduce poverty and inequality while diversifying the small-medium enterprises (SMEs); the result may contribute to the well-being of the communities, more job openings, and boost economic activities at both community and national level.

Recommendations for Action

Zambia is currently threatened with the ever increase in hydroelectric power intterruptions and this has posed a threat to business in particular the manufacturing sector and small-medium enterprises. The strategies provided by the participants in this study might offer essential information not only to the manufacturing industry but the entire business community. Key recommendations for action includes investments in generators, solar-powered plants, power stabilizers, and power storage facilities.

Although investments in diesel generators may not be sustainable due to the emerging urgency of climate change and availability of fosil fuel for operations because of activists campaigning against mining of fossil oils (Marqusee & Jenket, 2020). Alternative renewable energy sources may not only save the environment at the height of global warming but foster more environmentally-friendly power generating units.

Therefore, manufacturers may consider investments in power stabilizers and storage facilities to be fully operational when faced with the challenges of hydroelectric power interruptions. For the industry to achieve this, manufacturing business leaders may need to do the following:

1. Manage production stock through engaging teams in off-peak production hours .
2. Integrate timely leadership decision-making to invest in generators whose turn-time is faster than other alternative power sources druing intterruptions.
3. Manage the costs of production input through costs of sales.
4. Create contigency plans to manage barriers associated with managing the cost of diesel, maintenance and servicing of generators.
5. Develop strategies that account for the impact on climate regarding energy constraints and make suitable (alternative) green investments (Marqusee & Jenket, 2020).

Leaders in the manufacturing sector who desire to be successful may need to review and reflect on the findings of this study to identify areas of intervention to effect changes in their systems, business environment, policy and consider implementing the above strategies to plan and manage hydropower interruptions. Besides, dissemination of the results of this study through ZAM annual meetings and policy analysis sessions, and literature websites, including Walden University library, may be beneficial not only to the manufacturing sector but also to business communities in general.

Recommendations for Further Research

In this qualitative multiple case study, the aim was to explore strategies to manage hydroelectricity interruptions in the Zambian manufacturing sector. The target population was six senior managers who have proven success in managed hydropower interruptions. For further research and knowledge to be added to the manufacturing industry, I recommend increasing the target population sample and a different research design and methodology. A mixed method study approach may be valuable to address the quantitative aspects of the study. In addition, time was a limiting factor because of the target population. Therefore, I would recommend considering other operational staff to eliminate the restraints of data collection. I focused on manufacturers based in Lusaka, Zambia, and consideration of other cities would broaden the results. I would further recommend future research to consider different industries beyond the manufacturing sector that are challenged with power interruptions and non-strategic staff to examine the impact of power interruptions on businesses (i.e., small to medium enterprises (SMEs)). Finally, I would recommend further research to include the influence of climate change and the use of alternative renewable energy to manage hydropower interruptions for business sustainability purposes.

Reflections

The enthrallment I had to pursue My Doctor of Business Administration degree was motivated by both personal and professional perspective to enhance my skills as a scholar and leader. Having accomplished many goals in my career of management accounting, administration, lecturing, and finance, I was interested in expanding my

professional prospects by seeking new challenges in leadership, consultancy, business management, and strategic growth. Therefore, I challenged myself to conduct meaningful research that would satisfy my personal and professional career and contribute significantly to the body of knowledge with a focus on the manufacturing industry because of the passion and belief I have for the sector as a game-changer to reduce poverty and inequality.

I also wanted to make a meaningful contribution to the manufacturing industry by eliminating my personal understanding of how the sector has managed the challenge of hydropower interruptions. Being a critical industry for developing economies, one may not afford the luxury of sharing preconceived ideas and values compared to developed economies. Therefore, I thought I might assist leaders within the industry to develop suitable strategies to minimize operational costs, consider best alternative approaches and maximize profitability with possible consideration of green industrialization or production.

Walden University's commitment to social change presented an opportunity to view academia differently. The social change encouragement challenged me to take the research beyond the benefits of the industry and its impact on the communities and how business cannot survive without the community (its environment). The perspective of all-inclusiveness in a doctorate study triggered the need to elaborate on why industries should consider social influence in strategy formulation and execution. In this regard, I will endeavor to pitch my future presentation on the impact of social change on persons, societies, institutes, customs, philosophies, or civilizations.

The DBA journey was challenging, and Walden University's mode of delivery helped me perceive the rewards. In my four years of studying the program, I have learned and appreciated the need for patience, perseverance, consistency, kindness, and resilience. In my earlier stages, mostly at the prospectus stage, I almost gave up due to frustrations and costs affiliated with the program. However, it was during the prospectus stage, that I emerged more decisive and willful to complete my program as the learning journey unfolded and presented the brighter picture.

At the proposal stage, I excelled greatly, but then I hit a bottleneck during the IRB process and data collection. Fortunate, this time my focus was on the investment made, and milestones achieved that kept me pushing forward. I used my mentors/chairs to help me sail through. In addition, my family support and prayers kept reminding me why I pursued this course and the possibility of many communities that would benefit from the perceived social change. I faced challenges considering the industry's competitiveness during my data collection and analysis, and almost gave up. However, I maintained my ethics and professionalism as a researcher, not allowing any biasness to influence my study. Despite a general understanding of the challenges faced by Zambia with regard to hydropower interruptions.

In this qualitative multiple case study and target population new perspectives of the industry were brought to my attention and the genesis of hydropower supply to other sectors of the economy other than that of the mining industry. This perspective unlocked the interviews process and was free from biasness with objective interactions and critical assessment of the data captured. I followed the interview protocol, note-taking, and

software-aided programs to transcribe the interviews to maintain consistency. I checked for accuracy and completeness through the member checking process before concluding the analysis and outcomes.

Research papers consider several variations and contexts; the variations may be qualitative or quantitative. Therefore, it was essential for me to be distinct and concise with the choice of words and persevere in expanding my knowledge. I picked two critical lessons: simplicity of the intention of terms used and getting the job done. I have come to appreciate the importance of being concise. I enjoyed every moment with my global classmates and interactions with my chair(s) as well as the Walden university community. Distance was not a barrier, and I would do it again with Walden University!

Conclusion

Hydro energy demand is increasing significantly from 590 TWh to 3,100 TWh, whereas the installed capacity is expected to grow from 120 GW to 700 GW (Programme for Infrastructure Development in Africa, 2019). Implying that significant investment in hydropower and other renewable energy supply initiatives is required to meet future demand. In this qualitative multiple case study, I explored strategies that some manufacturing leaders use to manage hydroelectric power interruptions. The target population consisted of six leaders in the manufacturing sector who have demonstrated success in using strategies to manage hydroelectric power interruptions based in Lusaka, Zambia. I used MaxQDA to compile and analyze data efficiently.

The study generated four critical themes that emerged during data collection, and these were reinforced during the analysis of the data emphasizing the leading research question and conceptual framework. The study elaborated on the following themes:

a) Managing stock gaps,

b) Investment in generators (turn-time),

c) Managing cost of input, and

d) Investment in stabilizers and storage facilities to manage interruptions.

The findings aligned with the existing literature and comprehension concerning the CT that there is no one best way of managing a business. Besides, organizations should align themselves to the evolutionary decision-making attributed to the challenges faced. The use of leadership style, decision-making, and locational understanding proved to be efficient management styles to achieve organisational targets and objectives of the manufacturer. In addition, having an environment that aligns well with the demands of the organization and is task-oriented to motivate employees and enhance job satisfaction.

Managing stock gaps was critical and this translated into managing scheduling man-hours and investment in generators to keep production running. At the very best, the industry should consider investing in renewable energy such as solar-powered sub-station grid and supply any excess electricity generated to primary grids for domestic consumption, therefore, positively contributing to social change. Lastly, investment in power stabilizers and power storage facilities is an essential decision that manufacturing leaders must consider.

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Appendix A: Interview Protocol

Institutions/Organization: _____

Interviewee (Code): _____

Interviewer/Researcher: _____

Section A: Survey section used:

A.1: Interview Background (brief introduction and opening remarks)

A.2: Institutional Perspective and Strategic Management/leadership in Managing hydropower interruptions (interview questions)

A.3: Department and Discipline its central role in managing hydropower interruptions (investigative questions)

A.4: Demographics (no specific questions)

- Observation of non-verbal cues.
- Interpretation or elaboration of certain terminology or signs, as needed.
- To get more in-depth responses follow up questions and probing for clarity

Other topics discussed: _____

_____

Documents obtained: _____

_____

_____

Post Interview Comments or Leads: Schedule and book date or confirm date for particpants follow-up member checking via email, Zoom or phone call. Statement of appreciation and conclusion; general discussion of emergent arguments

Section B: Follow-up Member Checking

B.1: Send email to participants with summary of the interview responses for Member Checking and verification. Corrective action of views in line with participant's feedback; and inclusion of insightful minutes

B.2: Conduct follow up interviews after the initial interview to get feedback and responses on potential emerging themes from the data captured for further question and concise blending of the interpretation as needed for each of the interview questions to address the central research question of the phenomenon.

Appendix B: Sample Correspondence

Sample Phone/Zoom/email protocol

1. Ask standard question direct to the CEO/CFO/Production director for the manufacturing business
2. If the feedback or response is positive proceed with the assessment questions. If feedback is negative, thank the participant for engaging and their time then end conversation.
3. If the feedback is positive book for an appointment:

   Script: When and what timings would it be suitable for us to meet physical or virtually?
4. Wait for the response, address any concerns or clarifications sought, schedule time and politely ask for valid and preferred email and phone number.

   Script: Follow up with an email for your confirmation after agreeing on the date and timings for the interview. Thank you for your time and appreciate your assistance, looking forward to meeting you as per agreed time and date!

Email confirmation Standard:

Subject: Request to take part in a Research Study

Dear {Participant/Recipient Name}

My name is Mpafya Mutapa, and I am a doctoral student at Walden University (USA) undertaking my Doctor of Business Administration (DBA) degree.

I am conducting a study to explore what strategies manufacturing leaders use to manage the increase in hydropower interruptions.

I plan to conduct individual interviews with a minimum of six managers at strategic level i.e., CEO/CFO/Production line directors within Lusaka, Zambia to gain an understanding of modern methods used in business to address issues of hydropower interruptions.

The aim of this study is to benefit society by providing information to the business environment, by addressing issues of production down time, increase productivity, job creation, and improve livelihoods of communities employed in the manufacturing sector. In addition, the study may be used for further research to be added to the knowledge database.

After successful completion of all interviews, the data captured from the interview will be transcribed, and additional notes taken during the interview by myself will be added and recognize any potential themes that will be provided to you for feedback and member checking. The whole idea of this process is to remove any biases and ensure that I transcribe the Interview correctly and the meaning and context of the interview discussion is captured truthfully.

If you wish to withdraw from this interview at any particular time, please do not hesitate to inform me directly via my phone or reply to the same email address.

Thank you very much for your consideration and I look forward to hearing from you. If you have further questions concerning the same, please feel free to contact me.

Mpafya Mutapa (Mr.)
DBA Student, Walden University

Appendix C: Interview Questions

The following question will be used in a semi structured interview approach to probe participants understanding of the phenomenon and collect data.

1) What strategies have you used to manage hydroelectricity interruption?
2) What strategies have been most effective to manage hydroelectricity interruption?
3) What strategies were least effective to manage hydroelectricity interruption?
4) What, if any, were the key barriers to implementing strategies to manage hydroelectricity interruptions and how were any key barriers addressed?
5) How, if at all, have you modified your most successful strategies to manage the hydroelectricity interruption?
6) What additional information, if any, can you share regarding your strategies to manage hydroelectricity interruption?